

NARRATIVE FOR CIRCULAR ECONOMY IN CITIES: CONDITIONS FOR A MISSION-ORIENTED INNOVATIVE SYSTEM

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ABSTRACT

In response to the consequences of urbanisation, including the production of over 70% of global emissions and the increase in social inequalities, cities have set themselves ambitious missions to catalyse innovative solutions for the transition to a circular economy. This exploratory research examines the conditions for such missions to trigger the development of an innovative system to support cities in this transition. While several studies have been conducted on the narrative of the circular economy as a 'way of doing', this article adopts the position of the circular economy as a 'way of thinking'. To further explore the conceptual diversity of the circular economy, this article uses the method of rapid ethnography in the context of a Dutch region pursuing a circular mission. The results highlight that a mission alone is not enough to create an innovative and inclusive system as the underlying narrative lacks congruency, suggesting that the circular economy may not be the most compelling narrative for the sustainability mission of cities.

INTRODUCTION

The clock is ticking for cities to act and in fact, Amsterdam aims to be fully circular by 2050, Stockholm to be climate positive by 2040 and London to be a zero-carbon city by 2030, while the EU is striving to reach 100 climate neutral cities by 2030. Cities are under increasing pressure to address the challenges of urbanisation. They are estimated to be home to more than two-thirds of the world's population by 2050, currently produce half of the world's waste and are responsible for more than 70% of greenhouse gas emissions (Sánchez Levoso, Gasol, Martínez-Blanco, Durany, Lehmann & Gaya, 2020). Thus, what can be observed since the Paris Agreement to limit global warming, is that cities are responding by setting ambitious 'missions'.

This is what Mazzucato (2021) defines as the mission economy whereby missions serve as a catalyst for multi-scale innovations through a motivational sense of urgency. It is inspired by the 1969 Apollo mission to send a human to the Moon, which through many unexpected collaborations and a shift away from the status quo, resulted in innovations that have revolutionised our lives to this day (Mazzucato, 2021). This mission method is increasingly recognised by scholars to foster a societal change (Diercks, Larsen & Steward, 2019). Hekkert, Janssen, Wesseling and Negro (2020) framed this process as the development of a mission-oriented innovation system in which a wide range of institutions from university to entrepreneurs to communities, come together to innovate in pursuit of a common societal mission.

The path of innovation taken by a growing number of cities to fulfil their sustainable mission is the transition to a circular economy (CE). This is especially embodied in the EU where CE is at the core of the Urban Agenda (European Commission, 2020). However, as a recent concept, CE is still highly contested with over 100 definitions (Kirchherr, Reike & Hekkert, 2017).

The central principle is to establish a regenerative model for production and consumption patterns, moving away from the linearity of the 'take-make-dispose' by focusing instead on 'reduce-reuse-recycle' (Kirchherr et al., 2017).

However, the literature on the implementation of CE focuses mainly on the technical aspect and on how companies can change their business model. This narrow scale does not support a system change towards sustainability, but merely a technical adjustment that justifies continuous economic growth (Geissdoerfer, Savaget, Bocken & Hultink, 2017). Moreover, the legitimacy of the CE model is also questioned due to the lack of a social dimension (Fratini, Georg & Jørgensen, 2019). Nonetheless, there is a growing interest in the narrative for the meso scale of cities where CE is seen as a more holistic paradigm. In fact, this reflects the role of cities in shaping sustainable transformation, as they have the resources, knowledge and social capital that make them centres of innovation (Hodson & Marvin, 2010; Sánchez Levoso et al., 2020). It is therefore by adopting a holistic approach to social and environmental well-being that the CE mission of cities can foster a sustainable development paradigm (Jaeger-Erben, Jensen, Hofmann & Zwiers, 2021).

To twist the words of Nelson (2011): “If we can land a man on the moon, why can't we implement a circular economy in the cities?”. However, for the moon landing, the change was targeted solely on technological and scientific expertise. For CE in a city, it implies a new narrative of the socio-ecological organisation of the entire city system, not solely restricted to a few stakeholder groups (Sánchez Levoso et al., 2020). Hence, the concern is on how to navigate the lack of congruence between public and private institutions towards a common goal (Kattel & Mazzucato, 2018; Repo, Anttonen, Mykkänen & Lammi, 2018) or how to give directionality yet freedom for disruptive innovation policies (Diercks et al., 2019).

Although many cities are setting ambitious missions for the coming years and while the mission-driven innovation system has recently emerged as a promising framework for fostering the socio-ecological aspect of CE, there is still a lack of practical knowledge on the conditions for its materialisation. Thus, this article explores the following research question:

What are the conditions for developing mission-oriented innovation systems to support cities in their transformation towards a circular economy?

The aim of this research is to explore the prerequisites for the development of a mission-oriented innovation system to foster a circular transformation in cities. The objectives are to understand how the mission can convey the social-ecological narrative of the CE, and to explore the type of governance and key actors necessary to activate such complex innovative systems. A better understanding of this process will enable policy makers to unleash the power of their mission. In addition, it provides concrete suggestions for the holistic implementation of the CE narrative in cities that is currently lacking in the literature (Prendeville, Cherim & Bocken, 2018). Finally, it also opens a theoretical path to investigate alternative models of governance and collaboration, as well as different CE narratives.

This exploratory research follows a qualitative approach by observing the case of a Dutch city and its surrounding region in developing an innovative system for their CE mission. The structure of the article is as follows. The next chapter reviews the literature to capture the growing interest in urban circularity and the associated innovation policies and governance. This will be followed by a detailed description of the rapid ethnography methodology used in this paper to answer the research question. The results will then be presented and discussed in more detail, along with theoretical and practical implications. Finally, the article concludes with limitations and directions for future research.

LITERATURE REVIEW

Narrative for Urban Circular Transformation

Sustainable development: the circular economy narrative

Our current socio-ecological system is increasing social inequalities and overstepping planetary boundaries (Raworth, 2017). The catastrophic consequences of the COVID-19 crisis are also a reflection of the vulnerability and incompatibilities of this system. According to Leach, MacGregor, Scoones and Wilkinson (2021), the crisis has only accelerated the inevitable towards what many predicted would be the limits of linearity in production, behaviour, and consumption patterns. As a result, the concept of the circular economy (CE) has received increasing attention in the EU as “a promising narrative to step outside the status quo” (Leipold, 2021:1) but it is still subject to a lot of ambiguity.

It is often considered from the perspective of the Ellen MacArthur Foundation, the leading institution for CE, as a regenerative approach to waste and resource management, which also proves to be cost-effective in the long run. However, instead of being used to break away from the status quo, the narrow technical and cost savvy scope of CE becomes a validation for maintaining the economic growth paradigm (Costanza, 2008; Jaeger-Erben et al., 2021). In addition, many authors have criticised the lack of the social dimensions (Kirchherr et al., 2017; Merli, Preziosi & Acampora, 2018). Some argue that it is only through social transformation and intrinsic narrative that CE can become a sustainable pathway, i.e., the development of a circular society is the basis for creating multi-level cooperation towards circular practices (Jaeger-Erben et al., 2021).

Indeed, Friant, Vermeulen and Salomane (2020) concluded that by the current neglect of the social implications, CE comes close to a practice of greenwashing than a transformative path for sustainable development. In other words, the initial objective of the CE narrative was for it to become a systematic way of thinking, which would lead to adequate actions. Instead, the way of thinking remains unchanged and therefore, the current CE is a way of doing which does not reflect the sustainable development paradigm (Campbell-Johnston, Cate, Elfering-Petrovic & Gupta, 2019; Leipold, 2021). It is therefore necessary to develop strategies to support the holistic implementation of CE, which is particularly relevant at the urban level (Prendeville et al., 2018).

Circular economy narrative in cities

EU cities are increasingly turning to CE to lead the sustainable transition (Sodiq et al., 2019) as they have a central role in facilitating societal transformations and even more so with regards to promoting more circular production and consumption patterns (Fratini, Georg & Jørgense, 2019). However, the ‘way of doing’ framing issue persists as CE in cities is too often associated with merely a waste management practice (Prendeville et al., 2018). Waste management is only one part of what a city entails as a complex system of intertwined networks, infrastructures, cultures, and resources (Paiho et al., 2020). This means that nothing can be considered in isolation, all parts are integrated holistically whereby, if one element is omitted, the rest cannot function properly. For example, Ashford and Kallis (2014) found that by providing social benefits such as reduced working hours for the same pay, it leads to positive environmental behaviours, as people have more time and money to invest on sustainable alternatives. Therefore, municipalities must also consider the socio-ecological narrative of the transformation of CE to promote a holistic

implementation (Kębłowski, Lambert & Bassens, 2020), which also requires reframing policies and coordinating different stakeholders.

Mission-oriented innovation systems

Rethinking innovation: shooting for the moon

In the urban context, the holisticness of the CE narrative implies a fundamental system change (Whicher, Harris, Beverley & Swiatek, 2018). In turn, such a system change implies innovation in production, consumption and governance models (Gravagnuolo, Angrisano & Girard 2019). For sustainability, there is a new wave of innovation policies that is no longer pushed towards quantity for economic competitiveness, but rather aimed at quality for solving societal challenges (Bugge & Fevolden, 2019; Diercks et al., 2019).

Thus, reframing the implications of innovation becomes a challenge for policy makers, leading to a growing interest among scholars in deciphering innovation policy strategies (Grillitsch et al., 2019; Schot & Steinmueller, 2018). One of the most prominent approaches in the past five years is the re-emergence of the mission-oriented innovation policy (Diercks et al., 2019), also central in the recent book published by Mazzucato (2021). Mission-oriented innovation policy was initially used in the context of scientific programmes such as space exploration, but it is progressively seen from a holistic point of view through its ability to create a policy environment that allows for greater freedom in the type of innovations to solve ‘wicked’ problems. (Friant et al., 2020; Termeer, Dewulf, Breeman and Stiller, 2013). In short, it is a way of orienting innovation policies towards the societal mission, rather than the economic agenda.

Figure 1 illustrates this dynamic. For example, the Sustainable Development Goals are broken down into more manageable and specific tasks which are then translated from the top down

into sectoral investments to trigger several projects in the form of experiments. In addition, investments in experiments ought to include a wide range of disciplines (Mazzucato, 2021). Indeed, a wider body of knowledge is required for sustainable development, including expertise of the earth system, economics, as well behavioural and social science, to name but a few (Marra, Mazzocchitti & Sarra, 2018). Hence, the numerous top-down stimuli act as a motivation and catalyst for problem-based innovations from the bottom-up, which will then feed back into the mission for with concrete solutions. While this approach puts policymakers in the role of catalyst for change, Hekkert et al. (2020) argue that a systemic view is also needed to consider the interaction of a wide range of stakeholders in the CE transformation. The authors have therefore defined it as a mission-oriented innovation system framework to place greater emphasis on the complex coordination of stakeholders working collaboratively towards a mission. As a result, attention is being directed to the governance mechanisms for shaping and coordinating the mission-oriented innovation system.

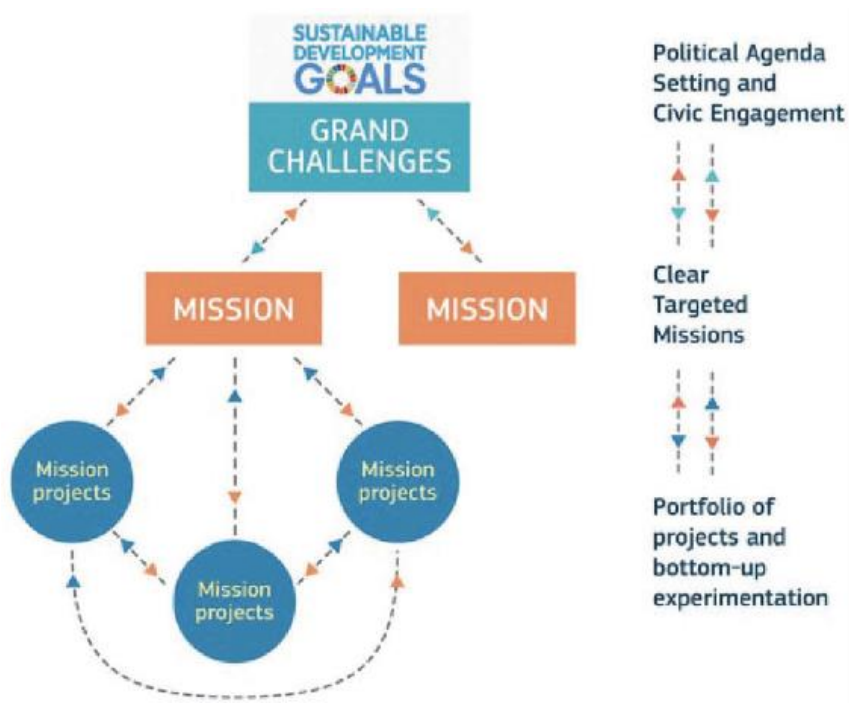


Figure 1. Mission-oriented innovation system (Mazzucato, 2018)

Rethinking governance: the dynamic interaction between bottom-up and top-down

The shift from linear economy to CE implies a review of the linearity of the governance systems themselves (Karpouzoglou, Dewulf & Clark, 2016; Termeer & Metze, 2019). Fratini et al. (2019) highlight that governance is about the collaboration between different stakeholders such as entrepreneurs, consumers but also scientific institutions to change production and consumption patterns. For CE in cities, especially in the EU, the bottom-up approach has been favoured to enhance knowledge co-creation and citizen innovations for contextual solutions (Frantzeskaki & Rok, 2018). For example, the EU Reflow project has enabled Milan to transform its traditional markets to promote local circular production, or Berlin to use its underground water pipes to redirect energy waste from industrial processes to heat local homes (Reflow, 2021). Nonetheless, the role of government is also being evaluated as a crucial coordinator and facilitator for the circular shift (Mazzucato, 2021). Indeed, within the mission-oriented innovation system, it is argued that only governments have the capacity and resources to steer the scale of the change required (Hajer et al., 2015). According to Ehnert et al. (2018), the fact that municipalities have the power to regulate the innovative agency of local stakeholders calls for more decentralised governance.

Prendeville et al (2018) point out that attempts to determine who has the most important role in transformation undermine the focus needed to develop inclusive solutions. Patterson et al. (2017) studied the different types of governance for sustainable transformation and concluded that top-down steering, together with bottom-up initiatives is a co-evolutionary process that requires equal engagement. Furthermore, with circularity as a holistic paradigm and the climate crisis as a common threat (Jaeger-Erben et al., 2021), governance models need to be able to adapt to system complexity.

Adaptive governance is growing in popularity as a horizontal governance model for managing the pursuit of a change in socio-ecological systems. It encourages the self-organisation of multidisciplinary and highly collaborative networks (Chaffin, Gosnell & Cosens, 2014; Karpouzoglou et al., 2016; Obersteg et al., 2019). In cities, the adoption of this adaptive governance has proven effective in addressing the uncertainty of environmental and social challenges through shared responsibility (Chaffin et al., 2014). The flexibility promoted by this approach encourages experimentation, rather than being stuck in institutional inertia. In addition, Folke, Hahn, Olsson and Norberg (2005) argue that with an adaptive governance system, networks of public and private institutions can develop common understandings and design localised policies.

Accordingly, the concept of CE in cities is emerging and still contains much narrative and operational ambiguity. Figure 2 provides a visual representation to summarise the proposal of this research on the interconnected elements that must be associated with a mission for it to become a catalyst for CE in cities. The conditions include CE as a system, a mission as a catalyst for change and adaptive governance as a multi-discipline collaboration. Indeed, it is crucial that when the CE's mission is stated, the underlying holistic narrative is also recognised so that everyone works towards a common goal. Furthermore, only by recognising the socio-ecological component of CE, as well as the need for co-creation between private and public actors, can inclusive results be achieved for the well-being of the city's inhabitants and the planet. Finally, the combination of a flexible governance model that encourages experimentation within city networks, and the mission as a motivational tool, allows for achieving disruptive innovations that challenge the status quo. Hence, the co-evolution of these factors can foster a mission-oriented innovation system for circular cities.

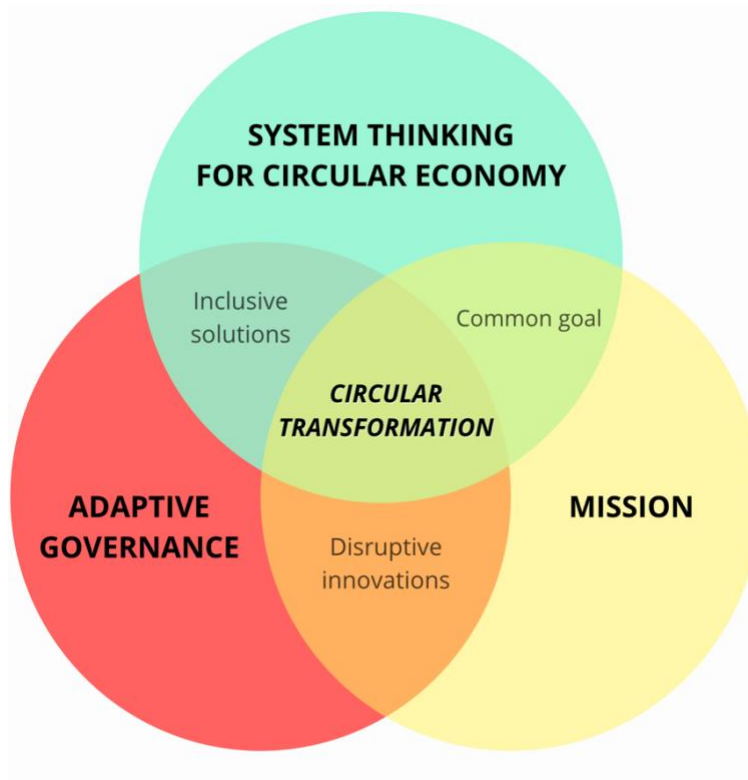


Figure 2. Conditions for Urban Circular Transformation (Author/Researcher, 2021)

METHODOLOGY

This chapter outlines the methodology utilised in this paper to understand the conditions necessary for a mission-oriented innovation system to foster circular transformation in cities.

The scope of research is highly contextual and complex, implying a need to select a suitable methodological route. Thus, this research followed a rapid ethnography defined as a form of ethnographic method that mainly aims at collecting data from different sources directly related to the research aims (Ranabahu, 2017). Ethnographic studies were first used in anthropology to study culture behaviours but are now used in a wide range of disciplines to capture the complexity of the

social world through qualitative data. As CE in this paper is connoted with societal transformation, having a more immersive approach to the phenomenon is crucial to draw appropriate conclusions.

Nevertheless, rapid ethnography follows the same phases as its long-term counterpart: preparation, socialisation, and data collection. The following sections detail each of the phases. Starting by going back to the development of the subject and research strategy (preparation), the initial interactions and familiarisation with the context (socialisation), the formal data collection and data analysis method.

Preparation

The preparation phase is the time spent determining the direction and format of the research. The watchword during the preparation phase was to keep an open mind. The pivotal point in my research development was the help of my practice supervisor, Alexander Grit (Hanze University of Applied Sciences in Groningen) who shared his extensive knowledge with me. Additionally, he gave me access to his valuable network and as the focus was yet to be determined, I had the opportunity to talk with two people that shifted my perspective on CE. I spoke to a member of the Municipality of Amsterdam about the transition to the Doughnut Economy, as well as to the founder of a sustainability consultancy. Their inputs, together with brainstorming sessions with Alexander and reviewing the literature, led me to refine the topic and to select the most appropriate case.

The case of Groningen

The context studied for this study is the city of Groningen in the northern Netherlands as they are undertaking a circular transition. Groningen is a fast-growing, dynamic, and innovative

city, with strong influence on its surrounding regions. Moreover, the municipality is undertaking many projects and developing partnerships to enable the achievement of their ‘circular by 2050’ mission. Hence, it represented a great opportunity to study the context of the city of Groningen, and its surroundings, in their various circular transformation projects.

Sampling strategy

To select participants, I used Alexander's network to contact different people. Although this method resembles snowball sampling, I had my own selection criteria which are those of purposive heterogeneous sampling to avoid bias (Saunders et al., 2019). Thus, to get insights in the innovative system in Groningen, criteria included people from different disciplines working with disruptive innovation methods and sustainability-driven projects in the region. The final sample consisted of seven participants (see Table 1).

Pseudonym	Position	Current related tasks
Frank	Account manager in Economic Affairs Department at the municipality of Groningen	Working on stimulating innovations and on connecting universities, start-ups and organisations in Groningen and northern regions
Amber	Policy advisor for the circular economy at the municipality of Groningen	Coordinating different projects and develop an ambition plan for the city following recommendations from OECD
Eric	Coordinator at the Health Hub Roden	Working with the Critical Friend method and experimenting for solutions in the transition needed in healthcare
Angela	Student in industrial product design in Hanze University of Applied Sciences	Intern at Health Hub Roden, working and experimenting with the Critical Friend method
Henry	Mentor for inclusive and sustainable enterprise at Structura-Groep	Working with the Critical Friend method for inclusive solutions and promoting personal development for serendipity
Lena	Strategic advisor at the municipality of Groningen	Working on several programmes, including innovation on citizen participation
Christina	Project leader in circular waste management programme at municipality of Groningen	Working on a circular hub for waste management and many projects including community involvement

Table 1. Study participants

Critical Friend method

Most of the participants are currently working with the Critical Friend method, a constructive feedback method currently being experimented by the Hanze University and Alfa-college in Groningen. The aim of this method is to appoint a critical friend to a learner who will give their expertise and time to ask challenging questions aimed at bringing clarity and new insights. The term "friend" is essential as this must be a trusted person, willing to listen and offer constructive criticism as an advocate for the learner's success. First introduced in education, the critical friend method is now being studied in entrepreneurial settings. In fact, this new learning method enables self-reflection and new ways of framing a (wicked) problem which open the paths for unexpected discoveries and innovations (Costa & Kallick, 1993).

Socialisation

The socialisation phase is the most crucial in ethnography research, to build trust with the participants and familiarise with the real-life settings. This phase was most challenging considering the restrictions imposed by the COVID-19. However, in rapid ethnography the use of the 'non-traditional' socialisation strategy through digital platforms are also increasingly recognised as an effective way to bridge geographical gaps (Baines & Cunningham, 2013), or in that case, a virus gap. Therefore, most of the socialisation happened through friendly emails to establish the first connection prior to the more formalised data collection. In addition, Alexander took me on a tour of the various circular initiatives in and around Groningen, which was an excellent opportunity to 'socialise' with the context.

Our first stop (Figure 3) was at The Suikerterrein, a former sugar factory ground made available by the municipality for entrepreneurs to experiment freely with sustainable projects, among which De Loskade, a ‘pop-up’ circular and self-sufficient neighbourhood.

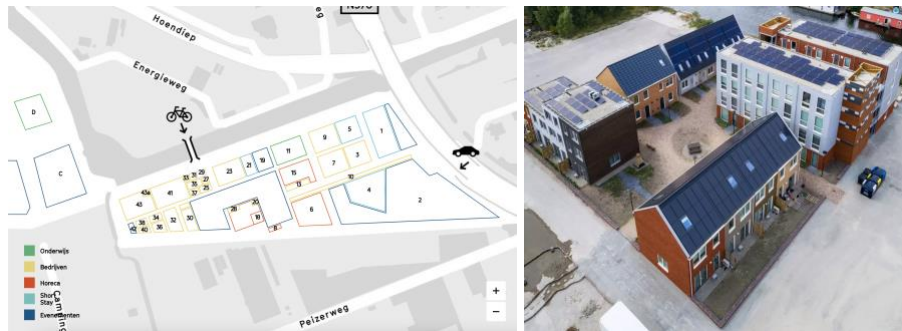


Figure 3. The Suikerterrein (left) and De Loskade (right)

The second stop (Figure 4) was at the Tiny Houses Westpark, a location designated by the municipality to encourage citizen’s initiative to create a self-sufficient neighbourhood through the construction of tiny houses.



Figure 4. Tiny Houses Westpark: tiny houses (left & middle) and community garden (right)

Our third stop was on the Campus Groningen, looking around the Energy Transition Centre as well as the Start-up City which brings together the University of Groningen, the Hanze University of Applied Sciences, the region, and several companies for innovation.

The final stop (Figure 5) of the day was to the Health Hub Roden, an innovative hub working for the healthcare transition where I had an initial conversation with Angela and Eric. The hub is supported by the Hanze University of Applied Sciences and the province, and they are experimenting on multidisciplinary methods, including the Critical Friend method.



Figure 5. Health Hub Roden

Data collection

To collect data for this research, I conducted a total of seven semi-structured interviews as they offer the subtle balance between the need of framing the complexity of the topic, whilst allowing for the flexibility of an iterative reasoning (Bryman & Bell, 2013). The two participants from the Health Hub Roden were interviewed simultaneously to generate more discussion. As all respondents were part of two organisational backgrounds (i.e., municipality and university/entrepreneurship), I developed two interview guides to capture the distinctions (Appendix A). All interviews were conducted on online meeting platforms, were recorded and transcribed. Regarding ethics of the research, each interview participant signed a consent form that was then reiterated verbally at the beginning of the interviews. Furthermore, to ensure anonymity, pseudonyms are used.

As all the interactions I had during this process were highly valuable, I also included notes taken during informal conversations and field observations that took place in the preparation and socialisation phase. Moreover, following each of the interviews, participants shared additional documents to illustrate their answers which were also included in the data analysis, such as the circular roadmap for Groningen, as well as the OECD report for the city. This also enabled me to triangulate the data and increase the validity of the findings (Lincoln and Guba, 1985).

Data analysis

The thematic analysis was used to analyse the data (Braun & Clarke, 2006). Whilst a narrative analysis was considered to expose the different perspectives, the data collected presented some core similarities and thus, the thematic analysis allowed for more tangible understanding (Braun & Clarke, 2006). The coding was done in the qualitative analysis software ATLAS.ti, following the Gioia method for a rigorous data structure (see Figure 6) (Gioia, Corley & Hamilton, 2013). Starting with the 'first-order categories', I rapidly found connections which allowed me to group a disorganised plethora of over 80 codes into more concrete categories. This was followed by more specific 'second order themes' by having more concrete understanding of the narrative and the underlying meanings. Finally, 'aggregate dimensions' organically emerged from bringing a more theoretical mindset. The results are presented in the following chapter.

RESULTS

This chapter presents the results of this study on uncovering the conditions for a mission-oriented system to enable a circular transformation in cities. Appendix B shows an attempt to

generate a code tree and illustrates the complexity of organising the results, as each code is interconnected. Nevertheless, after a more detailed analysis and identification of different concepts and themes, two interrelated dimensions emerged for the mission-oriented innovation system (Figure 6). It is interesting to note that the first dimension focuses on what the term 'mission-oriented' represents, especially regarding the CE's narrative in the city. This is then linked to the second dimension of the “innovative system”, which is more about how innovation is perceived.

Different narratives

The mission integration

The first observation is that Groningen is working towards a mission, but that this mission is not yet integrated into the whole municipality. The mission set by the municipality of Groningen is to follow the national ambition to become fully circular by 2050. To develop an action plan in achieving this mission, the municipality turned to (and invested into) the OECD that had a circular city project. The thorough and tailored report from the OECD included 20 recommendations for Groningen (Appendix C). The municipality translated the recommendations and set itself more sector-specific missions notably in the waste sector, with a target of being waste-free by 2030. In fact, the roadmap developed by the municipality does not appear to integrate many social aspects present in the OECD report, which was confirmed by Amber that stated that it is something they will incorporate in the future. As for the economic development of the city, the circular economy is hardly mentioned in the report even though investment criteria have changed and are not “only the price, quality, but also the sustainability and the local offers” (Frank).

The lack of full integration of the circular mission was particularly visible at COVID-19 where the ambition of the CE was relegated to the background in favour of short-term economic

interventions to save local businesses. Amber acknowledged that it was a mistake, and they are currently back on track. Nevertheless, building a common ambition for the mission across all departments of the municipality is proving to be a real challenge. Indeed, the interpretation of the narrative behind the mission differs because of the intergenerational clash, different political views, and economic paradigms. Due to the several internal dissonances, the majority of respondents believe that the transformation will be more incremental than disruptive.

System thinking: the ownership of the problem

Christina argued that the lack of integration of such a disruptive mission is not an issue limited to the municipality as “it is not that the department is not good, it is also about people” (Lena). In fact, this is linked to the idea of system-thinking and that when it comes to circularity, the narrative involves everyone simply because “it is a problem for us all” (Henry). Thus, as the problem is common, the solution must be inclusive through common effort.

However, many interviewees pointed out that too often the responsibility is passed on to others, especially top institutions, to find and implement the suitable solutions. Thus, citizens do not feel part of the change because of the political barrier that “the municipality is more like you have to do this and that, and we are watching you” (Christina). In fact, the top-down approach was very often criticised during the interviews and was instead arguing that the narrative needs to be integrated by the citizens to trigger a deep-rooted change through a bottom-up approach as the dynamic is that “when their (the citizens’) demands or their questions become different, you (municipality) also have to change” (Christina). The aim should be to “bring the ownership of the problem also by the citizens, then you get sustainable solution, only then” (Eric). Indeed, by doing so, citizens feel part of the story and thus, part of the solution and allows for the change to come

within oneself, rather than forced through policy tools. Nevertheless, there is the ongoing challenge that “everybody wants change, but nobody wants to be changed” (Eric). Thus, the idea is to develop an intrinsic motivation and willingness among all individuals to create a bottom-up dynamic towards the mission.

Challenging the status quo

As the current narrative of economic growth is rooted, it is difficult to visualise what circularity entails. The interviews showed that to trigger intrinsic motivation, different strategies are put in place to materialise this abstract concept and demonstrate that another way is possible.

Indeed, the municipality of Groningen is experimenting on ways to integrate citizen’s participation in the mission for CE. The strategies seem to be more concerned with communication and bringing awareness as “there’s a big role also for the city to make sure that people are all on the same knowledge level” (Amber) when it comes to the circular transformation. For instance, Christina is coordinating the project of the Circular Waste Hub, a waste plant 2.0, where people come to bring their waste and a second-hand shop will evaluate if it can be reused, a ‘repair café’ is made available if repair is possible and the last resort is the recycling. Therefore, this hub is tackling a deep-rooted use of linearity by educating and bringing awareness of valuing waste in a different way and presenting CE in a more integrated way. For Christina, this is a way to normalise circular practices. However, the analysis showed that there is no one-strategy-fits-all and that reaching people depends on the generations which shape the way they perceive the world. When it comes to children, it is easier to shape their perceptions through workshops and educational activities, but for older generations, creating community groups on Facebook seem more effective.

This study also revealed that other disciplines are also adapting to the new sustainable paradigm, especially from the social perspective. In fact, Henry developed a framework to focus on human development, as opposed to just economic business development, for empowerment and inclusive outcomes. Furthermore, for CE, the aim is to educate people about their direct relationship with the earth system and thus create an intrinsic understanding of the need to regenerate resources. Hence, it is only by challenging this status quo that we can move forward and innovate for alternative solutions.

Serendipity and innovation

Despite their different backgrounds, there are many similarities in each participant's discourse on innovation. The analyses revealed that the path to disruptive mission-oriented innovation is twofold: first, to create a bubble of trust and shared value around a common mission, and second, to introduce multidisciplinary inputs into this bubble for inclusivity and serendipity. In addition, the use of the critical friend method provides a more thorough picture of how innovation occurs and stories are shared.

Entering the bubble

Regarding innovation, the interviews yielded that the creation of an enabling environment is essential. This comes back to the idea of shared value and setting a common vision, where people only work together if “we have the same way of thinking about the world, about our picture, of our vision of the people and human” (Henry). Angela and Eric translated this idea into the metaphor of climbing a mountain (Appendix D). The idea is that when working in a team, it is important that there is a consensus on the mountain top to reach. As each mountain is unique, so

are the methods and paths for climbing it. Therefore, if all efforts are focused on that specific mountain (i.e., the mission), innovative solutions are more likely to emerge.

Once the top of the mountain is in sight, it is a matter of experimenting with the best climbing tools, venturing down different trails, and learning from the people you meet along the way. Indeed, it is about creating an environment that celebrates trial and error and in the Health Hub Roden “every Friday, we tell our ‘mistake of the week’” (Angela). Especially when dealing with a complex problem, Eric stressed that failures are necessary to find solutions.

The municipality is also experimenting with ways to initiate innovation and collaboration at different levels through various forms of leadership and governance. They are doing so by providing the different actors with the necessary resources to create these conducive environments. This was observed during the visit to the Tiny House Westpark where the municipality gave freedom to citizens in their common initiatives to create circular communities. The same approach is used in SuikerTerrein with the former factory ground for sustainable entrepreneurial initiatives. Another example in waste innovation, the municipality is working closely with schools by giving access to different raw materials for the students to experiment on ways to reuse/recycle. However, in innovating for CE, the analysis showed that it is also pivotal to incorporate a system-view inside the bubble to gather different expertise to develop inclusive solutions for everyone to be able to climb the mountain.

Extending the bubble

The need for multidisciplinary input was widely suggested by the participants, to enhance mutual learning. The critical friend method acknowledges the need of an outside view where “it takes other people with other views and different questions to get out of your own bubble. And

make connections that you didn't make by yourself" (Lena). Furthermore, the involvement of 'friends' from different disciplines is crucial for inclusivity because "if you keep it exclusive, keep it to yourself, the chance of serendipity will be always small" (Henry). In fact, the word 'serendipity' emerged several times as the goal of the process, as a synonym for innovation because if you "put the condition in place [...] then it brings the solution by themselves" (Eric). Thus, the role of the critical friend is to facilitate serendipity by asking questions that can also turn into a focus on the mission.

In fact, the municipality also appears as a facilitator in working with this holistic approach of not only creating enabling environments, but Frank highlighted their role as a contact person, an intermediary between different institutions. The institutions that were the most mentioned were entrepreneurs, businesses, universities, hubs, and community organisations. This was also reflected in the various sites visited during this study, such as the Campus of Groningen and Health Hub Roden, which are used to connect entrepreneurs and universities in the same space. In addition, the municipality invests in organising meeting events and runs several projects to promote multidisciplinary exchanges. This also extends to the surrounding regions in the north of the Netherlands, as Groningen wishes to use its influence and resources to help other cities in their transformation.

An important element that was mentioned several times by the participants is the lesson taken from the COVID-19 and the increase of digital interactions. While digital alternatives were repeatedly mentioned as projects the municipality is working on to establish contacts, there seems to be a consensus that people want more face-to-face interactions. And that they are essential for serendipity and trust. Angela talked about the importance of body language and Lena on the small talks over coffee that are underrated places for creative ideas. This was also experienced during

this study through an informal discussion about the next holiday in the mountains which led to the metaphor mentioned above.

Therefore, the lack of integration of the mission revealed an underlying lack of intrinsic motivation, as the linear paradigm is still strongly embedded. Nonetheless, many actors, from policymakers to entrepreneurs, are focusing on a bottom-up approach. In fact, all the respondents of this study were equally passionate about making a positive societal change, regardless of their profession, which showed the importance of an individual's own world narrative in achieving a mission. As for innovation, experimenting was a central element in all the interviews, with the aim of enhancing serendipitous discoveries. This also included the need for a multidisciplinary method to develop inclusive solutions. The unexpected result is the many possibilities that the critical friend method can provide for innovation, but also to guide institutions in navigating different narratives. The following chapter will discuss these findings and implications in more detail.

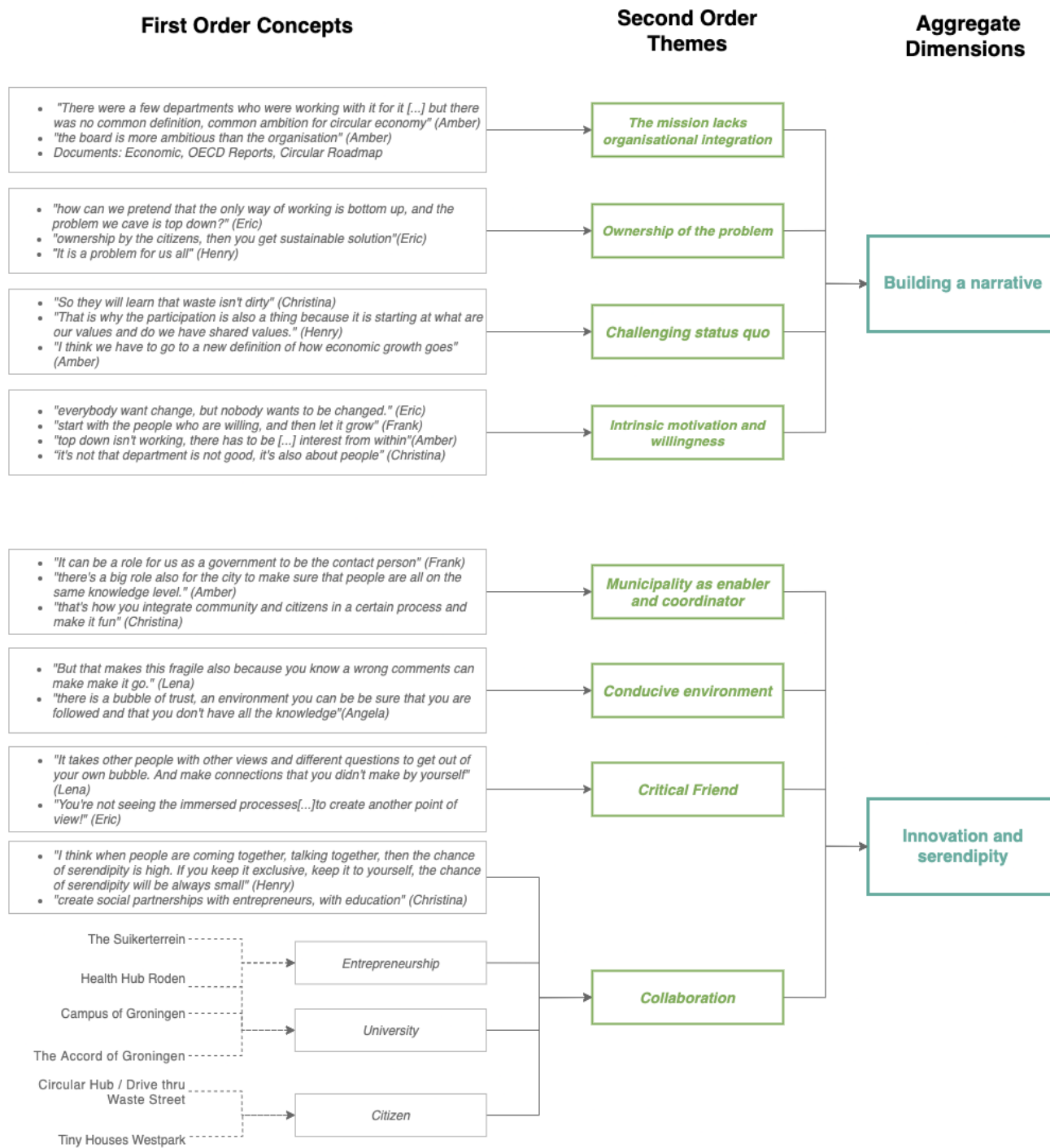


Figure 6. Conditions for a mission-oriented innovative system

DISCUSSION

This paper investigated the question: ‘*What are the conditions for developing mission-oriented innovation systems to support cities in their transformation towards a circular economy?*’. The aim was to identify the prerequisites for the mission set by the city to become the trigger of an innovative system for CE.

Figure 7 is a revised framework following the results of this study where the narrative emerges as a central component. This final chapter interprets the different elements of this framework and provides recommendations for practitioners. It concludes by outlining the limitations of the research and suggesting avenues for further research.

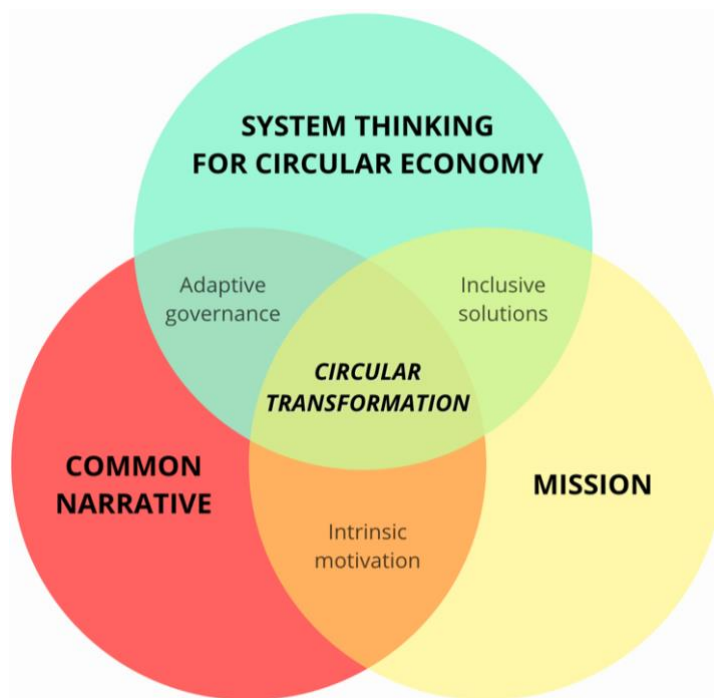


Figure 7. Conditions for Urban Circular Transformation: revised framework

(Author/Researcher, 2021)

Intrinsic motivation

The initial objective was to understand how the mission could convey the socio-ecological narrative of the CE (Hekkert et al., 2020). What has been uncovered is that the adoption of the mission does not convey the narrative, it is in fact the narrative underlying the mission that conveys its adoption. Indeed, the results demonstrate that the CE transformation depends strongly on the intrinsic motivations of each stakeholder in the city. However, not only is CE a contested concept in the literature, but in practice, its implementation is equally inconsistent (Korhonen, Nuur, Feldmann & Birkie, 2018). As it is the case in Groningen, the CE mission fails to be integrated, even within the institution from which it emanates. The factor preventing the integration of the mission within an institution is not the institution itself, but the conflict between people's different perspectives on what CE implies. Such a divergence is likely to lead to a lack of understanding of the mission and thus, an apprehension of change that endorses institutional inertia (Simoens & Leipold, 2021).

Jaeger-Erben et al. (2021) stated that for CE to truly create a shift and embed sustainable values, the roots of its socio-ecological narrative must be revived. Indeed, the CE is caught in the dissonance between the subtle, yet fundamental, differences between the implications of the socio-economic system and those of the socio-ecological system. In the former, the idea is that the economy, or more precisely technological solutions, will solve environmental challenges, which is the predominant narrative today (Costanza, 2008; Raworth, 2017). The latter praises systemic solutions with humans as an integral part of the earth system (Berkes & Folke, 1998, Jaeger-Erben et al., 2021).

This is interpreted by the results as a lack of ownership of the problem by citizens, as in a socio-economic system, it is difficult to create a sense of shared responsibility as individualist

behaviours are encouraged (Leipold, Welder & Hohl, 2021). In fact, one of the barriers to taking problem ownership among citizens is due to misconceptions about the role of different institutions in creating solutions (Lachapelle & McCool, 2007). There is the engrained story that the government is the entity in charge of fixing the world's problem (Mazzucato, 2021; Repo, Anttonen, Mykkänen & Lammi, 2018).

It is for this reason that citizen participation and empowerment is a growing concern for circular cities (Khair, Lee & Mokhtar, 2020). The aim is to trigger the willingness of citizens themselves as part of the problem and thus, the solution. This applies to everyone, whether they are policy makers, entrepreneurs, students, or consumers. This can be equated to a bottom-up dynamic. However, it appears that the debate between a bottom-up or top-down approach is not actually relevant in the case of setting a mission for CE. It is about coming back to the narrative of the CE as an engagement coming from within because only by involving everyone can the needed societal change be achieved (Lauer, Metcalf, Metcalf & Mohr, 2018). Hence, the narrative suggested by the results of this paper is the socio-ecological fact that the current challenges spare no discipline and put us all in the same boat (Grillitsch et al., 2019).

The first practical recommendation is to create a narrative around the mission to trigger intrinsic motivation and transfer ownership of the issue to citizens (Leipold et al., 2021). This includes investing in communication campaigns and events, increasing initiatives and projects for enabling citizens participation and leadership. It is also about informing about the uncertainties of the new paradigm and the implications of linear consumption patterns (Lauer et al., 2018). Policy tools such as regulations and subsidies are still a powerful stimulus but as they rest on extrinsic motivation it can only lead to incremental change. Additionally, this calls for a strategy to coordinate a common narrative in the city. The critical friend method has proved particularly useful

in building an environment for change. For example, to maintain a coherent narrative, it is advisable to select and train a critical friend in the common problem narrative so they can ask the right questions within the different institutions. That way, the critical friend becomes a trustworthy ally in staying accountable to the mission.

Hence, the existence of a shared holistic narrative allows for the creation of multi-level and multidisciplinary networks of like-minded people and the emergence of adaptive governance

Adaptive governance

The initial assumption was that adaptive governance is needed to establish a mission-oriented innovation system. It is in fact an important component, however, what this study revealed is that this type of governance is more a product of the shared narrative between stakeholders and systemic thinking about the CE.

Indeed, adaptive governance is a range of networks working together towards a “desired state for social-ecological systems” (Chaffin et al., 2014 :56), where the willingness to engage is essential. The goal of these interactions is to materialise the CE narrative by experimenting on compatible consumption behaviours or production patterns. Thus, this leads to what Hekkert et al. (2020) defined as the creation of an innovative system towards a societal mission where the mission governs and guides actions whilst leaving a lot of freedom for the unexpected (McBirnle, 2008). Indeed, this research found that the goal is not about achieving innovation per se, but rather about stimulating multidisciplinary serendipitous discoveries.

Although this governance model puts everyone on the same level to bring about the systematic CE change in the city, the role of the municipality as a facilitator in this process is undeniable (Gorissen, Spira, Meynaerts, Valkering & Frantzeskaki, 2018). They have the

resources and capacity to stimulate and coordinate networks (Mazzucato, 2021). Hence, the second recommendation to enable adaptive governance is to invest in shared spaces such as innovation hubs. Indeed, this allows for different disciplines and institutions to experiment and learn from each other. In addition, this recommendation builds on the lessons learned from COVID-19 about the importance of face-to-face interactions to create an environment of trust and sharing. Therefore, with regards to enabling serendipity, physical hubs should be favoured over digital platforms (this includes investing in a good coffee machine to unleash the power of coffee talks). Through the multidisciplinary interactions of sharing a similar ambition for a systematic CE, the mission can become a catalyst for inclusive solutions.

Inclusive solution

The final conclusion is on the consequences of a lack of social consideration when developing a mission-oriented innovation system for CE. The findings revealed that when only the technical element, i.e. the socio-economic perspective, is suggested in relation to the CE, the CE's mission is in turn only integrated at a very specific scale. Returning to the case of the municipality of Groningen, the CE mission is enticed as an additional department, rather than as an integral part of the institution. Thus, the quest for circular solutions includes only a handful of sectors and expertise such as waste, energy, or building. On the one hand, this confirms that the mission does work as a trigger for sectoral innovation as it was the case for the Apollo Mission. On the other hand, it does not provide evidence that the mission can foster the inclusive innovations implied by the system-thinking behind CE (Mazzucato, 2021).

This observation highlights that CE may well be a misleading concept for cities, which also explain why it is contested and almost impossible to define (Friant et al., 2020; Korhonen et al.,

2018). Moreover, this study is yet another demonstration that the social element is too often left out in CE implementation (Leipold et al., 2021). However, the social element is essential in for sustainable city to enhance the quality of life for its inhabitants and address growing issues of social justice (Jaeger-Erben et al., 2021). Unless its socio-ecological aspect is consciously integrated, it appears that the CE is not the most suitable model to foster the shared-problem narrative nor for triggering inclusivity in mission-oriented innovation system in cities.

Therefore, the last recommendation of this study for cities in their sustainability journey is to instead of the narrative of CE, to focus the mission on the Doughnut Economy introduced by Kate Raworth (2017). The Doughnut Economy is a framework of sustainable development focusing on the balance of operating between the planetary boundaries (i.e., what the earth system can regenerate) and social foundations (i.e., health, food, house). Moreover, the broad concept was downscaled at a city level which is currently being experimented in Amsterdam, Philadelphia, and Portland. The idea behind the concept is resting on “How can our city be a home to thriving people, in a thriving place, whilst respecting the wellbeing of all people, and the health of the whole planet?” (Fanning, Krestyaninova, Raworth, Dwyer, Miller & Eriksson, 2020 :7). It integrates the social element into the circular narrative, as the CE is also a core element of the Doughnut Economy framework regarding production and consumption (Raworth, 2017).

This brings us full circle, as this could also facilitate a system-view narrative and clarify what the mission entails for different stakeholders. As a result, it would trigger more inclusive solutions and the development of a mission-driven innovation system where multidisciplinary networks can thrive.

In conclusion, a coherent and consistent narrative for CE within the city is the missing component to trigger the development of a mission-oriented innovation system. Whatever efforts

governments make to develop missions or invest in innovation for CE, if the underlying story is not shared by stakeholders, it is doomed to failure. Therefore, a bottom-up approach is the only way to create the 'from within' narrative, i.e., intrinsic motivation, to overcome resistance to change and bring about disruptive innovation. Moreover, when aiming for socio-ecological transition, this may also imply the need to move away from CE as the core of the mission. Instead, cities need to focus on an alternative concept that promotes inclusive innovations and adaptive governance based on the fact that we are all working on a common problem.

Limitations and further research

This research presents a few limitations that should be considered as well as opportunities for further research. Firstly, the timeframe of the study was relatively short and as the circular mission is rather recent in the municipality of Groningen, the outcomes of the different projects and challenges faced could not be included. The time frame also limited the number of respondents which impedes on the generalisability of the conclusions. Secondly, the COVID-19 impinged on the socialisation phase of the study and having online meetings is also likely to have limited opportunities for serendipity. Nevertheless, it creates the prospect for a longitudinal ethnographic study to gather more observations on how the mission-oriented innovation system develops over time. This could also include the consequences of COVID-19 as a case to study the resilience of the systems.

This exploratory paper is part of the recent momentum to re-establish the CE narrative 'from within', which opens the way to further research. First, there remain many grey areas around the implementation of a mission-oriented innovative system for circular cities. Hence the need for

transdisciplinary research encompassing expertise from leadership to behavioural to environmental sciences, to highlight strategies for developing a common narrative for CE. This includes investigating the narrative of the Doughnut Economy in comparison to CE. Second, the critical friend method has proved particularly valuable in this research and further research could explore its ability to encourage and coordinate storytelling across different institutions. For example, conducting action research on the impact of this method could be particularly instructive in improving its potential. Finally, the case of Groningen is often absent from the literature on circular cities in the Netherlands, which tends to centre on Amsterdam or Rotterdam. Yet, with its citizen-orientation, its many ongoing projects, its regional influence and its many enthusiastic members, the city can offer great added value to the understanding of the CE.

REFERENCES

- Ashford, B. N. a, & Kallis, G. 2013. A Four-day Workweek: A Policy for Improving Employment and Environmental Conditions in Europe. *The European Financial Review*, 53–58.
- Baines, D. & Cunningham, I. (2013), “Using comparative perspective rapid ethnography in international case studies: Strengths and challenges”, *Qualitative Social Work*, Vol. 12, No. 1, 73-88.
- Berkes, F., and C. Folke. 1992. A systems perspective on the interrelations between natural, human-made and cultural capital. *Ecological Economics* 5:1-8.
- Braun, E. & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101
- Bryman, A. & Bell. 2015. *Business research methods* (4th ed.). New York, NY: Oxford University Press
- Bugge, M. M., & Fevolden, A. M. 2019. Mission-oriented innovation in urban governance: Setting and solving problems in waste valorisation. *From Waste to Value: Valorisation Pathways for Organic Waste Streams in Circular Bioeconomies*, 91–106.
- Campbell-Johnston, K., Cate, J. ten, Elfering-Petrovic, M., & Gupta, J. 2019. City level circular transitions: Barriers and limits in Amsterdam, Utrecht and The Hague. *Journal of Cleaner Production*, 235: 1232–1239.
- Chaffin, B. C., Gosnell, H., & Cosens, B. A. 2014. A decade of adaptive governance scholarship. *Ecology and Society*, 19(3): 1–13.
- Costa, A. L., & Kallick, B. 1993. Through the lens of a critical friend. *Educational Leadership*, Vol. 51(Issue 2): 49–51.
- Costanza, R. 2008. Stewardship for a “full” world. *Current History*, 107(705): 30–35.
- Diercks, G., Larsen, H., & Steward, F. 2019. Transformative innovation policy: Addressing variety in an emerging policy paradigm. *Research Policy*, 48(4): 880–894.
- Ehnert, F., Kern, F., Borgström, S., Gorissen, L., Maschmeyer, S., & Egermann, M. 2018. Urban sustainability transitions in a context of multi-level governance: A comparison of four European states. *Environmental Innovation and Societal Transitions*, 26(June 2017): 101–116.
- European Commission (2021) *Urban Agenda for the EU*. Accessed online <https://ec.europa.eu/futurium/en/urban-agenda.html>. Viewed June 3, 2021.

Fanning, A., Krestyaninova, O., Raworth, K., Dwyer, J., Miller, N. & Eriksson, F. 2020. *Creating City Portraits: A methodological guide from The Thriving Cities Initiative*. Accessed online <https://www.circle-economy.com/resources/creating-city-portraits> Viewed May 30, 2021.

Folke, C., Hahn, T., Olsson, P., & Norberg, J. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources*, 30: 441–473.

Frantzeskaki, N., & Rok, A. 2018. Co-producing urban sustainability transitions knowledge with community, policy and science. *Environmental Innovation and Societal Transitions*, 29(June 2017): 47–51.

Fratini, C. F., Georg, S., & Jørgensen, M. S. 2019. Exploring circular economy imaginaries in European cities: A research agenda for the governance of urban sustainability transitions. *Journal of Cleaner Production*, 228: 974–989.

Friant, M.C., 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(April): 104917.

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. 2017. The Circular Economy – A new sustainability paradigm? *Journal of Cleaner Production*, 143: 757–768.

Gioia, D., Corley, K., and Hamilton, A. 2013. Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational Research Methods* 16(1), 15-31.

Gorissen, L., Spira, F., Meynaerts, E., Valkering, P., & Frantzeskaki, N. 2018. Moving towards systemic change? Investigating acceleration dynamics of urban sustainability transitions in the Belgian City of Genk. *Journal of Cleaner Production*, 173: 171–185.

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 (Switzerland)*, 11(13).

Grillitsch, M., Hansen, T., Coenen, L., Mörner, J., & Moodysson, J. 2019. Innovation policy for system-wide transformation: The case of strategic innovation programmes (SIPs) in Sweden. *Research Policy*, 48(4): 1048–1061.

Hajer, M., Nilsson, M., Raworth, K., Berkhout, F., Bakker, P., de Boer, Y., Rockstrom, J., Ludwig, K., Kok, M., 2015. Beyond cockpit-ism: four insights to enhance the transformative potential of the sustainable development goals. *Sustainability* (2), 1651–1660.

Hekkert, M. P., Janssen, M. J., Wesseling, J. H., & Negro, S. O. 2020. Mission-oriented innovation systems. *Environmental Innovation and Societal Transitions*, 34(April 2019): 76–79.

Hodson, M., & Marvin, S. 2010. Can cities shape socio-technical transitions and how would we know if they were? *Research Policy*, 39(4): 477–485.

Jaeger-Erben, M., Jensen, C., Hofmann, F., & Zwiers, J. 2021. There is no sustainable circular economy without a circular society. *Resources, Conservation and Recycling*, 168(February): 105476.

Karpouzoglou, T., Dewulf, A., & Clark, J. 2016. Advancing adaptive governance of social-ecological systems through theoretical multiplicity. *Environmental Science and Policy*, 57: 1–9.

Kattel, R., & Mazzucato, M. 2018. Mission-oriented innovation policy and dynamic capabilities in the public sector. *Industrial and Corporate Change*, 27(5): 787–801.

Kębłowski, W., Lambert, D., & Bassens, D. 2020. Circular economy and the city: an urban political economy agenda. *Culture and Organization*, 26(2): 142–158.

Khair, N. K. M., Lee, K. E., & Mokhtar, M. 2020. Sustainable city and community empowerment through the implementation of community-based monitoring: A conceptual approach. *Sustainability (Switzerland)*, 12(22): 1–16.

Kirchherr, J., Reike, D., & Hekkert, M. 2017. Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127(April): 221–232.

Korhonen, J., Nuur, C., Feldmann, A., & Birkie, S. E. 2018. Circular economy as an essentially contested concept. *Journal of Cleaner Production*, 175: 544–552.

Lachapelle, P. R., & McCool, S. F. 2005. Exploring the concept of “Ownership” in natural resource planning. *Society and Natural Resources*, 18(3): 279–285.

Lauer, F. I., Metcalf, A. L., Metcalf, E. C., & Mohr, J. J. 2018. Public Engagement in Social-Ecological Systems Management: An Application of Social Justice Theory. *Society and Natural Resources*, 31(1): 4–20.

Leach, M., MacGregor, H., Scoones, I., & Wilkinson, A. 2021. Post-pandemic transformations: How and why COVID-19 requires us to rethink development. *World Development*, 138: 105233.

Leipold, S. 2021. Transforming ecological modernization ‘from within’ or perpetuating it? The circular economy as EU environmental policy narrative. *Environmental Politics*, 00(00): 1–23.

Leipold, S., Weldner, K., & Hohl, M. 2021. Do we need a ‘circular society’? Competing narratives of the circular economy in the French food sector. *Ecological Economics*, 187: 107086.

- Lincoln, Y. S., & Guba, E. 1985. *Naturalistic Inquiry*. Beverly Hills, CA: Sage.
- Marra, A., Mazzocchitti, M., & Sarra, A. 2018. Knowledge sharing and scientific cooperation in the design of research-based policies: The case of the circular economy. *Journal of Cleaner Production*, 194: 800–812.
- Mazzucato, M. 2018. Mission-oriented innovation policies: Challenges and opportunities. *Industrial and Corporate Change*, 27(5): 803–815.
- Mazzucato, M. 2021. *Mission Economy: A Moonshot Guide to Changing Capitalism*. London, England: Allen Lane
- McBirnie, A. 2009. Seeking serendipity: The paradox of control. *Aslib Proceedings: New Information Perspectives*, 60(6): 600–618.
- 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.
- Nelson, R. R. 2011. The Moon and the Ghetto revisited. *Science and Public Policy*, 38(9): 681–690.
- Obersteg, A., Arlati, A., Acke, A., Berruti, G., Czapiewski, K., Dąbrowski, M., Heurkens, E., Mezei, C., Palestino, M. F., Varjú, V., Wójcik, M. & Knieling, J. 2019. Urban regions shifting to circular economy: Understanding challenges for new ways of governance. *Urban Planning*, 4(3): 19–31.
- Paiho, S., Mäki, E., Wessberg, N., Paavola, M., Tuominen, P., Antikainen, M., Heikkilä, J., Rozado, C. A. & Jung, N. 2020. Towards circular cities—Conceptualizing core aspects. *Sustainable Cities and Society*, 59: 102-143.
- Patterson, J., Schulz, K., Vervoort, J., van der Hel, S., Widerberg, O., Adler, C., Hurlbert M., Anderton, K., Sethih, M. & Barau, A. 2017. Exploring the governance and politics of transformations towards sustainability. *Environmental Innovation and Societal Transitions*, 24: 1–16.
- Prendeville, S., Cherim, E., & Bocken, N. 2018. Circular Cities: Mapping Six Cities in Transition. *Environmental Innovation and Societal Transitions*, 26: 171–194.
- Ranabahu, N. 2017. “Rapid” but not “raid.”: A reflection on the use of rapid ethnography in entrepreneurship research. *Qualitative research journal*, 17(4), 254–264.
- Raworth, K. 2017. *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. London: Random House Business
- Reflow 2021. *Reflow project*. Accessed online <https://reflowproject.eu/>. Viewed June 3, 2021.

Repo, P., Anttonen, M., Mykkänen, J., & Lammi, M. 2018. Lack of Congruence Between European Citizen Perspectives and Policies on Circular Economy. *European Journal of Sustainable Development*, 7(1): 249–264.

Sánchez Levoso, A., Gasol, C. M., Martínez-Blanco, J., Durany, X. G., Lehmann, M. & Gaya, F. G. 2020. Methodological framework for the implementation of circular economy in urban systems. *Journal of Cleaner Production*, 248.

Saunders, M. N. K., Lewis P., & Thornhill, A. 2019. *Research Methods for Business Students* (8th ed.). Harlow, England: Pearson

Schot, J., & Steinmueller, W. E. 2018. Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy*, 47(9): 1554–1567.

Simoens, M. C., & Leipold, S. 2021. Trading radical for incremental change: the politics of a circular economy transition in the German packaging sector. *Journal of Environmental Policy & Planning*, 0(0): 1–15.

Sodiq, A., Baloch, A. A. B., Khan, S. A., Sezer, N., Mahmoud, S., Jama, M. & Abdelaal, A. 2019. Towards modern sustainable cities: Review of sustainability principles and trends. *Journal of Cleaner Production*, 227: 972–1001.

Termeer, C. J. A. M., Dewulf, A., Breeman, G., & Stiller, S. J. 2015. Governance Capabilities for Dealing Wisely With Wicked Problems. *Administration and Society*, vol. 47.

Termeer, C. J. A. M., & Metze, T. A. P. 2019. More than peanuts: Transformation towards a circular economy through a small-wins governance framework. *Journal of Cleaner Production*, 240: 118272.

Whicher, A., Harris, C., Beverley, K., & Swiatek, P. 2018. Design for circular economy: Developing an action plan for Scotland. *Journal of Cleaner Production*, 172: 3237– 3248.

APPENDIX A - Interview guide

Introduction

- Introduce yourself
- How did you get involved in the circular economy?
- What is your role in relation to the circular economy?

Abstract concept

- Could you give your definition of circular economy?
- In your opinion, how can the circular economy be applied to the urban level?
- Could you tell me if and how you see a social element in circularity / circular economy?
- How do you think circular economy can best be applied in an everyday context?

Municipality : Strategy / mission oriented

- What does circular innovation imply to you?
- What type of governance do you perceive the municipality has in the CE transformation?
- In a few words, can you explain what your current circular implementation strategy is?
 - Do you have any particular area of focus?
 - Did you develop mission? Clear targets?
 - Where do you direct your investments the most?
 - What is the role of innovation?

Critical Friend:

- *Could you give a definition to the method?*
 - Its aim?*
 - Link to innovation?*
- *Who is the critical friend, how do you select them?*
- *In the context of the circular transition, how can this method be helpful?*
- *Can you think of some challenges or ways to improve the method?*

Showing the diagram, brief explanation,

- In your context, who are the stakeholders that need to be involved?
- Do you see similar types of interactions between these stakeholders?
 - Who are the people you are trying to involve the most?
 - Incentives? Policies? Investments? Hubs?
- When it comes to circular innovation, do you see the role of the municipality as promoter, enabler or partner?

CFM: How do you connect the critical friend method to this innovation path?

Where would you situate it on the diagram?

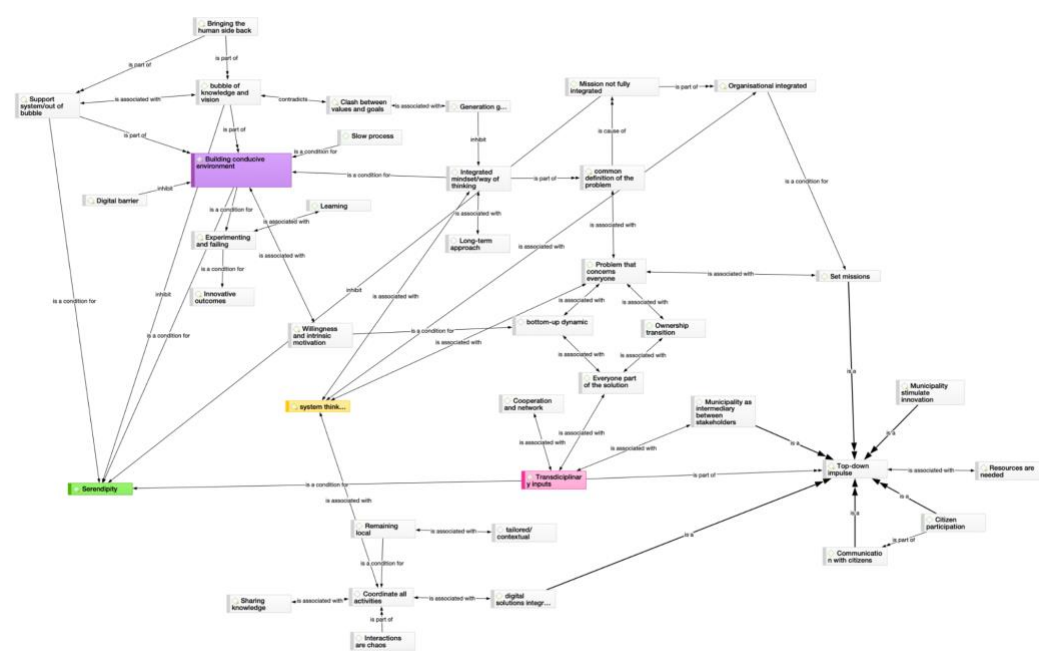
Link to a bottom-up approach?

- *What do you think is the role of policymakers in this process?*

Facilitators? Enablers? Partners?
- *What is the role of the region/municipality in your own project?*

Closing questions
- What is your view on the implications of the covid crisis for this circular transformation? (positive and/or negative)
- What are your next projects?

APPENDIX B - Code tree



APPENDIX C - OECD recommendations for Gemeente of Groningen

1. Make the city a role model
2. Map existing circular initiatives in various sectors
3. Promote stakeholder engagement to identify their roles in the implementation of the circular economy strategy
4. Develop a strategy on the circular economy
5. Promote a circular economy culture
6. Promote training programmes and develop technical capacities
7. Promote competition of ideas, awards and certifications
8. Create demand by being a launching customer
9. Facilitate coordination across municipal departments and across regional and provincial strategies
10. Facilitate offline and online platforms for practice exchange
11. Facilitate the connection with business and universities
12. Establish a Single-Window for businesses
13. Strengthen the existing networks to grab the "low-hanging fruits" from co-operation of local businesses
14. Facilitate the connection between urban and rural areas
15. Identify gaps and ways forward on how to adapt laws and regulations
16. Identify financial conditions and opportunities
17. Put in place Green Public Procurement
18. Create spaces for experimentation
19. Generate an information, evaluation and monitoring system
20. Enable the circular economy transition beyond electoral cycles

APPENDIX D - Mountain metaphor

