Master's Thesis

FROM WASTE TO EMBRACE

Driving Circular Strategies through Inclusiveness in Dutch Circular Area Development

Written by:

Arishta Oemrawsingh

TU Delft

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Master Thesis Research

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This thesis is written in fulfilment of the requirements for the degree of Master of Science (MSc) for the master program Construction Management and Engineering (CME) at the Faculty of Civil Engineering & Geosciences at Delft University of Technology.

TU Delft

Colophon

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Preface

Ironically, this preface marks the beginning of your reading adventure, yet for me, it is the grand finale of my challenging journey through this research thesis. After dedicating nine long months solely to this pursuit, I am elated and excited to present you with this report. This thesis is the culmination of my entire university experience, albeit one that was spent in a maze of restrictions brought on by COVID. Despite the difficulties, it has been an enlightening, stressful, but all-around wonderful adventure for me. When it came to selecting my research topic, it was a no-brainer. Every course related to area development and circularity genuinely piqued my interest, and I always knew this is what I would be graduating on.

This research has taught me much more than its contents; it has taught me patience, perseverance, and dedication. Before I dive into the acknowledgements, I must express my sincere gratitude to my first supervisor, Quirien Reijtenbagh. Throughout this process, your consistent support, sincere curiosity, and eagerness to impart your knowledge have been nothing short of exceptional. Special shoutout to our little in-between sessions of geeking out, talking about everything Marvel – they were "Loki" the best! I would also like to express my gratitude to Dr. Aksel Ersoy, my second supervisor, for his insightful feedback and probing remarks that kept pushing me to improve my work. Furthermore, a big thank you to my chair, Dr. Daan Schraven, for his valuable input during our sessions. Your knack for using analogies always amused me and made your feedback stick, making it easily understandable.

Lastly, I want to extend my heartfelt thanks to all the participants who made time for this research. Without you, this research would not be complete. Each and every one of your dedication and passion for sustainable, circular, and inclusive neighbourhoods has been truly inspiring and has strengthened my belief in my research even more.

Of course, I cannot forget to give a special mention to my family and friends. You have been my pillar of support throughout this process, always listening intently with a smile on your faces. Even when my research jargon went over your heads, you remained interested, and for that, I thank you. Your patience and love have meant the world to me, and during this process I felt them even more strongly. Lastly, to my wonderful parents, mama and papa, thank you for your unwavering love, support, and countless sacrifices. This thesis is dedicated to you, as a token of my deepest gratitude.

And now, with nothing else left to add, I simply say: happy reading!

Arishta Oemrawsingh
29/06/2023

Executive Summary

Introduction

Global efforts to combat climate change are increasingly influencing national strategies. The Netherlands, for instance, has adopted the "*Nederland circulair in 2050*" policy, striving for a waste-free, circular economy (CE) by 2050. Circular area development is a relatively novel development and one of the strategies the Dutch government is implementing to assist the country in achieving the goals outlined above. Circular area development focuses on resource optimisation within a particular geographical area, taking into account the entire lifecycle of such resources from creation to end-of-life. The CE concept is central to circular area development, where waste is reduced and materials are continuously reused, thereby producing a sustainable loop.

Inclusiveness, the notion of creating equitable environments where everyone can participate, is a critical consideration in circular area development. This ensures that urban planning, design, and governance include all perspectives, particularly those from marginalised or underrepresented groups. The issue of inclusiveness in circular area development is relatively underexplored, revealing a knowledge gap in the existing literature. Addressing this, the research aims to develop guiding principles for inclusiveness in Dutch circular area development through a comprehensive literature review and semi-structured interviews. These principles are expected to provide a pathway for policymakers, stakeholders, and practitioners to drive the implementation of circular strategies, ensuring inclusivity throughout the transition.

The main research question for this research is:

How can the application of inclusiveness principles support and drive the implementation of circular strategies within Dutch Circular Area Development?

This research's findings offer valuable guidance to stakeholders in planning and decision-making phases of circular area development projects, aligning them with inclusiveness and CE goals.

Methodology

The study adopts a qualitative exploratory research method to research the concept of inclusiveness in circular area development. According to Busetto et al. (2020), the flexibility provided by qualitative research makes it suitable for the context and aims of this research. The necessary data for the study is primarily obtained through a comprehensive review of relevant literature and semi-structured interviews. These interviews enable a more in-depth understanding of how inclusiveness is perceived and incorporated in Dutch circular area development projects.

A theoretical overview is developed using the literature review, this overview is used for the semi-structured interviews in order to guide the development of guiding principles for inclusiveness in circular area development.

Thematic analysis, a method that focuses on identifying patterns within a data set, is used for analysing the collected data. It allows the identification of key themes and patterns (Braun and Clarke, 2012; Vaismoradi et al., 2013) in the data. This approach begins with data familiarisation, followed by the creation of codes that summarise the essential components of the data. Subsequently, related codes are grouped together, allowing emergent themes to be identified. After a careful review and precise naming, these themes inform the research findings. These themes enabled the development of the initial set of guiding principles. The accumulated data is processed and evaluated in order to find key patterns and themes that inform the set of guiding principles. As a result, the research yielded a comprehensive set of guiding principles informed by both the theoretical framework and practical observations through interviews.

Results

The theoretical overview required refinement to align more accurately with the specific circumstances in the Netherlands, revealed during the semi-structured interviews. This revised theoretical overview maintains its academic foundation while integrating practical insights gathered from interviews, ensuring its relevance to the realities of inclusiveness in Dutch circular area development.

The initial set of guiding principles are developed based on the literature review, theoretical overview, and the semi-structured interviews. These principles serve as practical guidelines for various circular area development stakeholders, including businesses, policymakers, and society. An analysis of the interviews revealed five main themes for developing principles of inclusiveness in circular area development. These themes are: Stakeholder Engagement & Collaboration (with seven principles under this theme), Education & Awareness (two principles), Access & Equity (five principles), Promotion of Sustainable & Circular Practices (three principles), and Localisation (three principles). Each theme contributes to the broader understanding of inclusiveness in Dutch circular area development, providing a comprehensive framework for further exploration and application.

During the interviews, many barriers for the successful implementation of inclusiveness in circular area development were discussed. These barriers form the preconditions necessary for the successful implementation of the initial set of guiding principles. These preconditions are Reorient Organisational and Societal Structures to Better Implement Circular and Inclusive Strategies, Enable Policy Coherence and Adaptability for Effective Implementation, Decrease the Shortage of Skilled Professionals, Update the Rewarding system that Incentivises Traditional Behaviour to Sustainable Reward System, Reorient Area Development from an Economically Dominated Model to a Human-Centred Model, Improve the Economic Viability in circular area development Strategies, and Turn Inclusiveness into a Standard for circular area development.

Conclusions

The initial set of guiding principles highlight the importance of trust, openness, clear communication, and inclusiveness in the successful execution of circular area development projects. By considering these principles, the decision-making process and strategic planning in circular area development can be significantly enhanced.

The guiding principles identified in this research serve as a foundation for supporting and driving circular strategies in Dutch circular area development. Principles under the theme of Stakeholder Collaboration & Engagement stress the importance of inclusivity and balanced power dynamics. Similarly, principles in the Education & Awareness theme emphasise the need for integrating circular thinking in education and fostering community involvement in sustainable practices. Further, Access & Equity principles underscore the government's role in promoting CE activities and ensuring equitable access to circular area development benefits. Principles relating to the Promotion of Sustainable and Circular Practices stress the need for a paradigm shift towards shared models of consumption and appreciation of the economic, environmental, and social values of circular practices. Lastly, principles under the theme of Localisation highlight the need to tailor circular initiatives to local contexts, considering individual needs, local resources, and community potential.

This study emphasises the importance of inclusiveness as a key aspect in circular area development and the transition to a CE. When implemented successfully, inclusivity may propel communities to be more sustainable, resilient, and equitable, allowing significant progress towards a more inclusive and CE.

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List of Abbreviations

UN	United Nations
GHG	Greenhouse Gas
CE	Circular Economy
CAD	Circular Area Development
EIPs	Eco Industrial Parks
MQ	Main Question
SQ	Sub-Research Question
BE	Built Environment
C2C	Cradle to Cradle
3Rs	Reduce, Reuse, and Recycle
CC	Circular City
SLR	Systematic Literature Review
SD	Sustainable Development
NGOs	Non-governmental organizations

1. Research Introduction

According to the United Nations (UN), the world population was 7.6 billion in 2018, with 4.2 billion residing in cities. By 2050, the world's population will be 9.7 billion people, with 68% of them living in cities (The World Bank, 2019). Of more than 75% of all global greenhouse gas (GHG) emissions attributed to human activity, energy consumption is by far the greatest contributor. Transportation, electricity and heat, buildings, manufacturing, construction, fugitive emissions, and other fuel combustion are all included in the energy sector (Mengpin et al., 2022).

Cities account for more than 75% of a country's GHG emissions, and they are highly accountable for the world economy's carbonization (Wei et al., 2021). The two main sources of these GHG emissions in cities are transportation and construction (UN Environment Programme, n.d.). At the same time, the construction industry consumes 40% of all materials and produces 40% of all waste. The need for change in the built environment (BE) is largely recognised. As a means of addressing the aforementioned challenges, the Paris Agreement of 2015 is the first global climate change agreement to include policy responsibilities for all nations in order to lower global warming with 1.5 degrees Celsius compared with pre-industrial levels by the end of the century (Radoslav, 2016; UNFCCC, 2015).

1.1 Dutch Measures

Many nations, including the Netherlands, are working on their plans to achieve the objectives outlined in agreements like the Paris Agreement. By 2030, the government hopes to attain the (intermediate) goal of 50% use of primary resources (minerals, fossils, and reserves) in collaboration with social partners. The Netherlands' objectives to attain this aim of utilising raw materials are similar to those of other countries. A policy called "*Nederland circulair in 2050"* was passed in June 2018 to reduce greenhouse gas emissions by 100 percent by 2050. So, by 2050, the Netherlands aims to achieve a circular economy (CE). An economy in which waste is non-existent, goods and raw materials are reused, and sustainable renewable resources are used as much as achievable (Rijksoverheid, 2018). The CE is one of the strategies for mitigating or limiting climate change (Rijksoverheid, 2016).

Only through a shift from the existing linear economy can a CE be realized. The conventional linear economy revolves around the production of waste from natural resources, generally better known as the *take-make-dispose* concept. The traditional method of manufacturing products and then discarding them as waste is harmful to the environment. Although society has fully developed recycling and advocates resource efficiency, actions aimed at achieving this efficiency ignore the finite nature of material supply (Ellen MacArthur Foundation, 2015). Cities function in a global economic system built on a linear economy, which reflects and exacerbates the model's flaws. An increase in demands and strains on urban infrastructure and higher usage of city resources have resulted from population expansion (mostly in cities). This, along with a lack of an integrated city management plan, results in economic losses from structural waste as well as adverse environmental impact (Ellen Macarthur Foundation, 2017).

1.1.1 Circular Area Development

Circular area development (CAD) is a relatively novel development. It is one of the strategies the Dutch government is implementing to assist the country in achieving the goals outlined in accordance with policies like "*Nederland circulair in 2050"*.

Key areas which CAD focusses on are the development of circular buildings that make the most use of available resources and allow for continued use of the structure and its components. For instance, by recording the products and materials used in the structures in building- and materials passports, by incorporating R-ladder design principles, or by examining the effects that building methods and material selections have. All of these interventions are quite helpful, especially when the market is being pushed toward environmentally friendly solutions (van Bueren et al., 2021; Metabolic, 2021).

However, CAD involves more than just limiting material flows at the building level while it is being constructed. The BE has a significant influence, much of which is localised at the area level. The location of different functions like living, working, and leisure in the urban environment, as well as decisions about infrastructure and mobility, are all determined at the area level (Metabolic, 2021). CAD is also concerned with where these material flows fit into the area. This applies to both the construction and renovation of buildings and areas, as well as during the use of those areas and the buildings therein. It concerns both a scale and spatial issue (van Bueren et al., 2021). Circular strategies like reuse, recycling, and energy recovery are examples of looping actions that are essential to the supply of circular resource flows in areas like cities. However, there are several impediments in the way of these actions being put into effect, for example, a lack of resources and security challenges (Williams, 2019).

Post-industrial areas are prevalent in many European cities, particularly close to the downtown. It is becoming more widely accepted that previously built land—such as post-industrial landscapes—is an underutilised resource for urban redevelopment (Loures, 2015). Many post-industrial districts in the Netherlands like Rotterdam (Merwe4Haves), Amsterdam (Buiksloterham), and The Hague (Binckhorst) are now using CAD as a redevelopment plan. Using additional financing, expertise, and collaboration to encourage the growth of circular enterprises, place-specific policies are employed in CAD to transform areas into circular hubs (van der Ven, 2021).

1.1.2 Inclusiveness

Cities serve as a melting pot for people from many cultural backgrounds, faiths, passions, and socioeconomic statuses in an increasingly urbanised world. Cities and municipalities in this situation must simultaneously deal with the challenges of accommodating the influx of people from various social and racial backgrounds and combating the trend of growing socioeconomic polarisation and the segregation of cities into affluent and underprivileged neighbourhoods (Hanson, 2004). A city that is inclusive is intended to remove barriers for all classes and demographics (Alsayel et al., 2022).

First, it might be challenging to define what "inclusive" actually entails and how cities actually achieve this (Alsayel et al., 2022). Since it is still unclear which social groups should

be included in what specific locations, opportunities, or activities, as well as how the interests of some identified groups can be taken into account and respected without unduly compromising those of others, the concept of "inclusion" is particularly underdefined (Alsayel et al., 2022). The basis of inclusiveness, however, is upon the process of creating environments in which all individuals, regardless of their background or ability, can participate, contribute, and have their voices heard.

In the context of CAD, inclusiveness refers to the idea that the planning, design, and governance of areas should be equitable, empowering, and inclusive. This is done by taking into account all viewpoints, requirements, and contributions of all actors, especially marginalised and underrepresented groups (McDonough and Braungart, 2002).

1.2 Problem Statement

While hundreds of millions of urban dwellers' basic needs are still unmet, cities are already plagued by serious environmental issues like pollution, congestion, and excessive waste. Unprecedented urbanisation makes it even harder to provide everyone with access to adequate housing, energy, water, sanitation, and mobility. Cities are at a turning point. The success of cities in providing services to everyone while growing competitively within a protected environment for decades to come will depend on decisions taken now about the development of urban infrastructure and these decisions need to be founded on socially inclusive concepts (United Nations, 2011).

The main objective of CAD is the development of an area that functions as naturally as attainable for all users and in which cycles are closed as much as possible (Metabolic, 2021). CAD is a practical application of CE principles and its aim is to create sustainable, circular systems in a community. However, as it gains popularity, there still is a risk that certain members of the community will not be able to participate in the shift to this CE. With that being said, the success and legitimacy of the transition to a CE depends on ensuring that it is inclusive and accessible to all members of a community. Therefore, it is imperative to examine how inclusiveness can contribute to supporting and driving circular strategies within Dutch CAD.

The problem statement is that while CAD intends to establish a CE, not everyone may be able to participate in this CE. It is crucial to include those who might struggle to adjust to this change and to make sure that inclusiveness is a top priority during the transformation process.

1.2.1 Knowledge Gap

Numerous studies have suggested the CE as a viable solution to the challenges of resource scarcity and climate change, which have been made worse by population increase and expanding infrastructural needs (Blomsa and Brennan, 2017; Bocken et al., 2016; Ghiselinni et al., 2018; Schroeder et al., 2019, Stahel, 2016). There is a notable knowledge gap in understanding the social dynamics involved (i.e., how individuals behave in a group over time and how they can collaborate) and the social advantages of a CE, despite the fact that there is a plethora of technical literature on circular strategies, like "how" to close loops (Swagemakers et al., 2018). Murray et al. (2017, p. 25) wrote that ‘of the three pillars of

sustainability (social, economic and environmental) it is the former that is least expanded in most of the conceptualizations and applications of the CE'. In order to build a comprehensively sustainable strategy, some scholars have urged increased attention of the social dimension of the CE (Blomsma and Brennan, 2017; Kirchherr et al., 2017; Merli et al., 2018). Inclusiveness is often considered an important aspect of social dynamics, as it can shape the quality of relationships and interactions between different social groups. It can also influence the degree to which diverse perspectives and experiences are taken into account in decision-making processes, leading to more equitable and sustainable outcomes.

The concept of inclusiveness in CAD has not been studied widely. This is concluded by conducting a systematic literature assessment on Google Scholar, where relevant search terms as "Inclusiveness" and "Circular Area Development" were used. This resulted in a limited number of scholarly articles. This review so made clear that this topic is underexplored still in academia and is in need of further comprehensive study. There is a limited understanding of how inclusiveness can be integrated into circular strategies to make them more inclusive for each member of the community. There is not much written about the barriers to participation in CAD and potential benefits that inclusiveness may have for CAD. There is much to be studied on the potential contribution of inclusiveness to the development and implementation of circular strategies within Dutch CAD.

This knowledge gap will be filled by the data collected by this research. Data collection will be done by a comprehensive literature review and semi-structured interviews.

1.2.2 Research Objective

With acknowledging the knowledge gap in the literature of inclusiveness in Dutch CAD, it is deemed important to develop an initial set of guiding principles, inspired by the approach taken by Konietzko et al. (2020), who utilised this approach for their own research, citing a need for more knowledge regarding innovation towards more circular ecosystems. The intention of these principles is that they will serve as normative propositions, create a standard for evaluation, and establish a common understanding of inclusiveness in CAD.

The primary objective of this research is to identify and establish an initial set of guiding principles for inclusiveness within the context of Dutch CAD, for driving and supporting the implementation of circular strategies. These guiding principles could provide guidance for policymakers, stakeholders, and practitioners working towards a more inclusive CAD.

A transition to an inclusive CAD is essential for creating a CE that is inclusive, sustainable, and able to meet future expectations. In the transformation process, inclusiveness must be a key consideration. Participatory research, inclusive methodologies, and inclusiveness in the urban environment can all be used to guarantee that the government, residents, and stakeholders from all backgrounds are involved in transitions that are just, sustainable, and inclusive (López Reyes and Mulder, 2021; Huttenen et al., 2022; Soma et al., 2018). This philosophy is reflected in the 2030 Agenda for Sustainable Development, which states that "no one should be left behind." Nevertheless, despite the fact that this idea is frequently used and mentioned, targeted efforts in terms of policy creation, implementation, and review remain insufficient.

1.3 Research Questions

The following main research question (MQ) is derived from the problem statement and research objective:

How can the application of inclusiveness principles support and drive the implementation of circular strategies within Dutch Circular Area Development?

To provide a more comprehensive response to the main research question, the following sub-research questions (SQ) are formed:

1. How are inclusiveness and CAD defined and conceptualised?
2. What inclusive strategies can be used to advance circular strategies in CAD projects?
3. What methods and approaches can be employed to analyse Dutch CAD for inclusive and circular principles?
4. What are the key principles for inclusiveness in Dutch CAD?

1.3.1 Research Importance

Based on the underlying assumptions that other studies have noted the need for additional research on the social dynamics involved and the social benefits of the CE, this study emphasises the potential value that inclusiveness may have in the development of circular areas. Progress in creating a more sustainable and inclusive CE can be gained by examining how inclusiveness might help circular strategies in CAD. The results of this study can also guide future research into the development of inclusive circular areas, adding to the body of knowledge in this area and influencing practise and policy.

Policymakers, practitioners, and communities in the Netherlands could benefit from research on the role of inclusiveness in CAD. The guiding principles can guide stakeholders during the planning and decision-making phase of a CAD project, as well as be incorporated in a CAD project's requirements or guidelines, helping ensure that the project's outcome align with goals of inclusiveness and the CE.

Policies and initiatives that promote equitable and sustainable CAD can be devised by focusing at how inclusiveness might contribute to circular strategies. Research on the benefits of inclusivity in CAD can also encourage community involvement in the formulation and application of circular development plans.

1.4 Research Demarcation

CAD in the Netherlands is the study's primary topic. Area development is typically deeply ingrained in local laws and regulations. There are various plans, authorities, and processes in every nation, province, and municipality. Different nations have different business models, legal documentation, and ways of collaboration. Comparing CAD to conventional area development in the Netherlands will be pointless when looking for new deltas across all those distinct factors in other nations.

The circular development of areas involves a wide range of stakeholders. This study focuses on one side's experiences with circular development. Managers, advisors, supervisors etc. working from the bottom up are referred to as "the developer side." Top-down approaches from the municipality and other perspectives on the development of circular areas are not included.

1.5 Research Strategy

Table 1.1 Research Design

Part	Sub-question(s) Answered	Description	Methodology
1 Concepts	1 & 2	The first part of this research delves into the concepts to lay the foundation of this study. A comprehensive literature review will be done to understand how these concepts are defined and explained. In this process, definitions, theoretical perspectives, and contexts associated with inclusiveness, the CE, and CAD will be discussed. After the theoretical review, the focus shifts from understanding the conceptual essence of inclusiveness and CAD to uncovering practical strategies that embody these principles. The purpose of this section is to make a theoretical overview.	Literature reviews
2 Practices	3	This part of the study aims to determine the most effective approach to research CAD projects from the perspective of inclusiveness. In this phase, as part of the methodology, interview questions will be developed, and the interviews will take place. The purpose of this phase is to compare theory and practice, by asking interviewees to give their perspectives on the theoretical overview in the Dutch context.	Semi-structured interviews
3 Synthesis	4	In the last part of the research, there will be synthesis of academic perspectives with practical insights from experts in the field. The end result will be a set of guiding principles based off this synthesis. This part ends with conclusions and discussion.	Lesson drawing

1.6 Thesis Outline

Seven thesis chapters represent three research parts that make up the research: *Concepts, Practices, and Synthesis*. Research aims, questions, and techniques are included in each of these three sections. In the sections that follow, these are explained. Using a specific research methodology, this main question is addressed (figure 1.1).

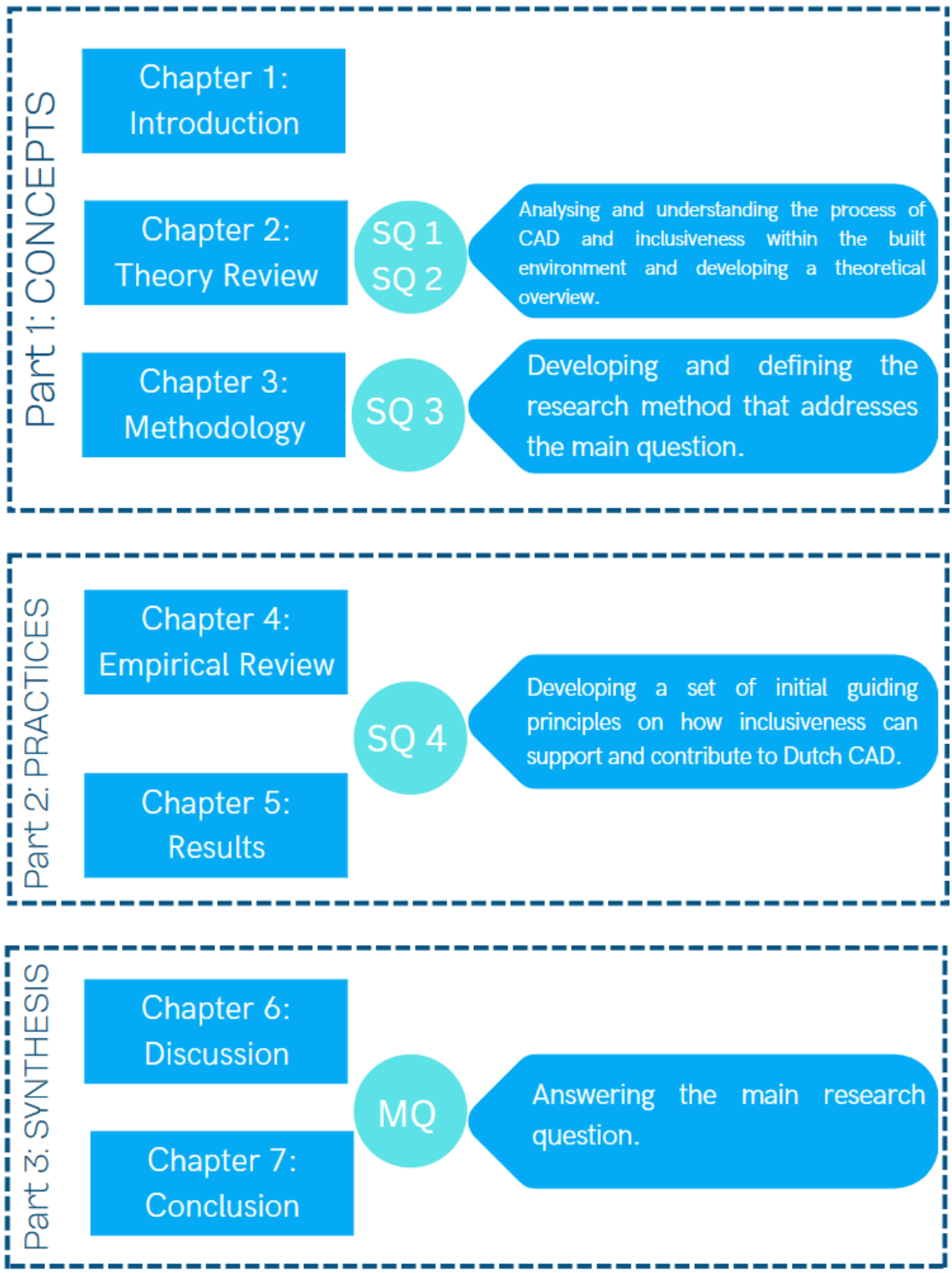


Figure 1.1 Thesis Outline. Own Illustration.

2. Theory Review

This chapter aims to answer the first and second research question, namely, "H*ow are inclusiveness and CAD defined and conceptualised?"* and *"What inclusive strategies can be used to advance circular strategies in CAD projects?"*

2.1 Introduction to the Theory Review

This chapter provides insights to the concepts of CAD and inclusiveness and provides an overview of the concept of CE and inclusiveness strategies in the context of CAD.

This literature review gives the reader a clear understanding of the fundamental ideas upon which the research is based and shall cover key areas for creating a solid foundation for addressing the main research question: "*How can the integration of inclusiveness principles contribute to the development and implementation of sustainable circular strategies within Dutch Circular Area Development?*" The review begins with exploring the CE concept and its principles. This is needed to better grasp the concept of CAD, its applications in urban planning, and its relationship with CE principles.

To better understand inclusiveness, its importance is discussed in sustainable development (SD), and inclusiveness in CAD is discussed. Attention is given to the knowledge gap in understanding the social dynamics involved in CE and the social benefits that may arise from it. The review will examine the existing literature on inclusive strategies in CAD projects and the potential benefits and challenges of implementing such strategies.

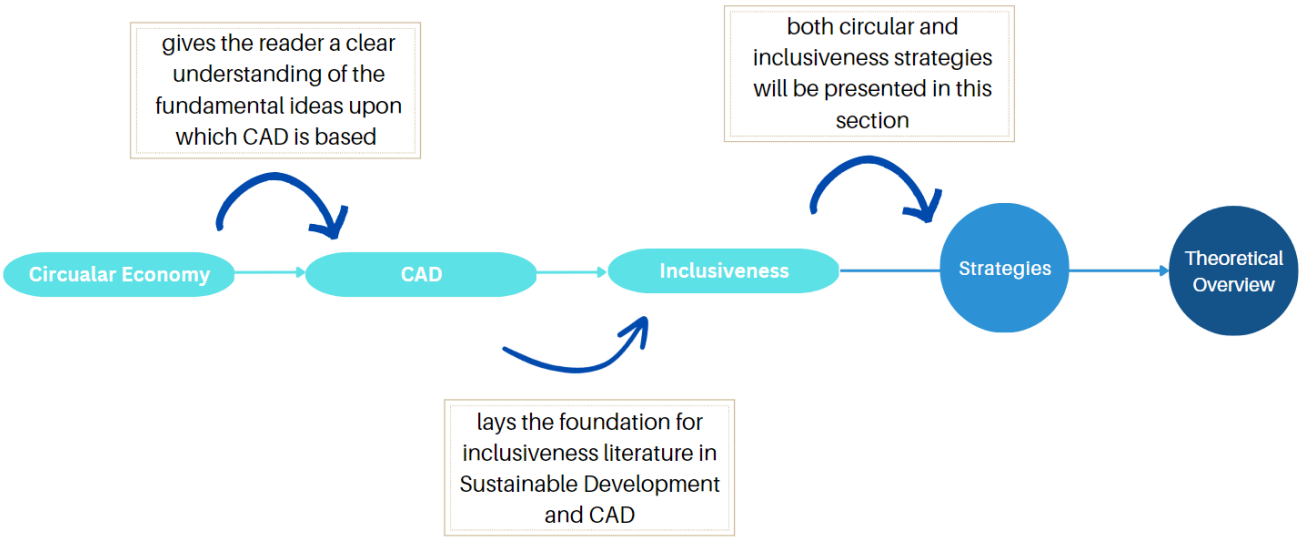


Figure 2.1 Overview of the Chapter. Own Illustration

2.2 A Brief History of The Circular Economy

Academics and politicians have been pressured to develop a new pattern to depart from the economic model used since the industrial revolution in order to better manage resources that are becoming more limited and to mitigate severe environmental repercussions. The concept of CE was developed during the course of the past century and gained widespread acceptance in the past 10 years. However, the origins of CE remain unclear and cannot be directly attributed to a single piece of work. It is generally agreed upon that the concept of CE is deeply rooted in a variety of perspectives. Figure 2.3 gives a comprehensive view of all theories regarding circularity (Friant et al., 2020).

The CE is a strategy that is being promoted as a viable replacement for the present linear economy. In terms of a circular model of reduce-reuse-recycle, the CE offers a method for reducing waste and increasing resource value retention, a goal that has been at the centre of circularity since the beginning of the concept. The conception of circularity can be found related to ways to deal with waste.

With its origins in industrial economics and the product-life factor, the CE concept was given life in the 1980s. Whereas the first wave of circularity theories dealt with waste reduction, this group had its focus on connecting input and output in strategies for eco-efficiency (Friant et al., 2020).

The last wave of circular theories focus is on integrating socio-economic approaches to resources, consumption, and waste. It can be further divided into reformist views of circularity and transformational views of circularity. Theories such as regenerative design, cradle2cradle (C2C), and performance economy were part of the reformist views of circularity. The transformational views of circularity include blue economy, material efficiency, transition movement, and transition design (Friant et al., 2020).

The Ellen MacArthur Foundation bases CE on three principles: eliminating waste and pollution, preserving commodities and resources, and renewing natural systems. A shift to a CE, according to the Foundation, increases long-term resilience, commercial and economic possibilities, as well as environmental and societal benefits like promote the wellbeing, decreased inequality, and prosperity of all its citizens (Ellen MacArthur Foundation, 2015; Schröder et al., 2020). In short, the CE is essentially concerned with reducing environmental impact and value retention of products and materials.

2.3 Link Circular Economy to Circular Area Development

The link between CE and CAD is the BE. The BE has a substantial influence on the environment and offers significant opportunities for lowering energy use, greenhouse gas emissions, and waste production. The literature of CE ideas in the BE is often disconnected and focuses on the challenges of one supply chain stage, often the end-of-life stage. The focus is mostly on recycling and reuse as ways to reduce waste from construction and demolition (Adams et al., 2017).

There are various dimensions to the BE. These dimensions are called Building Scales, and they can be viewed from various angles. These dimensions are differentiated to simplify

	Circularity 1.0 and 2.0: Techno-fixes to waste		Circularity 3.0: Integrated socio-economic approaches to resources, consumption and waste		
Precursors to circularity	Circularity 1.0: Dealing with Waste	Circularity 2.0: Connecting Input and Output in Strategies for Eco-Efficiency	Circularity 3.1 Reformist views on the Circularity		Circularity 3.2 Transformational views of Circularity and visions of the Global South
Preamble Period		Excitement Period		Validity Challenge Period	
1945-1980		**1980–2010**		**2010-present**	
Gandhian economics (Kumarappa, 1945)	Waste-Water Treatment (Holcomb,1970)	Industrial Ecology (Frosch and Gallopoulos, 1989)	**First holistic Circularity frameworks**	**New holistic Circularity views**	**Transformational views of Circularity**	**Non-western visions of Circularity**
The Economics of the Coming Spaceship Earth (Boulding, 1966)	Solid Waste Management and Recycling (Levick and Davies, 1975)	Circular Economy (Pearce and Turner, 1989)	Rio Declaration on Environment and Development (UN, 1992)	Blue Economy (Pauli, 2010)	Transition Movement (Hopkins, 2008)	Buen Vivir/ Sumark Kawsay (Government of Ecuador, 2008)
The tragedy of the Commons (Hardin, 1968)	Bio-Digestion (Hughes, 1975)	Eco-design /Design for environment (Ryan *et al.*, 1992)	Regenerative design (Lyle, 1994)	Material Efficiency (Allwood *et al.*, 2011)	Degrowth (Latouche, 2009)	Ubuntu (Shumba, 2011)
The Population Bomb (Ehrlich, 1968)	Energy Recovery (Boyle, 1977)	Cyclic Economy (Tibbs, 1993)	Natural Capitalism (Hawken *et al.*, 1999)	Third Industrial Revolution (Rifkin, 2013)	Eco-socialism (Löwy, 2011)	Ecological Civilization (Zhang *et al.*, 2011)
The entropy law and the economic process (Georgescu-Roegen, 1971)		Industrial Metabolism (Ayres and Simonis, 1994)	Sound Material-Cycle Society (Government of Japan, 2000)	Eco-system Economy (Scharmer and Kaufer, 2013)	Laudato Si' (Pope Francis, 2015)	Ecological Swaraj (Kothari et al., 2014)
The Closing Circle (Commoner, 1971)		Cleaner Production (Baas, 1995)	Cyclical Economy (Young *et al.*, 2001)	Regenerative Capitalism (Fullerton, 2015)	Transition design (Irwin, 2015)	Suma Qamaña / Vivir Bien (Artaraz and Calestani, 2015)
Social Ecology (Bookchin, 1971)		Reverse Logistics (Rogers and Tibben-Lembke,1998)	Materials Matter (Geiser, 2001)	Sharing Economy (Frenken, 2017)	Economy for the Common Good (Felber, 2015)	Buddhist, Confucian and Taoist ecology (Arler, 2018)
Limits to Growth (Meadows et al., 1972)		Eco-industrial parks and networks (Côté and Cohen-Rosenthal, 1998)	Cradle to Cradle (McDonough and Braungart, 2002)	Doughnut Economics (Raworth, 2017)	Post-growth (Jackson, 2016)	Radical Pluralism / Pluriverse (Kothari *et al.*, 2019)
Ecological Design (Papanek, 1972)		Biomimicry (Benyus, 1998)	The Natural Step (Robert, 2002)	Symbiotic Economy (Delannoy, 2017)	Permacircular Economy (Bourg, 2018)	
Small is Beautiful (Schumacher, 1973)		Product Service System (Goedkoop et al., 1999)	Performance Economy (Stahel, 2010)	Social Circular Economy (Social Circular Economy, 2017)	Voluntary Simplicity (Trainer and Alexander, 2019)	
Conviviality (Illich, 1973)		Extended Producer Responsibility (Lindhqvist, 2000)		Spiral Economy (Ashby *et al.*, 2019)	Convivalism (Caillé, 2019)	
Steady-state economics (Daly, 1977)		Industrial Symbiosis (Chertow, 2000)		Coviability (Barrière et al., 2019)		
Permaculture (Mollison and Holmgren, 1978)		Closed-loop Supply Chain (Guide et al., 2003)				
Décroissance (Gorz, 1980, first published in French in 1975)		Biobased Economy / Bioeconomy (OECD, 2004)				
Deep Ecology (Næss and Rothernberg 1989, based on 1976 book in Norwegian)		The Biosphere Rules (Unruh, 2008)				
Overshoot (Catton 1980)						

Figure 2.2 Timeline of Circularity Concepts and Ideas. Source: Friant et al. (2020)

complexity. By applying various physical scales, the BE research can be separated into several dimensions. Pomponi and Moncaster (2017) list the following dimensions: manufactured components, buildings, cities, the BE, and the natural environment, as depicted in figure 2.3.

These dimensions are connected because functioning on the area scale involves materials, components, and buildings, all of which have unique properties. The complexity increases with each dimension, since there are more stakeholders engaged. Additionally, although larger dimensions are established via public actions, smaller dimensions are mostly the result of private initiatives.

As depicted in the figure below, area development falls between the buildings dimension and the cities dimensions, that means, both governmental and private efforts are present.

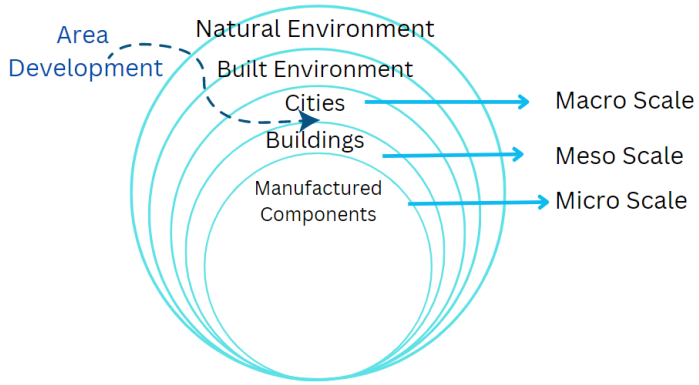


Figure 2.3 Scales within the Built Environment. Own Illustration. Adapted from Pomponi *and* Moncaster, 2017.

According to Pomponi and Moncaster (2017), the micro (i.e. manufactured components) and macro scales (i.e. cities, neighbourhood, built environment), are the primary focus of BE research from a CE perspective. From a circular perspective, there is already a dearth of literature on the scale on the buildings dimension, but there is almost no scientific research on CAD (Luijt, 2019).

This means that this research will need to pull from both upper boundary (cities dimension) and lower boundary (buildings dimension) to further the research on CAD.

2.4 Rationale for Focusing on Circular Area Development within Building Scales: Building and City Dimension

Several factors underline the reasoning behind focusing on CAD within the Building Scales of the building dimension and the city dimension, as seen in figure 2.3. By examining CAD as being between the building and cities limit, this research aims to address the knowledge gap to contribute to a better understanding of CAD's relation to the CE. The following sums up the rationale behind focusing on CAD as being between the building and city dimension:

1. **Scarcity of CAD Literature**: As mentioned earlier, there is almost no scientific research on CAD (Luijt, 2019). This study will help fill in the gap and contribute

to the development of a comprehensive body of knowledge on CE principles and their application in CAD.

2. **Interconnectedness of the Dimensions**: Given that CAD falls between the dimensions of the Buildings and Cities, it is essential to take both into account when looking into CAD. This approach can lead to an overarching understanding of applying circular principles at the different levels of the BE and how they are applied in CAD projects.
3. **Stakeholder Engagement**: At both dimensions, various stakeholders are present, for example, construction companies, waste managers, project managers, and residents. Examining CAD through these two dimensions makes the engagement possible of both level's stakeholders, resulting in a more cohesive and nuanced outcome, as different stakeholders can share their knowledge and expertise.
4. **Practicality**: By putting CAD in the context of the Building Scales, a deeper understanding of CAD and the CE is gained and could help guide stakeholders in decision-making processes for realising the development of sustainable urban development and practises.

2.5 Circular Area Development

Area redevelopment projects are particularly important since they may determine how resources will be used in the future and determine the future course of infrastructure development for the next few decades. Contributions addressing changes in urban structure, resource use patterns, and infrastructure fragmentation are still scarce and fragmented. Area redevelopment projects are crucial from at least two angles. Urban areas impact city infrastructures, profoundly altering the possibility for the circularity of urban resource flows. They also include changes in land use with consequences for material flows and transformation of city functions. Area redevelopment can either enable or hinder future circularity transformation from the standpoint of CE transition (Domenech and Borrion, 2022).

A relatively recent concept is CAD. Key areas which CAD focusses on are the development of buildings that that make the most use of available resources and allow for continued use of the structure and its components (i.e. circular buildings). For instance, by implementing R-ladder design principles, by tracking the goods and materials used in the buildings in building- and materials passports, or by analysing the consequences of construction techniques and material choices are all ways to limit material flows. All of these interventions are quite beneficial, particularly when the market is being pushed toward finding eco-friendly solutions (van Bueren et al., 2021; Metabolic, 2021). But CAD entails more than merely restricting material flows when a project is being constructed.

The BE significantly influences local ecosystems and communities at the area level. This influence is manifested through infrastructure and mobility decisions, as well as the placement of various activities like living, working, and leisure in an urban setting, are all made at the area level (Metabolic, 2021). Where these material flows fit into the space is another issue for CAD. This holds true while places and buildings are being built or renovated as well as while such areas and structures are being used. Both a scale and a geographical problem are involved (van Bueren et al., 2021). In many European cities, especially those in the centre,

post-industrial neighbourhoods are common. Previously developed land, such as post-industrial areas, is increasingly acknowledged to be an underutilised resource for area redevelopment (Loures, 2015).

2.5.1 Phases in Area Development

Dutch area development is broken down into four distinct phases: initiation, planning, realisation, and maintenance, as seen in figure 2.4. Although the names of the phases can occasionally be somewhat different in literature, the concept is generally the same (Franzen et al., 2011; Peek and Troxler, 2014; Heurkens, 2022).

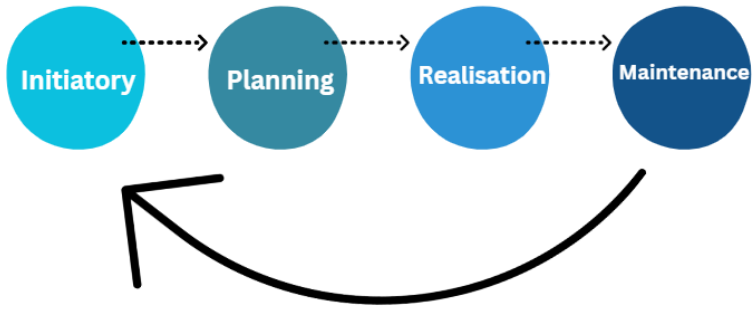


Figure 2.4 Phases in a Development Project. Own illustration, adapted from Franzen et al. (2011)

Initiation Phase

The intention to develop a specific area for area development is born during the initiation phase. This first step in area development might come from the public or private sectors. The goal of the area development must be determined at this phase. The procedure must be followed, and support from the involved and affected parties must be sought in order to fulfil the aim. In both the beginning phase and succeeding phases, the ambition must become the basis on which all actors interact (Franzen et al., 2011).

Planning Phase

Following the shared formulation of the ambition, the planning phase begins and lasts until the beginning of construction. In this phase, all sectoral and facet-related elements are combined into a plan to give them the best spatial and functional quality and, moreover, to make the plan workable with the resources at hand. Although the actual development does not start until the following phase, agreements on risk sharing must be formed then. A manner that progresses the process and, ultimately, yields a strategy that can be realised must be found to combine the many interests and professional lines of approach (Franzen et al., 2011).

Realisation Phase

The relevant parties who have secured agreements in the two preceding phases implement the plan during the realisation phase. Specific construction-related activities define this phase. A plan may seldom be carried out exactly as it was intended because area development sometimes takes several years and because conditions may change over that period. The handling of the disparity between the developed plan (such as a master plan) and the changing

plan therefore defines this phase; there is a certain conflict in the execution phase's need for flexibility (Franzen et al., 2011).

Maintenance Phase

The maintenance phase follows the realisation phase. Each project has a different kind of maintenance. For example, building exploitation is a term used for building maintenance, but historic buildings and monuments require specialised maintenance. A common misconception is that maintenance is a reactive duty that solely involves repairing and restoration. But is can also be used as an aggressive strategy, in which upkeep is a continual activity, prompt signalling of possibilities and weaknesses, and the beginning and direction of changes. It can be considered a sliding scale, with the most extreme shift qualifying as an area development process (Franzen et al., 2011).

2.6 Inclusiveness

In this section the concept of inclusiveness and its importance in SD will be discussed. Its link with the Sustainable Development Goals (SDGs) and the various strategies that can be employed to promote inclusiveness will also be presented.

2.6.1 Inclusiveness: A Concept

The concept of inclusiveness at its core revolves around the process of developing environments where all individuals can participate, contribute and have their voiced heard, regardless of their background or abilities. In the context of inclusiveness, the value of having a community that is diverse is recognised, and it is to be ensured that everyone their voice and needs are considered and addressed.

2.6.2 Inclusiveness in Sustainable Development

This section is written to emphasize the broader context in which CAD operates, and its important relation to inclusiveness as a guiding principle for SD at large. The benefit of this is to create a more holistic understanding of inclusiveness in the greater context of SD, and the interdependencies between inclusiveness and other SD principles like economic growth and environmental protection.

One of SD’s principles is preserving the environment and fostering economic growth. Another principle of SD is ensuring that the benefits of development are equally distributed throughout the population. Inclusiveness is a fundamental principle of SD and plays a crucial role in ensuring the equal distribution of opportunities and benefits to all citizens.

As mentioned before, by 2030 one of the UN SDGs aims to “leave no one behind”. There is an interconnectedness and interdependence between the well-being of people, prosperity, and the planet. Inclusiveness practices ensures that all members of society, with a special emphasis on the most marginalised in a community, can access and benefit from development initiatives.

Within SD, inclusiveness practices can be found in various domains, including social, economic, and environmental (Liang et. al, 2021):

1. **Social Inclusion**: which guarantees that everyone has access to public housing, transit, and infrastructure on an equitable basis;
2. **Economic Inclusion**: which is viewed as a process of eradicating material imbalances and enhancing access to work opportunities, and includes two subdimensions: community and finance and segregation and economic regeneration;
3. **Environmental Inclusion**: which calls on individuals to refrain from conducting their modes of production and consumption in a way that sacrifices the needs and interests of future generations.

2.6.3 Inclusiveness in Circular Area Development

Inclusiveness in CAD refers to the idea that the planning, design, and governance of circular areas should be equitable, empowering, and inclusive, taking into account the needs, perspectives, and contributions of all stakeholders, including marginalized and underrepresented groups. This approach differs significantly from the traditional way of area development, which often prioritizes economic growth and technological efficiency over social equity and community well-being (McDonough and Braungart, 2002).

Incorporating inclusiveness into CAD is increasingly seen as an important addition to this emerging model of SD. This is because inclusiveness ensures that the benefits and opportunities generated by CAD are shared equitably among all members of the community, rather than being restricted to a privileged few. Moreover, inclusiveness also helps to foster a sense of ownership and participation among community members, leading to greater engagement, empowerment, and social cohesion. Area redevelopment has been acknowledged as one of the most comprehensive and effective tools that governments can use to promote more inclusive, resilient, safe, and sustainable cities because it is an integrated and inclusive process that combines physical, environmental, and socioeconomic measures. Area redevelopment offers chances to enhance living standards and generate economic opportunities for locals in addition to infrastructure improvements. Inclusiveness—ensuring that no one is left behind in the process—is increasingly important. Area redevelopment that is inclusive and sustainable encourages a paradigm shift in how people live in urban areas. It needs to take into account factors relating to the social, economic, physical, and environmental sectors (Urban Solutions, 2018; UN Habitat, 2021).

2.7 Circular Economy and Inclusiveness Strategies in CAD

This section will present strategies of CE in CAD that have been found in the literature. Afterwards, inclusiveness strategies based on the CE strategies will be given, also based on the literature. This is needed to answer the second SQ, *"What inclusive strategies can be used to advance circular strategies in CAD projects?"* This question will be answered in the form of a theoretical overview.

2.7.1 Reasoning behind Circular Economy and Inclusiveness Strategies

The scarcity of literature pertaining to CE strategies in the context of CAD presents a unique challenge to this study. Because of this lack of literature of CE principles in CAD, the choice has been made to examine the CE strategies at the intersection of the building dimension and the city dimension, as seen in figure 2.2. This choice is driven by several key considerations. Starting at the building dimension, it provides a bottom up perspective where some of the best-known CE principles are most directly applied (section 2.7.2 will delve into these principles). By understanding the CE strategies at this dimension might give interesting insights into the feasibilities of implementing CE strategies in CAD. The city dimension, however, provides a more macro-level perspective, where frameworks of the Circular City (CC) provide a broader view of how these CE strategies can be applied across multiple key sectors within a city. These CC frameworks might lead to an understanding of how CE strategies can be integrated into larger systems and policies, which is crucial when considering CAD.

2.7.2 Layout of the Following Sections

When the CE strategies are found (section 2.8.1), based on the CE principles of the building dimension (section 2.7.3) and the CC frameworks of the city dimension (section 2.7.4), inclusiveness strategies are developed based on the CE principles and the key sectors in which they operate (section 2.8.2). This approach offers a significant step towards ensuring sustainable and equitable area development. This is summarised in figure 2.5 and explained further in chapter 3: Methodology. The last section will give an overview of the findings of the chapter and its main findings.

Figure 2.5 Rationale behind CE and Inclusiveness Strategies. Own Illustration.

2.7.3 Circular Economy Principles - Building Dimension

Various CE principles are discussed in this section. These are a few of the CE 's best-known principles. They are circular guidelines that are frequently applied to individual buildings. This section will discuss the use of CE concepts at the building scale, which is a critical first step towards a BE that is more sustainable. The C2C paradigm, the closed-loop method, the R-Ladder, and regenerative design are important concepts that apply at this scale and discussed below. These guiding concepts all have their own special insights and approaches, but they also have some things in common. For example, they all strive for maximum resource efficiency, by means of repurposing (C2C), extending product life (closed loop), or restoring ecosystems (regenerative design). Another thing these concepts have in common is their forward-looking nature. Each concept strives to actively contribute to a more sustainable future, and not just tackle current practices' negative impacts.

Closed-loop Method

The closed-loop method of production and process, depicted in figure 2.6, design attempts to promote long-life products, reconditioning activities, and waste prevention. Due to its emphasis on stock optimization, the CE substitutes preservation value for added value and utilisation value for residual value. Decoupling economic development from resource extraction and waste production is essentially what the CE calls for. According to Stahel (2013), the CE's emphasis on managing existing stock is centred on three main loops: product life extension activities, reuse and resale of commodities, and recycling of molecules (secondary resources).

According to the closed-loop method, building lifecycles should be closed-loop systems in which components and materials are optimally utilised and kept at their best value. The technical cycle consists of selecting materials and components that can be reused, refurbished, repaired, and remanufactured to extend their service life. The biological cycle, on the other hand, involves natural materials that can be biodegradable or compostable (e.g., bio-based materials) at the end of their life (Rahla et al., 2021).

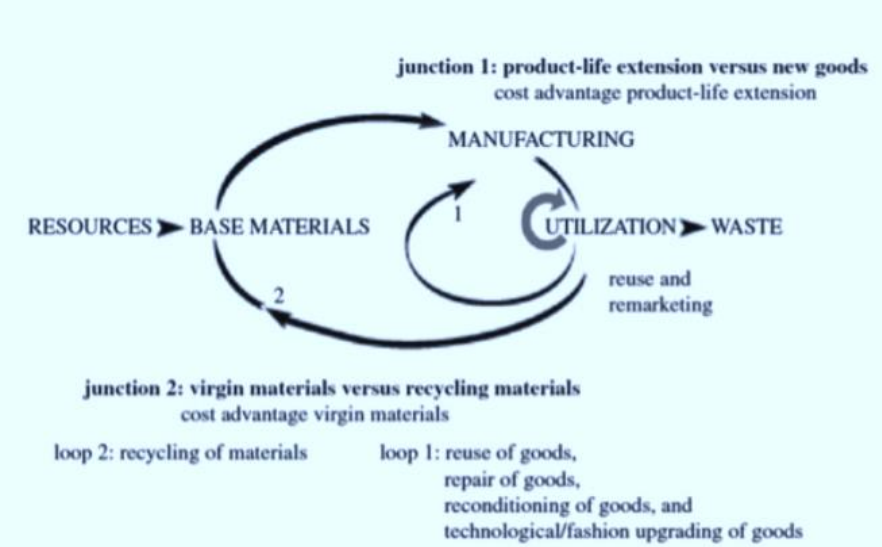


Figure 2.6 Main Loops of a Circular Economy. Source: Stahel (2013)

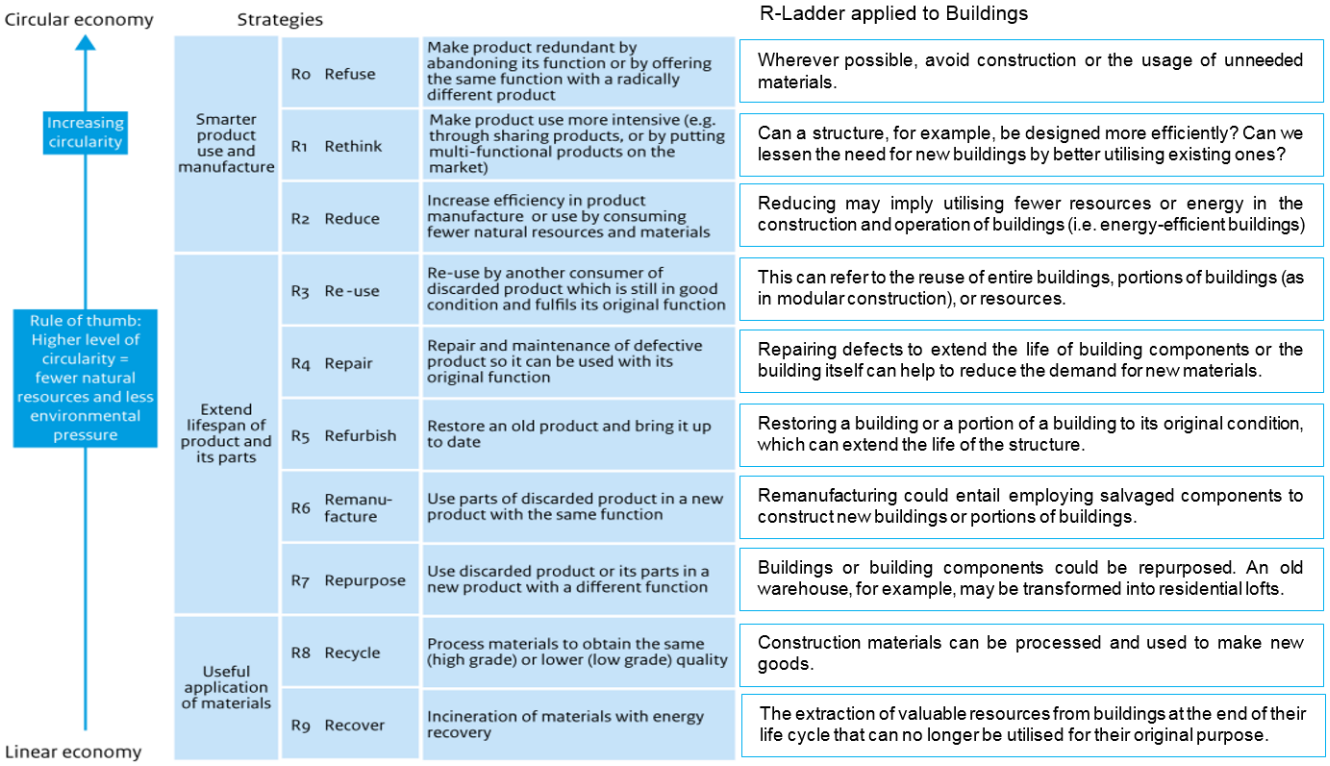
R-Ladder

Reduce, Reuse, and Recycle (the "3Rs") is a well-known sustainability method in the construction industry to reduce negative environmental effects and design out waste (Rahla et al., 2019).

Initially, the 3Rs were used to frame the notion in Chinese literature relating to CE. When a product approaches the end of its useful life, "Reuse" is the action of using it again for the same purpose, and "Recycle" is the procedure of recovering waste to create a new product. "Reduce" refers to the action of minimising inputs and outputs such as raw materials and garbage. Later, the 3R's principles were expanded to a 9R's framework (the R-Ladder) to include more actions and more successfully transition to CE, as seen in figure 2.7. Three

important tactics to boost innovation and circularity in product design are included in the R-ladder (Potting et al., 2017).

Relating these concepts to buildings, also seen figure 2.6, has the potential to reduce negative environmental consequences by keeping materials and components in use and ensuring their reuse when the building reaches the end of its useful life. Designing for a CE entails planning for adaptation, flexibility, and disassembly in order to permit reversibility and recover the value of the building's products. This practise will limit the consumption of raw materials and waste generation beginning with the design stage (Rahla et al., 2021, p. 4). For example, the first step is Refuse, when applied to buildings, avoid construction or the usage of materials where possible. This could include making greater use of existing structures or spaces or developing buildings to be more efficient so that fewer resources are required.



Strategies			R-Ladder applied to Buildings
Smarter product use and manufacture	R0 Refuse	Make product redundant by abandoning its function or by offering the same function with a radically different product	Wherever possible, avoid construction or the usage of unneeded materials.
	R1 Rethink	Make product use more intensive (e.g. through sharing products, or by putting multi-functional products on the market)	Can a structure, for example, be designed more efficiently? Can we lessen the need for new buildings by better utilising existing ones?
	R2 Reduce	Increase efficiency in product manufacture or use by consuming fewer natural resources and materials	Reducing may imply utilising fewer resources or energy in the construction and operation of buildings (i.e. energy-efficient buildings)
Extend lifespan of product and its parts	R3 Re-use	Re-use by another consumer of discarded product which is still in good condition and fulfils its original function	This can refer to the reuse of entire buildings, portions of buildings (as in modular construction), or resources.
	R4 Repair	Repair and maintenance of defective product so it can be used with its original function	Repairing defects to extend the life of building components or the building itself can help to reduce the demand for new materials.
	R5 Refurbish	Restore an old product and bring it up to date	Restoring a building or a portion of a building to its original condition, which can extend the life of the structure.
	R6 Remanu-facture	Use parts of discarded product in a new product with the same function	Remanufacturing could entail employing salvaged components to construct new buildings or portions of buildings.
	R7 Repurpose	Use discarded product or its parts in a new product with a different function	Buildings or building components could be repurposed. An old warehouse, for example, may be transformed into residential lofts.
Useful application of materials	R8 Recycle	Process materials to obtain the same (high grade) or lower (low grade) quality	Construction materials can be processed and used to make new goods.
	R9 Recover	Incineration of materials with energy recovery	The extraction of valuable resources from buildings at the end of their life cycle that can no longer be utilised for their original purpose.

Figure 2.7 R-Ladder principles, applied to the buildings. Adapted from PBL (2015) and RVO (2023)

Cradle2Cradle

The C2C paradigm states that there are two categories of nutrients employed in industrial processes: technological and biological. By maximising positive effects and minimising those caused by design for efficiency, this strategy tackles design for effectiveness (McDonough and Braungart, 2002). Since these procedures are effective and secure, C2C design views nature's "biological metabolism" as a paradigm for developing a "technical metabolism" flow of industrial materials. It is feasible to create product components that can be continually retrieved and employed by these metabolisms as biological and technical nutrition. The C2C framework (EMF, 2018) addresses energy and water inputs.

The C2C ideology encourages using building supplies and products that can be recycled or, best, repurposed. Upcycling is the process of turning an old product into a new one that has superior qualities to the original. Buildings are seen as material banks, where all materials and components are designed to be disassembled and used again without quality loss. Each stage of the building's lifecycle, such as planning, tendering, or operations, have different focuses. Several features can be introduced during the planning phase of a residential project. Here are some instances of how one of the future tenants of a private multi-unit residential building in Utrecht (Developer CPO Goeman Borgesiuslaan) is putting them into action. These are significantly less expensive to incorporate from the start than to retrofit (Mulhall et al, 2019).

- A sedum-green roof integrated with solar panels to minimise thermal stress and improve performance, promote cooling in the summer, support biodiversity, fine dust capture, and air purification.
- A central open "light & air column" connecting all floors extends from a roof-window all the way down to the bottom floor.
- During the summer, the roof window can be opened to promote natural ventilation via the same central column.
- A white south-facing façade to reflect sunlight and passively avoid warming in the summer.

Regenerative Design

According to the theory of regenerative design, buildings and cities should be developed in a regenerative manner to restore ecosystems (Rahla et al., 2021). Present regenerative design suggests a change from a mechanical understanding of urban systems to an ecological and holistic approach, which has been widely popularised by the study and practise of Bill Reed and numerous co-authors. By placing ecosystem functioning and site patterns at the centre of the design process and striving for the mutually beneficial coevolution of social and ecological systems, it challenges conventional techniques and tools for sustainable urban design (Blanco et al., 2021).

Urban projects using regenerative design are intended to encourage positive effects, enabling coevolving and thriving social and natural systems. Buildings must be created with the intention of improving the long-term interactions between local communities, the BE, and the environment at large. The goal of regenerative design is to not only prevent but also undo the factors that contribute to environmental deterioration and climate change (Naboni and Havinga, 2019).

There are significant contrasts between traditional development and regeneration, as seen in figure 2.8. As a result of the place based, integrative, and participatory design methodologies, ecological health improves rather than deteriorates, and there are major positive effects on community health and wellbeing. Healthy, resilient, and egalitarian communities are possible outcomes. Understanding local customs and indigenous knowledge, which can protect or establish cultural identity, is another important advantage. In its transition to greater environmental performance, regenerative development would also help to counteract the ongoing negative environmental impact of the existing building stock. These features of regenerative development might result in a speedier transformation of the BE and more public

acceptance of new development. In consequence, a strategically sound reaction to climate change could be to create a constructed environment that is more adaptive and resilient (Zari, 2010).

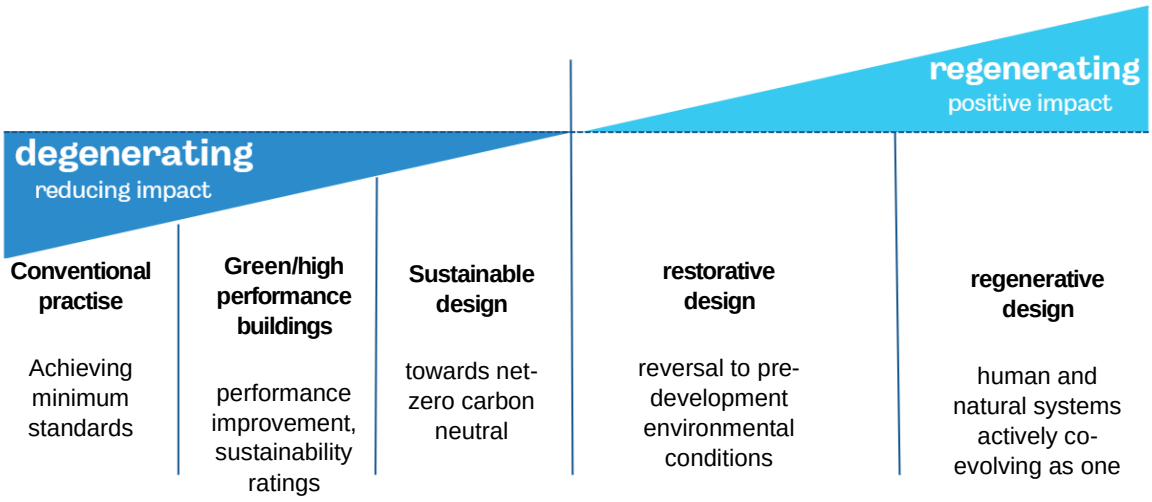


Figure 2.8 Conventional Practice vs. Regenerative. Source: Naboni and Havinga (2019). Own Illustration.

2.7.4 Circular Economy Principles – City Dimension

In this section, various existing frameworks in literature on circular cities where CE strategies are being implemented at the city level are compared, this approach is further explained in methodology chapter, section 3.2.3. Many frameworks have in common that they have similar areas of implementation of CE principles. This section of the literature review aims to synthesise various CC frameworks, clarify key implementation sectors, and highlight any gaps that might call for further study.

Cities have been regarded as being in a unique position to function as catalysts for the transition to a CE because they are made up of complex systems that include people, business, government, housing, transportation, diversified land uses, and infrastructure. Given their expanding nature and involvement in contributing to global concerns of resource shortages and climate change, cities have been highlighted as significant drivers in the transition to a CE (European Commission, 2019; World Economic Forum, 2018; Swilling et al., 2018).

The Circular City

The CC is a novel concept and practise in sustainable urban development, characterised by a geographical or territorial application of CE concepts to the physical components of the city and its primary activities. The CC is a response to the increasing resource consumption and waste production issues that is linked to the intricate and urgent difficulties of urbanisation. It aims to reduce the waste that our cities produce by extracting as much value as possible from already-existing materials and resources (including waste) and by reducing or completely avoiding the use of recently extracted resources from the Earth. The CC is comparable to the concepts of the "self-sustainable" regenerative city (Lambropoulos, 2021; Gravagnuolo et al., 2019). The idea of a CC has only recently been linked to resource flows and management in urban areas, establishing a method for using and reusing resources and tying the concept of

the urban environment to the notion of circular metabolism. By prioritising reuse, this new strategy avoids the "take-make-dispose" paradigm (Boeri et al., 2019).

In order to develop more comprehensive strategies for the CC implementation, academic research on the CE's implementation at the city level has primarily focused on attempting to define the concept, conducting case study analyses, or observing cities undergoing transitions (Boeri et al. 2019, Carriere et al. 2020). A number of frameworks that have been developed in recent years have been used to analyse how CE strategies are being implemented at the city level (Marin and De Meulder 2018, Prendeville et al., 2018, Gravanguolo et al. 2019). These frameworks provide analytical frameworks to add to the body of research on how the CE emerges when applied to the "spatial territorial dimension."

Circular City Frameworks

CC frameworks provide an innovative approach to SD, because it offers a comprehensive and integrated approach to SD. The CC frameworks can be utilised to construct a framework for area development. The reasoning behind this is as follows. CC frameworks use a macro-level approach, focusing on numerous sectors that are critical to the functioning of a city. Exploring CC frameworks can reveal how CE concepts can be incorporated into broad systems and regulations, which are essential for CAD. CC frameworks take into account the links between several industries, including energy, waste, water, and mobility, as well as their effects on one another and the environment. This makes it possible for decision-makers to build better, more long-lasting solutions for the growth of a specific area.

It is feasible to build communities that are more resilient and sustainable, reduce waste, and support a cleaner, healthier environment by implementing the ideas of the CC into local area development. Several CC frameworks will be used to create this research's own framework since it offers a comprehensive and practical approach to creating a sustainable future.

Several frameworks that have been developed in recent years have been used to analyse how CE strategies are being implemented at the city level (Marin and De Meulder 2018; Gravanguolo et al. 2019). In this section, an analysis of several of these frameworks and strategies are be presented.

Table 2.1 gives an overview of the key sectors in which circular strategies are being implemented in the CC, taken from several existing frameworks from the literature. Table 2.1 illustrates several instances of convergence between frameworks.

Although the frameworks provide useful insights, further study is still required to create a more inclusive overview for putting the ideas of the CE into practise at the city scale. Although it is not usually mentioned in current CC frameworks, the sector of citizens and communities is identified as a crucial sector for future exploration.

Table 2.1 Key Sectors of Circular Principles Implementation of Several Frameworks Found in Literature

Sectors	Gravagnuolo et al.	Paoli et al.	Ferreira and Fuso-Nerini	Petit-Boix and Leipold	Holland Circular Hotspot	Vanhuyse et al.
	2019	2022	2019	2018	2019	2021
Built Environment	Built Environment	Buildings	Buildings	Construction	Housing and Infrastructure	Construction
Energy & Mobility	Energy & Mobility	Energy & Mobility	Renewable Energy & Transport	Energy & Mobility	Energy	Energy & Transport and Storage
Waste Management	Waste Management	Waste	Waste Management	Waste Management	Industrial Parks	
Water Management	Water Management	Water	Water Management	Water Management	Water	Water & Sanitation
Industrial Production	Industrial Production	Textiles	Specific Industry	Industries & Business	Plastics	Extractive Industries
Food	Agri-Food	Food	Food	Food	Food	
Citizens & Communities	Citizens & Communities					
Other		Green	Demographics	Social Consumption	Consumer Goods	Other
			Digitalization			
			Education			Social and Manufacturing
			Local Resources			
			Policies and CE Innovation	Urban Planning		Public Administration and Defence

2.8 Theoretical Overview: Strategies

The preceding sections aimed to answer the first SQ, dissecting the current academic literature to understand the CE, inclusiveness and CAD. The focus now transitions to the second SQ: W*hat inclusive strategies can be used to advance circular strategies in CAD projects?*

This overview starts with key sectors as the first division. This is based on the theory of CC frameworks, where each sector has unique characteristics and challenges that requires specific strategies. Furthermore, it opens up the chance for a comprehensive examination across various sectors where CE and inclusiveness can be advanced. This section of the literature review will identify and explore the various inclusiveness strategies that can be employed to advance CE strategies in CAD projects. This analysis will cover different CE strategies, with a special overview of the key sectors of CAD implementation. Subsequently, the overview will also ensure that these CE strategies also address inclusiveness, thereby broadening the benefits of the CE.

2.8.1 Circular Economy Strategies

Prior to the presentation of the theoretical overview, table 2.2 will be presented that outlines the circular strategies identified in the literature. These strategies have been drawn from key sectors within CAD. By detailing these strategies, a better understanding of the social inclusion strategies that will be linked to them can be achieved.

Table 2.2 Circular Strategies and their Description

Key Sector	Circular Strategies	Description	Source
Built Environment	Material Reuse and Recycling	The practice of using waste materials, such as building components, as resources in new construction or other applications, reducing the need for virgin materials and promoting resource efficiency.	(Icibaci, 2019) (Morseletto, 2020) (Pacheco-Torgal, 2013)
	Green Infrastructure	The use of natural or green spaces, such as parks, gardens, and green roofs, as well as sustainable urban design practices, to provide ecological, social, and economic benefits, improve public health, and enhance community resilience in urban areas.	(EPA, 2023) (Buijs et al., 2019) (Semeraro, 2021)
	Circular Construction Methods	The use of sustainable materials, waste reduction strategies, and resource-efficient design practices in the construction sector to reduce waste, minimize the use of finite resources, and promote a CE.	(Norouzi et al., 2021)
	Life Cycle Thinking	Considering the entire life cycle of a product or service, from raw materials to disposal, in order to reduce its environmental impact, optimize resource use, and promote sustainability.	(Norouzi et al., 2021)
The Energy Sector	Energy Efficiency	Reducing the amount of energy required to perform a task or function, through the use of technology and design.	(de Schoenmaker, 2017)
	Renewable Energy	Energy sources that are replenished naturally, such as solar, wind, hydro, and geothermal, providing an alternative to finite fossil fuels and reducing the carbon footprint and environmental impact of energy production.	(Norouzi et al., 2021)
The Mobility Sector	Electric and Hybrid Vehicles	Vehicles that use a combination of conventional fuel and electricity to reduce dependence on fossil fuels, decrease emissions, and promote sustainability in the transportation sector.	(de Schoenmaker, 2017)
	Shared Mobility	Sharing and pooling transportation resources, such as cars, bikes, or scooters, to reduce the number of vehicles on the road.	(de Schoenmaker, 2017) (Shaheen & Chan, 2015)
	Sustainable Transportation Planning	The integration of environmentally friendly and socially responsible transportation options, such as cycling, walking, and public transportation, into urban planning to reduce emissions and promote sustainable mobility.	(Byars et al., 2017)
The Industry Sector	Resource Efficiency	The optimal use of natural resources, such as water, energy, and materials, through practices such as waste reduction, recycling, and the adoption of sustainable technologies, in order to minimize waste and reduce environmental impact.	(Morseletto, 2020) (Amanatidis, 2022)
	Closed-Loop Supply Chains	Sustainable supply chains in which waste materials and by-products are recovered and reused as inputs for new products, creating a circular flow of resources.	(Norouzi et al., 2021) (Winkler, 2011)
	Digital Solutions	The use of technology and innovation to improve processes, optimize resource use, and create new opportunities for sustainability.	(Chauhan et al., 2022) (Magrini et al., 2021)
The Food Sector	Food Waste Management	The practices and strategies used to minimize, divert, and effectively manage food waste, including reduction, composting, and recovery for human or animal consumption.	(Rashid & Shahzad, 2021)
	Local Food Production	The production of food within a specific geographic region, reducing the need for transportation and promoting sustainability and resilience in the food system.	(Jurgilevich et al., 2016)

			(Stein & Santini, 2022)
Waste Management	Waste Reduction	Reducing the amount of waste generated through source reduction and waste minimization initiatives.	(Norouzi et al., 2021) (Morseletto, 2020)
	Recycling	Promoting the recycling of waste materials to conserve resources and minimize waste.	(Morseletto, 2020)
	Waste-to-Energy	The process of converting waste materials into energy, such as electricity or heat.	(Astrup et al., 2014)
Water Management	Water Conservation and Reuse	Reducing water consumption by using efficient techniques, and recycling treated wastewater.	(Voulvoulis, 2018) (Morseletto et al., 2022)
	Wastewater Treatment	Wastewater treatment is the process of removing contaminants and pollutants from sewage or other forms of wastewater to produce clean and safe water.	(Amanatidis, 2022)
Citizens and Communities	Community Engagement	The process of involving members of a community in decision-making and problem-solving, with the aim of promoting collective ownership and commitment to initiatives and outcomes.	(UN, 2020) (CTSA, 2011) (USDN, 2019)
	Sustainable Lifestyles	Way of living that reduces the impact of an individual's activities on the environment, while ensuring social and economic well-being.	(UN, 2022) (Akenji & Chen, 2016)
	Circular Community Development	Holistic approach to sustainable urban development that aims to promote resource efficiency and waste reduction by creating closed-loop systems in communities.	(Kara et al., 2022) (Almigheerbi, 2020) (EWWR, 2021)

2.8.2 Theoretical Overview – Circular and Inclusiveness Strategies

The preceding table served to define the various circular strategies. Table 2.3 presents the theoretical overview of the intersection of inclusiveness and CE strategies within the context of keys sectors in CAD.

For example, in the key sector of the BE, CE strategies like "Material Reuse and Recycling" could encourage communities and business participation in material collection and processing. This leads to circular economies as well as inclusiveness, by offering participation chances and potential job opportunities. Another example could be in the Energy sector, where the strategy of "Energy Efficiency" is made inclusive by providing financial incentive and technical assistance to SMEs and low-income households to adopt energy-efficient technologies and practices.

Table 2.3 serves as a guide to the various strategies for achieving circularity and inclusiveness in key sectors within CAD. It provides a comprehensive overview of how inclusiveness can be incorporated within CE strategies.

Table 2.3 The Theoretical Overview

Key Sector	Circular Strategies	Inclusive Strategies	Sources
Built Environment	Material Reuse and Recycling	Encourage involvement of communities and businesses in material collection and processing to create local circular economies. Encouraging the community to share resources and materials can help to promote material reuse and recycling.	Sala Benites et al (2023)
	Green Infrastructure	Involve local communities in the planning and management of green spaces to ensure that they are accessible and relevant to all.	Nieuwenhuijsen (2021)
	Circular Construction Methods	Create job opportunities and provide training for individuals who may be marginalized or disadvantaged.	Clube and Tennant (2022)
	Life Cycle Thinking	Encourage collaboration between all stakeholders in the building life cycle, including designers, builders, users, and waste management providers, to ensure a holistic approach to circularity.	Sala Benites et al. (2023)
The Energy Sector	Energy Efficiency	Providing financial incentives and technical assistance to SMEs and low-income households to adopt energy-efficient technologies and practices.	Curtin et al. (2017) Curtin (2019)
	Renewable Energy	Encouraging the development of local renewable energy projects, especially in rural and remote areas, to provide access to clean energy for all and create local economic benefits.	Curtin et al. (2017) Lennon et al. (2019)
	Renewable Energy	Ensure equitable distribution of clean energy and involve the younger generation in decision-making. Also involve the general population through participation and communication.	IEA (2021) Androniceanu and Popescu (2017)
The Mobility Sector	Electric and Hybrid Vehicles	Provide incentives and subsidies for the purchase of electric and hybrid vehicles and supporting the development of charging infrastructure in communities.	Bakker and Trip (2013) Zamit and Aldeiri (2021)
	Shared Mobility	Provide access to affordable shared mobility options and developing shared mobility services in underserved communities.	Ryöppy et al. (2022) Paddeu et al. (2020)
	Sustainable Transportation Planning	Engage with marginalized communities to understand their transportation needs and ensure that sustainable transportation plans are inclusive and equitable.	Department for Transport (2021)
The Industry Sector	Resource Efficiency	Provide training and education programs to improve the resource efficiency of SMEs and promote circular practices in the heavy industry sector.	SDG 9 Albaladejo et al. (2021)
	Closed-Loop Supply Chains	Promote an industrialization strategy that puts people and the environment first. Promote green jobs.	Yuan et al. (2020) Albaladejo et al. (2021) Clube and Tennant (2022)
	Digital Solutions	Support the development of digital solutions for SMEs and providing access to financing and technical assistance to adopt digital technologies.	Sareen (2021)

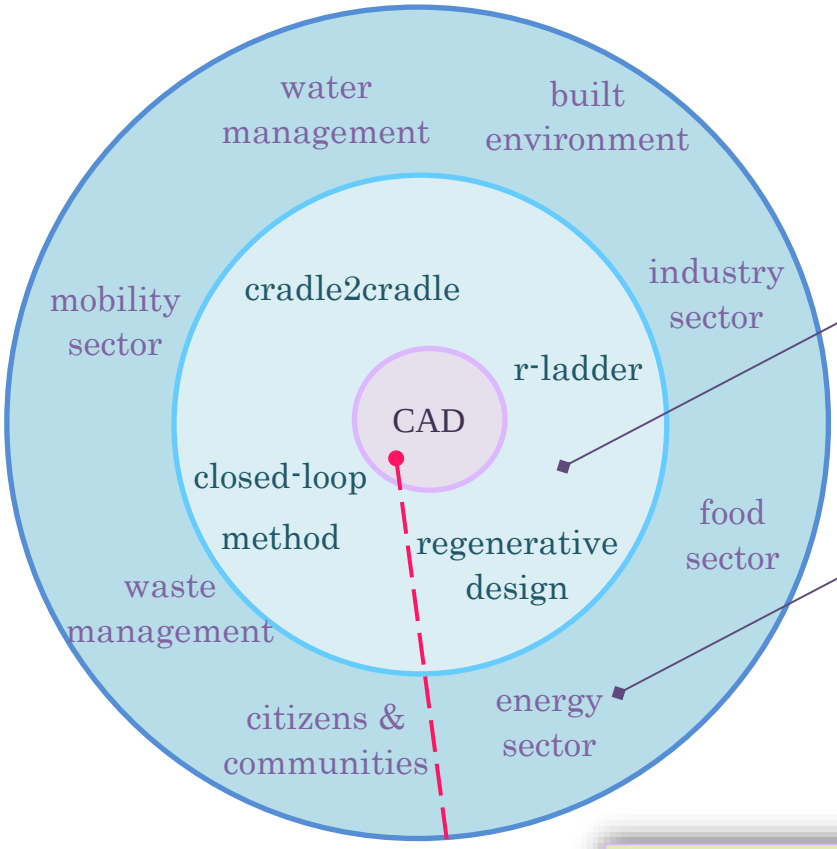
The Food Sector	Food Waste Management	Engage with marginalized communities to reduce food waste and promote food security and supporting the development of food waste reduction programs for SMEs.	Benyam et al. (2018) Giordano et al. (2022)
	Local Food Production	Promote stakeholder engagement and a healthy and sustainable food system.	Overheid van NU (2020)
Waste Management	Waste Reduction	Create well-developed structures for citizen involvement to reduce waste and promote sustainable waste management practices.	Izdebska and Knieling (2020)
	Recycling	Provide access to recycling services for marginalized communities and supporting the development of closed-loop supply chains for recycled materials. Include the recycling industry in the local production network and improve citizens' awareness, knowledge and practices.	Tong et al. (2021) Babaei et al. (2015)
	Waste-to-Energy	Support the development of waste-to-energy technologies and promoting the use of waste-to-energy technologies in local communities.	Izdebska and Knieling (2020)
Water Management	Water Conservation and Reuse	Employing education and awareness campaigns can help raising awareness of the significance of water management and conservation among citizens.	Kumari and Singh (2016)
	Wastewater Treatment	Encourage local participation as to meet particular local needs. Engaging communities in decision-making processes around water management can help to ensure that the needs and concerns of all groups are considered and addressed.	Jhansi and Mishra (2013) Prihandrijanti and Firdayati (2011)
Citizens and Communities	Community Engagement	Ensure inclusive, deliberate, and impactful citizen engagement. To guarantee that citizen interaction remains genuine and legitimate, policymakers must create clear, predictable, and long-lasting methods but must otherwise refrain from interfering. Create space for citizens' initiatives.	Schönwälder (2021) RLI (2020) Denters et al. (2013)
	Sustainable Lifestyles	Provide simple regulations all around. Provide awareness campaigns can help to increase understanding of the importance of sustainability and the role that individuals can play in promoting sustainable lifestyles.	RLI (2020) Denters et al. (2013) ENOLL (2021)
	Circular Community Development	Create gatherings that can act as a breeding ground for new ideas and a place where initiators can meet. Building partnerships and collaboration with stakeholders, such as community organizations, local businesses, and government agencies.	RLI (2020) Denters et al. (2013)

Table 2.3 explains various strategies for achieving circularity and inclusiveness in key sectors within CAD. These strategies are drawn from academic literature, theoretical frameworks, and grey literature. However, there exists a gap in the literature of a lack of research on the practical implementation of these strategies and the potential barriers to inclusiveness within the context of CAD. When looking at the real-world setting, there may be challenges for implementing these strategies that could not be found in academic literature. These challenges could be technical limitations, socio-economic factors, or regulatory barriers. There may also be barriers to inclusiveness. By acknowledging these gaps, this research will aim to address these gaps though interviews with professionals within the BE. The interviews will serve as a validation the individual strategies and sectors and to understand the potential barriers to their implementation.

2.8.3 Interpretation of the Theoretical Review

CIRCULAR AREA DEVELOPMENT

visualisation of theoretical contributions



best known CE principles within the BE

key CAD sectors within the BE

INCLUSIVENESS

the planning, design, and governance of circular areas should be equitable, empowering, and inclusive, taking into account the needs, perspectives, and contributions of all stakeholders, including marginalized and underrepresented groups

sector specific example theoretical overview

key sector:
mobility sector

circular strategy:
shared mobility

inclusiveness strategy:
Provide access to affordable shared mobility options and developing shared mobility services in underserved communities.

NEXT PAGE

theoretical overview and integrating insights

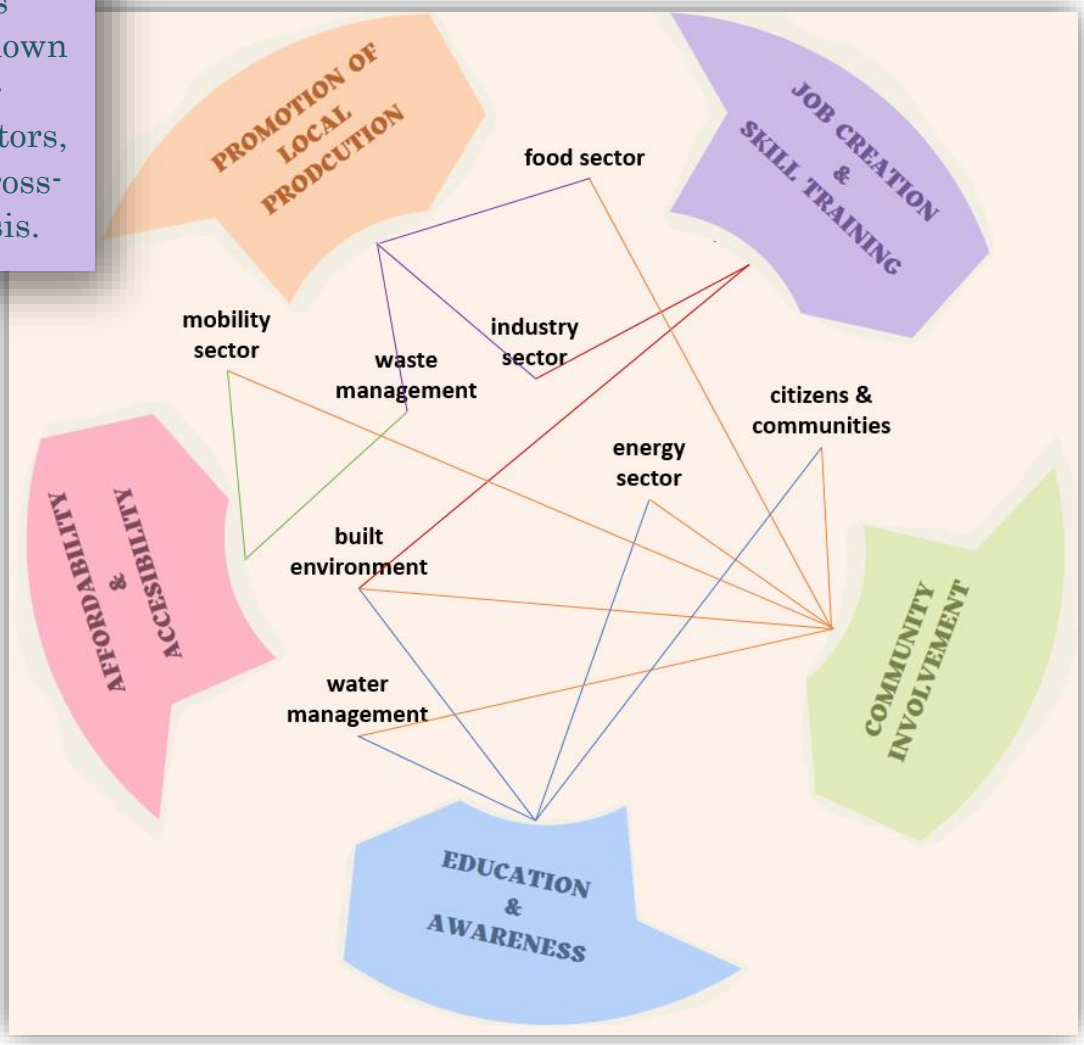
Detailed analysis further research

(Further explained in Methodology Chapter)

An integrative perspective enables the examination of patterns among all the inclusiveness strategies used in the theoretical overview. In CAD, moving away from a sector specific approach leads to a more comprehensive understanding of inclusiveness strategies.

this integrative approach allows for creating more resilient and adaptable strategies that can take into account the particularities and complexity of several sectors while fostering inclusiveness.

In the figure below, a typology (5) of all the inclusiveness strategies are shown to cross over multiple key sectors, thus enabling cross-sectoral analysis.



3. Methodology

The procedure for gathering data and analysing it in order to respond to the research questions is described in this chapter. This chapter aims to answer the third sub-question: "*How to analyse Dutch CAD for inclusive and circular strategies*?" As a result, section 3.1 of this chapter begins by introducing the research strategy and the research methodology. Based on the research stages that are described in the preceding part, 3.2 then goes into more detail about the research methodology. The research methodology covers the literature review method, the interview protocol development, the interview method, and strategy for the analysis of the results.

3.1 Research Strategy

Exploratory research is described as research conducted to address an issue that is not yet well understood. It is carried out to gain a deeper understanding of the current issue, but it will not produce definitive findings. When doing such a study, the researcher begins with a broad concept and uses the research as a tool to pinpoint potential research topics (Stebbins, 2012). This research is exploratory in nature due to the paucity of knowledge on inclusiveness in the BE and CAD. As a result, the study's research methodology is qualitative (Bryman, 2012). Qualitative research is known for being flexible, open and responsive to context (Busetto et al., 2020). As a result of this, Fossey et al. (p. 723, 2002) describes: "sampling, data collection, analysis and interpretation are related to each other in a cyclical (iterative) manner, rather than following one after another in a stepwise approach".

To get the necessary data for developing the initial set of guiding principles, this research primarily uses a literature review and semi-structured interviews. Getting information on participants' experiences, attitudes, and beliefs in relation to a particular study question or topic of interest is a useful research strategy (Ryan et al., 2009). A number of interviews are be used in this study among other qualitative research techniques for data collection. The conversational nature of semi-structured interviews gives participants the opportunity to discuss any topics they feel are relevant.

3.2 Research Methodology: Thematic Analysis

In this section the research methodology is discussed in depth. Since thematic analysis is a qualitative approach that enables the discovery of patterns and themes within collected data, it has been chosen as the research methodology for this study. This fits in well with the objectives and methodology of the study since it emphasises the value of finding the most important themes that emerge from the data while also providing flexibility in the analysis of themes (Braun and Clarke, 2012; Vaismoradi et al., 2013). Although more rigorous research techniques, such as grounded theory or content analysis, also aim to comprehend processes or phenomena through the analysis of data and identification of significant themes or patterns, it is a more systematic and structured approach that can be time-consuming, complex, and involve difficulties in the sampling process (Vaismoradi et al., 2013; de Jonge et al., 2007). Thematic analysis is thus an appropriate and effective tool for this type of research, as it is flexible, exploratory, and allows for inductive reasoning.

The topic of inclusiveness in CAD has not yet received much attention in academic research. Because of this, thematic analysis is an appropriate research method for this study, as it limits the occurrence of the researcher's own preconceived notions while still being able to find themes and patterns in a transparent and systematic way. When small sample sizes are available, thematic analysis offers a flexible and exploratory approach when analysing data (Nowell et al., 2017). Thus, researchers are enabled to better grasp their research subject and make analytical inferences and conclusions.

The process of thematic analysis typically consists of several steps (Delve, 2022; Lester et al., 2020), which are outlined below. These steps entail becoming familiar with the data by reading pertinent literature and the interviews conducted for the study, then creating codes that effectively summarise the data. From then, through the grouping of related codes and the discovery of commonalities, themes start to emerge. They should be thoroughly examined and precisely named so that each theme stands out and is not repeated. The analysis's conclusion will be the presentation of findings as a set of guiding principles in the report.

3.2.1 Research Approach

Figure 3.1 depicts the research's approach. A literature review is done in part one, and data is gathered through interviews in part two. The research is divided into two parts and five phases. The first part contains the first phase of the research process, and that is to gather data from literature, where the first and second sub-research question are addressed. The next part of the research is conducted based off the findings from the first part. Part two of the research includes a number of interviews to ascertain how inclusiveness is/can be implemented in key sectors within CAD in order to advance circularity in the area. Prior to the interviews, interview candidates are chosen in accordance with selection criteria (section 3.2.2) and the interview protocol is developed as well. After the interviews have taken place, the findings are evaluated and discussed (Chapter 4).

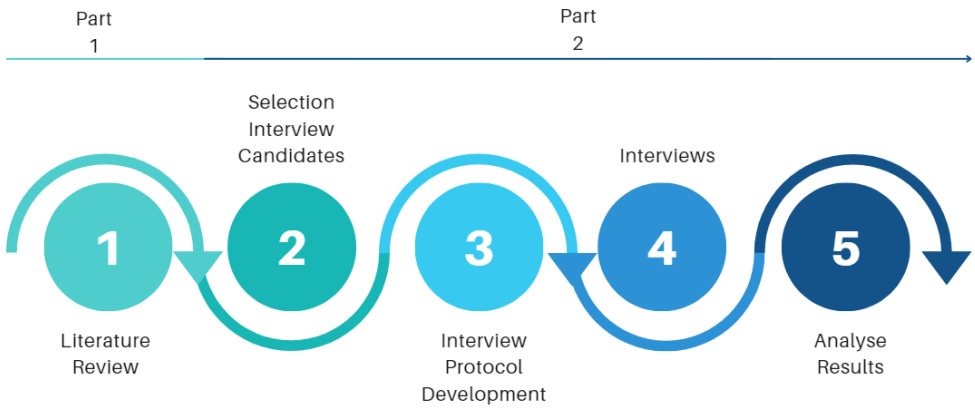


Figure 3.1 Research Process. Own Illustration.

3.2.2 Phase 1: Literature Review

The theory review is the main topic of the first phase. The development of a comprehensive theoretical overview is the primary goal of the initial phase of the research. This overview is based on a review of applicable scholarly (white/formal) and grey literature. The process and

selection of sources can be seen in figure 3.2. This process has been adapted from Garousi, Felderer and Mäntylä (2019).

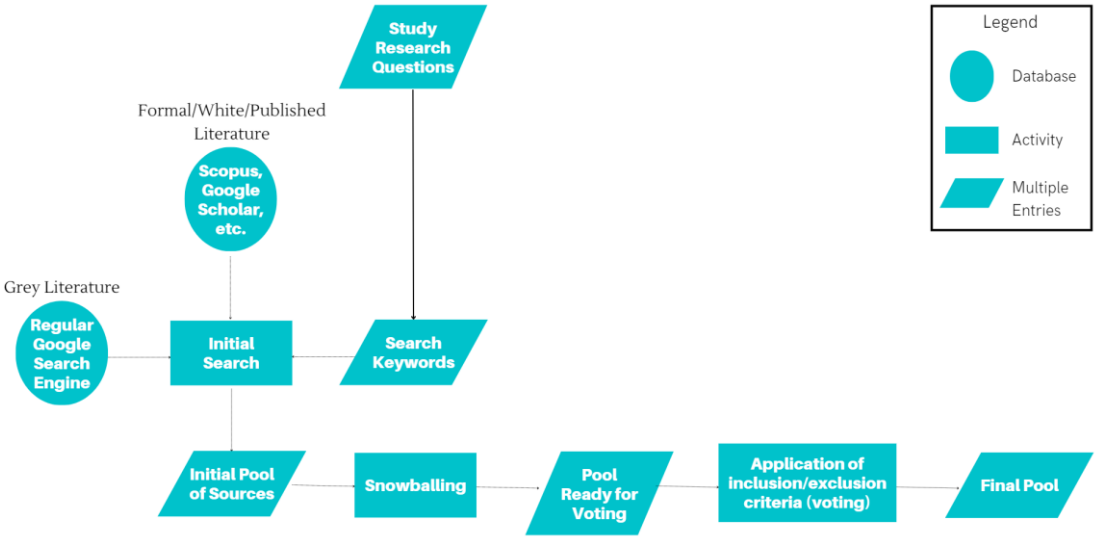


Figure 3.2 Source Process and Source Selection for Literature Review. Adapted from Garousi et al. (2019). Own Illustration.

The theory review is conducted in accordance with a systematic literature review (SLR). The SLR should adhere to a clearly defined process or plan where criteria should be clearly outlined before the review is undertaken. It is a thorough, transparent search that is done across numerous databases and grey literature, and it is one that other researchers could duplicate (Dewey and Drahota, 2016; Mun et al., 2018). Phase 1 aims to answer the first two research sub-questions. To do this, a deeper understanding of the research's key subjects is reviewed. First, keywords are used to search for articles. The table 3.1 lists the search terms that are utilised.

Table 3.1 Keywords Used for Literature Review

TOPIC:	Keywords Used for Search:
1 CIRCULARITY IN THE BUILT ENVIRONMENT	Circular economy, Circularity, Circular economy AND Construction industry/sector, Circularity AND Built Environment, Circularity AND Buildings, Circular AND Principles AND Built Environment
2 CIRCULAR CITIES	Circular AND Cities, Circularity AND Cities, Circular economy AND Cities, Cities AND Circular AND Frameworks, Circular AND Frameworks, Key sectors AND Circular city, Circular City Frameworks
3 CIRCULAR AREA DEVELOPMENT	Circular area development, Circular AND Regeneration Projects, Dutch AND Area development, Phases AND Area Development, Urban area development, Circular AND Urban area development
4 INCLUSIVENESS	Inclusion, Inclusiveness, Inclusiveness OR Inclusion AND Built Environment, Inclusiveness/Inclusion AND Circular city/cities, Inclusiveness/inclusion AND Built environment AND Circular Buidlings, Inclusivess AND Energy AND Sector AND Circularity, Incluisveness AND Mobility Sector AND Cicularity, Inclusiveness AND Wastewater AND Treatement, Inclusivenss AND Water AND Conservations, Inclusiveness AND Waste treatment OR Waste collection OR Waste recovery OR Recycling OR Reuse, Inclusiveness AND Circular economy AND Industrial Production, Incluisvess AND Food waste management OR Food banks, Inclusiveness AND Circular economy AND Citizens OR Local, Inclusiveness AND Responsible consumption OR Household collection schemes

In order to create the theoretical overview, inclusive strategies had to be discovered in the literature. Due to the scarcity of information in this field, grey literature had to be used in

addition to academic literature. Grey literature, or the varied and heterogeneous corpus of information accessible outside of and not subject to typical academic peer-review processes, can have a number of beneficial effects for further research and practise, for example, grey literature offers up-to-date information on current developments and can be released more swiftly than academic (Adams et al., 2017). Another beneficial effect that grey literature has is that it can provide unconventional and alternative perspectives, offering new insights and ideas.

Grey literature is derived from a complicated landscape of information pieces produced during actual actions. It will take time and include difficult trade-offs, the appropriateness of which will depend on the study's objectives. To strengthen its relevance and influence, the grey literature can, however, integrate diverse perspectives from experience into the scholarly conversation (Adams et al., 2017).

Grey literature used in this research went through simple a quality assessment, based on the checklist proposed by Garousi, Felderer and Mäntylä (2019). The checklist used for this research can be found in table 3.2. As seen in the table, both the building dimension and the city dimension have been used in the search. The first topic concerns the building dimension and is concerned with the actual implementation of CE strategies at the building level. As a result, keywords like "Circularity AND Buildings" and "Circularity AND Built Environment" were chosen. For the city dimension (topic 2), a more expansive perspective was needed, taking into account the city and a wide range of sectors within cities. As a result, keywords like "Circular AND Cities" and "Circular Economy AND Cities", were chosen.

Table 3.2 Quality Assessment Checklist of Grey Literature. Adapted from Garousi et al. (2019). Own Illustration.

Criteria	Questions
Authority of the Producer	• Is the publishing organization reputable? • Is an individual author associated with a reputable organization? • Has the author published other work in the field? • Does the author have expertise in the area?
Methodology	• Does the source have a clearly stated aim? • Does the source have a stated methodology? • Is the source supported by authoritative, contemporary references? • Are any limits clearly stated? • Does the work cover a specific question? • Does the work refer to a particular population or case?
Objectivity	• Does the work seem to be balanced in presentation? • Is the statement in the sources as objective as possible? Or, is the statement a subjective opinion? • Is there vested interest? • Are the conclusions supported by the data?
Date	• Does the item have a clearly stated date?
Position w.r.t. Related Sources	• Have key related Grey Literature or formal sources been linked to / discussed?
Novelty	• Does it enrich or add something unique to the research? Does it strengthen or refute a current position?

3.2.3 Theoretical Overview Approach

This section will discuss the methods applied for developing the theoretical overview (table 2.3). The development of the theoretical overview begins with an in-depth literature review. This review concentrates on the fields of the CE, BE, CAD, and inclusiveness. Particular attention is paid to the BE and its dimensions, as presented in Pomponi and Moncaster (2017). As shown in figure 2.3, the literature review identifies key dimensions within the BE, highlighting the building- and city dimension. These dimensions are key for this research, as CAD functions within these dimensions, warranting an inclusion of both these dimensions in further research.

This approach also acknowledges the significance of involving multiple stakeholders, involved in both the building- and city dimension. The inclusion of these diverse viewpoints not only broadens the scope of this research but also enhances the validity of its findings.

Delving into the city dimension, it is decided to analyse existing frameworks on CC. This analysis aims to understand how CE strategies are currently being implemented at the city level. The goal was to extract common areas of implementation across these frameworks, providing a more robust theoretical grounding for our research.

As seen in table 2.1, based on the analysis of the CC frameworks, key sectors for implementation of circular strategies in a CC are identified. Here however, the following is decided for the theoretical overview. The theoretical overview adopted for this study is developed through an analysis that aims to identify the common sectors among frameworks, where a minimum of four frameworks shared the same key sector. For instance, at least four frameworks include “Energy” as a pivotal sector for the implementation of circular principles. Based on this information, “Energy” is considered as a critical sector to be incorporated into the theoretical overview of this study. The only exception to this criterion is the sector “Citizens and Community.” Despite not meeting the minimum criteria, this sector is added to the theoretical overview of this research due to its significance in terms of inclusiveness. In the context of CAD, it is essential to consider the perspective and involvement of the area’s citizens. Thus, the explicit inclusion of citizens in the theoretical overview is deemed necessary to promote an inclusive approach to CAD.

In conclusion, the theoretical overview is developed by synthesising all the collected data, providing an integrated perspective on CAD within the building- and city dimensions. The goal of the methodology of the theoretical overview is to lay the groundwork for a CAD that acknowledges the complexities and interconnectedness of the various scales and stakeholders involved in CAD.

Section 2.8.3 gives an overview of the steps undertaken during the literature review. Ultimately, having a holistic approach serves to develop more robust and adaptable principles accommodating the complexity of key sectors while fostering inclusiveness. This approach entails categorizing inclusiveness strategies in overarching groups. This typology offers a better, more integral understanding of how inclusiveness can drive and support CAD projects. In section 3.2.8, delves further into this typology and how it furthers the research.

3.2.4 Phase 2: Selection Interviews Candidates

To determine which interviewees to include in this study, purposive sampling and snowball sampling will be employed. Purposive sampling is a strategy in which the researcher chooses particular participants or groups based on a specified goal or criterion. The sample is chosen according to specified criteria that are pertinent to the study subject. This approach is frequently utilised when a small sample size is available, and a thorough study of a certain event or population is the main objective. The grounds for using a purposive technique are founded on the concept that, given the study's aims and objectives, distinct types of people may hold different and important viewpoints regarding the ideas and topics under consideration, and hence must be included in the sample (Martínez-Mesa et al., 2016; Campbell et al., 2020). Purposive sampling is used to better match the sample to the research's goals and objectives, boosting the study's integrity and the reliability of the data and outcomes (Campbell et al., 2020). The snowball sampling approach involves the participating study interviewees selecting other potential study participants from their own social networks (Naderifar et al., 2017).

This study's interviewees are required for offering relevant and unique opinions. Based on their professional background and expertise, interviewees should be able to share their career experience and opinion on the influence of inclusive strategies on circular strategies of CAD. Nonetheless, the information gathered may be skewed due to the diversity of individuals, which can lead to inaccurate or incomplete findings, and can also affect the validity and reliability of the research. Interviewee selection criteria are designed for this research stage in order to acquire unprejudiced answers.

Determining the appropriate number of individuals to recruit is estimating the moment at which “data saturation” is achieved, or when adding additional participants no longer glean new information. Guest et al. (2006) states that in homogeneous research with purposive sampling, such as many qualitative investigations, 12 interviews should be enough to achieve data saturation. According to Dworkin (2012), a vast number of publications, book chapters, and books offer guidance and recommend 5 to 50 participants as adequate. Based off this, this study will limit the number of participants to between 8 and 15.

Participants in the study must meet one of the following selection criteria:

1. Experts in area development who have executive, managing, or supervisory, research or advisory positions;
2. Professionals that work as advisors or researchers for CE;
3. Professionals that work as advisors or researchers for on inclusiveness in area development.

In addition to the ability to supply information, the participant's commitment is critical. As a result, in addition to the selection criteria, their interests and dedication to the research process should be evaluated.

Once the possible interviewees have been chosen, they will be invited with informed consent (Appendix A.1). The data management plan for the research is used to provide informed consent (see Appendix A.2).

3.2.5 Phase 3: Interview Protocol Development

The process of the creation of the interview protocol is outlined in figure 3.3. In the following sections the second and third step will be described. This process has been developed based on the findings of Jacob and Furgerson (2012) and Turner (2012).

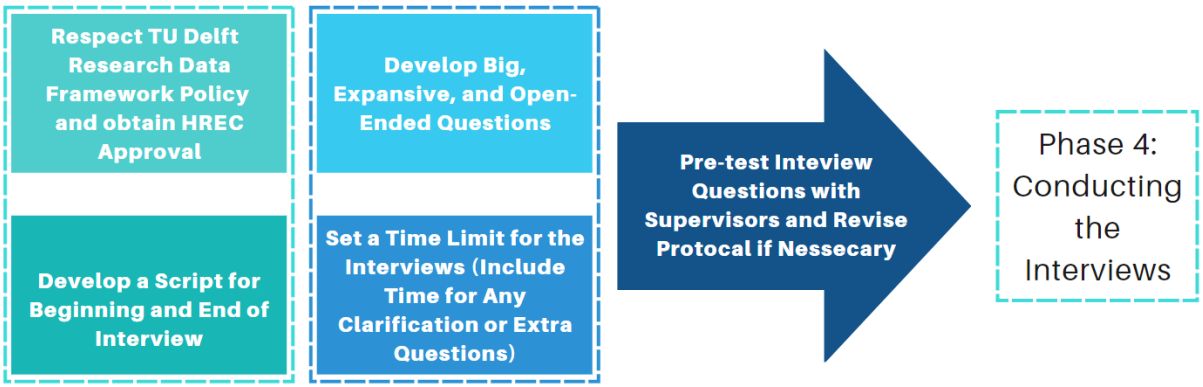


Figure 3.3 Step-by-Step plan for Creating the Interview Protocol. Own Image.

The semi-structured interviews will be no more than 60 minutes and will consist out of 5 parts. These five parts are:

1. **Introduction**

   The interviewer will give a brief overview of the study in this segment. The interviewer will also clarify the purpose and significance of the interview with the participant and remind them that the interview will be recorded. The data management strategy and informed permission for the interview were already acknowledged to the interviewees prior to the interview.

2. **Circular Area Development**

   In the second segment of the interview, the circular strategies of the framework will be discussed. The interviewees are to explain their opinions on circularity in area development, both within their own job and in general practice. This segment of this interview aims to validate this part of the research's framework.

3. **Inclusiveness Strategies**

   In the third segment of the interview, the inclusiveness strategies of the framework will be discussed. The interviewees are to explain their opinions on inclusiveness in area development, both within their own job and in general practice. This segment of this interview aims to validate this part of the research's framework.

4. **Opportunities and Barriers of Framework**

   The fourth section of the interview seeks to identify the opportunities and barriers of inclusiveness in the creation of circular areas. The participants provide input on whether

the circular strategies in Dutch area development are progressed by the inclusivity strategies outlined in the framework. The participants also present their views for and against considering inclusiveness as a necessary factor of Dutch area development.

5. **Closing**

   A summary of the interview will be given in the final section, and the interviewee will be reminded of the transcription agreement. The interview transcript will be provided to the interviewees, who have two weeks to respond if they have any questions or more information. In addition, before to concluding the interview, the interviewer will inquire as to the availability of other potential interview candidates for the snowball method of interviewee recruitment.

The structure of the interviews makes it possible to get relevant information from the participants, allowing for a comparison of the responses on an equal term. The interviewing process includes predetermined questions that are arranged to lead interviewees as they describe their professional experience. This interview process contains open-ended questions and opportunity for follow-up inquiries. The interviews mean to reveal (in detail) how inclusiveness is being implemented in key sectors within CAD in order to advance circularity in the area. The interview transcripts are used to gather the data.

The interview protocol development can be found in Appendix B.2.

3.2.6 Phase 4: The Interviews

The purpose of the interview in this study is to learn about and understand the participants' perspectives on how inclusivity may support circular strategies in CAD. The interviews were semi-structured to acquire consistent data due to the topic's scope. The semi-structured interviews are conducted after interviewee selection.

Semi-Structured Interviews

First, the decision to employ semi-structured interviews will be discussed in this section. Quantitative data can be gathered in a variety of ways, including document analysis, observations, semi-structured interviews, and focus groups. The process of data gathering will be explained in this section. The term "document analysis" describes the researcher's examination of written documents (Russel, 2003). Observations (in contrast to reported behaviour or opinions), are particularly helpful for gaining insights into a particular situation and actual behaviour. Two forms of observations, participant or non-participant observations, can be used to make qualitative conclusions (Hak, 2007). According to Hijmans and Kuyper (2007), interviews are used to acquire an understanding into a person's subjective experiences, attitudes, and motives (instead of facts or behaviours). Focus groups are large-group interviews used to delve into the knowledge and experiences of participants, as well as the motivations behind their actions. Focus groups are often guided by an established moderator who follows a topic guide or "script" and generally consist of 6–8 participants (Van Royen and Peremands, 2007).

The type of philosophy that supports qualitative research does not presuppose an impartial hierarchy of evidence or methodology. In other words, each decision about the use of a single method or a combination of methods must be dependent on the research question that requires to be addressed and a critical evaluation of whether or to what extent the method in question can achieve this (Busetto et al, 2020).

For this research, the choice had to be made whether to employ interviews, focus groups, or a combination of both. The next paragraph will describe the process that had led to the decision of employing semi-structured interviews.

The individual interview is one of the most effective methods for understanding people and delving deeply into a subject. It can elicit rich information regarding personal experiences and perspectives. Although individual interviews allow for spontaneity, flexibility, and response to individuals, they frequently take a lot of time and work to conduct, to transcript, and to analyse (Carter et al., 2014). On the other hand, focus groups get information from a group of individuals who can hear one another's responses and make further remarks that they might not have made otherwise. The interaction between participants, which encourages the identification and sharing of multiple viewpoints on the same matter, is crucial to the success of researchers who conduct focus groups (Carter et al., 2014). Considering both approaches, it was decided to conduct semi-structured interviews for this study in order to get more in-depth responses. Due to the complexity of focus groups, scheduling meetings individually may be faster than getting participants together simultaneously and within the time limitations of this study.

Interviewee Selection Process

As mentioned before, this research employed semi-structed interviews to gather the necessary qualitative data. The process of finding the participants for the research's interview can be seen in figure 3.4. The participants were all found and reached out to via LinkedIn. Of 18 of individuals that were contacted, 6 agreed to participate. An informed consent form was issued once the respondents consented to take part in the interviews. All candidates were asked to recommend other individuals who met the selection criteria. This led to the recruitment of 3 more interviewers, for a total of 9 interviews for the project. Every participant who demonstrated a desire to participate in the study was sent a research participant consent form (Appendix A.1). This form outlines the purpose and topic of the interview, a summary of the data management plan regarding identifiable personal information, and a document containing the research plan.

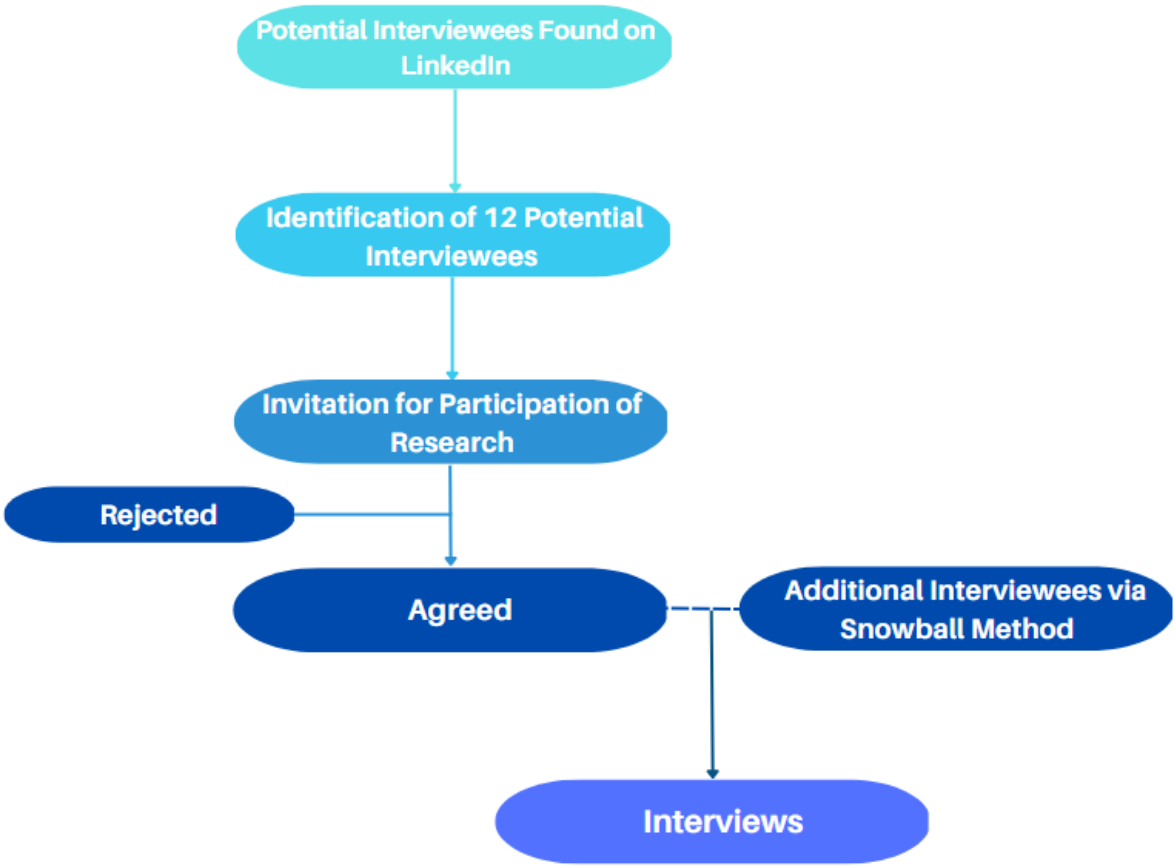


Figure 3.4 Interviewee Selection Process. Adapted from Jeongeun (2022). Own Illustration.

3.2.7 Phase 5: Analysis Results

Data collection is done using thematic analysis, an analytic method commonly used to identify patterns across language-based data. Thematic analysis allows for a great deal of "theoretical flexibility," and it can lead to either theory- or data-driven findings that address a variety of research questions. Sorting and sifting through the data set to find comparable words and/or correlations is a frequent process while conducting a thematic analysis and has been described as being widespread across various qualitative analytic approaches (Lester et al., 2020).

Phase-based data analysis has the advantage of making the process transparent for both the qualitative researcher and (in the end) the reader of a particular research report. These stages are especially suitable for thematic analysis, in which the researcher seeks to generate broad descriptive statements that convey their overarching interpretation of the data and in response to their research questions (Lester et al., 2020; Delve, 2022). These phases can be seen in figure 3.5.

The process of "coding," which is crucial to thematic analysis, is giving labels or categories to different data segments. Data may be better organised through coding, which also makes it simpler to spot trends and themes. Atlas.ti is a programme for qualitative data analysis that uses computers to assist the coding procedure. The researcher can arrange and classify the data using Atlas.ti, as well as find and follow codes and themes that appear across the data set. Additionally, the software offers capabilities for visualising and synthesising the data, which

makes it simpler to spot trends and connections between codes and themes. The coding and analysis process can be sped up by using Atlas.ti in conjunction with thematic analysis, and it can also help to guarantee that the analysis is uniform, methodical, and open.

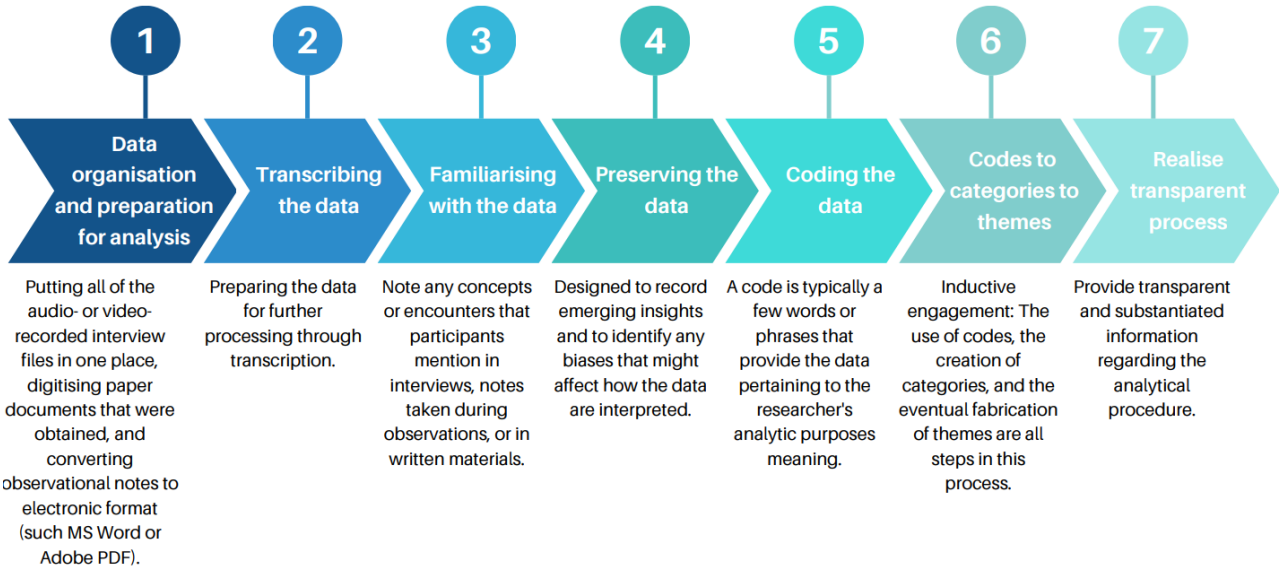


Figure 3.5 Data Collection Process. Adapted from Lester et al. (2020). Own Illustration.

3.2.8 Coding Methods and Criteria

For this research, the coding criteria and theme development is an integral part of the data analysis as they provide a structure and help identify patterns to the collected data. The coding process is guided by the following methods and criteria (also seen in figure 3.6)

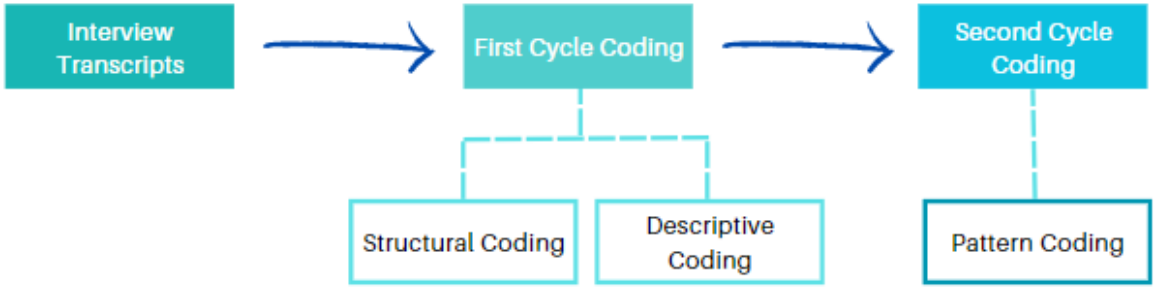


Figure 3.6 Process of Coding, Own Illustration.

In data analysis, first cycle and second cycle coding are concepts in qualitative research that happen in two stages of data analysis. This research also uses the first and second cycle of coding when analysing the transcripts. Usually the first step after data collection (in this research's case, transcripts of semi-structured interviews) is the first cycle of coding, where an initial organisation and categorisation of the data is done (Saldaña, 2013). Different methods can be used during this stage, but the chosen methods of this research are Structural Coding and Descriptive Coding. Below is a description of both.

Several methods of coding are used during the analysis of the transcripts, with the first one being structural coding. Structural Coding applies a content-based or conceptual phrase representing a topic of inquiry to a segment of data that relates to a specific research question used to frame the interview (MacQueen et al., 2008, p. 124). The parts of the data that have

similar codes are then collected for a more in-depth coding and analysis. Structural coding is chosen for this research as it is best suited for research that involves multiple participants, standardised or semi-structured data collection (in particular interview transcripts), and exploratory research. In order to evaluate similarities, differences, and correlations across comparable parts, structural coding both codes and initially categorises the data set (Saldaña, 2013). According to MacQueen et al. (2008, p. 125), "structural Coding generally results in the identification of large segments of text on broad topics; these segments can then form the basis for an in-depth analysis within or across topics." Using this method as a starting point for categorising the data, thematic analysis can then be employed to further the analysis (Saldaña, 2013).

The other method used for coding of the data is Descriptive Coding. Descriptive coding is a coding method in qualitative research to summarise and categorise data by identifying and labelling the key topics during the data collection. This method focusses on identifying the subject of discussion and identifies what the content is about. Descriptive coding is a versatile tool and can be used in qualitative studies, especially useful for beginner qualitative researchers. The main intention of this method is to be able to visualise and understand the data in a general sense, forming initial categories for more in-depth analysis. Thematic analysis is a good way to further analyse descriptive codes (Saldaña, 2013).

After the first cycle coding is completed, the second cycle of coding can begin. The intention of this second cycle is to organise and review the initial codes created, in order to identify larger themes, patterns, or relationships within the data. This cycle assists in synthesising, refining, and explaining the patterns found in the first cycle. Methods used in the second cycle can include Pattern Coding, Focused Coding, Theoretical Coding, etc (Saldaña, 2013).

For the second cycle of this research's coding process, Pattern Coding is used. This is a more advanced method of coding used in qualitative research data analysis. This method usually follows an initial cycle of coding and aims to identify emergent themes and explanations by consolidating the data into a more concise unit of analysis (Miles and Huberman, 1994). Key to pattern coding is the framing of assertations, meaning that this method enables the researcher to make explanatory conclusions regarding the data. By organising the data into themes, larger trends or significant relationships can be identified that leads to insightful conclusions (Saldaña, 2013).

This method is implemented by collecting excerpts of similarly coded data from the first cycle. These first cycle codes are first examined to determine their degree of commonality. Then these codes are grouped under different pattern codes. These pattern codes then assist in describing a key topic or theme. To further analyse Pattern Codes, various methods such as grounded theory, thematic analysis, content analysis, and more can be employed (Saldaña, 2013).

3.2.9 Phase 6: Development of the Initial Set of Guiding Principles

The development of the initial set of guiding principles will involve a systematic process of investigation, analysis, reflection, and synthesis. This will be based on the literature review and expert knowledge.

The first step in formulating the guiding principles is to conduct a wide-ranging and in-depth review of academic literature in order to identify pre-existing theories and conclusions on CAD and inclusiveness, which is done in Chapter 2: Literature Review. The following phase is creating the theoretical overview and the visualisation of the theoretical contributions. In this visualisation, an integrated approach is developed, where inclusiveness strategies in overarching groups are divided, in order to develop more comprehensive and adaptable guiding principles.

Semi-structured interviews are done to compare these findings to the experiences of experts. The typology of the inclusiveness strategies and the principles will be further enriched and developed based on the expert interviews, creating an integral theoretical contribution to academic research.

After the interviews, key themes, patterns, and linkages will be found from this data through analysis. The data will be coded and analysed using the codes in the thematic analysis in order to find important trends. These trends will result in key guiding principles.

The original set of guiding principles should be subject to continuing assessment and improvement because they were created as a beginning point rather than as a finished product.

4. Results and Analysis

The chapter is divided into four sections, as seen in figure 4.1, and answers the last SQ: W*hat are the key principles for inclusiveness in Dutch CAD?* The first section will present the revision of the Theoretical Overview (Table 2.3). This chapter will present an initial set of guiding principles. These principles' intention is, through inclusiveness, to support and drive the circular strategies implemented in Dutch CAD.

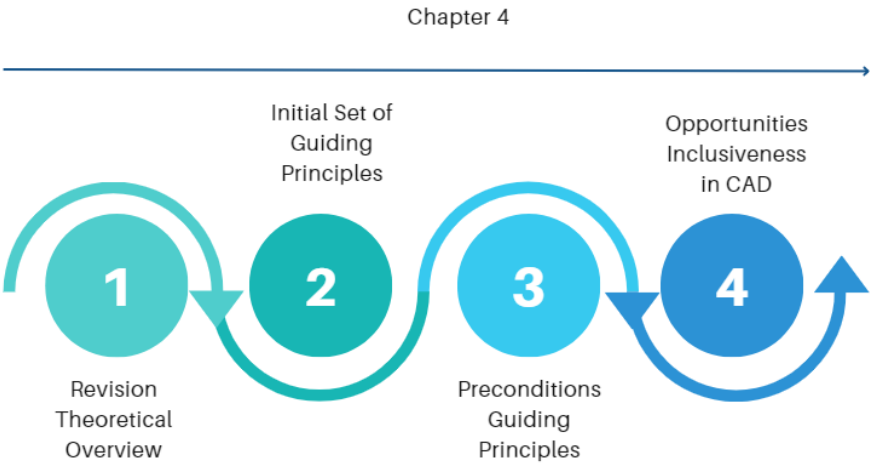


Figure 4.1 Outline Chapter 4. Own Illustration.

4.1 Theoretical Overview Adjustments

When conducting the interviews, it became clear that the theoretical overview needed to be modified to more accurately reflect the circumstances in the Netherlands. The revision enhances and refines the overview's practical importance in the Dutch context without negating the academic foundations. This is done based on the insights and experiences shared by the interviewees, ensuring it reflects the realities of inclusiveness and CAD implementation. The overview revision will be as follows: the text in red will be the adjustments that followed from the interviews.

The biggest additions to the overview are:

- When saying in an inclusiveness strategy to offer financial incentives, it should also emphasise on the fact that it should be offered through tangible objects, instead of cash compensation.
- When saying in an inclusiveness strategy that there needs to be engagement with communities, emphasis should be on giving communities the voice and power to make themselves heard.
- Citizens need to be made to feel ownership of sustainability issues, because then you get behavioural change and get people start participating on their own accord.
- Waste-to-Energy is a circular strategy that is too large scale to be adapted for small-scale communities, so that does not fit into this research's scope

Table 4.1 Revised Theoretical Overview

Key Sector	Circular Strategies	Inclusive Strategies	Additions
Built Environment	Material Reuse & Recycling	Encourage involvement of communities and businesses in material collection and processing to create local circular economies. Encouraging the community to share resources and materials can help to promote material reuse and recycling.	Circular strategy: Decomposing of structures, design in a way that it can be taken apart.
	Green Infrastructure	Involve local communities in the planning and management of green spaces to ensure that they are accessible and relevant to all.	
	Circular Construction Methods	Create job opportunities and provide training for individuals who may be marginalized or disadvantaged.	
	Life Cycle Thinking	Encourage collaboration between all stakeholders in the building life cycle, including designers, builders, users, and waste management providers, to ensure a holistic approach to circularity.	
The Energy Sector	Energy Efficiency	Providing financial incentives and technical assistance to SMEs and low-income households to adopt energy-efficient technologies and practices.	Offer financial incentives trough tangible objects instead of cash compensation
	Renewable Energy	Encouraging the development of local renewable energy projects, especially in rural and remote areas, to provide access to clean energy for all and create local economic benefits	Missing circular strategy: Seasonal storage of energy; use energy generated in summer in the winter.
	Renewable Energy	Ensure equitable distribution of clean energy (i.e. Energy Justice) and involve the younger generation in decision-making. Also involve the general population through participation and communication.	
The Mobility Sector	Electric and Hybrid Vehicles	Provide incentives and subsidies for the purchase of electric and hybrid vehicles and supporting the development of charging infrastructure in communities.	Offer financial incentives trough tangible objects instead of cash compensation
	Shared Mobility	Provide access to affordable shared mobility options and developing shared mobility services in underserved communities.	Missing circular strategy: De-growth, is about reducing the usage of in this case overconsumption.
	Sustainable Transportation Planning	Engage with marginalized communities to understand their transportation needs and ensure that sustainable transportation plans are inclusive and equitable.	Work together with communities and make them feel ownership
The Industry Sector	Resource Efficiency	Provide training and education programs to improve the resource efficiency of SMEs and promote circular practices in the heavy industry sector.	
	Closed-Loop Supply Chains	Promote an industrialization strategy that puts people and the environment first. Promote green jobs.	

	Digital Solutions	Support the development of digital solutions for SMEs and providing access to financing and technical assistance to adopt digital technologies.	
The Food Sector	Food Waste Management	Engage with marginalized communities to reduce food waste and promote food security and supporting the development of food waste reduction programs for SMEs.	Missing circular strategy: Reduction through prevention measures. Missing circular strategy: composting
	Local Food Production	Promote stakeholder engagement and a healthy and sustainable food system.	Missing circular strategy: De-growth, is about reducing the usage of in this case overconsumption.
Waste Management	Waste Reduction	Create well-developed structures for citizen involvement to reduce waste and promote sustainable waste management practices.	
	Recycling	Provide access to recycling services for marginalized communities and supporting the development of closed-loop supply chains for recycled materials. Include the recycling industry in the local production network and improve citizens' awareness, knowledge and practices.	
	Waste-to-Energy	Support the development of waste-to-energy technologies and promoting the use of waste-to-energy technologies in local communities.	Waste-to-energy is not really happening in small communities, more a large-scale circular strategy.
Water Management	Water Conservation and Reuse	Employing education and awareness campaigns can help raising awareness of the significance of water management and conservation among citizens.	Missing circular strategy: De-growth, is about reducing the usage of in this case overconsumption.
	Wastewater Treatment	Encourage local participation as to meet particular local needs. Engaging communities in decision-making processes around water management can help to ensure that the needs and concerns of all groups are considered and addressed.	Make sure that citizen engagement is diverse and representative of the community
Citizens and Communities	Community Engagement	Ensure inclusive, deliberate, and impactful citizen engagement. To guarantee that citizen interaction remains genuine and legitimate, policymakers must create clear, predictable, and long-lasting methods but must otherwise refrain from interfering. Create space for citizens' initiatives.	Give marginalised communities the power and the voice to guarantee impactful citizen engagement
	Sustainable Lifestyles	Provide simple regulations all around. Provide awareness campaigns can help to increase understanding of the importance of sustainability and the role that individuals can play in promoting sustainable lifestyles.	
	Circular Community Development	Create gatherings that can act as a breeding ground for new ideas and a place where initiators can meet. Building partnerships and collaboration with stakeholders, such as community organizations, local businesses, and government agencies.	

4.1.1 Comments on the Theoretical Overview

The theoretical overview presented in table 4.1, comprises key sectors within CAD. Within these key sectors, circular and inclusiveness strategies were identified. This sectoral division was used as a foundation upon which the overview was constructed, with the idea of offering structure and delineation for strategic exploration.

During the interviews however, a few interviewees suggested that the overview could be enhanced by fostering greater integration between the key sectors. Few excerpts of these sentiments are presented below. The first excerpt is from an interviewee that is engaged in a CAD project that focuses on different sectors within the area, called “program lines”:

“There are nine program lines…. so, one is water, one is mobility, one is a safe neighbourhood, one is data and the intention is that all this is integrated into each other, so that you can also achieve circularity. So, for example, an electric car and a charging station. Then you would prefer to have a two-grid charging station, which can also provide energy to the homes or what remains goes from the cars to the homes or vice versa…. And what I notice very much is that it is difficult that those 9 program lines still work quite a lot on their own island, which means that circularity also stagnates.” [3]

“I think it is really important to look at scale and not necessarily sector. So, to see, yes, I am now working on a scale, the industry or area development must become circular.” [2]

Regarding the inclusiveness strategy related to “Shared Mobility,” this interviewee said:

“It is really about accessibility. So that is how I would interpret something like inclusiveness. And from that point of view, I also think, you can actually apply it to any sector.” [6]

In response to this feedback, the experts acknowledged the need for a shift from a sectoral division to one that was more integrative. This shift means that the view of the key sectors of CAD, such as mobility, energy, and the built environment are not exclusive to single circular and inclusiveness strategies, but traverse multiple sectors within CAD. this way, having a holistic approach serves to develop more robust and adaptable principles accommodating the complexity of key sectors while fostering inclusiveness.

4.2 Initial Set of Guiding Principles

This section will present the initial set of guiding principles for the successful adoption and operationalisation of circular and inclusiveness strategies. These principles, coming from the theoretical overview and the interviews offer practical principles for various stakeholders involved in CAD, including businesses, policymakers, and society.

These principles, derived from the theoretical overview and the interviews, provide useful guidelines for various CAD stakeholders, such as businesses, governments, and society.

4.2.1 Interview Analysis - Themes

From the typology of the inclusiveness strategies during the theoretical review and from the interviews became apparent that there were 5 overall main themes for the development of principles for inclusiveness in CAD. As shown in table 4.2, these themes are as follows:

Table 4.2 The five Emerging Themes from the Data

	**Stakeholder Engagement & Collaboration**	This theme entails involving all stakeholders in decision-making processes. It acknowledges the need for solutions that take into account the diverse needs and interests of many groups.
	**Access & Equity**	This theme involves ensuring that the benefits of the CE are shared equally and addresses the particular needs of underrepresented and disadvantaged communities.
	**Education & Awareness**	This theme involves educating and raising awareness regarding circularity and sustainable practises, with a special emphasis on citizens and communities.
	**Promotion of Sustainable & Circular Practices**	This theme revolves around offering incentives and support to stimulate the implementation of circular strategies.
	**Localisation**	This theme emphasises the significance of developing local CE's, meeting the needs of the local community, and assisting local business and communities attempting to become more circular.

On the next page, a flowchart is presented to show the steps taken to get to this point.

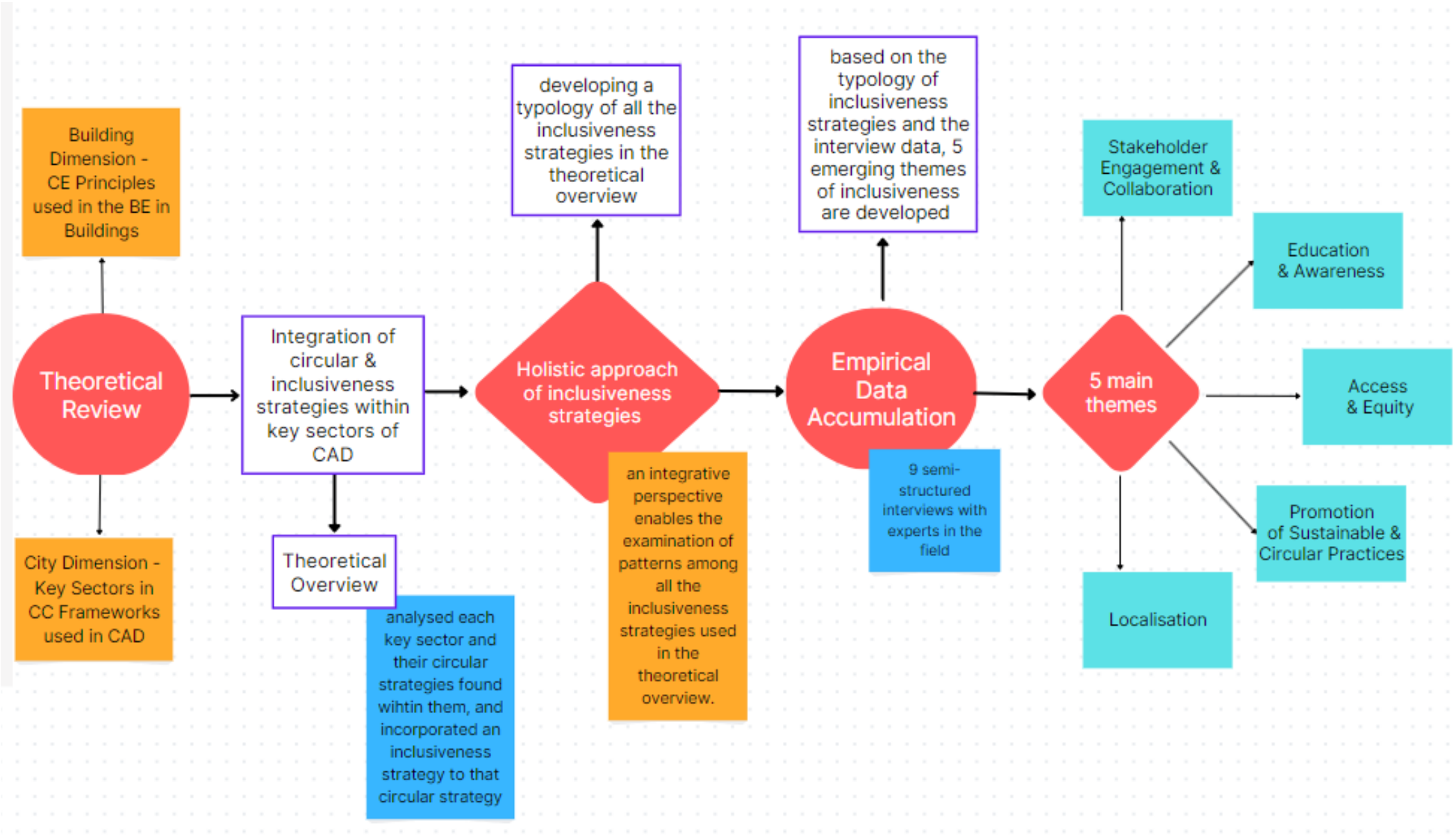


Figure 4.2 Flowchart of the Research up to the Development of the Main Themes. Own Illustration.

4.2.2 Coding Analysis

For this research, 9 interviews were carried out with experts actively working in the BE. The interviews were carried out in March 2023. The interviews lasted between 45 and 85 minutes. All the interviews were conducted using Microsoft Teams. After getting consent from the interviewees, the interviews were recorded and then transcribed. The table below show the expert and their field they are working in. the outer left column gives the codes assigned to each interviewee.

Table 4.3 Interviewee Information

Code	Position at Work	Date of Interview
[1]	Assistant Professor	10/03/2023
[2]	Specialist Strategic Participation	10/03/2023
[3]	Urban Planner	17/03/2023
[4]	Advisor Waste and Circular Economy	17/03/2023
[5]	Researcher (Urban Design, Public Space, Sustainability, Circular Community)	21/03/2023
[6]	Urban Researcher Social Sustainability	20/03/2023
[7]	Program Manager Circularity and Energy	22/03/2023
[8]	Area Developer	28/03/2023
[9]	Spatial Development Teacher and Designer	27/03/2023

After the data from the transcripts had been analysed using Atlas.ti, themes and patterns emerged. Below is a description of how these patterns were developed into principles. A more detailed overview of this analysis can be found in Appendix C.

When looking at the transcripts, the first step was to get familiar with the data. The transcripts had been read several times, before moving on to the next step, which was the initial coding and refinement of the coding. From that, several group codes were developed. 5 of these code groups were the main themes of the guiding principles. These were developed by looking at the codes and finding underlying patterns between them. For example, the theme localisation 5 codes were assembled. These were “Bottom-Up Initiatives”, “Collaboration & Localisation Challenges”, “Community Engagement & Local Production”, “Context-Dependent Implementation”, “Sustainability & Local Development.” In these codes, excerpts of interviewees are stored. In these excerpts, key words or sentences were used to formulate a guiding principle and its definition.

The coding framework, having all 8 coding groups and all 67 codes can be found in Appendix C.4.

On the following two pages, two overviews of the guiding principles, opportunities and preconditions are shown, in order to have a concise and bird’s-eye view of all the results. In subsequent sections, these overviews will be explained further in detail.

Table 4.4 Overview of the Themes and Initial Set of the Guiding Principles and Added Value of Principles

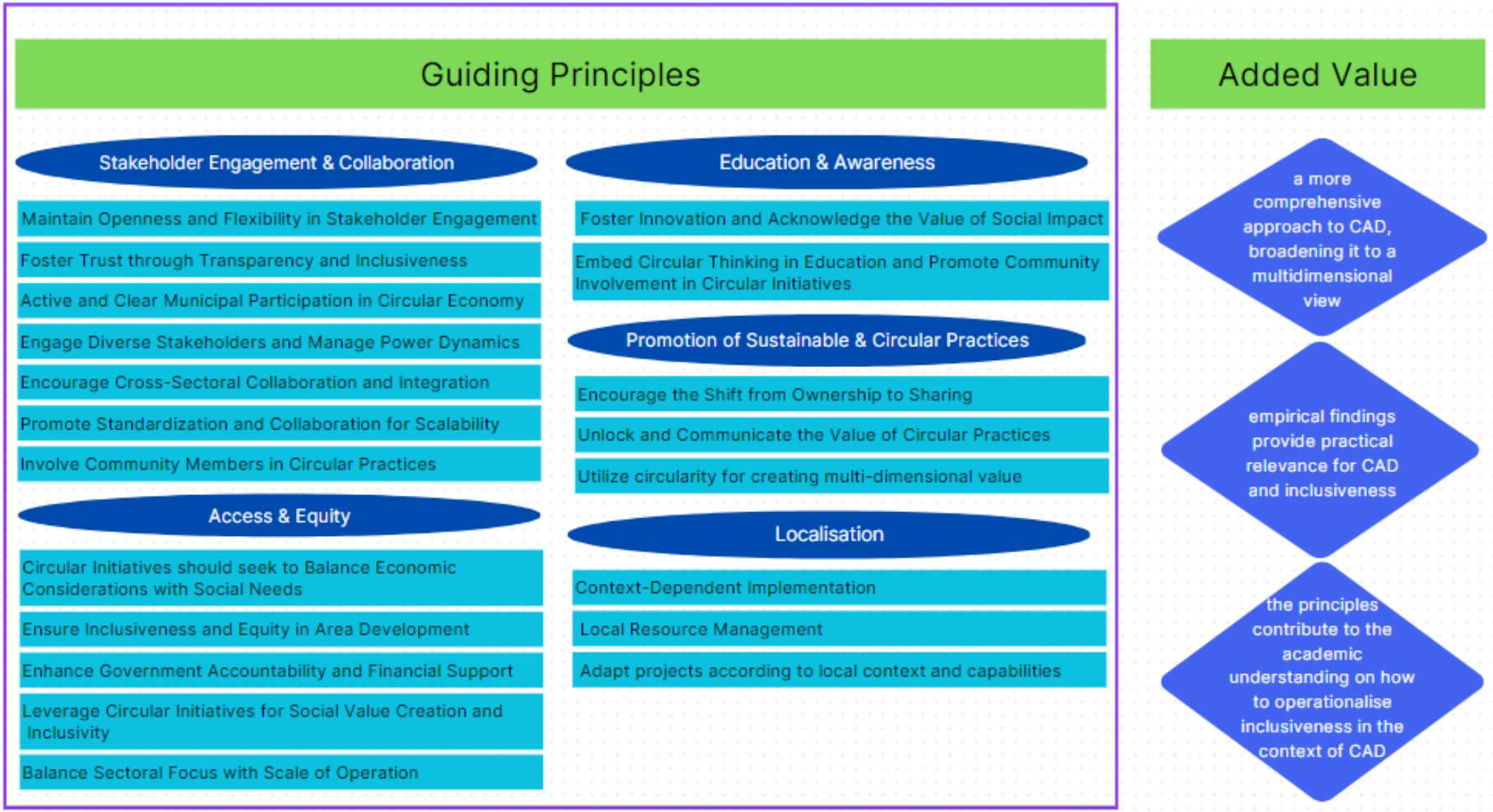


Table 4.5 Overview of all Preconditions to the Guiding Principles and Opportunities for Inclusiveness in CAD

Preconditions to Guiding Principles	Opportunities for Inclusiveness in CAD
Reorient Organisational and Societal Structures to Better Implement Circular and Inclusive Strategies	Inclusiveness for Accelerated Development
Enable Policy Coherence and Adaptability for Effective Implementation	Inclusiveness as a Preventive Measure
Decrease the Shortage of Skilled Professionals	Inclusiveness for a Healthier Economy
Update the Rewarding system that Incentivises Traditional Behaviour to Sustainable Reward System	Inclusiveness for Equality
Reorient Area Development from an Economically Dominated Model to a Human-Centred Model	Inclusiveness for Local Development
Improve the Economic Viability in CAD Strategies	Inclusiveness for Marginalised Communities
Turn Inclusiveness into a Standard for CAD	Inclusiveness for Enhanced Diversity

4.3 Theme 1: Stakeholder Engagement & Collaboration

4.3.1 Foster Trust through Transparency and Inclusivity

Key to having successful inclusiveness in CAD is ensuring that there is trust among all stakeholders, including citizens. This can be done by promoting transparency in decision-making processes, having stakeholders involved during all phases, documenting small-scale initiatives that have demonstrated success and scaling those up. Also important is the ability to be flexible and adapt to communities' specific needs and preferences, as noted by this interviewee:

"..so suppose you say with your research proposal I want to apply lifecycle methods, but then it turns out in a conversation that people are not at all waiting for your lifecycle, but that they would like a cultural programme. Then what do you do? Because you have received money for lifecycle research, but what is needed is a cultural programme. So, you actually have to be able to compromise a bit in that. So, you have to build that reciprocal relationship and I think you can also achieve inclusivity only if there is trust." [5]

Building trust is needed to overcome any scepticism or resistance towards inclusiveness and circular initiatives, as this interviewee notes:

"People no longer trust the organisations, the municipality, the housing association, everything is so large-scale. There is little room for human size. So, the citizen has also dropped out and by doing it (read: circular and inclusiveness initiatives) on such a small scale, they hook up again. So, trust is very important when it comes to citizens." [8]

4.3.2 Involve Community Members in Circular Practices

This principle lets citizens foster a sense of ownership, encouraging sustainable lifestyles. Encouraging locals to partake in circular practises like waste segregation, recycling, and litter picking not only promotes green jobs, but also creates a sense of the community caring for its own. This reciprocal relationship between community members and entities like the municipality can enhance these efforts, where at first small-scale efforts eventually grow into hubs for circular activity, as explained by this interviewee:

"…for example, the Afrikaanderwijk, they collected the waste there, so we took over the waste management from the government…. And they then hired the local people to do that work, who spent all day doing it. So, you have people who have a job or at least earn money to divert. And that is not only that they earn money themselves, but they also set an example for other people in the neighbourhood…..Well, they started with this, then there will now be a whole raw materials station, where organic material is then processed into food products. There will be a repair café, there will be a social place, and they are now also working on green roofs with waste from the market. So, like that, so you start somewhere and then slowly you connect all kinds of other projects and people, and that is how it expands." [5]

4.3.3 Active and Clear Municipal Participation in Circular Economy

Municipalities have a key role in the transition to a CE, acting both as leaders and facilitators in the process. This double role leads them to not only have to clearly define targets and requirements for successful implementation for inclusiveness in CAD, but also offer the flexibility in how these requirements are achieved. This way, creativity and collaborative problem-solving are stimulated. However, municipalities need to provide a supporting policy framework, with clear, context-specific rules and initiatives. Imposing top-down decisions should be avoided and giving communities the freedom to decide how to meet targets.

This interviewer has expressed the same sentiment by saying:

"We (read: the university) or the municipality come up with "what do you want green infrastructure, shared mobility?" We're going to impose this, but I do not think you'll ever get anything done that way. And then you do not get any inclusiveness at all, because people either do not do it or get angry… And so that is what the government is doing, I think, so now it is not good on two fronts, the government is not really coercive enough, is it? It should really just be stating, these are the targets, this is what we are going to achieve… And on the other hand, all sorts of things are being done, but there is no freedom at all, I think, given. So, I would like to turn it around, so I do set requirements, but how do you achieve that, then solve that together. And then you get a whole range of circular solutions." [5]

4.3.4 Encourage Cross-Sectoral Collaboration and Integration

For the successful implementation of CE initiatives and inclusiveness, it is critical to boost cross-sectoral collaboration and integration. A circular strategy should not be limited to a specific domain but should be integrated through multiple key sectors. This encourages a collaborative approach, where the key sectors work together rather than operating within their own sector. This will increase circularity and efficiency.

One interviewer talked about their CAD project:

"There are 9 program lines, so to speak, so one is water, 1 is mobility, 1 is a safe neighbourhood, 1 is data and the intention is that all this is integrated into each other, so that you can also achieve circularity…. And what I notice very much is that it is difficult that those 9 program lines still work quite a lot on their own island, which means that circularity also stagnates." [3]

4.3.5 Maintain Openness and Flexibility in Stakeholder Engagement

Openness and flexibility in stakeholder engagement in CE initiatives is crucial for effective stakeholder engagement. It is important for projects to be adaptable to the changing needs of stakeholders, as over time, societal questions and residents' needs may change. Furthermore, stakeholder involvement should avoid preconceived notions and foster an environment of shared ambition and goals, resulting in meaningful collaboration. Stakeholder engagement should be a dynamic process that needs active participation from every side.

"And what is also required for this is to maintain a degree of openness and flexibility in projects, so that knowledge that emerges later or that is also changeable, because the needs of residents also change. Some area development projects also run for 10 or 20 years and in that time completely different social questions have arisen, and some generations have simply grown up. So that just keeps changing. And then there must still be room, also in projects, to change course or make minor adjustments." [6]

Regarding whether initiatives came from the municipality or citizens, this interviewer said:

"One time it comes from the residents, the other time it comes from the municipality. But it is about finding each other..... It has to come from both sides, and you have to actually have a shared ambition or a shared goal and then and then beautiful things can happen. But if that is not there, so that shared goal or that shared ambition, then nothing will happen." [4]

4.3.6 Promote Standardization and Collaboration for Scalability

There are challenges when trying to scale-up circular initiatives to a comprehensive CE. The challenges become even more complex when there is no standardisation in structure or language. This has been expressed by the following interviewee:

"I think the need for open standards in all these types of strategies, so that you can seamlessly link the initiatives together, because otherwise information is lost, that is very essential. And that it actually comes back in a certain way in all these things, so that you literally understand each other. Because you use the same open standards to type your data, so that information can be made from data everywhere." [7]

Furthermore, it is important to actively encourage inclusiveness and diverse collaborations, to avoid having the same stakeholders, resulting in a closed-off environment, as noted by this interviewee:

"So, on the one hand, you have a very progressive movement. But it is very much in a bubble initiative. For example, when I really went all in on circularity around 2014, I met a whole series of people who fight very hard for it together with me. These are the people I still encounter at all meetings. Some more people are joining, but not a lot, so you just notice that it is a bubble." [7]

4.3.7 Engage Diverse Stakeholders and Manage Power Dynamics

In order for inclusiveness to support CAD projects, the active participation of diverse stakeholders must be ensured. These stakeholders include residents, local entrepreneurs, social workers, etc. It is also crucial to navigate and balance the power dynamics between all stakeholders involved and focus on each stakeholders' unique capabilities and needs.

"…also, about collaborations of various stakeholders who are involved in an area development. And these are now mainly dominated by the usual construction stakeholders and development stakeholders, so developers, municipality, planners, housing corporations, who actually take care of the construction project. But to be able to steer that balance more, it is especially necessary to work together with stakeholders who are more involved in the

management and use of the areas. So then you are also talking about residents themselves, but they can also be stakeholders, such as social workers who are active in neighbourhoods or area councils, local entrepreneurs, neighbourhood representatives, schools that have actually been present in places for a long time and therefore much better and know in detail what is happening in their neighbourhoods. And the integration of those kinds of stakeholders with the stakeholders who are also working on more construction projects, yes, that is very much needed." [6]

"If you want to achieve inclusion, you also need to know who do I want to include, where are those people, what do they do, what are their specific needs, how can I link their specific needs to someone else's offer, so that one can offer and the other's needs satisfied. Does it make him happy? …. where do we have conflicting interests, where are we complementary to each other? And if you want to make that transparent, you not only need to know what is where, but also who is where. And not in a privacy invasive way, but simply that people can express themselves based on their needs or their offers. And in that way, focus much more on collective value enhancement than on competitiveness." [7]

4.4 Theme 2: Education & Awareness

4.4.1 Embed Circular Thinking in Education and Promote Community Involvement in Circular Initiatives

Circular thinking should be embedded in early education in order to accelerate the shift in attitudes towards profit-making and resource exhaustion. By growing a new generation of circular thinking citizens, a more sustainable future can be met. Communities should also get involved in local circular initiatives, to increase awareness and the sense of ownership and responsibility over local resources. While campaigns can raise awareness about circular projects, practical actions and incentives should also be implemented in order to reinforce behavioural change.

It is essential to create structures that reward sustainable, as mentioned by this interviewee:

"If you do that with campaigns, then you offer something….You know, cigarette packs are full of all kinds of nasty surgical photos, but if you're addicted to a nicotine, you get used to those photos and then you just carry on. So just campaigns, information and so on, are often not enough. You actually have to create a structure that contains the reward for that behaviour." [7]

4.4.2 Foster Innovation and Acknowledge the Value of Social Impact

Measuring the success of an inclusive CAD project might not be best done through traditional formulas and measures. These traditional formulas often neglect social value and innovation. This is why more flexible, innovative, and more socially creative principles should be developed in order to move away from predefined formulas. The success of an inclusive CAD project creates social value. Efforts should be made to understand, acknowledge, and promote this social value, encouraging this challenge and new ideas that better align with circular principles.

“The transformation of our current economy to a CE is not that it is that easy. That requires an incredibly different way of thinking and also a completely different attitude towards making a profit and exhausting the earth.” [5]

“Its success is very difficult to measure. And, that is what I said earlier. We are still too much in that measuring world, instead of understanding social value. See, social value is very hard to measure and that is mostly what you get when you make something inclusive. And that is why it makes it very difficult. Because yes, when is it successful?... So, because it is hard to measure, I think the biggest barrier and the biggest challenge here is actually validating inclusiveness.” [3]

“…we apply our old thinking to new ways of acting.” [7]

4.5 Theme 3: Access & Equity

4.5.1 Ensure Inclusiveness and Equity in Area Development

Area development should be inclusive and representative of the diverse population. This means that diverse housing options must be maintained, marginalised communities need to have access to sustainable technologies, such as solar panels. Circular initiatives related to the energy transition should be promoted in such a way that fosters a sense of ownership among community members.

One interviewee noted:

“I have solar panels, so I am already in that energy transition and I have sustainable energy and they have a rented house. We do not have solar panels in a social rented house and then they do not participate in that energy transition. They do not feel like they own it either. So, no ownership.” [4]

4.5.2 Circular Initiatives should seek to Balance Economic Considerations with Social Needs

The current economic systems tend to favour growth, which can conflict with social equity goals. That means that the challenge lies in shifting towards a system where growth does not diminish social wellbeing, and success is not only defined by economic prosperity. There must be a balance created between the provision of essential services like affordable housing and accessible facilities and the financial reach of all community members.

“And also, there are still perverse rewards in the current economic system that depends on growth. Well, growth is rewarded and is rewarded harder than non-growth.” [7]

“…but we cater for people who need a helping hand. So that immediately strikes me, because you can say, we have a citizen, and he has a small budget. So, for example, what we …do in commercial complexes, you pay € 3 per wash. We have not done that, because our tenants are not going to do that (read: be able to pay for that). They pay € 600 per month, so we let

everyone pay €6 service costs per month for the washing machine, whether you use it or not or whether you use it 20 times, so we must at least take that into account financially." [8]

4.5.3 Leverage Circular Initiatives for Social Value Creation and Inclusivity

Circular initiatives should create social value by providing opportunities for diverse groups, with a special focus on the most marginalised. These opportunities could be in the form of employment, building skills, community involvement, etc. The success of a project is not only based on its impact on the environment, but also on the social value and benefits it has created within a community. If inclusiveness is at the core of these circular initiatives, it will ensure equitable access and benefits to all stakeholders involved. Circular projects should aim to foster social cohesion and community building through shared responsibilities and collaborative efforts (e.g., shared economy, communal hubs).

"…the dependence that you create between people because they join the sharing economy is, in my opinion, a very important motivator to also improve integration. And therefore, also the empowerment of people who often still remain on the sideline because they do not belong to the majority. So those are circular design principles that have the social by-catch that they also lead to more community and more communal design." [7]

"We had three buildings there and there would be some washing machine areas below…. At the same time, I discovered that people of Philadelphia came to live with a mild intellectual disability. They normally have daytime activities in Sloterdijk…. And then we came up with the idea, let that daytime activity take place in that washing machine room. So now there is a bicycle repair shop, there is a laundry bar where you can have your laundry washed and ironed and repaired. Biological detergent is now also being made." [8]

4.5.4 Balance Sectoral Focus with Scale of Operation

The scale of the operation and the crucial CAD sectors need to be balanced. When the impact and requirements at various scales are understood, a more comprehensive understanding of the circular transition can be attained. The practicality and effectiveness of CE projects can be improved, assuring their application and success across many contexts and scales, by striking a balance between this sectoral focus and the scale consideration.

"I think it is really important to look at scale and not necessarily sector. So, to say, I am now working on a scale, the industry or area development must become circular…. If you are talking about the level of, we want to deal in a much more circular way with the raw materials of the building, with the waste stream in the building, in a certain apartment building somewhere in Delft, then I think you are much closer to lessons from social workers, say from social work and from area builders, area directors, etc. I would look at scale and I would look at the roles that people have." [2]

"There are nine program lines, so to speak, so one is water, one is mobility, one is a safe neighbourhood, one is data and the intention is that all this is integrated into each other, so that you can also achieve circularity. The program lines are still very much regulating from

their own domain. I also see circularity as something like collaboration, to be able to achieve that. So, for example, an electric car and a charging station. Then you would prefer to have a two-grid charging station, which can also provide energy to the homes or what remains goes from the cars to the homes or vice versa." [3]

4.5.5 Enhance Government Accountability and Financial Support

Consideration of political aspects is crucial to the success of a CE. Industries that benefit from the prevailing linear model, may resist change, making it crucial to get government support and regulation. Universities and researchers should acknowledge and address these political factors to ensure their efforts do not remain on the periphery. Furthermore, governments have the responsibility to facilitate the participation of all residents in the transition to a CE. This responsibility goes beyond mere rhetoric, as government bodies must provide the necessary resources and infrastructure to support participation. Moreover, they should encourage residents to take ownership of the process, which can contribute to the wider acceptance of circular strategies. Lastly, governments could take innovative steps to promote circularity and inclusiveness, including providing financial support for individuals with lower income. This could take the form of subsidies or other forms of financial aid to make circular products or services more affordable.

"And then I think we should also bear in mind, but that is not at all the core of your research and also not of my research, but is that the health industry is of course an industry where the entire health care sector actually benefits from people who may be sick. It benefits from selling as many pills as possible. And so I think, as long as we in such a CE and also at a university do not realize that these political aspects are very important and also take a position on this, what we do will remain a bit on the margins." [5]

This interviewee talked about subsidies provided by the government:

"And the government, municipality or whoever, contributes the other €10…. It is a choice, is it not? It is a political choice. Of course, it has financial consequences, I understand, but it is a way of thinking about whether you can promote circularity and also link it to inclusiveness." [4]

4.6 Theme 4: Promotion of Sustainable & Circular Practices

4.6.1 Encourage the Shift from Ownership to Sharing

When establishing circular practises, there should be a change from ownership to sharing. It should become commonplace to share or rent out resources like tools, appliances, and garden areas. In this way, resource consumption and waste generation can be minimised, and community engagement may advance by focusing on using items rather than possessing them. In accordance with this principle, models that promote and facilitate the shared use of resources must be created, but only if they are both economically sound and inclusive.

"….circular strategies in terms of sharing and borrowing or renting electrical appliances such as washing machines….And parts of high-quality electrical equipment such as a washing machine, but you can also think of other equipment, such as a drill….I know that there are also initiatives at neighbourhood level and district level….where you can rent out those kinds

of materials for a low price. And that is of course an important circular strategy, is it not? So that you refrain from ownership and go more towards use." [4]

"…. or a drill. The average operating time of a drill in the Netherlands is approximately 12 minutes during its lifetime. You do not need a drill; you need a hole in the wall. 1 drill per (read: street block) block is enough…. And the dependence that you create between people because they join the sharing economy is, in my opinion, a very important motivator to also improve integration. And therefore, also the empowerment of people who often still remain on the sideline because they do not belong to the majority." [7]

4.6.2 Unlock and Communicate the Value of Circular Practices

Implementing circular methods is crucial, but it is also important to communicate and make accessible to stakeholders the value that these methods produce. Sharing information regarding the availability and accessibility of circular resources is necessary, as is showcasing their value through practical, tangible community projects. Stakeholders can adopt more sustainable practises, promote social connections, and cooperate based on circular ideals by releasing this value.

"If you only build circularly and use circular materials that are also adaptable, modular and reusable in the future, then you are of no use at all if you do not unlock that created value. Because if it is not unlocked, it cannot be used. So, people also need to know where that value is and when it will become available, so that we can also guarantee and optimize that future usability. But systems must be used for this, such as building passports…." [7]

4.6.3 Utilize Circular Principles for Creating Multi-Dimensional Value

Initiatives that promote circularity can be useful tools to generate value on a number of levels, including economic, ecological, and social. Engaging in local communities and developing social centres may all promote inclusivity and show tangible advantages, which may help communities participate. Adopting circular practises can also improve the environment and result in the establishment of valuable employment and social relationships. Such multi-dimensional value creation can begin small and expand over time as each success encourages increased engagement and growth.

"There are circular interventions or ways that organize a different form of that economy, that you use them to create value on multiple fronts and not just on economic area." [5]

"Then during one of my trips in Taiwan I came across a sort of recycling centre, where paper was collected. And then we come to inclusion and that is a very large group, say retired people. A piece of 40 or 50, and they were all sitting with huge trays of paper, they were cosy, chatting and drinking tea together, they were cutting away all the white paper from the printed paper….even though the scale they did was of course irrelevant, but they experienced useful function….and that was also the value of separating paper was miniscule compared to the social values that were created there." [7]

4.7 Theme 5: Localisation

4.7.1 Context-Dependent Implementation

CAD initiatives should be context-dependent, acknowledging the unique resources, needs, and wants of the local community. The location and the individuals involved have a big impact on how well inclusivity, sustainability, or circularity are implemented. It is essential to pay attention to community voices, exercise flexibility, and comprehend the unique environmental, social, and economic circumstances. Understanding the local environment is important for project design, use, and long-term sustainability since it reduces the likelihood of early obsolescence or inefficiency.

“There is also very much a context dependency in area development. It is also logical that, for example, that “involve local communities”, that it means something different in a different place.” [6]

Regarding CE in area development, this interviewee said:

“That depends quite a bit on the of the people and companies involved. So, you have the dimension of which company is there and what ambition and vision does it have? …. And besides that, of course you have municipal policy…. I work in Amsterdam, but the rules in Amsterdam North are stricter than in other parts of the city. So, it is a combination of which party, which persons and the policy of the municipality.” [8]

“A more circular Dutch society, that is also such a scale. You can always do more, you can always do less. Everyone has their opinion on that, including me, but that also depends on the context and the time.” [1]

4.7.2 Adapt Projects According to Local Context and Capabilities

The specific needs and urgencies of local communities should genuinely inform the development of projects. Small-scale efforts’ limitations should be acknowledged, and project scale and goals need to be adapted accordingly. Regarding a project success, the impact of local individuals and organizations should be taken into account. Specialised solutions that take into account the particular area, local potential and limitations, thus facilitating a successful inclusive circular development.

An example of urgencies of local communities is given in this excerpt:

“So that you have a fairly flexible market; so, you can come and say well, I'm going to involve these people in the community. We are now going to do something green. So, you come up with a circular goal, you get there. But then it turns out, for example, that that is not the urgency of these people from the community at all, because the urgency may be a job or something else, then it makes very little sense to impose your urgency, namely a green infrastructure. That is where you get resistance.” [5]

“Also, about collaborations of various stakeholders who are involved in an area development. And these are now mainly dominated by the usual construction stakeholders and development stakeholders, so developers, municipality, planners, housing corporations, who actually take care of the construction project. But to be able to steer that balance more, it is especially necessary to work together with stakeholders who are more involved in the management and use of the areas. So then you are also talking about residents themselves, but they can also be stakeholders, such as social workers who are active in neighbourhoods or area councils, local entrepreneurs, neighbourhood representatives, schools that have actually been present in places for a long time and therefore much better and know more in detail what is happening in the neighbourhoods. And actually, the integration of those kinds of stakeholders with the stakeholders who are also working on more construction projects, yes, that is very much needed.” [6]

“So, this is often said to be done, involve communities, but there is never a reciprocal relationship. So, I think to get inclusivity or actually commitment, so you need a reciprocal relationship. You will also have to give something back and also realize that you need to have a fairly flexible market…” [5]

4.7.3 Local Resource Management

To foster self-sustaining ecosystems, local resources and skills for circular solutions need to be maximised. For example, by employing local residents, utilising locally available materials, and creating local circular businesses. The area’s existing infrastructure can be repurposed to facilitate these businesses, for example, using shared communal spaces for waste segregation or recycling.

When discussing material re-use, this interviewee used the reuse of a door as example:

“And utopia is that that door is reused 1 to 1 in a new building, but that is often not possible. And certainly, in the Netherlands that is no longer possible, because the regulations have changed…. It will almost always have to have a waste by-product, so from when it comes out of a building and has to go to a new building, there is an intermediate step. And that intermediate step is often a carpenter, a paint factory…. But if you follow this principle to CAD, then in this case CAD is an area that ensures that the flow of materials can indeed be closed. And then it is often less important that you look at the buildings that actually have or released those materials. But after the functions that ensure that supply and demand can be matched.” [1]

4.8 Preconditions for Initial Set of Guiding Principles

This section presents the preconditions for the successful implementation of the initial set of guiding principles. These preconditions were developed based off the interviews and highlight the requisite circumstances that need to be established for the guiding principles to be effectively applied.

More specific, the preconditions were developed based off the barriers that interviewees identified for inclusiveness in CAD. The argumentation behind this is the following. When interviewees identified barriers for the practical implementation for inclusiveness in CAD, they provided insights on the obstacles that prevents the implementation of a certain inclusiveness strategy. Once these barriers became clear, conditions could be formulated to overcome them, becoming the preconditions for a successful implementation of the initial set of the guiding principles.

The interviews made it clear that preconditions must be formed before an initial set of principles for inclusiveness in CAD could be developed. The success of the circular and inclusion strategies is contingent on the fulfilment of the preconditions. The strategies' efficacy might be constrained if certain preconditions are not met. These preconditions are summarised in table 4.2.

In the following subsections, the preconditions that have been identified as necessary for the guiding set of principles during the interviews will be discussed.

Table 4.6 Preconditions to the Initial Set of Guiding Principle

	Reorient organisational and societal structures to better implement circular and inclusive strategies
	Enable policy coherence and adaptability for effective implementation
	Decrease the shortage of skilled professionals
	Update the rewarding system that incentivises traditional behaviour to Sustainable Reward System
	Reorient area development from an economically dominated model to a human-centred model
	Improve the economic viability in CAD strategies
	Turn inclusiveness into a standard for CAD

4.8.1 Reorient Organisational and Societal Structures to Better Implement Circular and Inclusive Strategies

Circular and inclusiveness strategies within CAD can only be properly supported if the foundations they are built on are accommodating. This means that there should be a reorganisation of current structured, including (but not limited to) government, political systems, and educational institutions, that goes beyond mere regulation and awareness campaigns. To become standard practises within CAD, this restructure necessitates a thorough reorientation and transformation of the current structures.

Some interviewees expressed the need for structural change:

"I really think the crux to that acceleration in this is actually towards a society that is equal and sustainable, it is also in another organization of our society, so you can have all these circular strategies, but actually inherent it means that we have to change our entire system, including government, including old political systems and probably including universities." [5]

4.8.2 Enable Policy Coherence and Adaptability for Effective Implementation

In order to effectively transition to a CE through CAD, policy limitation challenges must be overcome. Certain rules and regulations created by government can create obstacles, making it challenging to execute alternative circular approaches for area development.

"Those social goals are stated at the beginning, but there are actually almost no mechanisms to maintain them during the time that a project is running. Also, many technical goals or circular goals are converted into documents or that are worked out in concrete terms. And it is those social goals that remain hanging in the air. And there are actually no processes to fall back on." [6]

For the transition to be impactful, policy guidelines should be coherent, clear and adaptable to accommodate CE practices and all stakeholders involved. Next to circular objectives, the policies must also support the social values that can be achieved, as well as create mechanisms to sustain these social values.

"...we mainly look at which materials can we use best, how can we decompose, design in such a way that the buildings can be taken apart properly. Here and there some laws and regulations that will help with that…So, then you also see that the law and regulations are still lingering…But the developers do follow the law and regulations, but not always the other way around." [9]

It is also important to pay attention to the perpetuation of unsustainable practices under the guise of sustainability (greenwashing), by ensuring genuine efforts towards circularity and inclusiveness in CAD.

“I also work or have worked on real estate developments in which I was asked “well, how are we going to do this circularly” and then what you draw up is actually a kind of program of requirements….And that has led, for example, to the construction program of the Amsterdam Metropolitan Area....but it has also given rise to greenwashing….For example, it is said that “we have reused 98% of our material.” But what they actually mean is, we all harvested concrete from the demolition track. And, we have crossed that and that can now be put in a smart crusher and thus reused as gravel and sand and cement. But that is not quite what it is supposed to be. The intention is that you use the structures that you can reuse, let alone as a functional unit and not as recyclate, because recycling is literally the very last thing on your mind within a CE.” [7]

4.8.3 Decrease the Shortage of Skilled Professionals

There is a shortage of skilled professionals trained in circular strategies. That means the creation of education and training programmes that promote circular thinking and craftsmanship is essential for successful CAD. To ensure a steady supply of qualified workers in the CE sector, these programmes should put a strong emphasis on developing the capacities of both current professionals and future generations.

“There is another, more dominant dimension, is very much that spatial dimension. Which is also logical, because many of us are spatially trained professionals from civil engineering or as engineers, which is also reasonable. Technically trained in any case, so thinking very much in terms of delivering physical objects, physical places and therefore not so much of developing an area to actually increase the quality of life of people and residents. So that is more of a very fundamental impediment. Yes, actually once in our thinking and our culture, this is more of a kind of institutional layer, which is much deeper than a concrete instrument.” [6]

4.8.4 Update the Rewarding system that Incentivises Traditional Behaviour to Sustainable Reward System

The current traditional economic model, which prioritises growth and profitability over sustainability or inclusivity, needs to shift in favour of a sustainable reward system that supports activities that advance CAD. For instance, punishing unsustainable behaviour or providing financial incentives to project developers that place a high priority on inclusivity.

“There is also the fact that the wrong behaviour is still rewarded with success. That is much bigger problems than that we would not regulate or regulate hard enough. There really is that thing in there, so you have to look at how the macro sociological developments and the macro economic developments together still provide perverse incentives to themselves. That is still the biggest brake on progress.” [7]

4.8.5 Reorient Area Development from an Economically Dominated Model to a Human-Centred Model

The potential to make revenue is valued more highly in current area development models than the importance of fostering a sense of community and improving quality of life. It is

imperative to ensure that CAD advancements benefit all stakeholders, including communities and residents, by changing the perspective from one that is economically dominated to one that is more human-centred, creating a more inclusive CAD. Regarding this shift of perspective, this interviewee said:

"I also think that actually the whole approach to area development is almost a kind of obstacle because it is no longer really about developing places for people, but that other dimensions have become more dominant, so also the place as a place to make money. An economic component is always very strong and, let us say, the human dimension is sometimes forgotten." [6]

4.8.6 Improve the Economic Viability in CAD Strategies

Some circular CAD solutions, such as partial mobility, are not yet economically feasible. It is essential to create plans that can make these CAD strategies profitable, for instance by coming up with innovative business models or cost-effective technical solutions. A cost structure for circular strategies that is competitive with those of linear methods should be created, for example, by involving operational efficiency, advancements in technology, or economies of scale, could lower the costs of circular strategies.

"But for what I know about it is that it is very difficult to make money from it right now. Because, for example, properly distributing residual flows, etc., is very complicated." [2]

"How can you financially support the reuse of clothing? Or how can you financially support the reuse of furniture? And then we as Dutch people quickly say, it is not necessary at all. Because that has to earn itself and if it does not generate money, then you should not do it. But from a circular point of view, I think differently. You have to encourage it." [4]

4.8.7 Turn Inclusiveness into a Standard for CAD

For CAD to be effective and successful, inclusiveness should be adopted as a fundamental standard, spanning over all sectors and aspects of CAD. This implies that every citizen, regardless of their background, abilities, or opinions, should have a chance to contribute. By making inclusivity a standard, it is ensured that all stakeholders, including citizens and communities, are taken into account while designing the basic principles of CAD. In this way, CAD's overall efficacy can be increased through a variety of contributions, group decision-making, and a sense of community.

"I actually see it more as a kind of bottom layer, on the basis of which you can place all sectors of different aspects of area development on top of it. But when it comes to inclusive area development, you set a kind of standard that would apply to the entire area development. So, you set a standard of, the area development should be inclusive, so it should be for everyone. Actually, that is the very simple translation of including, not excluding anyone." [6]

4.9 Opportunities for Inclusiveness in CAD

The final part of this chapter will present the opportunities concerning inclusiveness and CAD. These opportunities highlight the factors that need to be addressed and the prospects that can be leveraged for inclusiveness in CAD.

Inclusiveness in CAD allows for design solutions that are mindful of all parts of societal, irrespective of their socio-economic status, origin, or abilities. The various opportunities that inclusiveness can offer within CAD are presented in this section. This section attempts to emphasise how an inclusive approach can help CAD achieve its objectives by highlighting these opportunities. Opportunities that have come up during the interview are presented below and the following sections will discuss each opportunity in detail.

1. Inclusiveness for Accelerated Development
2. Inclusiveness as a Preventive Measure
3. Inclusiveness for a Healthier Economy
4. Inclusiveness for Equality
5. Inclusiveness for Local Development
6. Inclusiveness for Marginalised Communities
7. Inclusiveness for Enhanced Diversity

4.9.1 Inclusiveness for Accelerated Development

Diversity in CAD supports an array of abilities, perspectives, and skills. The convergence of these factors has a synergistic impact that can encourage accelerated development. Diverse perspectives and special capabilities might result in creative CAD solutions. Additionally, the transition to a CE gives a significant chance for inclusivity in CAD. The ideas of CE are compatible with inclusivity values, such as promoting equitable access to opportunities and resources and trying to reduce waste and maximise resource usage. Therefore, the merging of CE and inclusiveness has the potential to act as a driver for development and sustainability.

“Yes, and that is a window of opportunity we think that is coming now, so that you can take all those others along in a loop. And CE is probably one of the most important, energy transition is another key to open that door. If you then indeed have a good or slightly better understanding of how CE and inclusiveness can be combined in this case, yes, it can happen very quickly.” [1]

4.9.2 Inclusiveness as a Preventive Measure

By anticipating social and community challenges, incorporating inclusiveness in the early stages of CAD can serve as a preventive strategy against potential future challenges, resulting in more efficient administration of CAD. Urban housing complexes are getting bigger and more complicated. Better community relations and possible problems in areas that are becoming more densely populated can be achieved through inclusivity.

“What you also see nowadays is that the residential complexes are becoming more and more massive. We have now built, there are 290 homes in it. We are getting more and more up. We build vertical cities. Then that social circularity is even more important, because the towers of

50 homes are on the Buiksloterham. That is a relatively small grain, but now we are building hundreds of homes on top of each other and then it is almost the norm that you focus on that inclusiveness, social circularity, meeting. That is an important dimension to mention. It is only getting more important." [8]

"Also, to prevent you from being in a situation where an area has been developed that; and what is circularity? Of course, you have to look ahead, so if something is not circular, why did you make it now? So, to prevent problems in the future, circularity and inclusiveness must be a starting point for area development." [4]

4.9.3 Inclusiveness for a Healthier Economy

An inclusive approach to CAD will not only strengthen the CE, it will also benefit society as a whole, making the prioritisation of inclusiveness in CAD lead to the creation of a healthier economy and society. Participation of the community in CAD can result in the creation of policies that explicitly promote behavioural improvements that are more in accordance with circularity objectives. Communities, for instance, can offer insightful opinions and active participation that improve the relevance and efficiency of CAD policies.

"I think a CE is also a healthier economy. And the more inclusive you make that, the healthier it is for society as a whole. So, it strengthens the CE." [3]

4.9.4 Inclusiveness for Equality

To achieve equality, it is imperative to have inclusiveness in CAD, by ensuring that the benefits of CAD are accessible to all community members. This means not only broadening access to circular solutions, but also ensuring a fair and equitable distribution of the benefits and responsibilities. This way, diverse participation, social and economic inclusiveness are fostered. for example, affordable mobility and energy-efficient housing reduces inequalities, resulting in a more inclusive society.

"I think that inclusiveness is just very important, to prevent a dichotomy between a group of people who do have access to circular solutions and then and a group that does not." [4]

"For example, if you already live in a rented house, you actually have less opportunity to have a lower energy bill, because you are not allowed to renovate that house yourself, while the owner-occupied house is." [6]

4.9.5 Inclusiveness for Local Development

By increasing local participation, generating green job opportunities, or fostering a more tolerant and understanding community, inclusivity in CAD could dramatically improve local development. Circular strategies and urgent community needs, for example like job creation, must be addressed when incorporating inclusivity in CAD. Focusing on both may result in less opposition and increased community involvement.

"So that you have a fairly flexible market; so, you can come and say well, I'm going to involve these People in the community. We are now going to do something green. So, you

come up with a circular goal, you get there. But then it turns out, for example, that that is not the urgency of these people from the community at all, because the urgency may be a job or something else, then it makes very little sense to impose your urgency, namely a green infrastructure. That is where you get resistance." [5]

4.9.6 Inclusiveness for Marginalised Communities

Particularly minority communities can gain from the inclusion of inclusiveness in CAD by levelling the playing field and ensuring access to the advantages of circularity. This is significant because, for a number of systemic, social, and economic reasons, these communities frequently face barriers to gaining the advantages of local development. People who rent their homes, for instance, might not have the freedom to make adjustments to them for energy efficiency. There is a difference because homeowners are spared from this restriction. Therefore, promoting inclusivity in CAD entails making sure all voices, particularly those who are frequently ignored or marginalised, are heard during the decision-making process.

"And indeed identifying, because I already saw marginalized somewhere in your framework identifying communities. marginalized communities their options are lower than other groups, despite the fact that certain facilities are the same in the areas." [6]

"Inclusivity is that as many different people as possible have a say and ownership. And in particular the people who are not normally discussed, so the *non-usual suspects* and you do not just reach them." [5]

4.9.7 Inclusiveness for Enhanced Diversity

Effectiveness, resilience, and equitability are all factors that could be enhanced with incorporating diverse perspectives and experiences. Involving diverse groups in decision-making - and planning processes is another important aspect of inclusiveness that enhances diversity. These participatory methods can increase a sense of belonging and participation among these many groups while also utilising their special knowledge and expertise to raise the quality and relevance of CAD efforts.

"Yes, so well on the one hand within my project X (anonymised) we also look at how such an area development is designed and one of the criteria is also In the vision and that is that it becomes an inclusive district, so that it is representative of the whole city X (anonymized). And that there should also be social rental housing there. But also, older people, young people, people with families with children, so as diverse as possible." [3]

"…. you can also make that comparison of how we solve that socially. The monoculture comes apart from an easily interpretable result, also with a lot of unrealized potential. You know, you miss things. Why would you want that? It is much richer and more fun if you take everyone's cool things and add them together instead of competing for scarce chances of happiness." [7]

5. Discussion

The previous chapter's findings from the literature study and semi-structured interviews served as the foundation for the initial set of guiding principles. These principles are developed and provided at the end of Chapter 4. This chapter will give provide an in-depth exploration of the research findings and its analysis. Challenges and limitations, as well as the applicability of the research will be presented.

5.1 Interpretation of the Theoretical Review

This study was founded on an extensive literature review, strengthened with practical insights obtained from semi-structured interviews.

5.1.1 Interpretation of CAD Analysis

The analysis of the CAD at the interface of building and city dimensions within the larger BE is at the foundation of this research strategy. The reasoning behind this decision is based on a few crucial aspects. Most of the literature on the implementation of CE ideas in the Built Environment focuses on individual supply chain stages, notably end-of-life stages (Adams et al., 2017). Given the scarcity of academic research on CAD within the setting of a CE and inclusiveness, this study makes a noteworthy contribution to the field (Luijt, 2019). The study intends to look at the relatively unexplored interconnections between different levels of BE and their relationship to CAD, in order to provide a more comprehensive knowledge of the complexity of applying CE principles.

The study also recognises the importance of multidimensional perspectives. The Built Environment is made up of many different dimensions, ranging from manufactured components to buildings, cities, and the natural environment. Each dimension involves a separate collection of stakeholders who play distinct roles in their respective dimensions, influencing the dynamics of CE application (Pomponi and Moncaster, 2017). As a result, a deeper awareness of these dimensions is critical in making more effective, thorough, and educated actions. Another crucial part of the chosen approach's justification is its practical effects. The study's goal is to offer insights that will help with sustainable urban planning, decision-making, and optimising the use of CE principles in practice.

While this approach has been beneficial to the research, it did have challenges and limitations. Because the research spans various dimensions of the BE, it dealt with a complex set of elements and relationships. These complexities may result in unclear data landscape, making it challenging to draw unambiguous conclusions. A limitation of the research was also while the research focuses on inclusiveness in CAD to fill a knowledge gap, the shortage of academic literature on the subject represented a challenge. This led to a reliance on a small number of sources, potentially affecting the depth and breadth of the research.

The literature review resulted in the implementation of circular strategies in key CAD sectors such as the Built Environment, Energy, Mobility, Industry, Food, Waste Management, Water Management, and Citizens and Community.

5.1.2 Interpretation of the Theoretical Overview

The theoretical review (table 2.3) found many CE techniques appropriate to each sector, as well as linkages to inclusiveness strategies. Every sector indicated in the theoretical overview has the ability not only to implement circular strategies but also to incorporate inclusiveness into those strategies. For example, the built environment sector can use material reuse and recycling initiatives (Icibaci, 2019; Morseletto, 2020; Pacheco-Torgal, 2013) to promote the CE while also involving local communities and enterprises (Benites et al., 2023). This involvement contributes to the development of a local CE that assures equal participation and benefits (IEA, 2021; Androniceanu and Popescu, 2017). The above approach is also applicable to other sectors, such as energy and mobility, where the emphasis is on a fair distribution of resources and opportunity.

These CE and inclusiveness strategies were then refined based on expert feedback obtained during interviews. According to interviewee feedback, better synergy between sectors is needed. To establish a CE, a more holistic, cross-sector approach is required, rather than perceiving CAD as having different components. This critical response prompted a re-evaluation, which resulted in the creation of the current holistic initial set of guiding principles.

Further additions to the theoretical overview were instead of cash incentives, the emphasis is on tangible benefits in the form of commodities. Cash incentives, may be beneficial, may not necessarily result in long-term behaviour change, whereas tangible objects may be more effective in instilling a sense of ownership and ongoing commitment to sustainability. There is a point to be made for cash incentives however; while feedback indicates that tangible objects may instil a stronger feeling of ownership and continued commitment to sustainability, the effectiveness of this approach is likely to be highly reliant on the unique community and cultural context. Cash rewards may be a more effective strategy for inducing behaviour change in some instances. The feedback also emphasised the significance of power dynamics in community participation. It is not enough to simply involve communities; they must also have the ability to voice their concerns and influence choices. According to the input, not all circular techniques are appropriate for all community scales. Waste-to-Energy, for example, was recognised as a solution that may be too large scale for small communities. This emphasises the significance of taking into account the scalability and adaptability of circular techniques in the context of unique communities.

One of the challenges of the theoretical overview was the subjectivity of the expert feedback utilised in developing the theoretical review process. These experts' perspectives and views undoubtedly contribute valuable and useful inputs to the study. However, it is also important to recognise that these viewpoints are based on the experts' specific experiences, histories, and biases. The scale of the interviews is likewise limited, considering that only nine interviews were done over the study its duration. Another challenge of this study is the general application of strategies across sectors. According to the study, each sector has the ability to incorporate inclusiveness into its circular strategies. However, the real implementation of these strategies may not be as seamless as the study predicts. The distinct qualities and limits of each sector may result in significant variation in the success of these techniques, influencing the overall results derived from this research.

5.1.3 Applicability of the Theoretical Framework

The theoretical overview developed for this study can serve as a tool for various stakeholders to better understand the underlying concepts and dynamics of CAD and inclusiveness. It is a comprehensive overview that encompasses sector specific CE and inclusiveness strategies. The theoretical overview can serve as a valuable tool for several stakeholders:

- Project teams, such as architects, urban planners, and (environmental)consultants, can utilise this overview to comprehend the integration of CE and inclusivity in CAD, providing an organised approach to strategy development and execution.
- This review can also be used by academics because it gives a condensed overview of CE and inclusivity strategies, serving as a reference point for future research.

5.2 Initial Set of Guiding Principles

Based on the theoretical overview and semi-structured interviews, the principles for supporting and driving CE strategies through inclusiveness in CAD were established. During the interviews, five main themes emerged, including stakeholder collaboration and engagement, access and equity, education and awareness, promotion of sustainable and circular initiatives, and localisation, laying the groundwork for the principles. These principles promote patterns such as maintaining openness and flexibility, increasing government accountability, incorporating circular thinking into education, supporting a transition from ownership to sharing, and adjusting initiatives to local context and capabilities.

Inclusiveness can be operationalised in CAD using these guiding principles, which span across the five major themes. The theme of Stakeholder Collaboration & Engagement includes maintaining openness and flexibility, establishing trust through transparency, and actively incorporating different stakeholders to balance power relations and offer their particular strengths. Municipal participation, as well as fostering standardisation and collaboration, were viewed as critical to scalability and cross-sectoral integration, with the need of incorporating community people in circular practises emphasised. These concepts demonstrate the importance of collaborative problem-solving and incorporating multiple viewpoints in the development and implementation of CAD initiatives.

The theme of Education & Awareness highlights this role in aiding the transition to a CE. Integrating circular thinking and encouraging participation from communities in circular efforts is key. The principles emphasise the need of encouraging innovation and acknowledging the value of social impact, stressing on the need of shifting away from traditional measures of success and towards recognising social value.

Access & Equity is the theme that emphasise the government its role in promoting CE efforts and assuring an inclusive CAD. The theme also suggests improving upon its accountability, offer appropriate (financial) support and resources, and ensure that the benefits of CAD are distributed evenly among community members. Finally, it underscores the critical role of government in encouraging all inhabitants' participation in the transition to a CE, both through policy and support.

The principles under the theme of Promotion of Sustainable & Circular Practices draw attention to the importance of changing consumer behaviour, supporting the shift from ownership to sharing, and unlocking the value of circular practises. They also stress the need for circular projects to provide value on several levels: economic, environmental, and social; promoting resource efficiency and sustainability while also assuring inclusion and community engagement.

Principles linked to the theme of Localisation indicate the need of context-dependent circular initiative implementation and local resource management. CAD efforts should be tailored to the specific needs and resources of local communities and recognise the potential for local resources and skills to facilitate circular solutions.

The principles under the five themes provide practical guidance to various CAD stakeholders (e.g., businesses, policymakers, and citizens). These topics served as the foundation for developing an all-inclusive CAD. These themes emphasise the significance of trust, openness, and clear communication in CAD projects, as well as government responsibility, community involvement, equity, and the value of local context. The principles highlight the interconnectedness of various factors and actors, and the need for a holistic approach addressing these elements. Because these are preliminary guiding principles, further testing, review, and refinement are required to fully assess their usefulness and applicability. This iterative implementation and evaluation process may disclose additional issues and constraints not previously explored in the research. For example, other factors or themes that were not included in the interviews but are nonetheless relevant to the implementation of inclusiveness in CAD are possible.

5.2.1 Applicability of the Initial Set of Guiding Principles

The initial set of guiding principles provides realistic and adaptable guidelines for fostering inclusiveness in CAD. Various stakeholders can make essential contributions to developing a more inclusive CAD by implementing these principles in their projects. These principles can serve a variety of stakeholders, including:

- Project teams can use these principles to assist them to create and implement their initiatives. The principles could be implemented selectively based on the context and local requirements of a particular project.
- Clients can include the initial set of guiding principles in their tender documents to ensure that potential contractors or consultants understand and follow these guidelines.
- NGOs and community organisations can use these principles in their advocacy activities and initiatives to ensure that CE practises within CAD are inclusive.

The tables on the next pages give practical examples of how the principles could be used by the different stakeholders.

Table 5.1 Example of how Project Teams can Implement Principles

<table>
<tr><th colspan="2">Stakeholder: Project Team</th></tr>
<tr><td colspan="2">Example: Redevelopment of a Neighbourhood</td></tr>
<tr><td colspan="2">Description: In a neighbourhood development project, to make sure that the development meets the various needs of the community members and is beneficial to all, teams might give "Stakeholder Engagement & Collaboration" and "Access & Equity" principles priority. Project teams can utilise the principles as a flexible outline to foster inclusiveness in CAD, by selecting principles that best apply to the project its unique context.</td></tr>
<tr><td>Initiation Phase</td><td>Principle: Foster Trust through Transparency and Inclusivity

Project teams can conduct stakeholder analyses and commit to transparency in all decision-making processes. This may include that all stakeholders be involved in each phase of the redevelopment projects, documenting all decisions, and adapting to specific community needs. For example, before this neighbourhood redevelopment starts, project teams could hold a series of public meetings, inviting all stakeholders and actively engaging with them and discuss the upcoming plans.</td></tr>
<tr><td rowspan="2">Planning Phase</td><td>Principle: Involve Community Members in Circular Practices

Project teams enter the planning stage by involving and engaging the community in talks about waste segregation, creating a neighbourhood composting system, and/or other circular practises, or about other circular practises that the community deems necessary. By doing this, local involvement in promoted from the get-go, a sense of ownership is fostered, and sustainable lifestyles are encouraged.</td></tr>
<tr><td>Principle: Active and Clear Municipal Participation in Circular Economy

Project teams collaborate closely with the municipality to set clear and achievable targets and requirements for the project, while still leaving room for the community to specify how to achieve these targets. For example, for the redevelopment of a neighbourhood, the municipality may set clear targets for waste reduction of renewable energy use for the project and collaborate with the project team to ensure the targets are realistic and achievable.</td></tr>
<tr><td rowspan="2">Design Phase</td><td>Principle: Encourage Cross-Sectoral Collaboration and Integration

Project teams make sure that the design process integrates ideas and expertise from different key sectors, making sure that collaboration and project efficiency are fostered. This way, circular strategies will be integrated throughout multiple sectors, therefore increasing the design its efficiency and circularity. For example, within the neighbourhood redevelopment example, project teams should seek out valuable input form the community, urban planners, local business owners, environmental experts and other key sector experts to create a design that strikes a balance between the needs of the community and the goals of the redevelopment project.</td></tr>
<tr><td>Principle: Maintain Openness and Flexibility in Stakeholder Engagement

Project teams retain a flexible approach to stakeholder participation in the case of a decades-long project redevelopment, realising that societal issues and communities' requirements might shift over time. For the redevelopment of a neighbourhood, project teams could continually update and inform actors during the process regarding the progress of the redevelopment project, leaving</td></tr>
</table>

	space for eventual adjustments of the approach based on the changing needs and community feedback.
Realisation Phase	Principle: Promote Standardization and Collaboration for Scalability Project teams can implement standardised structures and language to aid the scale-up of circular initiatives across different areas of the redevelopment project, for example, providing each building with a building passport, or developing material passports. When redeveloping a neighbourhood, project teams could ensure that the circular practises that are being implemented follow standardised protocols for possible replication in other neighbourhoods
	Principle: Engage Diverse Stakeholders and Manage Power Dynamics Project teams make sure that there is a diverse and inclusive group of stakeholders involved during this phase. Power dynamics between stakeholders must be carefully managed and special focus must be given to each group its unique capabilities and needs.
Throughout the Project	Theme: Education & Awareness Project teams could integrate circular education in organisations and execute awareness campaigns regarding the circular initiatives being implemented in the neighbourhood redevelopment project.
	Theme: Access and Equity Project teams ensure the accessibility and affordability of housing and facilities to residents and that sustainable technologies are equally available to all community members.
	Theme: Promotion of Sustainable and Circular Practises Project teams promote sustainable practices like communal gardens, transport sharing schemes, and shared recycling facilities. This promotes the sharing and reuse of resources in the neighbourhood.
	Theme: Localisation Project teams use the projects location to their benefit, respecting the needs and unique character of the neighbourhood and its community, utilising local resources and skills where possible, and adapting the redevelopment to the local context.

Table 5.2 Example of how NGOs/Organisations can Implement Principles

Stakeholder: NGO/Community Organisation
Example: A CAD project
Definition: These organisations are key in CAD as they often represent the interests of local communities. Implementing these CAD principles becomes valuable to these organisations, as it aligns with their mission to promote the welfare of their communities. these organizations could take on roles such as educators, advocates, facilitators, or implementors, leveraging the principles to guide their actions, collaborations, and advocacy efforts throughout the CAD process.
Community organisations encompass an array of entities, including, but not limited to, non-profit organisations, resident associations, and some NGOs. These organisations are critical during CAD projects, as they work to improve the quality of life within the community and make sure that locals voices are also heard in decision-making processes during the CAD project. Because these organisations work within a certain community, they are familiar with the local context of the area, the locals, and their unique needs, capabilities, and challenges. The principles developed in this research encourage inclusiveness, sustainability, and context-specific solutions that these organisations can relate to. By making sure the CAD principles are followed during a CAD project, these organisations can help facilitate circular development within their community, for example, by making sure that resources are used in an efficient manner, or that benefits are distributed equally. Organisations can see that the principles main goal is to foster more inclusiveness within a CAD project, and this value is often also what community organisations strive towards. In the context of CAD, organisations can take on roles such as advocates, educators, facilitators, or implementors, using these principles to help steer their actions, collaborations, and efforts throughout the CAD process.
Examples of organisations that could leverage these principles: 1. **Buurtcoöperatie Oostelijk Havengebied de Eester**: Local organisation in Amsterdam, created by and for locals aimed at achieving a neighbourhood that is safe, social, and sustainable. The organisation regularly organises sessions with locals to visualise the future of the neighbourhood. (https://buurtcooperatieohg.nl/) 2. **The Beach, Zwolle**: this organisation is a design, innovation, and sustainability agency that works closely with local communities, businesses, and institutions. They value sustainability, human capabilities, and equitable sharing. (https://www.thebeach.nu/)

Table 5.3 Example of how Clients can Implement Principles

Stakeholder: Clients	
Example: Redevelopment project	
Definition: A client (for example, a private real estate developer company) realising a redevelopment project can leverage these principles to ensure inclusiveness in CAD.	
Initiation Phase	Principle: Foster Trust through Transparency and Inclusivity The actors start with clear communication about the goals and strategies of the project, emphasising their commitment to creating circular areas though inclusiveness. This sets the tone of the project from the start to other stakeholders involved.
Planning Phase	Principle: Embed Circular Thinking in Education and Promote Community Involvement in Circular Initiatives Actors can incorporate educational programs pertaining to community groups to be brought on in early stages to learn about circularity and sustainability to contribute to these initiatives.
	Principle: Involve Community Members in Circular Practices Actors should encourage and make sure that there is community engagement and active participation in circular practises. They could create awareness programs that would help achieve the project its CE ambitions.
	Principle: Encourage the Shift from Ownership to Sharing Actors can promote models of shared resources in redevelopment projects. these models can be built into the plan from the beginning and followed through implementation phase.
	Principle: Utilize Circular Principles for Creating Multi-Dimensional Value Actors can aim to create multi-dimensional value in their projects, by continually assessing and communicating how projects are meeting functional requirements, contributing to the local economy, enhancing the local environment, and creating social value.
	Principle: Context-Dependent Implementation Actors should consider the local context in their project planning and should be integral to the visioning and design phases and should continue to influence decision-making throughout the rest of the project.
Implementation Phase	Principle: Promote Standardization and Collaboration for Scalability The actors make sure that the implementation of measures is standardised, facilitating their scalability to ensure replication in future projects. This

	promotes collaboration between different stakeholders to enhance learning and sharing of best practices.
	Principle: Leverage Circular Initiatives for Social Value Creation and Inclusivity Actors should put an emphasis and work towards on social value creation during the implementation phase of the project. This can be done by integrating measures that prioritise job creation for the local community or utilising the project to help build skills and capacity in the community.
Throughout the Project	Principle: Foster Innovation and Acknowledge the Value of Social Impact Throughout the project, actors can put mechanisms in place that can acknowledge, and reward innovative solutions and ideas rooted from the CE. They should also aim to measure and communicate the social impact that measures from the redevelopment creates at each phase.
	Principle: Ensure Inclusiveness and Equity in Area Development Actors should make sure that there is a constant diverse representation in the decision-making process during each phase. This can be done by setting targets for inclusiveness and monitor that these targets are being met.
	Principle: Unlock and Communicate the Value of Circular Practices Throughout the project, actors should be able to communicate each circular practice its benefit and value. This could be done by showcasing successful practices, sharing information regarding the benefits, and organising events to engage the community with the project.
	Principle: Adapt Projects According to Local Context and Capabilities Actors should have flexibility built into the project its phases, so it can be possible to adapt project goals or timelines based on local conditions or resources.

5.3 Preconditions to Initial Set of Guiding Principles

The initial set of guiding principles, established to support and promote CE efforts in CAD through inclusiveness, is an important outcome of this research, emphasising the necessity of integration and collaboration across sectors in CAD implementation. Seven preconditions are developed prior to the establishment of these principles.

The preconditions developed are centred around the barriers to inclusiveness in CAD, such as lack of skilled professionals or economically dominated models, as stated by interviewees. Understanding these barriers made the development of the preconditions possible, by stating conditions to overcome these barriers. These preconditions have to be met in order for creating an environment that is suitable for the adoption of these principles. The efficiency of these principles may be restricted if these preconditions are not met.

While expert interviews were used to identify the barriers to inclusiveness, the process of converting these barriers into preconditions necessitates an interpretive step. The researchers' interpretation and knowledge of the interview data may add biases or inaccuracies. Furthermore, because it mainly relies on the knowledge and perspectives of the interviewers, which may not be completely representative, this procedure does not necessarily account for all potential barriers. Also, meeting these preconditions may not automatically result achieving the perfect environment suitable for implementing the initial set of guiding principles. There could be other factors needed for this. Lastly, the effectiveness of the preconditions is ultimately determined by their practical implementation and those outcomes.

5.4 Opportunities for having Inclusiveness in CAD

Inclusiveness in CAD has the potential to provide a variety of societal and economic benefits. This study presented seven opportunities for inclusiveness in CAD, including accelerated development, boosting local development, and enhancing diversity. These opportunities highlight the potential for inclusiveness in CAD and demonstrate how CAD objectives can be met. One of the guiding principles' primary qualities is its adaptability. They give an overall structure for action, but they can be adjusted to specific contexts and requirements.

These opportunities, however, focus on the positive potential of inclusiveness in CAD. While this approach is instructive and encouraging, it may fail to account for all barriers, conflicts, or drawbacks associated with each developed opportunity. The developed opportunities are divided into broad categories such as "Inclusiveness for Accelerated Development" or "Inclusiveness for Equality." These categories may create a sense of “oversimplifying” the complexity and interdependence of inclusiveness in CAD. When in actuality, these opportunities may overlap, conflict, or interact in intricate ways that the research does not capture.

5.4.1 Applicability of Opportunities

The opportunities can be utilised to convince diverse stakeholders of the advantages of having inclusiveness drive and support CE strategies in CAD. These arguments lie in their potential to further environmental sustainability, promote social equity, and ensure the resilience of systems. By acknowledging and acting on these opportunities, a CE that meets the needs and ambitions of all community members can be achieved. These opportunities can benefit a variety of stakeholders, including:

- Clients/investors can be persuaded of the need for an inclusive CAD, by understanding that it can lead to various benefits, including accelerated development, a healthier economy, and social equity. Such awareness may make these actors more willing to fund such projects.
- Policymakers can make use of these opportunities to promote the case for an inclusive CAD in policy discourse and when developing CAD strategic directives.
- Advocacy groups and Non-governmental organisations (NGOs) might take advantage of these chances to raise awareness about the benefits of an inclusive CAD, potentially gaining community support for such initiatives.

6. Conclusions

This chapter answers the main research question: *How can the application of inclusiveness principles support and drive the implementation of circular strategies within Dutch Circular Area Development?*

The aim of this research was to understand and develop guiding principles of supporting and driving circular strategies within Dutch CAD, through inclusiveness. By means of an exploratory study based on a theoretical overview and semi-structured interviews, this research identified five key themes that emerged as critical for implementing inclusiveness in CAD; Stakeholder Collaboration & Engagement, Access & Equity, Education & Awareness, Promotion of Sustainable and Circular Initiatives, and Localisation.

Each theme has a set of principles for the implementation of inclusiveness in CAD. These principles have the potential to assist in effective decision-making and strategic planning among CAD stakeholders, ranging from policymakers and corporations to citizens, as well as to emphasise the necessity of trust, openness, and clear communication in the development and execution of CAD projects. Each theme has a different number of principles; the theme of Stakeholder Collaboration & Engagement has seven principles, Access & Equity has five principles, Education & Awareness has two principles, Promotion of Sustainable and Circular Initiatives and Localisation each have three principles.

Through these five themes and their guiding principles, inclusiveness can support and drive the circular strategies that are implemented in Dutch CAD.

The research emphasised the necessity of safeguarding openness, flexibility, and trust in terms of the theme of Stakeholder Collaboration & Engagement. These principles argue for the inclusion of various stakeholders to balance power relations, allowing them to offer their abilities and viewpoints. The application of these principles might result in more efficient, scalable, and integrated solutions, which support the success of CAD projects. Another key theme is Education &Awareness. According to the findings of the study, including circular thinking in training and encouraging community participation in circular initiatives is necessary for transforming attitudes and behaviour towards sustainable practises. The principles for Access & Equity underlined the government's responsibility in encouraging CE activities and providing equitable access to the advantages of CAD. The theme centres on the importance of government transparency, resource support, and inclusive policies that encourage involvement in the transition to a CE.

The principles under the theme of Promoting Sustainable and Circular Practises underline the significance of shifting consumer behaviour and moving from ownership to sharing models. They emphasise the economic, environmental, and social value of circular practises in fostering sustainability and community engagement. The Localisation theme highlights the importance of implementing circular initiatives in different contexts. In order to encourage circular solutions, inclusive CAD should include the individual needs, local resources, and the potential of local communities.

The overall conclusion is that these initial set of guiding principles offer an outline for various CAD stakeholders, including businesses, governments, and citizens to better support and drive the implementation of circular strategies. They emphasise the importance of trust,

openness, and clear communication, as well as government responsibility, community involvement, equity, and the importance of local context.

This research, however, is not without limitations and challenges. The interview-based approach's inherent subjectivity may have influenced the identification and analysis of themes and opportunities. Furthermore, the research may fail to capture the complexities, relationships, and potential conflicts among the identified themes and possibilities. The possible problems, disputes, or costs involved with achieving inclusion in CAD may be overlooked in the optimism of the opportunity.

The offered principles and opportunities must be addressed with context-sensitivity. When adopting these principles and striving to capitalise on these opportunities, the particular qualities, requirements, and restrictions of distinct local communities must be considered.

This study concludes that inclusiveness has the potential to play a critical role in CAD and the transition to a CE. The concepts and opportunities described in this study give an outline for incorporating inclusiveness into CAD while also noting the challenges and concerns that must be considered. inclusiveness, when used effectively, can support the creation of sustainable, resilient, and equitable communities, thereby making a big step towards a more inclusive and circular future.

7. Recommendations

In this chapter recommendations will be given for further research, based on the data garnered from the literature review and the semi-structured interviews. By building on the findings of this study, future research can continue to refine the understanding of inclusiveness in CAD within the CE, aiding in further development of effective and equitable principles.

Case Studies of Inclusive CAD Projects

Due to time and scope constraints, this study did not incorporate case studies. A recommendation for further research is to undertake detailed case studies to examine the successful implementation of inclusive CAD projects in different contexts. This might result in context-specific insights and practical examples of how identified principles are applied, presenting potential best practises and potential pitfalls.

Longitudinal Evaluation of Inclusiveness Principles in CAD

This research provides a foundation for future research by creating an initial set of guiding principles for inclusiveness in CAD and developing opportunities for their implementation in the Dutch setting. This study provided a foundation for future research by creating an initial set of CAD inclusiveness principles and finding opportunities for their implementation in the Dutch environment. However, the practical applicability and long-term consequences of these principles have yet to be thoroughly investigated. As a result, future research should include longitudinal studies that apply the inclusiveness principles described in this study to real-world CAD projects, potentially identify any unforeseen challenges or opportunities that arise during the implementation of the principles.

Innovative Measures for Success

Defining and quantifying inclusiveness in CAD presents a significant challenge. Traditional measures in CAD projects may not capture the range of values associated in inclusive CAD projects. For example, social values like social cohesion, trust, or improved wellbeing, are difficult to quantify, but critical to the effectiveness of an inclusive CAD. Therefore, it is recommended to focus on alternative innovative measures of success, that capture the nuanced, multi-dimensional aspects of these initiative, assessing not only economic worth but also social and environmental value. For example, studies may look into how to quantify social capital or community wellbeing and incorporate them into a broader measure of success. This quantitative data could help support qualitative findings, providing a broader perspective, and enable more specific and objective evaluations of the impact and efficacy of inclusiveness in CAD.

References

Adams, K. T., Osmani, M., Thorpe, T., & Thornback, J. (2017). Circular economy in construction: Current awareness, challenges and enablers. *Proceedings of Institution of Civil Engineers: Waste and Resource Management*, *170*(1). https://doi.org/10.1680/jwarm.16.00011

Adams, R. J., Smart, P., & Huff, A. S. (2017). Shades of Grey: Guidelines for Working with the Grey Literature in Systematic Reviews for Management and Organizational Studies. *International Journal of Management Reviews*, *19*(4), 432–454. https://doi.org/10.1111/IJMR.12102

Akenji, L., & Chen, H. (2016). A framework for shaping sustainable lifestyles determinants and strategies ii. *United Nations Environment Programme*.

Akhmouch, A., & Clavreul, D. (2016). Stakeholder Engagement for Inclusive Water Governance: "Practicing What We Preach" with the OECD Water Governance Initiative. *Water*, *8*(5). https://doi.org/10.3390/w8050204

Albaladejo, M., Henao, L. F., & Mirazo, P. (2021, April). *The Circular Economy: A driver of inclusive and sustainable industrial development | Industrial Analytics Platform*. UNIDO. https://iap.unido.org/articles/circular-economy-driver-inclusive-and-sustainable-industrial-development

Alessandria, F. (2016). Inclusive City, Strategies, Experiences and Guidelines. *Procedia - Social and Behavioral Sciences*, *223*, 6–10. https://doi.org/10.1016/J.SBSPRO.2016.05.274

Almigheerbi, T. S. (2020). Practices of the circular economy in Community Source projects: A preliminary study. *Informatyka Ekonomiczna*, *2020*(4), 9–20. https://doi.org/10.15611/IE.2020.4.01

Alsayel, A., de Jong, M., & Fransen, J. (2022). Can creative cities be inclusive too? How do Dubai, Amsterdam and Toronto navigate the tensions between creativity and inclusiveness in their adoption of city brands and policy initiatives? *Cities*, *128*. https://doi.org/10.1016/J.CITIES.2022.103786

Amanatidis, G. (2022, September). *Resource efficiency and the circular economy* . European Parliament. https://www.europarl.europa.eu/factsheets/en/sheet/76/resource-efficiency-and-the-circular-economy

Androniceanu, A., & Popescu, C. R. (2017). *An Inclusive Model for an Effective Development of the Renewable Energies Public Sector*.

Babaei, A. A., Alavi, N., Goudarzi, G., Teymouri, P., Ahmadi, K., & Rafiee, M. (2015). Household recycling knowledge, attitudes and practices towards solid waste management. *Resources, Conservation and Recycling*, *102*, 94–100. https://doi.org/10.1016/j.resconrec.2015.06.014

Babaei, A. A., Alavi, N., Goudarzi, G., Teymouri, P., Ahmadi, K., & Rafiee, M. (2015). Household recycling knowledge, attitudes and practices towards solid waste management. *Resources, Conservation and Recycling*, *102*, 94–100. https://doi.org/10.1016/j.resconrec.2015.06.014

Bailey, J. (2008). *First steps in qualitative data analysis: transcribing*. https://doi.org/10.1093/fampra/cmn003

Bakker, S., & Jacob Trip, J. (2013). Policy options to support the adoption of electric vehicles in the urban environment. *Transportation Research Part D: Transport and Environment*, *25*, 18–23. https://doi.org/10.1016/J.TRD.2013.07.005

Benyam, A., Kinnear, S., & Rolfe, J. (2018). Integrating community perspectives into domestic food waste prevention and diversion policies. *Resources, Conservation and Recycling*, *134*, 174–183. https://doi.org/10.1016/j.resconrec.2018.03.019

Blanco, E., Pedersen Zari, M., Raskin, K., & Clergeau, P. (2021). Urban Ecosystem-Level Biomimicry and Regenerative Design: Linking Ecosystem Functioning and Urban Built Environments. *Sustainability*, *13*(1), 404. https://doi.org/10.3390/su13010404

Blomsma, F., & Brennan, G. (2017). The Emergence of Circular Economy: A New Framing Around Prolonging Resource Productivity. *Journal of Industrial Ecology*, *21*(3), 603–614. https://doi.org/10.1111/jiec.12603

Bocken, N. M. P., de Pauw, I., Bakker, C., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, *33*(5), 308–320. https://doi.org/10.1080/21681015.2016.1172124

Boeri, A., Gaspari, J., Gianfrate, V., Longo, D., Saveria, , & Boulanger, O. M. (2019). *CIRCULAR CITY: A METHODOLOGICAL APPROACH FOR SUSTAINABLE DISTRICTS AND COMMUNITIES*. https://doi.org/10.2495/ARC180071

Bote Alonso, I., Sánchez-Rivero, M. V., & Montalbán Pozas, B. (2022). Mapping sustainability and circular economy in cities: Methodological framework from europe to the Spanish case. *Journal of Cleaner Production*, *357*, 131870. https://doi.org/10.1016/J.JCLEPRO.2022.131870

Braun, V., & Clarke, V. (2012). Thematic analysis. *APA Handbook of Research Methods in Psychology*, *2*, 57–71. https://www.researchgate.net/publication/269930410_Thematic_analysis

Buijs, A., Hansen, R., van der Jagt, S., Ambrose-Oji, B., Elands, B., Lorance Rall, E., Mattijssen, T., Pauleit, S., Runhaar, H., Stahl Olafsson, A., & Steen Møller, M. (2019). Mosaic governance for urban green infrastructure: Upscaling active citizenship from a local government perspective. *Urban Forestry and Urban Greening*, *40*, 53–62. https://doi.org/10.1016/j.ufug.2018.06.011

Buitelaar, E., Galle, M., & Sorel, N. (2014). The public planning of private planning: An analysis of controlled spontaneity in the netherlands. In *Cities and Private Planning: Property Rights, Entrepreneurship and Transaction Costs* (pp. 248–268). Edward Elgar Publishing Ltd. https://doi.org/10.4337/9781783475063.00020

Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological Research and Practice 2020 2:1*, *2*(1), 1–10. https://doi.org/10.1186/S42466-020-00059-Z

Byars, M., Wei, A., & Handy, S. (2017). Sustainable Transportation Terms: A Glossary. *The University of California Institute of Transportation Studies (UC ITS)*.

Calisto Friant, M., Vermeulen, W. J. V., & Salomone, R. (2020). A typology of circular economy discourses: Navigating the diverse visions of a contested paradigm. *Resources, Conservation and Recycling*, *161*, 104917. https://doi.org/10.1016/J.RESCONREC.2020.104917

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing: JRN*, *25*(8), 652. https://doi.org/10.1177/1744987120927206

Carter, N., Bryant-Lukosius, D., Dicenso, A., Blythe, J., & Neville, A. J. (2014). The Use of Triangulation in Qualitative Research. *Oncology Nursing Forum •*, *41*(5), 545–547. https://doi.org/10.1188/14.ONF.545-547

Chauhan, C., Parida, V., & Dhir, A. (2022). Linking circular economy and digitalisation technologies: A systematic literature review of past achievements and future promises. *Technological Forecasting and Social Change*, *177*, 121508. https://doi.org/10.1016/J.TECHFORE.2022.121508

Circular City Funding Guide. (n.d.). *Mobility*. Retrieved January 9, 2023, from https://www.circularcityfundingguide.eu/circular-sector/mobility/

Clube, R. K. M., & Tennant, M. (2022). Social inclusion and the circular economy: The case of a fashion textiles manufacturer in Vietnam. *Business Strategy & Development*, *5*(1), 4–16. https://doi.org/10.1002/bsd2.179

Coskun, A., Metta, J., Bakırlıoğlu, Y., Çay, D., & Bachus, K. (2022). Make it a circular city: Experiences and challenges from European cities striving for sustainability through promoting circular making. *Resources, Conservation and Recycling*, *185*, 106495. https://doi.org/10.1016/J.RESCONREC.2022.106495

Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (Fourth). Sage Publications.

CTSA Community Engagement Key Function Committee Task Force. (2011). *PRINCIPLES OF COMMUNITY ENGAGEMENT*.

Curtin, J., McInerney, C., & Ó Gallachóir, B. (2017). Financial incentives to mobilise local citizens as investors in low-carbon technologies: A systematic literature review. *Renewable and Sustainable Energy Reviews*, *75*, 534–547. https://doi.org/10.1016/J.RSER.2016.11.020

Curtin, J. (2019). *Title Financial incentives for low-carbon transition: from citizens to professional investors*. http://hdl.handle.net/10468/8564

de Ferreira, A. C., & Fuso-Nerini, F. (2019). A Framework for Implementing and Tracking Circular Economy in Cities: The Case of Porto. *Sustainability 2019, Vol. 11, Page 1813*, *11*(6), 1813. https://doi.org/10.3390/SU11061813

de Jesus, A., & Mendonça, S. (2018). Lost in Transition? Drivers and Barriers in the Eco-innovation Road to the Circular Economy. *Ecological Economics*, *145*, 75–89. https://doi.org/10.1016/J.ECOLECON.2017.08.001

de Jonge, D., Phil, M., Scherer, M., & Rodger, S. (2007). Consumer-Centered Process for Technology Acquisition and Use. *Assistive Technology in the Workplace*, 52–82. https://doi.org/10.1016/B978-032304130-0.50006-6

de Schoenmakere, M. (n.d.). *Circular by design — Products in the circular economy*.

Delve. (2022). *How to do thematic analysis*. https://delvetool.com/blog/thematicanalysis

Denters, S. A. H., Tonkens, E., Verhoeven, I., & Bakker, J. H. M. (2013). *Burgers maken hun buurt*. http://www.platform31.nl/uploads/attachment_file/41/Publicatie_Burgers_maken_hun_buurt.pdf

Development Bank, A. (2017). *Enabling Inclusive Cities: Tool Kit for Inclusive Urban Development*. https://doi.org/10.22617/TIM157428

Doranova, A., Roman, L., & Zhechkov, R. (2019). *CIRCTER-Circular Economy and Territorial Consequences Policy Guide*. https://www.espon.eu/sites/default/files/attachments/CIRCTER%20Policy%20guide_0.pdf

Dworkin, S. L. (n.d.). *Sample Size Policy for Qualitative Studies Using In-Depth Interviews*. https://doi.org/10.1007/s10508-012-0016-6

Ellen MacArthur Foundation, & Arup. (2019). *Mobility* . https://emf.thirdlight.com/link/qepnjpdledzh-ooj65j/@/preview/1?o

Ellen MacArthur Foundation. (2018). *Towards the circular economy Vol. 3: accelerating the scale-up across global supply chains*. https://ellenmacarthurfoundation.org/towards-the-circular-economy-vol-3-accelerating-the-scale-up-across-global

European Network of Living Labs (ENOLL). (2021). Change the future together: Co-creating impact for more inclusive, sustainable & healthier cities and communities. *European Network of Living Labs*. https://re.public.polimi.it/bitstream/11311/1183855/1/DLLD%202021%20-%20Proceedings.pdf

Facilitating Power, Movement Strategy Center, Nataional Association of Climate Resiliience Planners (NACRP), & Urban Sustainability Directors Network (USDN). (n.d.). *From Community Engagement to Ownership.*

Fossey, E., Harvey, C., Mcdermott, F., & Davidson, L. (2002). *Understanding and evaluating qualitative research**. 717–732. https://www.utas.edu.au/__data/assets/pdf_file/0018/165204/fossey-et-al-evaluating-qual-research.pdf

Franzen, A., Hobma, F., de Jonge, H., & Wigmans, G. (2011). *Management of Urban Development Processes in the Netherlands*. Techne Pres. https://pure.tudelft.nl/ws/portalfiles/portal/11176491/Management_of_Urban_Development_Processes_pdf.pdf

Fruergaard Astrup, T., Tonini, D., Turconi, R., & Boldrin, A. (2014). *Life cycle assessment of thermal Waste-to-Energy technologies: Review and recommendations*. https://doi.org/10.1016/j.wasman.2014.06.011

Garousi, V., Felderer, M., & Mäntylä, M. v. (2019). Guidelines for including grey literature and conducting multivocal literature reviews in software engineering. *Information and Software Technology*, *106*, 101–121. https://doi.org/10.1016/J.INFSOF.2018.09.006

Geneletti, D., & Zardo, L. (2016). Ecosystem-based adaptation in cities: An analysis of European urban climate adaptation plans. *Land Use Policy*, *50*, 38–47. https://doi.org/10.1016/J.LANDUSEPOL.2015.09.003

Ghisellini, P., Ripa, M., & Ulgiati, S. (2018). Exploring environmental and economic costs and benefits of a circular economy approach to the construction and demolition sector. A literature review. *Journal of Cleaner Production*, *178*, 618–643. https://doi.org/10.1016/j.jclepro.2017.11.207

Giordano, C., Graziano, P., Lazzarini, M., Piras, S., & Spaghi, S. (2022). Sustainable Community Movement Organisations and household food waste: The missing link in urban food policies? *Cities*, *122*, 103473. https://doi.org/10.1016/j.cities.2021.103473

Gladek, E., van Odijk, S., Theuws, P., & Herder, A. (2015). *Vision & Ambition Transitioning Amsterdam to a Circular City*. https://buiksloterham.nl/engine/download/blob/gebiedsplatform/69870/2015/28/CircularBuiksloterham_ENG_FullReport_05_03_2015.pdf?app=gebiedsplatform&class=9096&id=63&field=69870

Gravagnuolo, A., Angrisano, M., & Girard, L. F. (2019). Circular Economy Strategies in Eight Historic Port Cities: Criteria and Indicators Towards a Circular City Assessment Framework. *Sustainability 2019, Vol. 11, Page 3512*, *11*(13), 3512. https://doi.org/10.3390/SU11133512

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough? *Field Methods*, *18*(1), 59–82. https://doi.org/10.1177/1525822X05279903

Hak, T. (2004). Waarnemingsmethoden in kwalitatief onderzoek. *Huisarts En Wetenschap*, *47*(11), 205–212. https://doi.org/10.1007/BF03083720

Hanson, J. (2004). The inclusive city: delivering a more accessible urban environment through inclusive design. *Undefined*. https://discovery.ucl.ac.uk/id/eprint/3351/1/3351.pdf

Heurkens, E. (2022). *Area Development [PowerPoint Slides]*. https://pure.tudelft.nl/ws/portalfiles/portal/126825023/220512_Area_development_Heurkens_TU_Eindhoven.pdf

Hijmans, E., & Kuyper, M. (2007). Het halfopen interview als onderzoeksmethode. In *Kwalitatief onderzoek* (pp. 43–51). Bohn Stafleu van Loghum. https://doi.org/10.1007/978-90-313-6373-5_4

Huttunen, S., Ojanen, M., Ott, A., & Saarikoski, H. (2022). What about citizens? A literature review of citizen engagement in sustainability transitions research. *Energy Research & Social Science*, *91*, 102714. https://doi.org/10.1016/J.ERSS.2022.102714

Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructuredepartment-for-transport. (2021). www.gov.uk/government/organisations/

International Energy Agency (IEA). (2021). *Recommendations of the Global Commission on People-Centred Clean Energy Transitions*.

Izdebska, O., & Knieling, J. (2020). Citizen involvement in waste management and circular economy in cities: Key elements for planning and implementation. *European Spatial Research and Policy*, *27*(2), 115–129. https://doi.org/10.18778/1231-1952.27.2.08

Jacob, S. A., & Furgerson, S. P. (2012). Writing Interview Protocols and Conducting Interviews: Tips for Students New to the Field of Qualitative Research. *The Qualitative Report*, *17*, 1–10. http://www.nova.edu/ssss/QR/QR17/jacob.pdf

Jhansi, S., & Mishra, S. (2013). Wastewater Treatment and Reuse: Sustainability Options. *Consilience: Journal of Sustainable Development*. https://doi.org/10.7916/D8JQ10Q1

Jurgilevich, A., Birge, T., Kentala-Lehtonen, J., Korhonen-Kurki, K., Pietikäinen, J., Saikku, L., & Schösler, H. (2016). Transition towards Circular Economy in the Food System. *Sustainability 2016, Vol. 8, Page 69*, *8*(1), 69. https://doi.org/10.3390/SU8010069

Kara, S., Hauschild, M., Sutherland, J., & McAloone, T. (2022). Closed-loop systems to circular economy: A pathway to environmental sustainability? *CIRP Annals*, *71*(2), 505–528. https://doi.org/10.1016/J.CIRP.2022.05.008

Konietzko, J., Bocken, N., & Hultink, E. J. (2020). Circular ecosystem innovation: An initial set of principles. *Journal of Cleaner Production*, *253*, 119942. https://doi.org/10.1016/J.JCLEPRO.2019.119942

Kumari, M., & Singh, J. (2016). International Journal of Advanced Research and Review www.ijarr.in WATER CONSERVATION: STRATEGIES AND SOLUTIONS. *IJARR*, *1*(4), 75–79. www.ijarr.in

Lennon, B., Dunphy, N. P., & Sanvicente, E. (2019). Community acceptability and the energy transition: a citizens' perspective. *Energy, Sustainability and Society*, *9*(1), 1–18. https://doi.org/10.1186/S13705-019-0218-Z/FIGURES/8

Leppänen, J., Helsinki, D., Neuvonen, A., Ritola, M., Ahola, I., Hirvonen, S., Hyötyläinen, M., Kaskinen, T., Kauppinen, T., Kuittinen, O., Kärki, K., Lettenmeier, M., Helsinki/D-Mat), D., Mokka, R., Hicks, C., Brüggemann, N., Srour-Gandon, P., & Rossetti Di Valdalbero, D. (2013). *Scenarios for Sustainable Lifestyles 2050: From Global Champions to Local Loops About SPREAD Sustainable Lifestyles 2050 With inputs from the project consortium and project advisors*. www.scp-centre.orgWebsite:www.sustainable-lifestyles.euOnlinecommunity:www.sustainable-lifestyles.eu/communitySustainableLifestyles2050

Lester, J. N., Cho, Y., & Lochmiller, C. R. (2020). Learning to Do Qualitative Data Analysis: A Starting Point. *Human Resource Development Review*, *19*(1), 94–106. https://doi.org/10.1177/1534484320903890/FORMAT/EPUB

Liang, D., de Jong, M., Schraven, D., & Wang, L. (2021). Mapping key features and dimensions of the inclusive city: A systematic bibliometric analysis and literature study. *Https://Doi.Org/10.1080/13504509.2021.1911873*, *29*(1), 60–79. https://doi.org/10.1080/13504509.2021.1911873

Liu, Z., Jong, M. de, Li, F., Brand, N., Hertogh, M., & Dong, L. (2020). Towards developing a new model for inclusive cities in China: The case of Xiong'an New Area. *Sustainability*, *12*(15), 1–25. https://doi.org/10.3390/SU12156195

Livesley, S. J., McPherson, E. G., & Calfapietra, C. (2016). The Urban Forest and Ecosystem Services: Impacts on Urban Water, Heat, and Pollution Cycles at the Tree, Street, and City Scale. *Journal of Environmental Quality*, *45*(1), 119–124. https://doi.org/10.2134/JEQ2015.11.0567

López Reyes, M. E., & Mulder, Ingrid. (2021). *In search of Inclusive Participatory City-Making*. 475–485. https://doi.org/10.5151/EAD2021-142

MacQueen, K. M., & Guest, G. (2008). An introduction to team-based qualitative research. In G. Guest & K. M. MacQueen (Eds.), Handbook for team-based qualitative research (pp. 3–19). Lanham, MD: AltaMira Press

Marin, J., & de Meulder, B. (2018). Interpreting Circularity. Circular City Representations Concealing Transition Drivers. *Sustainability 2018, Vol. 10, Page 1310*, *10*(5), 1310. https://doi.org/10.3390/SU10051310

Martínez-Mesa, J., González-Chica, D. A., Duquia, R. P., Bonamigo, R. R., & Bastos, J. L. (2016). Sampling: how to select participants in my research study? *Anais Brasileiros de Dermatologia*, *91*(3), 326–330. https://doi.org/10.1590/abd1806-4841.20165254

McDonough, W., & Braungart', M. (2002). *Remaking the Way We Make Things: Cradle to Cradle* (ISBN 1224942886 104). North Point Press.

Merli, R., Preziosi, M., & Acampora, A. (2018). How do scholars approach the circular economy? A systematic literature review. *Journal of Cleaner Production*, *178*, 703–722. https://doi.org/10.1016/J.JCLEPRO.2017.12.112

Metabolic. (2021). *Handboek Circulaire Gebiedsontwikkeling*. https://www.metabolic.nl/wp-content/uploads/2021/12/Metabolic_HandboekCirculaireGebiedsontwikkeling.pdf

Mihas, P. (2023). Qualitative research methods: approaches to qualitative data analysis. *International Encyclopedia of Education(Fourth Edition)*, 302–313. https://doi.org/10.1016/B978-0-12-818630-5.11029-2

Miles, M. B., & Huberman, A. M. (1994). Qualitative data analysis: An expanded sourcebook (2nd ed.). Sage Publications, Inc.

Morseletto, P. (2020). Targets for a circular economy. *Resources, Conservation and Recycling*, *153*, 104553. https://doi.org/10.1016/J.RESCONREC.2019.104553

Mulhall, D. ;, Braungart, M. ;, Hansen, & Katja. (n.d.). *Creating Buildings with Positive Impacts*.

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, *18*(1). https://doi.org/10.1186/s12874-018-0611-x

Murray, A., Skene, K., & Haynes, K. (2017). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*, *140*(3), 369–380. https://doi.org/10.1007/S10551-015-2693-2/METRICS

Naboni, E., & Havinga, L. (2019). *Regenerative Design In Digital Practice. A Handbook for the Built Environment.* https://www.researchgate.net/publication/336121907_Regenerative_Design_In_Digital_Practice_A_Handbook_for_the_Built_Environment

Naderifar, M., Goli, H., & Ghaljaie, F. (2017). Snowball Sampling: A Purposeful Method of Sampling in Qualitative Research. *Strides in Development of Medical Education*, *14*(3). https://doi.org/10.5812/SDME.67670

Nieuwenhuijsen, M. J. (2021). Green Infrastructure and Health. *Annu. Rev. Public Health*, *42*, 317–328. https://doi.org/10.1146/annurev-publhealth

Norouzi, M., Chàfer, M., Cabeza, L. F., Jiménez, L., & Boer, D. (2021). Circular economy in the building and construction sector: A scientific evolution analysis. *Journal of Building Engineering*, *44*, 102704. https://doi.org/10.1016/J.JOBE.2021.102704

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, *16*(1). https://doi.org/10.1177/1609406917733847/ASSET/IMAGES/LARGE/10.1177_1609406917733847-FIG4.JPEG

OECD. (2011). *Perspectives on Global Development 2012 SOCIAL COHESION IN A SHIFTING WORLD*. https://doi.org/10.1787/persp_glob_dev-2012-en

OECD. (2015). *Stakeholder Engagement for Inclusive Water Governance*. OECD Publishing. https://doi.org/10.1787/9789264231122-en

Overheid Van Nu. (2020, January). *Enthousiaste ambtenaren zetten voeding op de stedelijke agenda's | Artikel | Overheid van nu*. https://www.overheidvannu.nl/actueel/artikelen/2020/01/15/enthousiaste-ambtenaren-zetten-voeding-op-de-stedelijke-agenda%E2%80%99s

Pacheco-Torgal, F. (2013). Introduction to the recycling of construction and demolition waste (CDW). *Handbook of Recycled Concrete and Demolition Waste*, 1–6. https://doi.org/10.1533/9780857096906.1

Paddeu, D., Shergold, I., & Parkhurst, G. (2020). The social perspective on policy towards local shared autonomous vehicle services (LSAVS). *Transport Policy*, *98*, 116–126. https://doi.org/10.1016/J.TRANPOL.2020.05.013

Peek, G.-J., & Troxler, P. (2014, May). *City in Transition: Urban Open Innovation Environments as a Radical Innovation*. https://www.researchgate.net/publication/281626440_City_in_Transition_Urban_Open_Innovation_Environments_as_a_Radical_Innovation

Pomponi, F., & Moncaster, A. (2017). Circular economy for the built environment: A research framework. *Journal of Cleaner Production*, *143*, 71 0–718. https://doi.org/10.1016/J.JCLEPRO.2016.12.055

Potting, J., Hekkert, M. P., Worrell, E., & Hanemaaijer, A. (2017). Circular Economy: Measuring Innovation in the Product Chain. *Planbureau Voor de Leefomgeving*, *2544*. http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2016-circular-economy-measuring-innovation-in-product-chains-2544.pdf

Prendeville, S., Cherim, E., & Bocken, N. (2018). Circular Cities: Mapping Six Cities in Transition. *Environmental Innovation and Societal Transitions*, *26*, 171–194. https://doi.org/10.1016/J.EIST.2017.03.002

Preston, F. (2012). A Global Redesign? Shaping the Circular Economy. *Chatham House*. http://biblioteca.fundacionicbc.edu.ar/images/d/d7/Bp0312_preston.pdf

Prihandrijanti, M., & Firdayati, M. (2011). Current Situation and Considerations of Domestic Wastewater Treatment Systems for Big Cities in Indonesia (Case Study: Surabaya and Bandung) . *Journal of Water Sustainability*, *1*(2), 97–104. https://www.researchgate.net/publication/266052376

Rahla, K. M., Mateus, R., & Bragança, L. (2021). Implementing Circular Economy Strategies in Buildings—From Theory to Practice. *Applied System Innovation 2021, Vol. 4, Page 26*, *4*(2), 26. https://doi.org/10.3390/ASI4020026

Rahla, K. M., Bragança, L., & Mateus, R. (2019). Obstacles and barriers for measuring building's circularity. *IOP Conference Series: Earth and Environmental Science*, *225*(1). https://doi.org/10.1088/1755-1315/225/1/012058

Raimo, N., Vitolla, F., Malandrino, O., Esposito, B., Paoli, F., Pirlone, F., & Spadaro, I. (2022). Indicators for the Circular City: A Review and a Proposal. *Sustainability 2022, Vol. 14, Page 11848*, *14*(19), 11848. https://doi.org/10.3390/SU141911848

Raj, B., Roy, R., Vepakoma, B. R., & Kumar, M. (2018). Inclusive Manufacturing: What it means and How it can accelerate growth of India? *RITES Journal*. https://www.researchgate.net/publication/325296933_Inclusive_Manufacturing_What_it_means_and_How_it_can_accelerate_growth_of_India

Rashid, M. I., & Shahzad, K. (2021). Food waste recycling for compost production and its economic and environmental assessment as circular economy indicators of solid waste management. *Journal of Cleaner Production*, *317*, 128467. https://doi.org/10.1016/J.JCLEPRO.2021.128467

Realizing the SDGs for All: Ensuring Inclusiveness and Equality for Every Person, Everywhere. (2019). *Together 2023*. https://sustainabledevelopment.un.org/content/documents/23216Together_2030__Position_Paper__HLPF_2019.pdf

Richters, R., van Houdt, J., Ekhart, A., Everhardt, V., & Olthof, J. (2016). *Doen Wat Nodig Is. Experimenten die maatwerk mogelijk maken.* https://agendastad.nl/content/uploads/2016/10/Publicatie-Doen-wat-nodig-is.pdf

Rijksoverheid. (2020). *Naar een inclusieve samenleving*. https://www.rijksfinancien.nl/bmh/bmh-6-inclusieve-samenleving.pdf

RLI (Raad voor de Leefomgeving en Infrastructuur). (2020). *Toegang tot de stad: hoe publieke voorzieningen, wonen en vervoer de sleutel voor burgers vormen. Digitale uitgave.* https://www.rli.nl/sites/default/files/toegang_tot_de_stad_website_def.pdf

R-ladder - Strategieën van circulariteit. (n.d.). Retrieved June 9, 2023, from https://www.rvo.nl/onderwerpen/r-ladder

Russell, C. K. (2003). Evaluation of qualitative research studies. *Evidence-Based Nursing*, *6*(2), 36–40. https://doi.org/10.1136/ebn.6.2.36

Ryan, F., Coughlan, M., & Cronin, P. (2009). Interviewing in qualitative research: The one-to-one interview. *International Journal of Therapy and Rehabilitation*, *16*(6), 309–314. https://doi.org/10.12968/ijtr.2009.16.6.42433

Ryöppy, M., Santala, S.-S., & Jacobson, S. (2022). Citizen-led approach to designing inclusive digital shared mobility services. *LUT Scientific and Expertise Publications*. https://www.sparcs.info/sites/default/files/2022-06/ISPIM_CPH_2022%20Citizen-led%20approach%20to%20designing%20inclusive%20digital%20shared%20mobility%20services_final.pdf

Sala Benites, H., Osmond, P., & Prasad, D. (2023). Inquiry on Perceptions and Practices of Built Environment Professionals Regarding Regenerative and Circular Approaches. *Buildings*, *13*(1), 63. https://doi.org/10.3390/BUILDINGS13010063/S1

Saldaña, J. (2013). *The Coding Manual for Qualitative Researchers* (J. Seaman, Ed.). SAGE Publications Ltd. https://emotrab.ufba.br/wp-content/uploads/2020/09/Saldana-2013-TheCodingManualforQualitativeResearchers.pdf

Säumel, I., Reddy, S., Wachtel, T., Schlecht, M., & Ramos-Jiliberto, R. (2022). How to feed the cities? Co-creating inclusive, healthy and sustainable city region food systems. *Frontiers in Sustainable Food Systems*, *6*, 334. https://doi.org/10.3389/FSUFS.2022.909899/BIBTEX

Schönwälder, G. (2021). Engaging citizens to boost climate neutrality and greater circularity: opportunities and challenges for research and innovation. *Clean Technologies and Environmental Policy*, *23*(2), 483–489. https://doi.org/10.1007/S10098-020-01902-2/METRICS

Schreiber, F., & Carius, A. (2016). The Inclusive City: Urban Planning for Diversity and Social Cohesion. *State of the World*, 317–335. https://doi.org/10.5822/978-1-61091-756-8_27

Schroeder, P., Anggraeni, K., & Weber, U. (2019). The Relevance of Circular Economy Practices to the Sustainable Development Goals. *Journal of Industrial Ecology*, *23*(1), 77–95. https://doi.org/10.1111/jiec.12732

Shaheen, S., & Chan, N. (n.d.). *MOBILITY AND THE SHARING ECONOMY: IMPACTS SYNOPSIS SHARED MOBILITY DEFINITIONS AND IMPACTS ▪ SPECIAL EDITION ▪ SPRING 2015*.

Soma, K., Dijkshoorn-Dekker, M. W. C., & Polman, N. B. P. (2018). Stakeholder contributions through transitions towards urban sustainability. *Sustainable Cities and Society*, *37*, 438–450. https://doi.org/10.1016/J.SCS.2017.10.003

Stahel, W. R. (2016). The circular economy. *Nature*, *531*(7595), 435–438. https://doi.org/10.1038/531435a

Stebbins, R. (2012). Exploratory Research in the Social Sciences. *Exploratory Research in the Social Sciences*. https://doi.org/10.4135/9781412984249

Stein, A. J., & Santini, F. (2021). The sustainability of "local" food: a review for policy-makers. *Review of Agricultural, Food and Environmental Studies 2021 103:1*, *103*(1), 77–89. https://doi.org/10.1007/S41130-021-00148-W

Swagemakers, P., Dominguez Garcia, M. D., & Wiskerke, J. S. C. (2018). Socially-Inclusive Development and Value Creation: How a Composting Project in Galicia (Spain) 'Hit the Rocks.' *Sustainability*, *10*(6), 2040. https://doi.org/10.3390/su10062040

Takács, Á., Kiss, M., Hof, A., Tanács, E., Gulyás, Á., & Kántor, N. (2016). Microclimate Modification by Urban Shade Trees – An Integrated Approach to Aid Ecosystem Service Based Decision-making. *Procedia Environmental Sciences*, *32*, 97–109. https://doi.org/10.1016/J.PROENV.2016.03.015

Tong, X., Yu, H., & Liu, T. (2021). Using weighted entropy to measure the recyclability of municipal solid waste in China: Exploring the geographical disparity for circular economy. *Journal of Cleaner Production*, *312*, 127719. https://doi.org/10.1016/j.jclepro.2021.127719

Tong, Y. D., Huynh, T. D. X., & Khong, T. D. (2021). Understanding the role of informal sector for sustainable development of municipal solid waste management system: A case study in Vietnam. *Waste Management*, *124*, 118–127. https://doi.org/10.1016/j.wasman.2021.01.033

Turner, D. (2010). Qualitative Interview Design: A Practical Guide for Novice Investigators. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2010.1178

U4SSC. (2020). *A guide to circular cities*. https://unece.org/sites/default/files/2021-01/2020_A-Guide-to-Circular-Cities.pdf

UN Habitat. (2001). *CITIES IN A GLOBALIZING WORLD*. https://unhabitat.org/sites/default/files/download-manager-files/Cities%20in%20A%20Globalizing%20World%20-%20Global%20Report%20on%20Human%20Settlements%202001.pdf

UN Habitat. (2021). *Urban regeneration as a tool for inclusive and sustainable recovery. Report on the Expert Group Meeting*. https://unhabitat.org/sites/default/files/2022/05/report_egm_urban_regeneration.pdf

UN-Habitat. (2016). Key Messages for the "New Urban Agenda" | United Nations Development Programme. *UNDP*. https://www.undp.org/sites/g/files/zskgke326/files/publications/Key%20Messages_2016_%20April%2018_The%20Nexus%20of%20Urbanization%20Violence%20and%20Conflict-%20Linking%20SDG%2011%20and%20SDG%2016.pdf

United Nations. (2015). *Transforming our world: the 2030 Agenda for Sustainable Development Transforming our world: the 2030 Agenda for Sustainable Development Preamble*. https://documents-dds-ny.un.org/doc/UNDOC/GEN/N15/291/89/PDF/N1529189.pdf?OpenElement

United Nations. (2016). *Leaving no one behind: the imperative of inclusive development Report on the World Social Situation 2016*. https://www.un.org/esa/socdev/rwss/2016/full-report.pdf

United Nations. (2011). *Guidelines for developing eco-efficient and socially inclusive infrastructure Are we building competitive and liveable cities?* https://www.greengrowthknowledge.org/sites/default/files/downloads/resource/uneclac-unescap-unhabitat-Guidelines.pdf

United Nations (UN). (2022). *SDG Indicators*. United Nations. https://unstats.un.org/sdgs/report/2022/

Urban Solutions. (2018). Inclusive Urban Regeneration. *Centre for Livaeable Cities, Singapore*. https://www.clc.gov.sg/docs/default-source/urban-solutions/urban-solutions-12-full.pdf

Valuing Water Initiative. (2021, August). *4 ways the circular economy can help us manage water* . https://valuingwaterinitiative.org/4-ways-the-circular-economy-can-help-us-to-manage-water/

van Royen, P., & Peremans, L. (2007). 5 Exploreren met focusgroepgesprekken: de 'stem' van de groep onder de loep. In *Kwalitatief onderzoek* (pp. 53–64). Bohn Stafleu van Loghum. https://doi.org/10.1007/978-90-313-6373-5_5

Vanhuyse, F., Haddaway, N. R., & Henrysson, M. (2021). *Discover Sustainability Circular cities: an evidence map of research between 2010 and 2020*. *2*, 50. https://doi.org/10.1007/s43621-021-00059-2

Vence, X., & Pereira, Á. (2018). *Eco-innovation and Circular Business Models as drivers for a circular economy Eco-innovación y modelos de negocio circulares como facilitadores de una economía circular*. https://doi.org/10.22201/fca.24488410e.2019.1806

Voulvoulis, N. (2018). Water reuse from a circular economy perspective and potential risks from an unregulated approach. *Current Opinion in Environmental Science & Health*, *2*, 32–45. https://doi.org/10.1016/J.COESH.2018.01.005

WBCSD. (2017). *Business guide to circular water management: spotlight on reduce, reuse and recycle*. https://docs.wbcsd.org/2017/06/WBCSD_Business_Guide_Circular_Water_Management.pdf

What is Green Infrastructure? | US EPA. (n.d.). Retrieved June 9, 2023, from https://www.epa.gov/green-infrastructure/what-green-infrastructure

Williams, J. (2019). Circular cities: Challenges to implementing looping actions. *Sustainability (Switzerland)*, *11*(2). https://doi.org/10.3390/SU11020423

Winkler, H. (2011). Closed-loop production systems—A sustainable supply chain approach. *CIRP Journal of Manufacturing Science and Technology*, *4*(3), 243–246. https://doi.org/10.1016/J.CIRPJ.2011.05.001

World Urban Campaign (WUC). (2022). *The City We Need Now! Realizing the New Urban Paradigm.* https://www.worldurbancampaign.org/_files/ugd/13b76e_71a114826fc649a890c54926f4854dd1.pdf

Yuan, Q., Fang Chin Cheng, C., Wang, J., Zhu, T. T., & Wang, K. (2020). Inclusive and sustainable industrial development in China: An efficiency-based analysis for current status and improving potentials. *Applied Energy*, *268*, 114876. https://doi.org/10.1016/J.APENERGY.2020.114876

Zammit, A., & Aldeiri, T. (2021). ELECTRIC VEHICLES CHANGEOVER SUSTAINABLE MOBILITY. *Local Councils' Association Malta*. https://www.um.edu.mt/library/oar/bitstream/123456789/95009/3/Electric_vehicles_changeover_sustainable_mobility_2021.pdf

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Appendices

Appendix A Human Research Ethics

The documents required by the Human Research Ethic Committee (HREC) for approval are included in this chapter. This part of the research is necessary since it involves the collecting of personal data for administrative purposes, including name, email, work experience year, position at current employer, and data from human resources.

A.1 Interview Informed Consent

You are invited to participate in a research study titled [From Waste to Embrace - Driving Circular Strategies through Inclusiveness in Dutch Circular Area Development]. This study is being done by Arishta Oemrawsingh, an MSc Construction Management and Engineering student] from TU Delft. The purpose of this research study is to provide a framework on how inclusiveness can contribute to supporting and driving circular strategies within circular area development. The interview will take approximately 50 to 70 minutes. The data collected in this research will be analysed. The personal data collected with consent will be used only for administrative purposes and stored separately from the interview transcripts.

The interviewees for this study are categorised into three groups: professionals in the area development who have executive, managing, or supervisory positions; professionals that work as advisors for area development or circular economy, and; professionals that work as advisors for on inclusiveness. You will be asked to elaborate (1) your career experience relevant to the research's objective, (2) expert opinion on the presented framework's circular strategies, (3) expert opinion on the presented framework's inclusiveness strategies, (4) expert opinion on possible opportunities and barriers of the contents of the presented framework.

The interview does not request participants to disclose any personal information they do not want to share, but some sensitive work experiences may come up in discussion. As with any online and offline activity, the risk of a breach is always possible. Any data collected will be kept confidential to the best of the researchers' ability and stored separately from identifying information. We will minimize any risks by storing all the collected data after misidentifying any directly identifiable information of the participants to avoid the participants being placed in a difficult situation of a data leak.

As stated above, the personal data collected with this informed consent will be used for administrative purposes and stored separately with the interview audio/video recordings and interview transcripts. After the interview, the transcript will be sent to the interviewee. This transcript will not contain any personal data. Some parts of the interview can be quoted in the thesis document; however, it will be anonymised in a way that does not provide any identifying information about participants. The data will only be shared among the responsible researchers and will not contain any identifying information.

You can voluntarily withdraw from this study at any time. You are not required to respond to every question. All personal and research data collected from the interview will be used only for administrative and research purposes and will be destroyed one month after the grading of the thesis. If there are any questions, participants can contact the research student.

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
I have read and understood the study information dated [*DD/MM/YYYY*], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
I understand that taking part in the study involves: [see points below]	☐	☐
• Data collection of personal information (e.g. occupation (position at work), years of work experience; • Data collection of personal experience at work; • Data collection of personal opinion based on your experience, expertise and opinion on the relationship between inclusiveness and circular area development; • This interview will be recorded (in audio and video) and will be automatically transcribed; • The transcription will be manually improved and sent to me for inspection; • The recordings of the interview will be deleted 10 days after sending the transcript, unless there are still objections to this; • The transcript will be anonymized and quotes from it can be used in the report; and • The originally non-anonymised transcript will be deleted immediately after anonymisation.		
I understand that I will not be compensated for my participation.	☐	☐
I understand that the study will end May 2023	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
I understand that taking part in the study involves the following risks described below. I understand that these will be mitigated.	☐	☐
I understand that my participation means that personally identifiable information and research data will be collected, with the risk that I can be identified from this.	☐	☐
I understand that within the Algemene Verordening Gegevensbescherming (AVG) part of this personal identifiable research data is considered sensitive, namely: • Name • E-mail address • Other contact details for digital communication • Image and sound recording of this interview	☐	☐
I understand that the following steps are being taken to minimize the risk of a data breach and that my identity is protected in the following ways: • The data will be anonymised as soon as possible • The non-anonymized data will be stored in a separate folder	☐	☐
I understand that the personal information collected about me that can identify me, such as name, contact information and image and sound recording, will not be shared outside the study team.	☐	☐
I understand that the personal data collected about me will be destroyed at the latest when the report is published.	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
I understand that after the research study the de-identified information I provide will be used for further research and education and will be shared in the repository of the TU Delft.	☐	☐
After the interview, the transcript will be sent to the interviewee. In case of doubt, the interviewee can contact the researcher within two weeks to add or remove parts of the answers given during the interview. No response within two weeks will be considered as an approval of the transcript and the quotation of the contents in the thesis.		
I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐

Signatures

_____ _____ __/__/____

Name of participant [printed] **Signature** **Date**

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____ _____ __/__/____

Researcher name [printed] **Signature** **Date**

Study contact details for further information: Arishta Oemrawsingh, a.oemrawsingh@student.tudelft.nl

A.2 Data Management Plan

Inclusiveness in Dutch Circular Area Development

0. Administrative questions

1. Name of data management support staff consulted during the preparation of this plan.

Question not answered.

2. Date of consultation with support staff.

Question not answered.

I. Data description and collection or re-use of existing data

3. Provide a general description of the type of data you will be working with, including any re-used data:

Type of data	File format(s)	How will data be collected (for re-used data: source and terms of use)?	Purpose of processing	Storage location	Who will have access to the data
Interview Recordings	mp3/mp4	Recording the interview sessions	To get a comprehensive understanding of inclusiveness strategies within circular area development.	Personal OneDrive	Principal Researcher.
Interview Transcripts	PDF	Transcription of the interview recordings	To get a comprehensive understanding of inclusiveness strategies within circular area development.	Personal OneDrive	Principal Researcher and the Individual Interviewee per Transcript.
Anonymized Interview Transcriptions	PDF	Anonymized transcription of the interview recordings	To get a comprehensive understanding of inclusiveness strategies within circular area development.	Personal OneDrive	Principal Researcher and the Graduation Committee.

Informed consent forms	PDF	Digitalized forms	To collect informed consent	Personal OneDrive	Principal Researcher.

4. How much data storage will you require during the project lifetime?

< 250 GB

The most data storage will be needed for interview recordings. Maximum 12 interviews will be conducted for this study, hence around 5 GB will be required.

II. Documentation and data quality

5. What documentation will accompany data?

- Other - explain below

Data will be shared in the Appendix of the master's thesis.

III. Storage and backup during research process

6. Where will the data (and code, if applicable) be stored and backed-up during the project lifetime?

- OneDrive

Personal OneDrive will be used.

IV. Legal and ethical requirements, codes of conduct

7. Does your research involve human subjects or 3rd party datasets collected from human participants?

- Yes

8A. Will you work with personal data? (information about an identified or identifiable natural person)

If you are not sure which option to select, ask your Faculty Data Steward for advice. You can also check with the privacy website or contact the privacy team: privacy-tud@tudelft.nl

- Yes

Participants will be interviewed, and personal information will be stored for administrative purposes (on the informed consent forms, for instance). The interviews will be recorded (in audio or video format, depending on the situation), and then transcribed. The transcription will not be shared with anyone until it is been made anonymous.

8B. Will you work with any other types of confidential or classified data or code as listed below? (tick all that apply)

If you are not sure which option to select, ask your Faculty Data Steward *for advice.*

- No, I will not work with any confidential or classified data/code

9. How will ownership of the data and intellectual property rights to the data be managed?

For projects involving commercially-sensitive research or research involving third parties, seek advice of your Faculty Contract Manager ***when answering this question. If this is not the case, you can use the example below.***

The data will only be accessible to the principle researcher during the research period. The supervisors will receive anonymized data, which will also be included in the thesis.

10. Which personal data will you process? Tick all that apply

- Data collected in Informed Consent form (names and email addresses)
- Signed consent forms
- Email addresses and/or other addresses for digital communication
- Names and addresses

Names, email addresses, and information gathered through informed consent forms will all be archived. A video recording of the interview will also be kept if it is conducted using MS Teams. The (video) recording will be instantly destroyed after the interviews have been transcribed and the interviewee has not provided any feedback.
Once the research is complete, additional personal information can be removed.

11. Please list the categories of data subjects

1. Professionals in the area development who have executive, managing, or supervisory positions;
2. Professionals that work as advisors for area development or circular economy
3. Professionals that work as advisors on inclusiveness in the built environment

12. Will you be sharing personal data with individuals/organisations outside of the EEA (European Economic Area)?

- No

15. What is the legal ground for personal data processing?

- Informed consent

16. Please describe the informed consent procedure you will follow:

Before the interview, I will mail the informed consent forms and request that the interviewees return them electronically. At the start of the interview, I will remind the interviewers once more of the specific agreements outlined in the informed consent form.

17. Where will you store the signed consent forms?

- Same storage solutions as explained in question 6

18. Does the processing of the personal data result in a high risk to the data subjects?

If the processing of the personal data results in a high risk to the data subjects, it is required to perform a Data Protection Impact Assessment (DPIA). In order to determine if there is a high risk for the data subjects, please check if any of the options below that are applicable to the processing of the personal data during your research (check all that apply).
If two or more of the options listed below apply, you will have to complete the DPIA. Please get in touch with the privacy team: privacy-tud@tudelft.nl to receive support with DPIA.
If you have any additional comments, please add them in the box below.

- None of the above applies

22. What will happen with personal research data after the end of the research project?

- Personal research data will be destroyed after the end of the research project

V. Data sharing and long-term preservation

27. Apart from personal data mentioned in question 22, will any other data be publicly shared?

- No other data can be publicly shared - please explain below why data cannot be publicly shared

I am not required to make my interview transcripts public because I am a master's student. Consequently, I decide against doing so. The option to utilise anonymous quotes is the only alternative I would use.

29. How will you share research data (and code), including the one mentioned in question 22?

- My data will be shared in a different way - please explain below

Data will be shared in the principle researcher's master's Thesis.

30. How much of your data will be shared in a research data repository?

- < 100 GB

31. When will the data (or code) be shared?

- As soon as corresponding results (papers, theses, reports) are published

32. Under what licence will be the data/code released?

- Other - Please explain

Data will be shared in the principle researcher's master's Thesis.

VI. Data management responsibilities and resources

33. Is TU Delft the lead institution for this project?

- Yes, the only institution involved

34. If you leave TU Delft (or are unavailable), who is going to be responsible for the data resulting from this project?

The first supervisor: Quirien Reijtenbagh - Q.A.M.Reijtenbagh-1@tudelft.nl

35. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

No external resources will be needed, as I will be doing the data management myself.

Appendix B Data Collection Protocol

B.1 Interview

The semi-structured interviews, which last between 50 and 70 minutes, are divided into five sections: an introduction, CAD, inclusiveness strategies, opportunities and barriers associated with those strategies, and closing.

The structure of the interviews makes it possible to get meaningful information from the interviewers, allowing for a comparison of the responses on an equal footing. The interviewing process includes pre-defined questions that are arranged to lead interviewees as they chronologically recount their job experiences. This interview process contains open-ended inquiries and space for follow-up inquiries.

B.2 Interview Protocol

Part 1: Introduction

De bedoeling van het interview

Allereerst wil ik u bedanken voor uw deelname aan dit interview. Dit interview maakt deel uit van mijn masterscriptie, die gaat over **hoe inclusiviteit de circulaire strategieën die worden gebruikt in de Nederlandse circulaire gebiedsontwikkeling vooruit kan helpen**. Tijdens dit gesprek kunt u uw ervaringen en gedachten delen over hoe inclusiviteit van invloed kan zijn op circulaire gebiedsontwikkeling. **Voor dit onderzoek is een raamwerk ontwikkeld op basis van relevante literatuur.** De bedoeling van dit interview is om het raamwerk te **valideren** (deel 2 en deel 3) en om na te gaan wat de **waarde en welke belemmeringen** (deel 4) inclusiviteit ondervindt in de Nederlandse circulaire gebiedsontwikkeling.

About Me

- Arishta Oemrawsingh, Master student CME bij TU Delft.
- Interesse in circulariteit en gebiedsontwikkeling en inclusiviteit.

Tijd

Circa 60 minuten

Privacy

Dit interview zal worden opgenomen, zoals ik u eerder heb meegedeeld in het toestemmingsformulier.

1. Kan ik nu beginnen met opnemen?
   (*Het interview wordt nu opgenomen)

Inleiding Geïnterviewde

2. Kunt u mij een korte introductie geven over uzelf en uw huidige en voormalige banen die relevant zijn voor deze studie?

Deel 2: Circulaire Strategieën

3. Volgens u, hoe manifesteert de circulaire economie zich in gebiedsontwikkeling?

4. Zijn er projecten of gevallen waarin circulariteit wordt geïmplementeerd in uw huidig of voormalige baan?
5. Als u kijkt naar de circulaire strategieën in het raamwerk, ziet u die terug in de praktijk?
6. Zijn er circulaire strategieën die u in de praktijk toepast, maar die u niet terugvindt in het raamwerk? Kunt u die nader toelichten?

Deel 3: Inclusieve strategieën

7. Hoe ziet u inclusiviteit in het kader van circulaire gebiedsontwikkeling?
8. Zijn er projecten of gevallen waarin inclusiviteit wordt geïmplementeerd in uw huidig of voormalige baan?
9. Als u kijkt naar de inclusieve strategieën in het raamwerk, ziet u die terug in de praktijk?
10. Zijn er inclusieve strategieën die u in de praktijk toepast, maar die u niet terugvindt in het raamwerk? Kunt u die nader toelichten?

Deel 4: Waarde en Belemmeringen

11. Werken de inclusieve strategieën naar uw professionele mening toe naar het bevorderen van de circulaire strategieën in de Nederlandse gebiedsontwikkeling?
12. Waarom is het waardevol om inclusiviteit mee te nemen in circulaire gebiedsontwikkeling?
13. Zijn er belemmeringen die u kunt benoemen voor het implementeren van de inclusieve strategieën die in het raamwerk staan vermeld?
14. Kunt u zich vinden in de genoemde inclusieve en circulaire strategieën met het oog op circulaire gebiedsontwikkeling?

Deel 5: Afsluiting

15. Is er nog iets dat u zou willen toevoegen aan wat we hebben besproken?
16. Heeft u vragen of opmerkingen voor mij?
17. Kunt u iemand anders aanraden met wie ik zou kunnen praten om meer te weten te komen over inclusiviteit en circulaire gebiedsontwikkeling? Zo ja, wie?

Ik waardeer uw mening en de tijd die u heeft genomen om aan dit interview deel te nemen. Binnen twee weken stuur ik u de transcriptie van het interview en kunt u contact met mij opnemen als u vragen hebt of iets wilt toevoegen.

EIND

C.1 Example of the Process of Development of Principle Foster Trust through Transparency and Inclusivity

Theme: Stakeholder Engagement & Collaboration	
Code	Trust
2:17 ¶ 90 in CJ they had really emphatically chosen to keep it small-scale and also kind of not make it too big and also not involve the municipality and also not go too much higher in their own organization to get more money, for example. Because otherwise they were afraid or almost certain that it would fail and that they would not get it done.	
3:28 ¶ 54 in EL it also has to do with trust, I think, so that at a higher scale level you also give people say and ownership over matters that the government always deals with.	
4:21 ¶ 155 in HD That confidence. Because that is reflected in consumer behaviour and acceptance, so consumers trust the linear economy, not the circular economy.	
4:26 ¶ 196 in HD the trust; people in general, i.e. residents, but also companies and organizations, have a distrust of circularity in relation to linearity.	
5:38 ¶ 129 in JK And that is public trust. So, if we take the initiative, it will soon be the case that people do not trust. Or they have worked on something before and then it fell through in one go. Or trust among citizens is also a real obstacle. People no longer trust the organisations, the municipality, the housing association, everything is so large-scale. There is little room for human size. So, the citizen has also dropped out and by doing it on such a small scale, they hook up again. So, trust is very important when it comes to citizens.	
summary	Trust is a crucial element for inclusiveness in CAD. An important strategy noted JK and CJ is keeping project small scale to avoid shutting down or expanding rapidly and getting too complex. As JK also notes, maintaining a 'human size' approach where individuals feel seen and considered, can help regain public trust. EL says that trust also extends to ownership, where they suggest that by giving people power over decisions traditionally handled by the government, at a higher scale, trust can be fostered. Lastly, HD notices that there is a general scepticism towards circularity as compared to linearity from various entities like residents, companies, and organizations.
principle	**Foster Trust through Transparency and Inclusivity**
description	Making sure there is trust among all stakeholders, including citizens, is essential to achieving successful inclusiveness in CAD. Promoting transparency in decision-making processes, involving stakeholders at every stage, recording small-scale efforts that have shown success, and scaling them up are all ways to do this. Flexibility and adaptability to the unique requirements and preferences of communities are also important.

C.2 Example of the Process of Development of Principle Circular Initiatives should seek to Balance Economic Considerations with Social Needs

Theme: Access & Equity	
Code	Economic Interests vs Social Needs
1:9 ¶ 39 in AF we also want to build social rental homes, and nobody wants to build them, because that is not convenient, so then as a government you have to decide which part will we fund or facilitate so that it remains affordable and that developments can continue	
5:21 ¶ 66 in JK as a housing association, must invest more and more deeply in social management, because this also costs money. But I can demonstrate that it is an in-depth investment, a social management that on this project where the laundry bar is located, that we have a better grip on the social side than in a complex where there is nothing.	
5:24 ¶ 75 – 76 in JK …but we cater for people who need a helping hand. So that immediately strikes me, because you can say something, we have a citizen. He has a small budget, so we, for example, what we do to give a very detailed example in commercial complexes, you pay € 3 per wash. We have not done that, because our tenants are not going to do that. They pay € 600 per month, so we let everyone pay € 6 service costs per month for the washing machine whether you use it or not or whether you use it 20 times, so we must at least take that into account financially.	
8:48 ¶ 147 – 148 in OB And also, that there are still perverse rewards in the current economic system that depends on growth. Well, growth is rewarded and is rewarded harder than non-growth. So it is still the case that say out of 10 companies that do something, 1 goes incredibly well and 9 then go down. That also means there that in the companies and governments that collectively form the global economy fewer and fewer players as time goes on, because you have to deal with saturation of markets. And so, we have to virtualize the economy as it is so nicely called. But is it possible for fewer and fewer players to continue to grow, at the expense of the fact that other parties experience negative growth at some point, and therefore fall out of the equation.	
summary	In this code group, there is an expression of balancing economic interests with social needs. AF talks about there still being affordability in initiatives, so people do not get left out. JK says that they struck this balance by coming up with a social scheme, where washing machines (social need) could be used for a flat service fee each month instead of per-use (economic interest). OB concludes that the current economic system rewards growth (which is more the case with linear systems, as they are already embedded in society and thus cost less, which equals more economic growth), rather than non-growth (which can be the case with circular start-ups that do not produce much growth, especially in the begin phases).
principle	**Circular Initiatives should seek to Balance Economic Considerations with Social Needs**
description	The existing economic systems frequently emphasise growth, which might be at conflict with the objectives of social equality. Therefore, the task is to move towards a system where success is not solely determined by financial assets and where growth does not reduce social well-being. The availability of basic services like accessible facilities and affordable housing must be balanced with everyone in the community's ability to pay for them.

C.3 Example of Process of the Development of the Principle Context-Dependent Implementation

Theme: Localisation	
Code	Context-Dependent Implementation
1:38 ¶ 171 in AF I think it depends a bit on how you formulate it and how you implement it.	
2:32 ¶ 144 in CJ But yes, this is also very much a context dependency in area development. It is also logical that, for example, that "involve local communities", that it means something different in a different place.	
3:26 ¶ 49 in EL I would advise that with inclusion you do need involvement, but you only get involvement if you do not go there with a preconceived notion yourself, and so that you also listen to what the rest wants and deal with it flexibly in your assignment.	
5:1 ¶ 20 in JK That depends quite a bit on the people and companies involved. So you have the dimension of which company is there and what ambition and vision does it have?	
5:3 ¶ 20 in JK So it is a combination of which party, which persons and the policy of the municipality.	
5:4 ¶ 27 in JK And Amsterdam North is not Amersfoort Vathorst, even when it comes to available materials. The task, the People, it is all context. So, you really just have to work with a number of principles, I always say, which you concretize in context, depending on that context.	
5:5 ¶ 29 in JK For example, I worked in Almere, where you had the Almere principles. There you simply had 10 rules, and within those rules you could therefore make a goal description and let the parties come up with the means themselves.	
5:35 ¶ 125 in JK And, that is what you said in the beginning again, depending on the context, who lives there? Which care party is there, what is the physical situation? So, you constantly have to look again at every project. What does this coalition mean?	
6:13 ¶ 65 in KB A more circular Dutch society, that is also such a scale. You can always do more, you can always do less. Everyone has their opinion on that, including me, but that also depends on the context and the time.	
7:16 ¶ 93 – 94 in MV A drive is that people who live somewhere, or work, or just like to come always improve designs, always know just a little better what is special about the green, what the sunny side is, what the nice side of an area is, which is the dark side. So it is important for that. That is purely just making the design and what do we build.	
7:17 ¶ 95 in MV And there are many elements to area development that allow you to do better. If you know what people want in the design, but also how they like to use it. Whatever facilities they want, that ultimately makes it more sustainable, so that means that there is much less chance that you will have to demolish things in 20 or 30 years or have to put them up differently.	
summary	In these excerpts, there is an emphasis on context when planning or implementing projects in communities. Like El, JK, and MV say, involving local people means something different in every community. Like JK says, Amsterdam and Almere both have different needs and ideas. Both have certain principles they

	both follow, but how these principles are implemented or operationalised will differ based on the context. MV notices that in projects, effective designs are ones that consider the people who live, work, and frequently visit the area, as they are the ones that have the most insight into what improvements are necessary. EL also mentions that the ideas and involvement of citizens during these design plans, make the end results more sustainable and are less likely to require significant changes in the future. It is a matter of looking at the local context and engaging those who know it best to drive the project.
principle	**Context-Dependent Implementation**
description	Initiatives for CAD should take into account the specific resources, requirements, and desires of the local community. How successfully inclusivity, sustainability, or circularity are implemented greatly depends on the context and the participants. It is crucial to hear what the community has to say, to be adaptable, and to be aware of the particular environmental, social, and economic circumstances. A project's design, use, and long-term sustainability depend on an understanding of the local environment because doing so lowers the likelihood of early obsolescence or inefficiency.

C.4 Coding Framework

Stakeholder Engagement & Collaboration	Localisation	Preconditions Principles
Collaboration and Localisation Challenges	Bottom-Up Initiatives	Barriers CAD
Community Engagement and Local Production	Collaboration and Localisation Challenges	Barriers Circular Economy
Influence Municipal Policy	Community Engagement and Local Production	Barriers Inclusiveness
International Considerations	Context-Dependent Implementation	CAD Challenges
Intersectoral Integration	Sustainability & Local Development	CE Strategies Challenges
Openness Stakeholders	**Promotion of Circular Practices**	Circular Economy Challenges
Scalability Challenge Inclusiveness and CE	Circular Value Unlocking	Financial Barriers for Inclusiveness
Stakeholder Engagement & Collaboration	Circularity for Multi-Dimensional Value Creation	Financial Challenges
Systematic Change	Enforcement of Policy	Inclusiveness Challenges
Trust	From Ownership to Sharing	Re-evaluation of Production Processes
Opportunities for Inclusiveness in CAD	Promotion of Circular Practices	Systematic Change
Inclusiveness for Participation	Sector Challenge	**Access & Equity**
Inclusiveness for Accelerated Development	Sector Recognition	Access & Equity
Inclusiveness as a Standard	**Education & Awareness**	Economic Interests vs Social Needs
Inclusiveness as Preventive Investment	Awareness & Education Circular Initiatives	Ethical Dimension Inclusiveness in CAD
Inclusiveness for a Healthier Economy	Education & Awareness	Inclusion and Social Value in Circular Projects
Inclusiveness for Equality	Innovation & Creativity	Intersectoral Integration
Inclusiveness for Local Development	Shortage Knowledge	Measuring Success
Inclusiveness for Marginalised Communities	Theoretical Nature CAD	Policy Limitations & Challenges
Inclusiveness for more Awareness	**Improvements Theoretical Overview**	Political Considerations
Inclusiveness for more Circular Areas	Utilisation of Waste Material	Social Housing
Inclusiveness for more Diversity	Material Sourcing & Re-usability	
	Guiding Principles	
	Circular Design Choices & Construction	
	Advice	


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