Circularity on the Periphery: Exploring the Circular Economy in Rural and Peripheral Geographies

by

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Abstract

The prevailing wisdom about the Circular Economy (CE) is that it is a largely technical and industrial endeavour, one that is centred in major urban cores. Recent scholarship has highlighted the need for more critical social sciences research on the topic to illuminate the human and social dimensions of CE. Heeding the call for more social sciences voices in the field of CE research, my thesis offers a qualitative perspective on small-scale stories of circular innovations in the Netherlands and Scotland. In particular, I focus on peripheral spaces in these countries; in the case of Scotland, this entailed an exploration of CE in and around the post-industrial city of Dundee and in the Netherlands, the research was more rural-focused. Drawing on thematic concepts like ethical consumerism, daily practice and institutional/political/social linkages, as well as scholarship focusing on peripherality and the scalar dimensions of sustainability transitions, this work offers an in-depth examination of the complex dynamics that underscore particular CE initiatives. More specifically, my research reveals that CE projects are diverse and site-specific in nature, therefore indicating that a blanket approach to CE is likely to be very ineffective. My findings emphasize the need to examine small-scale circular narratives to better understand what factors facilitate or inhibit their implementation. The smallness of these projects is to their advantage as smaller, peripheral actors are more likely to leverage creativity and innovative thinking, as they do not have to implement their projects across a wide geographical area. Their size also allows researchers to observe more clearly the various dynamics at play. The purpose of such studies is not meant to be didactic, but rather their intention should be to stimulate broader thinking about what the CE can mean across a multiplicity of contexts.

Acknowledgements

I am thankful to have found the Department of Geography at Memorial University as a "home" for my diverse and seemingly unclassifiable interests. As someone with a strongly Arts-focused academic background, yet with an interest in environmental/sustainability issues, I am so pleased that Geography allowed me to apply the critical thinking and research and writing skills I honed through a Joint Honours in English and French, an MA in English Literary Studies and a Bachelor of Education, to real-life contexts and important issues in contemporary environmental discourse. I am forever grateful to the wonderful people I have met in the Department who have stimulated and challenged my thinking, always inspiring greater curiosity and creativity on my part. In particular, I would like to thank my supervisor, Dr. Nicholas Lynch, whose unflagging support and endless patience helped me through this at times seemingly endless project. Thank you as well to my committee, Dr. Yolande Pottie-Sherman and Dr. Dean Bavington, for their help and guidance along the way. Of course, I owe a great debt of gratitude to all my interviewees whom I met throughout the research process and who were so generous with their time, agreeing to meet with a stranger from Canada who wanted to talk to them about their work. I wish them all the best in their respective endeavours.

I would also like to thank my family, my mother Eileen and my father Ron, for supporting me in yet another academic endeavour.

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List of Abbreviations

ACRRES-Application Centre for Renewable Resources

CE-Circular Economy

CF-Circular Friesland

Circular NE-Circular North East

CLSC-Closed Loop Supply Chain

EC-European Council

EMF-Ellen MacArthur Foundation

EU-European Union

ERDF-European Regional Development Fund

IE-Industrial Ecology

LCA-Life Cycle Assessment

NGO-Non-governmental Organization

NL-the Netherlands

PSS-Product Service System

Rli-Council for the Environment and Infrastructure

SCP-Sustainable Consumption and Production

SDG-Sustainable Development Goal

SER-Social and Economic Council of the Netherlands

SME-Small-Medium Sized Enterprise

UK-United Kingdom

UN-United Nations

WEF-World Economic Forum

ZWS-Zero Waste Scotland

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Chapter 1: Introduction

Dundee, for being a small-medium city, there's more spirit than in Edinburgh. I think that's one of the pros of being small: you get to know people…maybe you don't get challenged with as many ideas but…you do tend to support each other. ~ Interview

This quote from an informant in the Scottish city of Dundee is striking, not only for its brief yet profound summation of the state of sustainability initiatives in the city, but also for its more global application. Within the space of a couple of sentences, the informant seemed to beautifully elucidate what I believe to be a central theme of my work, namely that when we neglect small stories of sustainability by concentrating solely on larger, urban centres of circular innovation, we miss fascinating "in-between" narratives that occur in more peripheral spaces. These stories have much to tell us about how small-scale actors engage with and adapt emerging sustainability concepts to best fit their respective contexts, often employing great creativity.

Here, I am particularly concerned with the concept of the Circular Economy or CE (Figure 1.1).

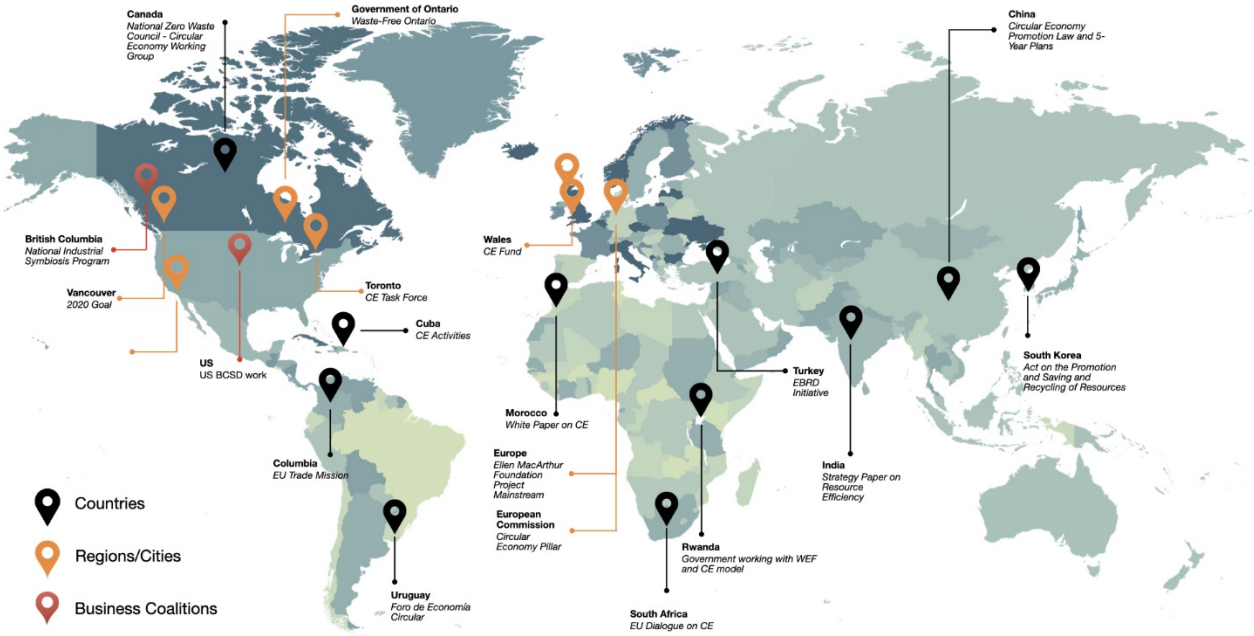

Figure 1.1: Circular projects around the world (adapted from Preston and Lehne, 2017: 6)

Quickly becoming a favoured strategy within sustainability policy and practice, CE emphasizes a circular approach towards production and consumption whereby materials and energy are endlessly circulated, with as little loss of value as possible. This stands in contrast to our current "take-make-dispose" model (Gregson et al., 2015; Geng & Doberstein, 2005). The concept is gaining traction outside of purely academic spheres and has been adopted into official environmental policies of a number of nations, including those in the European Union (EU) (Kalmykova et al., 2018). For example, Zero Waste Scotland, a CE implementation organization funded by the Scottish Government and the European Regional Development Fund and Circular Friesland Association, a Dutch provincial organization comprised of businesses, knowledge institutions, various organizations and governments. The acceptance of the CE approach is accelerating so rapidly that it appears to be outstripping the pace of critical interrogation. This is particularly true when it comes to social sciences research (Hobson & Lynch, 2016). As CE is

poised to dramatically reshape our everyday lives, and as much of the extant CE literature is largely technical in nature, there is an acute need for greater contributions from critical social scientists, including human geographers (Hobson & Lynch, 2016; Lynch, forthcoming; Gregson et al., 2015; Welch et al., 2017). These researchers can offer insights into the social dimensions of CE, including behavioural and consumption patterns, the attitudinal dispositions of potential circular consumers, as well as those policy, societal, cultural and legislative factors that help or hinder circular transitions.

In an effort to understand the social implications of the CE, this research focuses on two distinct but increasingly important spaces of circular development, the Netherlands (NL) and Scotland (UK). In the fall of 2019, I conducted extensive fieldwork to determine what factors circular practitioners (i.e., agenda setters, policy makers, entrepreneurs) were leveraging to facilitate the transition towards circularity. Early on, it was clear that both countries have made strides in developing and implementing robust, place-based, CE agendas. The Netherlands is considered a European leader in CE, which is partly due to the small country's need for greater autonomy in its material supply chains (Cramer, 2020). Scotland, while part of the UK, has a great deal of devolved authority with respect to its sustainability policies (including the design and implementation of a CE). The Scottish Government's (2016: 2) first CE policy documents, *Making Things Last*, characterizes CE as "an economic, environmental and moral necessity." Recognizing the need for circular policy and innovation, both the NL and Scotland have created ambitious CE policy initiatives. In the NL, industry has made considerable progress in rates of waste separation, recycling, and in building firm/social awareness of (and positive disposition to) CE, along with strong national policy support (Van Buren et al., 2016). Scotland prioritizes an urban and regional approach to CE, in order to capitalize, not only on the natural resources of

these regions, but also on their "regional specialism" and diversity (ZWS, 2018). As promoted by the CE delivery body, Zero Waste Scotland (ZWS), Scottish CE takes a collaborative approach in the development of circular economy cities and regions, including Edinburgh, North East Scotland, Tayside and Glasgow, through work with local academics, businesses and communities to identify circular growth areas (*How Circular Economy Can Help Scotland Build Back Better*, n.d.). For example, the Circular Tayside plan, which includes Dundee, as well as Angus, Fife and Perth & Kinross, identifies the following regional growth areas: oil and gas decommissioning industry; food and drink; engineering; eco-innovation (ZWS, 2018). What is largely missing from broader, more sweeping CE discussions are what I call the *in-between narratives* of CE. That is, those small stories of circular actors and innovations that characterize the implementation of CE within peripheral spaces. While the initial intention of this research was to explore more purely rural iterations of the CE, it became apparent that this lens would not be particularly well suited to my research area of the city of Dundee and its surrounding area. My research in the NL was more diffuse and was more focused on rural initiatives.

Across both contexts, similar emerging themes of circularity come into focus. These include the value of small, site-specific circular interventions that draw on the resources of the research areas, as well as the vital importance of understanding the human factors that drive or inhibit circular transitions. The purpose of this research is to interrogate those smaller CE narratives where such dynamics are more readily apparent and to determine what lessons can be learned from these contexts.

1.1 Research Objectives and Questions

The objective of this research has evolved considerably since its inception to its final iteration as a manuscript comprised of two specific chapters (Chapter 2 and 3). The initial focus of this research was to explore the possibilities of developing a heritage-based CE in rural Newfoundland – an important social-cultural and economic space experiencing rapid change. It was quickly clear that this focus was largely unfeasible due to the highly speculative and prescriptive nature of the work, and thus I shifted focus to explore the nature and context of rural CEs in countries of the global north: Canada, the Netherlands and Scotland. After conducting a number of interviews with Canadian policy makers and practitioners, I determined that the CE in Canada was not as well developed in practice as I required for my research, but I chose to include some of the insights garnered from these interviews in the final version.

While my initial objective was to study rural circularity, and indeed the interviews with the key informants focused on this theme, I realized that reframing my work as peripheral CE was more appropriate to the insights gained by my interviews. Peripheral spaces often appear to be characterized by a sense of community and integration and they may function as policy leaders on various innovation policy platforms (Fernandes & Makrychev, 2019). They may also leverage their socio-cultural resources to challenge more central, dominant spaces (Parker, 2008). Rurality will enter back into the conversation in Chapter 2, which investigates the emerging CE in the NL.

Ultimately, the objectives of this research have changed and evolved as it has gone through the preparation, research and data processing stages. While my principle organizing objective has always been to uncover the smaller, more hidden narratives of CE in order to determine how circularity operates outside major urban centres. In so doing, I explore the lessons we can learn

from these spaces of circular innovation and how they may be applied across a variety of contexts. This thesis will answer the following questions:

1. What does the CE look like in peripheral spaces, outside of major urban metropoles?
2. How do peripheral CE actors engage with circularity in ways that "right scale" the concept to their specific contexts?
3. What factors facilitate or inhibit CE adoption across scalar levels?
4. What lessons can be learned from small-scale CE stories and how are they applicable to various scalar contexts?

The answers to these questions further emphasize the critical importance of scale to all circular initiatives. Scale allows us to understand how similar processes may operate across different scalar levels, as well as how actors may simultaneously participate on both local and global levels, meaning the global and the local simultaneously influence and speak to one another, albeit not always in equal ways (Coenen et al., 2012).

The insights from this work are useful to circular policy makers and practitioners because they elucidate the complex network of relationships that undergird sustainability transitions in general and circular transitions in particular. While my work represents only a tiny slice of peripheral CE initiatives, the focus on small, highly specific examples is helpful in that it illustrates the key factors that are in operation in a way that is more immediately obvious than within a larger context with a lot more variables in play and a much wider geographical area. Additionally, it answers the call from human geographers for more social sciences-based inquiries into the CE (Hobson, 2019; Hobson & Lynch, 2016). My work, therefore, aims to be a useful addition to both practical and academic discussions of CE. I believe my work has a double value to researchers in that it illuminates the circular dynamics at play within specific, peripheral contexts that may escape the notice of those researchers whose work casts a wider net, while also interrogating the social factors at play. As the world moves rapidly towards the large-scale

adoption of the CE, it is critical to understand what a circular society could look like. This is not to say that it will be identical to the cases explored in the Netherlands and Scotland, but rather that these contexts offer us the opportunity to examine circular societies on a smaller, more manageable scale. This allows us to see more clearly what works, but also to trouble shoot in order to target those measures that are less functional or desirable.

1.2 Circular Economy Literature

The Circular Economy (CE) is an emerging sustainability concept that focuses on implementing closed-loop production and consumption that stands in contrast to the current linear model that takes raw materials for production of goods that are consumed and then disposed of when no longer of use (Gregson et al., 2015; Geng and Doberstein, 2008). The aim of the CE is "decoupling…environmental pressure from economic growth" (Ghisellini et al., 2015). The term can trace its origins to earlier sustainability concepts such as "limits to growth," "cradle to cradle" design and the "spaceship earth" metaphor (Kalmykova et al., 2018; Cardoso, 2018; Winans et al., 2017; Prieto & Sandoval et al., 2018), as well as Life Cycle Assessment (LCA) and Material Flow Analysis (Merli et al., 2018), Industrial Ecology (IE), Closed-Loop-Supply-Chain Management (CLSC) and Ecodesign (Reike et al., 2018).

The CE is rapidly being adopted by national policy-makers, most notably by the Chinese government and the European Union (Matthews & Tan, 2011; Korhonen et al., 2018; deMan & Friege, 2016). The latter released a CE action plan entitled *Closing the Loop* in 2015, which emphasized the environmental and economic potential of the CE, proposing regulatory and legislative targets to reduce waste and increase reuse/recycling across various sectors (CE,

2015). Academics and NGOs are also key CE policy drivers. One of the most prominent is the Ellen MacArthur Foundation, who define CE as "an industrial system that is restorative or regenerative… and aims for the elimination of waste through the superior design of materials, products, systems, and within this, business models (EMF, 2013).

The CE is exiting its "niche" setting within academic and policy spheres and is moving into the scope of more mainstream NGOs and environmental organizations, as well as global political and economic policy in ways that may herald profound structural transformation of society (Hobson & Lynch, 2016; Preston, 2012). Yet, despite the potentially radically transformative power of the CE, there is a distinct sense of conceptual "[b]lurriness" where the CE "means different things to different people" (Kirchher et al., 2017). There is at present a lack of consensus about the definition of CE, instead there are multiple definitions depending on the actors and their points of view (Kalmykova et al., 2018; Merli et al., 2018). The lack of clarity within CE discourse is an oft-cited criticism of the concept (Hobson, 2015; Blosma & Brennan, 2017; Merli et al., 2018; Kirchher et al., 2017). With the many competing definitions of the concept, there is a risk that the CE "may fall victim to dissonant views and consequently behind the potential attributed to it" (Reike et al., 2018: 259). One of the main concerns is that many CE proponents appear to belong to the "reformist school," which frames the concept in ways that are similar to the "win-win" philosophy of 1990's sustainability efforts where economic growth and environmental wellbeing are not considered mutually exclusive (Reike et al., 2018: 250). It is the overly optimistic approach of such a concept that appears to decouple economic growth and resource use that makes critical interrogation so crucial (Gregson et al., 2015).

Even given that the term is conceptually ambiguous, it remains useful as an umbrella concept that function as a "cognitive unit" which identifies and maps out a new phenomenon

within waste and resource management and opens up space for debate (Blosma & Brennan, 2017).

To remedy its definitional shortcomings, Hobson (2015) suggests that CE research needs a much "broader analytical lens" than is currently being applied and this lens needs to be largely informed by a critical social sciences approach. One of the main concerns of social sciences researchers is that most CE literature tends to focus on the environmental and economic dimensions of the concept, with little attention paid to the social and institutional spheres (Merli et al., 2018; Hobson, 2015). Indeed, the focus of CE research needs substantial broadening to understand the full implications of the move towards circularity as the CE is emerging as a radical way of transforming economies and societies *writ large* (Hobson & Lynch, 2016).

One of the ways in which CE is posed to transform our world is through altering our consumption patterns. According to the EMF, the CE will create a "new contract between business and their customers" (EMF 2013a:7). Another CE think tank, the Aldersgate Group, argues that the major stumbling block on the road to circularity is indeed 'consumer acceptance' (2012, ctd. in Hobson 2016). The focus on the transformative importance of the consumer within the context of the CE is potentially problematic, however, due to the lack of clarity with respect to what exactly the role of the customer constitutes (Mylan et al., 2016; Welch et al., 2017).

While a truly profound understanding of the role of the consumer may still be lacking within CE discourse, the key role of consumerism as part of an overall sustainability agenda has been in circulation since at least the early 1990s (i.e. the Sustainable Consumption and Production (SCP) at the World Summit on Sustainable Development). In recent decades, the emergence of various alternative forms of sustainable consumption have emerged to include: product-service systems (PSS), eco-efficient services, eco-leasing, second hand goods,

collaborative consumption (sharing or exchange of goods and services) (Rexflet & afOrnäs, 2009; Edbring et al., 2018; Hobson et al. 2018). While these models could potentially extend the life of various material goods, thus reducing the environmental strain of manufacturing, it is essential that such strategies affect attitudinal shifts on the part of the consumer to make them truly viable.

Another consideration when it comes to circular consumption is the way it overlaps with daily practice and the ways in which people interact with and think about the material stuff of their lives. Mylan et al. (2016) advise greater attention to the domestic sphere in discussions of circular consumption. Taking a socio-technical approach (i.e. an emphasis on the importance of the routine, the habitual, and the mundane, as well as the cultural meaning of everyday activities in patterns of consumption), they conclude that existing CE notions over privilege linear thinking. Household actors are not merely users who consume and dispose of resources in a straightforward, linear fashion but instead implicate their goods in a multitude of ways in daily practices. The authors focus here on food and the complex ways in which social, cultural, nutritional and behavioural factors come into play in domestic food choice, preparation and the disposal or reuse of surplus food (Mylan et al., 2016).

This thesis thus heeds the call of those scholars who believe that current CE literature is suffering from an impoverishment of social sciences perspectives. Focusing on small scale CE projects is an effective way of exploring the underlying socio-cultural dynamics, as well as the successes and challenges, of CE within a microcosm.

1.3 Locating the Periphery

I have chosen to classify the spaces I am analyzing for a number of particular reasons. When a purely rural approach to CE became untenable and undesirable as it restricted a more ample analysis of the data I gathered in the city of Dundee, I decided that the word "peripheral" was a better term to express the positionality of these spaces within their wider national contexts. Peripherality is perhaps an inadequate term, as it may not explain everything about these spaces, but I use it to refer to those spaces that fall outside of major urban centres and the CE agendas and/or that experience varying degrees of socio-economic marginalization. The concept of peripherality with which I am working owes much to Grabher (2018:1792)'s notion of marginality within the context of the periphery as "the specific position betwixt and between, centre and periphery, insider and outsider, mainstreams and mavericks." There is indeed an inbetweenness to the spaces I have studied; they are certainly not central, but nor are they completely isolated and lacking in dynamism and innovative spirit.

In some important ways, my understanding of periphery intersects with Doreen Massey's notion of place and space. She argues that peripherality is an ever-shifting concept due to the unevenness of the rollout of globalization (Massey, 2005). Similarly, Monios and Wilmsmeier (2012: 207) assert that peripherality is "not simply a status-it is a process of becoming peripheral." For Massey (2005: 11; 131), space "is always a process and never a closed system" and places "are not points or areas on maps but are integrations of space and time as spatio-temporal even that is open to constant reinterpretation and renegotiation. Peripherality is not a permanent state, and my exploration of the subject is mean to counter what Grabher (2018:1786) identifies as the tendency to relegate the periphery to the "residual category" of "those pitiable places" unable to break free of their geographical and historical circumstances. In my work, I

identify peripheral spaces as sites of experimentation and creativity where those actors involved in circular projects are not bounded by their seemingly limited circumstances and their peripheral identities may in fact be to their benefit. Parker (2008:5) asserts the validity of the "peculiar identities" of non-central regions as well as the "abilities to re-signify their geographical remoteness from power centres" and the ability to create and leverage their cultural and symbolic resources in order to speak back to, and perhaps even speak for, more central spaces.

The "peculiar identities" of peripheral places is reminiscent of Massey's characterization of local and localisms. While local places are at times reductively either criticized for being too local or praised for their supposed authenticity, the reality of these places is far more nuanced (Massey, 2005). In order to move beyond their purely local and individual struggles, these places must find a way to unite in an "accumulation of localisms" or the "adding up of particularities" against a common enemy (Massey, 2005:181). In my case studies, peripheral localities are united (albeit very loosely) in a struggle against environmental degradation and resource depletion and the particular ethic that unites them is the CE.

Peripheral places are characterized by cooperation and multiplicity, factors that allow them to succeed against the apparent odds. Working within the framework developed by Parker (2008), Fernandes and Makrychev (2019:391) argue that in addition to their strong sense of community, solidarity and integration, small and non-central states may operate as policy leaders or creators of new platforms that allow them to take the lead on policy promotions, offering them an advantage within the context of the "post-liberal momentum in international politics." Other factors that characterize peripheral success stories include broad networks of international partners (Fitjar & Rodriguez-Pose, 2011), social capital and social network, transportation and

communication technologies, educational institutions, private and/or public sector investment, tourism and the intangible characteristics of quality of life and place (Baladacchino, 2015).

A discussion of peripheral spaces also necessarily includes non-urban/rural and smaller urban spaces, which are of key demographic importance. As Rodriguez-Pose and Fitjar (2013) note, the majority of the world's population does not live in large cities. While some policy documents, produced by such organizations as the World Bank, express a belief in the capacity of urban cores to enliven and develop the rest of the countries in which they were located, a number of scholars, including economic geographers, believe the opposite is true (Rodriguez-Pose & Fitjar, 2013).

Cities do tend to dominate current circular discourse, however. In March 2019, the EMF (2019: 3) launched their suite of resources called *Circular Economy in Cities* in order to facilitate urban circular transitions, as they recognize "cities as a focal point in the transition to a circular economy". The Urban Agenda for the EU (2018:4) describes cities as both "the drivers of innovation and the economy" and "the battleground for many societal struggles of the 21st century," including the shift towards sustainability. Cities "play an essential role" in the implementation of the CE through their influence over both consumers and businesses. Additionally, "overall governance, enabling businesses, public procurement, consumption and resource management are all themes with a bearing on the development of CE concepts within cities" (Urban Agenda for the EU, 2018:4). Certainly, this perspective is not without precedent. Cities are both major consumers and waste generators, consuming between 60 to 80% of the world's natural resources and generating 50% of the planet's waste and 75% of its greenhouse gas emissions while also being poised to be responsible for 81% of total consumption growth by 2030 (Williams, 2019).

Yet placing all of CE's metaphorical eggs in the urban basket is not without its drawbacks. Hodson and Marvin (2008) caution that much is yet to be understood about the role of cities in socio-technical sustainability transitions while Prendeville et al. (2018) observe that urban circular policy makers are unclear as to what exactly constitutes a circular city and how it should be implemented in practice. Critics of urban CE/sustainability agendas underline the essential importance of understanding the scalability and context of these transitions. Williams (2019) and Paiho et al. (2020) particularly emphasize the importance of conceptualizing what exactly the CE means to its particular urban contexts before its implementation. Williams (2019) cautions that the EMF's production-centric RESOLVE framework, largely conceived of as a tool for businesses, has serious limitations when implemented within the urban context. This framework neglects the multi-sectoral nature and interconnectedness of urban systems (Williams, 2019). Similarly, Paiho et al. (2020, n.p.) recognize the need to understand "city streams and their interlinkages and boundaries" before adopting a circular agenda. The complexity of existing urban systems means that introducing CE must be done with great care and attention paid to the unique dynamics and circumstances of these spaces. This in no way undermines the importance of urban environments to the CE, but it does emphasize the need to appreciate scale and context. Within smaller spaces, whether they be rural environments or small cities, these systems can be studied more closely as they are more easily discernable and traceable. The value of examining these spaces is not that they provide blueprints for CE implementation, but rather that they allow us to experiment with circular ideas where the underlying dynamics, as well as the advantages and limitations, of these spaces are more readily apparent and therefore circular programming may be tailored accordingly.

1.3 Study Area

The study area for this project includes the Scottish city of Dundee and a number of surrounding areas (e.g., the City of Stirling and communities in the Scottish North East), and, several rural communities in northern provinces of the Netherlands (Figure 1.2).

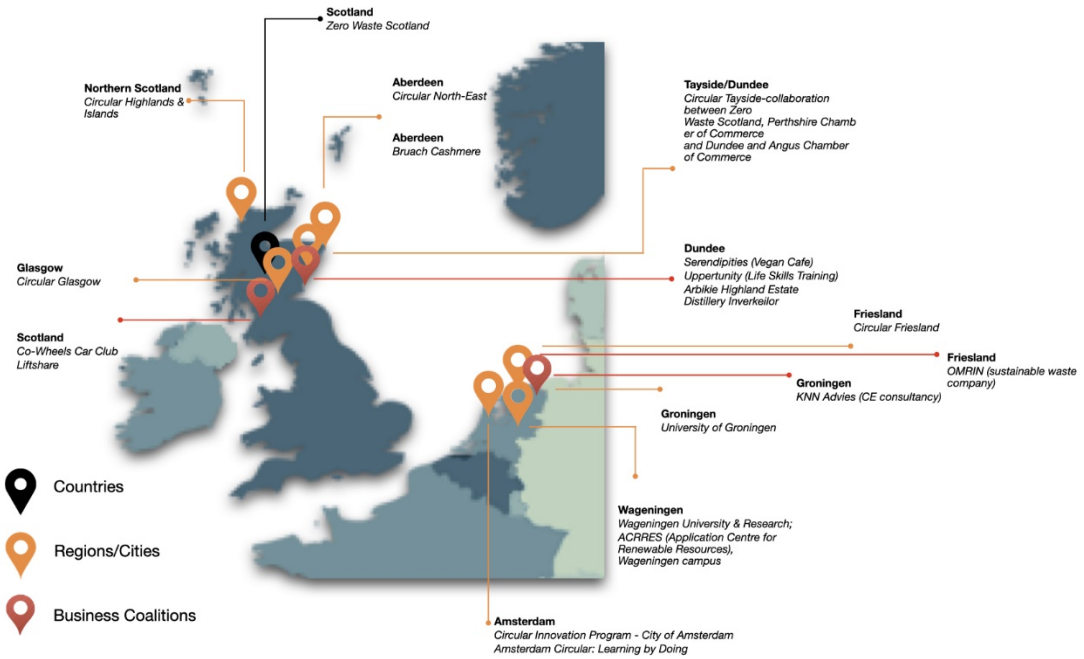

Figure 1.2: CE projects within the scope of my fieldwork (adapted from Preston & Lehne, 2017:6)

Additionally, supplemental telephone interviews were conducted with practitioners and policy makers in Canada (mainly located in southern Ontario). The somewhat diffuse nature of the geographical area under study is due to the logistics of coordinating interviews with various informants across the two countries that were visited. During my time in Scotland and the Netherlands, I was based, respectively, in the cities of Dundee and Lelystadt. These locations were chosen on the suggestions and invitations of individual informants, and I made numerous

trips to meet informants and in some cases tour facilities from these locations. In the case of Dundee, a member of the Dundee and Angus Chamber of Commerce invited me to a local business luncheon organized by the Chamber. Data collection commenced in June of 2019 and continued until November 2019, with the bulk of the data being collected during the two weeks of fieldwork conducted in September 2019.

1.4 Methods

As the study is designed to respond to the dearth of social sciences research on CE, I employed qualitative methodologies, with a focus on key informant interviews. The questions were developed in consultation with my supervisor and were initially focused on gathering data on the informants' organization and their role(s) within their respective organizations, as well as their thoughts on rural CE. Once the interviews were concluded, however, I realized that framing the informants' insights within the scope of peripheral CE made more sense, as not all of the cases were specifically rural in nature.

The information was highly valuable, due to its focus on key themes developed from my literature reviews, including: existing and emerging challenges concerning CE development outside of major urban centres; central policy and strategic tools; the nature of circular platforms and networks; key CE models and technologies; the meaning of CE for the individual organizations and the importance of communication of CE ideas to individuals and households.

Key informant interviews provided a more individualized and granular understanding of how national and regional CE plays out on the ground within the NL and Scotland, two countries that were specifically chosen for field work due to their robust and extensive CE agendas.

In total, I conducted six interviews with Scottish practitioners and eight with Dutch practitioners. These interviews lasted between 30 and 90 minutes in length and I conducted eight interviews in person and six over the telephone/Skype. All supplemental information from Canadian informants was gathered through telephone interviews. The participants were recruited through their email addresses, as these were available on the websites for their respective organizations. While I was in the NL and Scotland, I met further informants through personal introductions and, in one case, through a networking event. Initial Canadian interviews were conducted through the summer and autumn of 2019, and while the Canadian context were meant to figure more largely in the final results, I ultimately determined that the Canadian CE context was not as developed as those in the other two countries and that the data gathered from the informants did not fit well within the thematic framework emerging from the Dutch and Scottish contexts. The Canadian informants were largely recruited from a list of participants at a CE conference sponsored by the Federal Government, which was attended by my supervisor in March, 2019.

I transcribed the interviews using ExpressScribe software and then carefully coded the transcripts manually to uncover salient, unifying themes. Within the Scottish context, these themes include the CE and daily practice, craft consumption and social justice. In the NL, these themes are centred around the concept of linkages and include the role of educational institutions, political connections and the importance of social attitudes and cohesiveness, specifically within a rural context, to the implementation of CE.

In order to formulate my questions, as well as to give more definite thematic structure and organization to my findings, I conducted a number of extensive literature reviews. Before beginning my field work, I conducted a literature reviews of relevant CE literature, particularly

that written by social sciences researchers, in addition to a number of CE policy "road maps" and other documents created by circular organizations like the EMF. These documents allowed me to understand how CE stakeholders interpret, integrate and synthesize their CE thinking, as well as how they adopt new ideas and strategies.

1.5 Key characteristics of participants

In the Netherlands, four interviews were conducted at Wageningen University & Research, which has both a publically funded university branch and a privately funded research branch. Within Wageningen is the research project team ACRES (Application Centre for Renewable Resources), which is focused on the rural economy, particularly on the possibilities of using rural space to produce green energy and products. Wageningen Research is divided into five different business units, including animals, environment and plants, and ACRES itself is an initiative for both plants and animals. The project is research based, but also involves the development of a pilot project to test the feasibility of farm-scale digesters, which produce green gas from cow manure and crop waste, such as straw from maize. Additionally, they generate bioethanol to create green gas or to use for animal feed. The digestate produced during these processes can be used as fertilizer or for algae production. The algae in turn may be used for animal or human nutrition.

I also conducted an interview with the corporate social responsibility manager of a large agricultural company, the head of communications and marketing for a sustainable company in the province of Friesland, a project leader from a sustainability-focused consulting company, as well as a University of Groningen researcher. Within Scotland, the informants consisted of

employees of Zero Waste Scotland (a government-funded organization focusing on policy development and the motivation of individuals and businesses to accept CE), who were variously employed in aspects of CE implementation, as well as a craft designer/company founder and informants involved with the social entrepreneur/charitable sector. The data is corroborated or challenged by supplemental insights garnered from two other interviews conducted with informants in the Scottish North East.

Canadian informants were largely recruited from public and private sustainability-focused institutions, directly involved with CE, although one was a European graduate student conducting research in the Canadian context.

All participants were anonymized as much as possible, although the names of their respective institutions were included when it was necessary to do so. For example, it would be impossible not to mention the name of Zero Waste Scotland, as it is the principle CE organization within that country. I have chosen to identify the participants by their positions within their organizations.

1.6 Research Process

When I decided to undertake a MA at MUN's Department of Geography in early 2018, I consulted with Dr. Nicholas Lynch, as I believed that he would be best suited to being my supervisor in a project that suited my research skills and interests. He was working on CE research, mostly focused on the urban context, and I was interested in rurality. The initial focus on this research was to combine these two interests in a project focusing on rural circularity within the context of rural Newfoundland. There was also a heritage dimension to the project,

although this was found to be too limited. My original proposal was structured around these ideas, although the project evolved considerably since then, as dictated by the data I collected during my literature reviews and interviews. I kept the cultural/humanities focus in the form of the socio-cultural dimensions of CE.

On June 3, 2019, the Interdisciplinary Committee on Ethics in Human Research (ICEHR) approved the project (#20200184). On June 29, 2020, this project had its ethical approval extended to June 30, 2021. Following the initial ethical approval, I began the interview process in June 2019, ending in November 2019. In total, I conducted 14 field interviews in the NL and Scotland, as well as four in the Canadian context that I ultimately used, in addition to a small number of others that were not used. These interviews were conducted in person when possible and by telephone when it was not. The time and place of the interviews were arranged at the convenience of the informants. I distributed a recruitment script (Appendix 1) to interview participants through email. Once the participants agreed to an interview, I sent them a consent form (Appendix 2). I also brought a copy of the consent form to the interviews, in case the informants had forgotten their copy. Before beginning the interviews, I checked with the informants to make sure they were comfortable with the interviews being recorded. No one refused and no concerns were raised.

I constructed an interview guide (Appendix 3) in collaboration with my supervisor that was based on one he had used for interviews with other CE practitioners. CE practitioners were asked questions about their respective organizations and their respective roles therein, the networks in which they were involved, the role of technologies and business models in developing an integrated rural CE, as well as the challenges in adopting CE at the household level. The results of the interviews were transcribed by using ExpressScribe software and I coded

the interviews by hand, highlighting the salient themes that united the research. The coding process was completed by summer 2020 and I completed the writing of the thesis between August and December 2020.

1.7 Power and Position

Issues related to power and position, especially with regard to the interviews process, are important but were not key concerns in this research project. While I was an outsider within the Dutch and Scottish contexts, I was interviewing professionals and practitioners who were not in marginalized positions. As an academic researcher, however, I was aware of my responsibility to accurately represent the words of the participants. I took care to make sure to avoid including any highly personal/subjective comments in the manuscript. While the identifying markers have been removed where possible, these individuals are involved in CE organizations and I did not want to include anything remotely incriminating that could be potentially problematic if they were identified.

While there was no appreciable asymmetrical power imbalance between interviewer and interviewee, I was always cognizant of the fact that I was representing the thoughts and opinions of the informants. This is a considerable responsibility and I made sure to take the utmost caution in transcribing and presenting their words in my final work.

1.8 Argument

The Circular Economy is rapidly gaining acceptance from governments, NGOs, businesses and other organizations. While it may seem an attractive option for meeting the growing material needs and demands of the world economy without irreparable environmental damage, much remains unknown about this concept. In particular, we are lacking strong, comprehensive data about the human/socio-cultural implications of CE, a critical shortcoming of a model that is projected to radically transform all levels of human society. If the concept is to succeed and gain widespread adoption across various social, economic, political and geographical scales, we must first understand how circularity will impact the daily lives and practices of those who will be asked to accept it. The CE is not a blanket concept that may be rolled out across the globe without modifications, as what works in one context may fail in another. This is particularly true when it comes to implementing CE models that have been developed in a major urban context to smaller spaces. One strategy to remedy this shortcoming of the CE is to examine how CE plays out in these smaller, more peripheral spaces. Such sites are living laboratories of circular experimentation where the underlying dynamics that foster or inhibit circular innovation and implementation are more readily apparent. Being small also frequently implies more creativity and out of box thinking when it comes to CE, as it is less risky to experiment with more radical ideas when they are confined to smaller areas and populations. The marginality of some of these spaces may also increase their appetite for creative solution generation, as they understand that they are often lower on the agenda of national policy makers. Finally, peripheral CE does not mean that these spaces are divorced from their national and international context. Peripheral actors engage with, take, modify or reject ideas from the

broader context, according to their needs. They may also “speak back” to more central spaces and offer important insights that may have implications beyond their borders.

1.9 Thesis Structure

This thesis is comprised of four separate chapters and is in manuscript form. Following the present chapter which introduces the thesis, Chapter 2 begins with literature reviews of relevant CE literature, as well as circular scale, circularity in the agrifood system and emerging themes of new rural scholarship. Chapter 3 begins with literature reviews of relevant CE literature, as well as ethical consumption, craft consumption, peripherality, small and post-industrial cities and social justice in the context of CE before exploring my findings from my Scottish field work. I then explore these themes within the context of my fieldwork in the NL. I have chosen to order the chapters this way as it allows the thesis to move from the broader context in the rural Netherlands to the more specific local context of Dundee. Chapter 4 presents a discussion and concluding section. It summarizes the key findings and their implications for future research.

1.10 Findings

In Chapter 2 I explore the theme of linkages in the context of Dutch rurality in order to understand how networks of linkages across Dutch rural space integrate various perspectives and areas of expertise. These diverse perspectives allow for deeper analysis, as well as useful critiques and suggestions for the various actors involved. These findings emphasize how smaller,

rural spaces function as valuable sites of sustainable and circular experimentation as ambitious CE agendas are scaled to meet the needs of those particular contexts. In Chapter 3 I explore the emerging case of circularity in Dundee -- a small, post-industrial city that arguably stands on both sides of the socio-economic divide in Scotland; a space that has long been considered a peripheral urban space but that recently has been shedding its peripheral identity and rapidly gaining status as an urban 'core'. Here, I uncover how smaller spaces and actors engage with CE in ways that eschew sweeping policy agendas in order to tailor circular strategies to best suit their particular strengths. In short, this case study highlights the existence of distinct geographies of the CE. Together, Chapters 2 and 3 illuminate how small-scale circular interventions challenge the notion of a one-size fits all CE agenda and offer the possibility of not one CE but many, united by their emphasis on material and social sustainability.

Chapter 2: Linking the Loops: Exploring interconnectivity in the rural Dutch Circular Economy

Abstract: The Circular Economy (CE) is an increasingly influential sustainability strategy across various countries and contexts. The concept posits the seemingly endless cycling of materials and energy with minimal loss of value. The approach taken by CE practitioners can vary depending on the context, with certain countries and regions emerging as CE leaders. The Netherlands is widely regarded as a European CE champion, with most of the attention being focused on the major urban centres of CE innovation. What is missing from these discussions is an appreciation of the role of rural circularity in the Dutch context. In my research, I explore how proximity, collaboration and scale operate within interlinked networks of Dutch actors who focus on circular rurality, particularly within the provinces of Flevoland and Friesland. Through semi-structured interviews and site visits, this paper investigates three types of linkages that facilitate Dutch rural CE transitions: linkages between educational or other knowledge institutions and outside actors; political linkages (or lack thereof) between the national governments and largely rural provinces; the importance of socio-cultural values and connections in sustainability transitions. These case studies allow me to explore how successful CE transitions within rural spaces integrate various perspectives and areas of expertise, allowing for deeper analyses, helpful suggestions and judicious critiques. Together, these narratives demonstrate how smaller, rural spaces allow for CE experimentation that is scaled to meet the needs of those particular contexts. While not all of these contexts may be suited to larger scale implementation, they are no less valuable within their respective contexts. These stories underline the importance of rejecting blanket applications of CE policies in favour of smaller regional and local applications.

Keywords: Circular Economy; rurality; rural sustainability; sustainability transitions; sustainability linkages; CE policy; CE research; social dimensions of sustainability; social CE

2.1 Introduction

Our society lives from what the earth and the economy have to offer us: we use raw materials to provide us with food, shelter, heating, clothing, electrical devices and mobility. Our need for raw materials will only increase in the years to come, both in the Netherlands and in the rest of the world. At the same time, we waste an abundance of raw materials, thus unnecessarily losing the value they have for us, polluting the environment and impacting the climate. It is estimated that by 2050 there will be more than nine billion people on earth that will need sufficient amounts of food and clean water. They will also want to live in good health, in safety and in prosperity within the limits that our planet can bear (the SDGs, sustainable development goals). To make this possible, we must and can take action now. It is time for the circular economy ~ (Gov NL, 2017).

In 2017, the Dutch Government set out to define their vision of a Circular Economy, one in which environmental, human and economic wellbeing are interwoven in a sustainability strategy that targets the specific needs of the Netherlands, while still maintaining a global focus. This statement encapsulates the Dutch Government's motivation for pursuing a Circular Economy (CE) agenda. The Government expresses intense commitment and enthusiasm for the concept, believing it to be a means of achieving material and social sustainability. As one of the European leaders of CE, the Netherlands offers a rich context in which to explore CE thinking, policy, application and controversies. The small scale of the country means that the impacts of circular decision making are more immediately apparent, as they tend to be concentrated in specific loci. The smallness of the Netherlands also means that various ideas can more easily circulate between a variety of actors, being shaped, critiqued, rejected or improved by multiple hands before, during, or after implementation.

The Netherlands presents a unique opportunity to study Circular Economy (CE) practices and policies in their incubation stage. The Netherlands is a leading proponent of CE within Europe and the world, yet this fact does not mean that the country's circular story has been written. When I travelled to the country in the fall of 2019, I discovered that there is considerable

room for lively debate and discussion when it comes to the implementation of CE. Controversies persist and there exists no one definitive locus of circular policy and innovation. Instead, the Dutch circular context is characterized by collaboration and linkages between the thinkers and the doers. Mobilizing knowledge from various sectors invigorates the discussion and offers needed critiques and supports, which a single-tier approach to circularity may be unable to provide. Current circular research tends to focus rather uncritically on the technical and core scientific aspects of CE, at the expense of a deeper and more sustained engagement with the social, cultural and historical dimensions of circularity (Hobson & Lynch, 2016; Hobson, 2015; Hobson, 2019; Fratini et al., 2019). My work aims to show how a fuller appreciation of all the dimensions of CE can constructively inform current and emerging discourse and that by drawing on a diversity of voices within the circular landscape, the concept has a greater chance of success.

As a relatively geographically small country, it is perhaps unsurprising that the CE networks in the Netherlands are characterized by various networks of linkages. These linkages may take on a number of forms, whether institutional, political or socio-cultural and they may be strong or weak linkages. Creating connections between various interested parties is essential for a cohesive, holistic implementation of a CE. There is an important role for transition brokers, whose intermediary (and seemingly neutral) role in circular and other sustainability shifts, has been acknowledged by Cramer (2020) in the Dutch context. These actors enhance regional transformations, forge alliances, create necessary preconditions and develop initiatives (Cramer, 2020).

Based on my research in the Netherlands, I have discovered that strong linkages between educational or other knowledge institutions and businesses and/or local governments are

identified as facilitators of smoother and more advanced CE transitions, but weaker linkages, particularly on the political front, may be advantageous as well, leaving regions and organizations with more freedom for creative solutions generations. While the Netherlands has strong national CE policies, venturing outside the metropolitan core allows us to observe how circular initiatives function in ways that are shaped to their immediate, unique contexts. The various institutions and individuals involved with circular initiatives are able to make, re-make and critique circular practices, by bringing their particular expertise to the table. Sometimes what is needed is a judicious academic critique from a seasoned researcher and sometimes what is needed is a spirit of rural cooperation and cultural pride on behalf of regional residents. A coherent and cohesive circular narrative is not one that has a blanket application across all regions, but rather one that is a patchwork of small, regional and local applications that demonstrate thoughtful engagement with the values and principles of a circular economy. The guiding question of this research, then, is how do collaboration and networks of interrelationships operate to enhance the implementation of the Dutch CE, particularly in the rural context?

This paper begins with a three-part literature review, the first part of which explores the repositioning and revaluing of rurality in current scholarship, the second examines the role of CE at the rural scale and the third engages with the rural question of circularity within the agrifood system. Focusing on the Netherlands as a case study and particularly focusing on the provinces of Flevoland and Friesland (see Figure 2), I explore the key theme of linkages across three domains: universities/knowledge centres; the political sphere and the rural socio-cultural sphere. In the conclusion, I reiterate how a renewed focus on the rural sites of circular experimentation can illuminate the ways in which a variety of actors within these spaces are engaging with

critical ideas, processes and policies of CE to craft agendas that engage with, challenge and reshape existing CE narratives. Rural actors, or those who have a vested interest in rurality demonstrate the many ways in which rural spaces are moving towards defining CE on their own terms, which may sometimes be in opposition to official circular policy. Ultimately, what these spaces and actors have to teach us is that circularity is not a one size fits all policy, but instead a series of small, finely honed and locally specific policies that can only be effective if they are constructed with input from a variety of perspectives and if space is made for small-scale innovation and experimentation.

2.2 Exploring and Expanding the Circular Economy

The focus of the CE is the implementation of closed-loop models of production and consumption that turn the end product of one process into the useful input of another. In this process, materials are not wasted and are constantly looped back into production, unlike our current "take-make-dispose" model (Gregson et al, 2015; Geng & Doberstein, 2008). Within the CE, wastes from all industries are inputs into "follow-up ventures to produce beneficial artifacts for human use" in a cycle of "production/recycle/reuse" that is "repeated *ad infinitum*" (Sikdar, 2019: 1173).

Of late, the CE is also remarkable for its adoption by national policy-makers as a sustainability and development goal, most notably by the Chinese government and the European Union (Matthews & Tan, 2011; Korhonen et al., 2018; deMan & Friege, 2016). The CE as a concept first gained popularity in China in the 1990's as a reaction to economic growth and the limitations of natural resources in the hopes of harnessing the power of material flow recycling

in order to diminish the environmental strain of economic development (Blomsma & Brennan, 2017). The concept has risen to prominence within the European policy context and where its goals are similarly connected to the belief that economic growth does not necessitate environmental destruction and in fact, may be viewed a reworking of capitalism that fits within the current context of sustainability as evidenced by the claim that increasing circularity will be beneficial in terms of stable job and business creation, supply chain security, as well as the stabilization of resource prices (Kalmykova et al., 2018). In 2015, the European Union released a CE action plan entitled *Closing the loop*, which emphasized the environmental and economic potential of the CE, proposing regulatory and legislative targets to reduce waste and increase reuse/recycling across various sectors (EC, 2015). See Figure 1 for a global overview of CE projects.

Academics and NGOs are also active participants in the CE discussion. One of the most notable of these is the Ellen MacArthur Foundation (EMF), which offers education and support for policy makers, administrators, and the business community, among others, who are interested in making the shift towards circularity. For the EMF (2015: 5), "the concept is characterised, more than defined, as an economy that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times".

Publications from organizations like the EMF are essential to understanding not only how the CE is defined in real-world contexts, but also the directions its development may take since they are current leaders in circular thinking and advocacy. Their emphasis on the concept of scale is also important, as the CE's ultimate value to policy makers and practitioners lies in its scalability and its adaptability to various contexts. The following paper highlights the very particular context of rural Netherlands. While the Netherlands is geographically small and many

of its CE efforts are centred in urban centres like Amsterdam (Fratini et al., 2019), there are many valuable insights to be gained from a closer study of Dutch rurality. In order to better understand how rural spaces may serve as incubators of CE/sustainability, I draw on insights from rural scholarship that emphasizes the dynamism and creative vitality of these spaces.

2.2.1 Reawakening Rurality

The reawakening of interest in rural areas as spaces of circular innovation connects with other recent scholarship that aims to show the vitality and enduring nature of rural places, despite the fact that urbanization is increasingly framed as both global and inevitable. Brenner and Schmid's (2014) widely popular conceptualization of "planetary urbanization" challenges long-standing discourses of rural-urban binary, claiming that such a binary is untenable since it "*divides the indivisible*". In their view urbanization is now a "planetary phenomenon" where "the socio-cultural and political-economic relations of capitalism are enmeshed" (Brenner and Schmid, 2014:747). Given the intimate interweaving of urbanization with global economic, cultural and political systems, Brenner and Schmid contend that there simply is "no longer any *outside* to the urban world" (2014:751).

Grabher (2018: 1785), however, cautions against the notion of cities as "harbingers of progress and emancipation, as well as the locus of creativity" for the over-privileging of the urban "systematically impoverished our understanding" of peripheral innovation and has led to the conceptualization of these regions as "defeated places." Yet rurality is not synonymous with stasis and isolation. Fifty years of rural scholarship have revealed the "increasing fluidity and dynamism of rural spaces" whose "functional structure responds to both endogenous and exogenous stimuli" (Mitchell, 2013: 375). Rurality retains great significance to geographers.

Halfacree (2006:2)'s conception of rurality is "inherently spatial" and he argues that rurality must be understood as both a "'locality'" and as "'social representation,'" concluding that they are "intrinsically interwoven and co-existent" instead of contradictory.

The complexities of contemporary rural life have led to a "turn" in the rural "development paradigm" that takes a more "holistic" approach to rural revitalization efforts the moves beyond economic/agricultural concern (Mahon et al., 2018; Van der Ploeg et al., 2008). This vision of rural development engages with the "unique store of cultural capital" found in rural spaces in order to develop it in ways that emphasize sustainability across the "interdependent" spheres of economy, environment and society (Mahon, 2018; Van der Ploeg et al., 2008; Marsden, 2003; Sonnino et al., 2008). In this new rural development framework, development becomes not one, but many, strategies that contrast and may even compete with one another within specific location, each with their own particular histories and contexts. These development trajectories are unified by their goal of preserving the value of local livelihoods and economies while broadening the local economic base (Mahon et al., 2018; Van der Ploeg et al., 2008; Marsden, 2003; Sonnino et al., 2008). Rural development strategies typically eschew mainstream, highly-regulated, market-based policies, which tend to promote a kind of sector-based fragmentation that frequently impede local actors from properly engaging with local development challenges (Marsden, 2006).

Similarly, Mitchell (2013) "'creative enhancement'" of "'multifunctional'" rural space which adapts to economic innovation and remerges in a form both familiar and transformed. Horlings and Marsden (2014:17) also focus on the diversity of place-based rural development strategies. Refer to their work on the parameters of "(niche) innovation" in rural spaces, which includes the "*interconnectedness of cities with their hinterlands"* which is essential to an

integrative, place-based rural development because emerging urban-rural interfaces can stimulate new "eco-economic strategies" that lead to more "multifunctional" means of using land (2014).

Rural space does not exist or operate in isolation, as its rural identity is frequently negotiated in relation to urban spaces. This is not to diminish the importance of the rural, for as Massey (2005:10) reminds us, space/place does not exist as a "seamless authenticity" and there is an "internal negotiation" of its identity "both spatial and otherwise." Rural identity is not fixed and is in constant renegotiation, not only with itself, but also with larger urban spaces. This relationality does not undermine the inherent value of rural CE initiatives, instead it emphasizes the importance of rural CE to wider discussions of the concept.

The CE opens up a space for rural actors, policy makers, academics and various practitioners to intersect and share expertise and to experiment with a variety of circular initiatives. The Dutch circular rural landscape is still emerging, but already complex and sophisticated narratives are visible. These intriguing case studies offer evidence of how rural locations present the possibility for circular experimentation within smaller, and therefore perhaps safer, spaces of innovation. The crucial element in these discussions is scale and the operation of CE innovations across various scalar levels. It is therefore essential that we understand the role of scale within sustainability transitions, as well as its relevance to rural circularity in particular.

2.2.2 Circular Scalability and the Circular Rural

Scalability is of crucial importance to sustainability transitions scholarship. This body of literature illuminates the multiple interweaving factors that underlie social and technological shifts towards sustainability (Markard et al., 2012; Coenen et al., 2012; Smith et al., 2010).

While not focusing explicitly on circularity, insights gained from this scholarship can highlight the ways in which CE may succeed or fail within a specific context. Coenen et al. (2012) advise the adoption of a spatial dimension in such analyses in order to be better attuned to non-technological supports to these transitions such as culture as well as research or educational facilities (Coenen et al., 2012). The authors also emphasize the role of local "niches," or protective environments that allow for the incubation of socio-technological innovation, as well as the concept of scale, which allows us to understand how actors participate simultaneously in relationship on local and global levels (Coenen et al., 2012). Thus, we can determine which relationships are most likely to "upscale" to the global level while realizing that phenomena operating on different scales may appear distinct even though the same underlying processes are at work (Coenen et al., 2012).

Small-scale "experiments" are important in influencing local, national and policy developments as it allows for simultaneous bottom-up and top-down developments (Jurgilevich et al., 2016). In particular, Geels and Schot (2007:400) describe the role of local niches as "'[t]echnological *niches form the micro-levels where radical novelties emerge*'" and these "novelties" or "experiments" may be scaled-up from the "protective" spaces of these niches to have a wider societal relevance. Such emerging experiments are best taken as indicators of the beginnings of potential changes at the niche level, as they may not always be scalable or sustainable (Jurgilevich et al., 2016). This is an important caveat for any circular or sustainable business model, as scalability and replicability of these models are essential elements of their success (Zucchella & Previtali, 2019). The EMF additionally recognizes the importance of scale within business in declaring that "economies need a balance of various scales of businesses to thrive in the long term" (2013:7).

The scale I am interested in here is that of the rural. A rural CE is still an emerging topic and one that needs greater understanding (Masullo, 2017; Uvarova et al., 2019; Salvia et al., 2018; Ciani et al., 2016; Muizniece et al., 2019; Kristensen et al., 2016). Focusing on rural spaces of circular innovation may seem to contradict the apparent importance of urban CE. In March 2019, the EMF (2019: 3) launched their suite of resources called *Circular Economy in Cities* in order to facilitate urban circular transitions, as they recognize "cities as a focal point in the transition to a circular economy". The Foundation targets cities as sites where creative planning and design, combined with the capacity to make and access local ingenuity and skills will lead the innovation in the CE (EMF, 2019). Interestingly, the emphasis on the "local" in the EMF report indicates that the authors recognize that there is still a use for place-based strategies and actors within the context of an urban CE (EMF, 2019). Certainly, Williams (2019: 2754) does not see a tension between the urban and the local, emphasizing the need for local resource flows and the importance of local knowledge in the creation of "appropriate solutions for the protection of natural capital" in the city region. If cities are not necessarily the "white knights" of sustainability/CE transitions, and there is an acknowledged need for a local approach in any CE context, it makes sense widen the scope of CE explorations to determine how circularity functions within the context of rurality.

Certainly, the role of rurality within the CE is acknowledged by some scholars, who believe it occupies an important position within the overall narrative. Masullo (2017:85) suggests that the "economy of nature is a circular economy" and closing the broken loops created by linear farming activities could be achieved by reproducing natural metabolic processes through anaerobic bacterial digestion and composting (Masullo, 2017).

In the contemporary context, rural systems continue to face sustainability challenges and are often presented with contradictory solutions (Salvia et al., 2018). Thus, if circularity is to be introduced as an effective sustainability solution, it must be approached as a unified driver of the rural economy that promotes system change, the strengthening of community ties as well as the incorporation of abandoned areas and marginalized communities (2018). The adoption of circular models rural SMEs (small and medium enterprises) may help to alleviate some of these challenges, as it can help these businesses become more competitive, retain employees and stimulate rural growth through job creation (Dimitrov & Ivanov, 2017). The challenges to the adoption of circularity are considerable, however, as Uvarova (2019) points out in her study of the adoption of circular innovations within the context of rural SMEs, which are essential to rural development. She discovered limited uptake of CE business models and innovations, which she attributes to a lack of knowledge and understanding of these models, financial limitations, as well as a lack of motivation to innovate due to the comfort and familiarity of traditional methods and approaches (Uvarova et al., 2019). These problems may not be limited to rural SMEs, however, see Bassi and Dias (2019) for further research on the challenges SMEs encounter during sustainability transitions. Thus, understanding the limiting factors for CE adoption, as well as the inherent problems with CE technologies, may be better identified in smaller contexts, which function as potential test cases where issues may be identified more clearly before they are scaled up to large scale business and social contexts.

The agrifood sector presents an intriguing new locus of circular experimentation while bringing the CE into conversation with rurality. According to Kristensen et al. (2016:750), while still an emerging topic, circular food systems represent one of a number of "alternative food networks" that are "perceived as nexuses around which new attitudes, demands and practices are

being articulated and performed." Circular food systems are increasingly gaining attention from various businesses, institutions and organizations as, unlike other alternative food networks, a CE of agrifood emphasizes collaboration, partnerships and offers a "scalar politics" that is "less rigid," i.e., localized models of food and agriculture are prioritized, but not dogmatically enforced when other scalar approaches are more feasible (Kristensen et al., 2016: 751).

2.2.3 Feeding into Circularity: The role of CE in the Agrifood Sector

The need for greater understanding of the potential role of circularity in a rural context is largely due to the need for sustainable innovations in the agricultural/food system. At present, 42% of the world's population makes its livelihood from agriculture, thus making its sustainability a critical necessity for the future (Anzar-Sánchez et al., 2019). Yet modern agriculture largely employs the take-make-dispose model employed by other industries, demanding a constant input of finite raw materials, while producing an output of waste and pollution (Zucchella & Previtali, 2019). The environmental problems of agriculture are well documented (see: WEF, 2017; Van Zanten, et al. 2019; Del Borghi, et al., 2020; Jeffries, 2019; Toop et al., 2017). While farmland will need to double over the next 25 years to ensure adequate global food supply, there will be fewer land and water resources and this intensification will entail massive social, economic and environmental costs (Del Borghi et al., 2020).

Despite these challenges, our global food systems are essential to human health and to the sustainability of the planet, meaning it is crucial to develop systems that are "inclusive, sustainable, efficient, nutritious and healthy" (WEF, 2017: 14). These systems are threatened by such global trends as the growing population (in particular the middle class) and their nutritional

demands, inequality and slowed economic growth, malnutrition and food insecurity. Even possible technical solutions are uncertain, and their application is largely uneven, leaving practical policy solutions as necessary for true systematic change (2017). The EMF (2019:13) asserts that realizing a circular vision at scale necessitates a "global systems-level change effort that is cross-value chain, spans sectors and complements existing initiatives".

Given the current unsustainability of food production, it is perhaps unsurprising that Circular Economy principles have been proposed as potential solutions. An ideal CE of the food sector would involve reducing food waste, re-using food, the utilization of food waste by-products, nutrient recycling, as well as dietary changes towards more diverse and sustainable choices (Jurgilevich et al., 2016). Despite the growing interest in CE, there is a dearth of studies pertaining to the CE and food, which may point to a lack of awareness of the interconnectedness of the food system and the complex spaces in which it operates. Barros et al. (2020) remark that the "peak development" of the theme of circular agriculture has not yet been reached, although a number of researchers have used similar terms to describe a circular approach to agriculture, without necessarily using the term "circular agriculture." The longest standing term in this field is "industrial ecology," although the circular concept within agriculture refers to "very old practices" that turned animal manure into fertilizer. CE is an attractive strategy for the development of sustainable agriculture, with some scholars calling its implementation "inevitable" (Jun & Kuan, 2011:1530). Circular agriculture may solve rural problems created by conventional agriculture, such as ecological damage and resource depletion, and what is more, the industrial systems of contemporary agriculture may be more amenable to circular adaptations than those of other industries (Jun & Kuan, 2011). Agriculture should be targeted as a key primary sector industry within a CE and indeed it is tightly connected with the Europe 2020

strategy promoting smart, sustainable and inclusive growth within a more resource efficient and competitive economy (Dimitrov & Ivanov, 2017).

The bioeconomy has certain commonalities with the CE and it has also been targeted for a small, regional approach in order to foster its development within the "specific capacities and resources" of the area, rather than proceeding with a generalized approach at a national or international level (Muizniece et al., 2019:13; see also: European Commission, 2018; Barros et al., 2020).Despite the potentially radically innovative nature of circular agriculture and the bioeconomy, many of the practices under discussion have longer history and are often traditional in nature. This idea is echoed by Zucchella and Previtali (2019: 280) who contend that a circular model of agriculture "builds on" the tradition of returning to the soil that which had been taken out, a practice which has recently fallen out of favour. They locate this model in a particular context of an Italian agricultural business, the owner of which espouses a philosophy of "neo-rurality," meaning the development of rural areas which integrate agricultural products with service production while increasing the ecological and productive quality of the surrounding landscape. Indeed, the model is so well integrated that the authors do not describe it as a stand-alone business model but as an ecosystem (2019).

The cultural and environmental aspects of agricultural innovation are also reinforced by the European Economic and Social Committee Employers' Group (2015) who stress the need for innovative agricultural models because these businesses are "not only economic players, but also social actors" who "safeguard" such "community goods" as "culture, tradition and good practices" (1). The EC (2018) additionally stresses the "leading" role of farmers in a transition towards a bioeconomy. Interestingly, the Committee rejects the notion that agriculture needs to

be viewed as old and traditional and in fact its innovative potential can be attractive to younger people (2015).

The transformative role of a circular rural agricultural model is not confined to its immediate environments as Barros et al. (2020) observe that circular agricultural models can contribute to the UN's Sustainable Development Goal (SDG) 2, which focuses on food security by promoting sustainability within agrifood systems. Zucchella and Previtali (2019) argue that the scalability of the rural model in their case study benefits not only the surrounding countryside but also the nearby metropole. Urban and rural spaces are thus not neatly divided in a circular model, a point underlined by the EMF (2019)'s *Cities and the Circular Economy for Food* report. While acknowledging the transformational role of cities in a circular food system, their power lies not only in their role as CE hubs, but also in their ability to interact with and influence food producers in peri-urban (areas within 20 km of a city) and rural areas. Through mutually beneficial collaborations with farmers, cities can connect more easily with localised food production and can in turn reuse the by-products of the system at as high a value as possible (EMF, 2015).

2.3 Methods

This paper investigates the way various CE practitioners are investigating, challenging and implementing key questions of circularity. The focus in these interviews is largely on the role of CE in a rural context and the importance of institutional, political and social connections in facilitating or hindering circularity. Methodologically, this paper is largely based on eight principal interviews conducted in the Netherlands, with supplemental data gathered from

interviews conducted over the phone from St. John's, Canada, between June and November 2019. Four interviews were conducted at Wageningen University & Research, which has both a publicly funded university branch and a privately funded research branch. Within Wageningen is the research project team ACRES (Application Centre for Renewable Resources), which is focused on the rural economy, particularly on the possibilities of using rural space to produce green energy and products. Wageningen Research is divided into five different business units, including animals, environment and plants, and ACRES itself is an initiative for both plants and animals. The project is research based, but also involves the development of a pilot project to test the feasibility of farm-scale digesters, which produce green gas from cow manure and crop waste, such as straw from maize. Additionally, they generate bioethanol to create green gas or to use for animal feed. The digestate produced during these processes can be used as fertilizer or for algae production. The algae in turn may be used for animal or human nutrition.

I also conducted an interview with the corporate social responsibility manager of a large agricultural company, the head of communications and marketing for a sustainable company in the province of Friesland, a project leader from a sustainability-focused consulting company, as well as a University of Groningen researcher.

The data is corroborated or challenged by supplemental insights garnered from interviews conducted with informants in Scotland and Canada. These interviews lasted between approximately 30 to 90 minutes. The informants were contacted primarily through email, as found on their organizations' websites, but also through personal introduction and, in one case, networking. All participants were given letters of introduction/research objectives as well as informed consent forms.

The interviews focused on a range of key themes developed from a literature review, including: an overview of the existing literature on CE; peripherality; emerging rurality; CE in the rural context and the role of the agrifood sector. In order to preserve the anonymity of the informants, I have removed their names, although I have kept the names of their organizations in most cases since they are so specific that it would be difficult to obscure them.

The interview data were transcribed and analyzed qualitatively. I transcribed the interview data using ExpressScribe software and then carefully coded the transcripts to uncover salient, unifying themes and then highlighted all the data pertaining to these themes, which include the role of educational and political institutions and the importance of social attitudes and cohesiveness, specifically within a rural context, to the implementation of CE. Furthermore, the research also integrates data derived from the textual analysis of relevant academic literature which takes a social sciences approach to CE, as well as various aspects of contemporary peripherality and rurality, in addition to a number CE policy 'road-maps' and other documents created by circular organizations like the EMF. These documents are vital to understanding how various stakeholders interpret, integrate and synthesize new ideas and strategies in the emerging sphere of CE policy and practice.

2.4 Small but Mighty: CE innovation in the Netherlands

The CE in the Dutch context is considerably unique and advanced, making it "one of the leaders" in the EU (Cramer, 2020). Van Buren et al. (2016) identify five key reasons why the country has enthusiastically adopted circularity: 1) the Netherlands imports 68% of its raw materials, leaving it vulnerable to fluctuating prices and supply security problems; 2) the CE may

increase the earning capacity of the country; 3) Dutch industry has already demonstrated considerable circular progress with high rates of waste separation, recycling and firm awareness of (and positive disposition towards) CE; 4) enthusiasm for the concept in civil society; and finally, 5) strong national policy support, related to which the Netherlands has established its strong position in recycling and waste flow management over the last number of decades (Rli, 2015).

The Dutch government's strategy, *A Circular Economy for the Netherlands by 2050*, aims to develop a CE in the use of primary raw materials by 2050 (2016). According to the Dutch government, the CE "provides an answer to the great challenge of the 21st century," which is the efficient use of raw materials (8). It additionally presents a tremendous economic opportunity to the Netherlands, while also contributing to a cleaner environment. In a CE, the country will "treat products, materials and resources within the earth's capacity to provide them and in an efficient and socially responsible manner so that future generations can retain access to material prosperity" (8). The government's report responds to advisory reports by the Social and Economic Council of the Netherlands (SER) and the Council of the Environment and Infrastructure (Rli), and its Unifying Vision of the CE incorporates previous visions and goals related to biomass and raw materials, which focus on transitioning from fossil-based raw materials to biomass as a resource (2016).

While the Netherlands is a CE champion and pioneer, the lessons learned in this context are not necessarily transferable. As Cramer (2020) notes, the country has a "long-standing tradition of cooperation, consensus-building and democratic self-rule," while in other countries, the "interaction between business, government and civil society is more antagonistic" (n.p.). In

the Netherlands, an increasing number of citizens, industries, authorities and research institutions are working together on innovative CE projects (Van Buren et al., 2016).

The scale of CE innovations is also relevant within the Dutch context with the Rli (2015) acknowledging that circular opportunities generate different effects depending on their scalar level, requiring different measures toward their implementation and support. Therefore, a systematic approach across European, national, regional and/or local is necessary, as is closer attention to the potential opportunities within scalar levels. Cramer (2020)'s study of transition brokers (those who implement the establishment of circularity at various system levels) in six Dutch regions found a desire to scale up their successful local initiatives and to become more involved in national and EU CE policy-making, as well as to connect their initiatives with national policy and to create information-sharing platforms for other transitions brokers. The Netherlands may still have work to do to realize circular spatial potential, however, as Van den Berghe and Vos (2019) suggest that the importance of space with respect to fostering circular urban regions has not yet been fully incorporated into design schemes, thus undermining the potential of these areas as spatial cores of a future urban CE.

Considering these issues, I turn to explore how a particularly Dutch iteration of the CE is evolving within educational, political and socio-cultural spheres. The insights provided by the informants in the following sections highlight the vital importance of collaboration and interconnectedness within the CE. This is particularly true with respect to smaller and more rural spaces where the connections between actors are more immediately apparent and where the need for creative and collaborative solutions are more acutely felt. This research aims to illuminate those smaller, more niche spaces of CE innovation that often are not factored into the existing CE discourse.

2.4.1 Educational Institutions

Educational and other knowledge institutions are key players in the Dutch CE, both in terms of the research they conduct and in the mobilization of that knowledge. As they are centres of CE thinking, development and critical interrogation within the Netherlands, it is essential to understand how university researchers understand the concept of CE and how their insights inform the practice of other institutions.

I spoke with two members of ACRES in a joint interview. One of the informants was a biologist turned specialist in environmental technology, which includes worm production, waste streams and bioplastics. The other was a specialist in crop protection, particularly the problem of weeds, as well as fungi and algae. During the interview, one of the informants summarized the circular approach of ACRES as follows:

> …if you produce green materials without producing oil then you look at all kinds of circularity to what kind of waste products you can use with it. So, the main focus was just the energy and climate problem, from that approach they took on circular farms. That was not the main focus from the beginning.

The ACRES's foundation was partly political in origin as the director of Wageningen, together with a number of politicians, saw the potential in the area, and after securing funding, started a crop project in 2008 and then an installation in 2010. The strategic geographical location of Wageningen in the relatively new province of Flevoland was instrumental in the creation of ACRES, due to its proximity to important agricultural activities and its extremely high soil quality. The agricultural character of the area, according to one of the informants, "makes it easier to connect all types of biomass and energy," in addition to the province's unusually high number of wind turbines.

The interview provided considerable insight into the structure and functioning of ACRES within its web of national and European connections:

> at this moment we are doing that at the university and part of the research is done in EU projects [which require internal collaboration] and then we have co-operations with other universities and other institutes and many of the projects we are doing are together with other companies also researching here.

The companies mentioned are largely SME's. Regardless of the value of these corporate collaborations, the independence of the research is paramount, even if it is not favourable for the companies. For example, at the beginning of the ACRES project, they collaborated with an energy company who decided after five years that the project was too far from the practical implementation stage and chose to end their partnership. Any such collaborations are made clear within the published research and an agreement to transparency is mandatory. As one of the informants asserted, "we think as a university…it's very important to be independent, we will only give the information that we found." This collaborative spirit extends not only to SME's but also to internal collaborations within Wageningen itself. Overall, ACRES values collaboration and aims to collaborate as much as possible.

A fellow ACRES researcher, on the Agriculture and Society team and the project lead on sustainability agriculture, reaffirmed the collaborative nature of the group's work, remarking, "I think our team is a bit different from the others [in that] we are more, let's say integrative from [an] economy point of view… and also from [a] societal point of view." ACRES's orientation away from strictly academic pursuits is largely due to its private funding: some of the projects are commissioned by farmers' associations and cooperatives and others by companies or provinces. As a result, its researchers base their topics on market speculation in terms of what they think will appear on public or private agendas. The Agriculture and Society team also does

a lot of work on other projects from other teams, including economic evaluations for ACRES as a whole, as it is more technologically oriented.

Despite the integrative nature of the project, Wageningen, like many other research institutions in the Netherlands, is sectorial in nature, meaning researchers working on plants are working separately from those working on livestock and from those working on food and biobased solutions, etc. This structure can make it challenging for those researchers working on circular agriculture, such as the informant from the Agriculture and Society team who remarked that for them, circular agriculture is "a bit of a strange topic because it doesn't really fit in the organizational structure" of the institute, as it does not fit with the project agenda of the plant researchers, yet "soil and plant production are really the starting point of the cycle." While Wageningen's sectorial divisions are potentially problematic, the institute also offers advantages to those who, like the informant, "look across our borders, let's say…and cooperate with our colleagues so it's easy to find somebody in the organization to work with." The possibility of cooperation within Wageningen means they have the potential to do valuable work on CE or circular agriculture because all their departments represent the domains that should be cooperating within a circular framework. Here, interdepartmental collaboration could potentially mirror the kind of sectorial cooperation that should characterize the implementation of circular systems. Such a notion is echoed by Lindgreen et al. (2020) who argue that additional transdisciplinary research is necessary to effectively assess CE initiatives and that the connections between academic research and the practical implementation of CE assessment are at the beginning stages.

The Agriculture and Society team's project on circular agriculture or mixed (arable/dairy) farming began approximately four years earlier as an internal project because the researchers

believed it should be on the agenda. Researchers have the ability to propose potential projects and, in this case, academic and public interest coincided as the issue of excess manure in the Netherlands (due to the small country's abundance of livestock) became a matter of public debate (Levitt, 2018), leading to general interest in circular agriculture. I spoke to the Agriculture and Society team project lead on sustainability agriculture who expressed some doubts about the efficacy of circular agriculture as a sort of panacea for the ills of the farming sector, ACRES was fortunate to be working on the topic at the same time that circular agriculture solutions were being proposed by the new Ministry of Agriculture. In this way, the researchers may contribute to public debate in a constructive and nuanced manner. The researchers take a stakeholder approach (here the stakeholders are often farmers) to maximize the positive impact for them. To further this agenda, the researchers focus on behavioural dimensions of change and innovation. As the informant observed, "it's not [just] technology but [also the fact that] people have to work with it [the technology]. That's the approach in the project." Despite the stakeholder-approach, the informant was somewhat cautiously skeptical about the role of academics in a real-world context. As he stated, "a lot of research is still quite linear: to research and write a booklet and put it on the Internet and hopefully everything changes (laughs)." His statement is a clear-eyed assessment of the limitations of the influence academics can have, when their work is conducted in isolation and without consideration for those who will be active participants in its implementation. Of course, the value of university research must be acknowledged by those outside the realm of academia. Further interviews within the Netherlands revealed that the work undertaken by universities and research centres is valued by various agencies who collaborate with them and seek their expertise in crafting their circular agendas.

One corporate collaborator (who is also a Wageningen alumunus) chose to work with the university because "we are complementary to each other." In this case, knowledge institutions can do research on relevant topics, such as circular agriculture and crop diseases. Yet another informant, who himself moved from a position of head of communications at a university to head of communications at a sustainability focused company, cited the company's desire to work with "centres of excellence." They collaborate not only with Wageningen but also with the University of Groningen because Wageningen is a "centre of excellence in the agricultural, rural and food business while Groningen offers technological knowledge to their operations. Collaboration with universities allows companies to draw on their expertise and knowledge within specific sustainability topics, but companies may also serve a more intermediary role, as in the case of a consulting company that triangulates between universities/knowledge institutions and organizations with circular ambitions that may not yet know how to make the necessary transitions. A sustainability consultant, working with a company which grew out of the University of Groningen and of which the university still owns a small percentage, describes the organization as "a cross-section between governments and the educational centres and…small-medium sized companies." They play a "connecting role as seeing what's happening in connecting all the people together." These relationships are advantageous because some of the questions with which they engage "aren't answered directly, so you need some extra knowledge or some research to get an appropriate answer." The proximity to university researchers additionally allows them to propose cutting edge techniques to companies that are potentially useful but with which they are unfamiliar.

These mirror insights with other interviews with Canadian experts working on a Smart Cities/circular food initiative that links urban and rural. The organization with which one

informant is employed is “an important partner” because “we have the education,” drawing on both an urban university and rural research facilities, as well as proximity to food producers. As a result, the informant’s organization has access to the entire value chain, which allows them to occupy an important position in terms of their ability to inform, influence and coordinate between the various actors who will be essential to CE transformations. Additionally, the “university is very important to keep the credibility and the quality and security of things really high.” The participation of university research can elevate the status of circular projects by lending them an air of credibility and legitimacy, a very important consideration in this type of collaboration.

All of these interviews reveal the central role of academic research to the practical development and implementation of CE in the Netherlands, dispelling the perhaps unfair notion that academic concerns are divorced from practical ones As demonstrated by my interviews with the ACRES researchers, these collaborations are strategically valuable and serve to practically mobilize the information gathered by the researchers and therefore have an important role to play in transitions towards circularity. Researchers and practitioners are also united in their concerns about the limits and flaws of current government policies and regulations, the subject of the following section.

2.4.2 Politics

All of the key informants were united in their acknowledgement that the Dutch government is devoting considerable energy and resources to its circular strategy, but that its vision is somewhat limited, whether it be in terms of its fragmented approach to CE, the complications of regulations or its apparent inattention to, if not neglect of, regional innovations. The political face of Dutch CE is rather complex and at times contradictory and the strength and practicality of certain national policy initiatives varies depending on the regional context. The relationship between rural spaces and the national government is particularly worthy of note. As Massey (2005:9) observes, "the politics of interrelationships mirrors" the proposition that "space is the product of interrelations." Rural identities are highlighted and even asserted through their relationships with the Dutch central government. As rural actors resist or modify national CE policy initiatives, they not only highlight their own regional strengths and innovations, but they also speak back to central authorities, resisting the notion of peripheral subjugation by the metropole.

The Wageningen researcher on the Agriculture and Society team highlighted what he perceives as a lack of coherence in the Dutch government's enthusiasm for circular agriculture, which seems separate from other key elements of the CE, such as questions about the role of carbon and energy, while at the same time largely ignoring the human role in the agrifood system and instead focusing only on nutrient cycles. He remarked that the Ministry of Economic Affairs and Climate Policy has its own policies on circular agriculture, which appear "quite separate" from the reality of circular agriculture in practice and that despite the current "big discussion" of the concept there "seems no direction." Unfortunately, circular agriculture "becomes an objective in and of itself" and "something nice and we should all want [it], but we don't know

why." The informant even questioned the wisdom of devoting considerable time and effort to circular agricultural policy-making since there is a lot of circularity inherent in the Dutch agricultural system and it is "already quite optimal." Curiously, policy makers tend to characterize the biomass left on fields for soil management purposes as "wasted," demonstrating a lack of understanding of the actual value of biomass as it is currently being used. As one informant observed, the smallest cycle in the circular system is of organic matter from plant to residue on the fields and this cycle "is at risk if you take everything away for [a] biobased economy." The informant's comments echo Gregson, et al. (2015) who suggest that the CE is emerging as a form of "moral economy" where certain types of "high-quality recycling" activities are considered to be correct ways of circulating materials. Moreover, the potential conflation of CE with recycling means that cycling materials back into the system too often takes precedence over other so-called 3 R-imperatives, namely reduce and reuse (Reike et al., 2018; Grund et al., 2019). Horvath et al. (2019) caution that current CE metrics focus on input indicators like material consumption and resource productivity, while neglecting the issue of waste generation, and in fact, the CE can actually *encourage* high waste generation.

The Dutch government's 2013 *Horizon 2020* policy commitments to circularity can lead to further missteps on the technological front with respect to investments in research and innovation, as not all technologies are cost effective and may be "ten times more expensive and two times more effective," as one of the Wageningen informant stated. He also added, "technology will not solve everything." In fact, sometimes more effective solutions are found in older agricultural technologies or methods, such as those practices for decades by organic farmers. Indeed, Dimitrov and Ivanov (2017) consider organic farming as a vital part of a sustainable circular agricultural model. Unfortunately, many organic farming techniques are not

"innovative" in nature, however, researchers cannot publish on them. Here, the informant seems to be cautioning against the kind of technological solutionism described by Taffel (2018). He writes that since the 1970s computational technology has grown and expanded so massively that it has "led to a popular discourse of technological solutionism, whereby digital technology allegedly drives a cascade of disruptive and innovative changes that predominately produce technological, economic, social and cultural transformations" (Taffel, 2018:164). Despite the somewhat utopian promises of technology, however, the acceleration of digital technologies are likely to have devastating ecological consequences without radical, circular interventions. These concerns are all the more pressing during the massive environmental upheaval of the so-called Anthropocene, which is in some ways the inverse of technological solutionism, as it posits that human activity and progress threaten to do irreparable harm to the planet. Taffel (2018) instead recommends finding a balance between the two extremes to envision a better, more sustainable future. Similarly, the notion of overreliance on technology as a sustainability panacea is also challenged by Marsden and Farioli (2015) in their defense of local sustainable-place making in the context of the eco-economy. Social innovation predicated on local knowledge and "more reflexive governance arrangements" allows for the "re-localisation of social, economic and ecological assets" in a way that prioritizes "trans-local participation and recognition of diversity but also reciprocity" (Marsden & Farioli, 2015: 341). In this model, the social side of innovation becomes as important as the technological.

The need for integration was also stressed by the informant, not only across the various governmental departments (such as the Ministry of Agriculture, Nature and Food Policy and the Ministry of Economic Affairs and Climate Policy), which all have their own seemingly discrete circular domains, each of which has its own "circle of influence," but also across geographic

regions. Regional integration is a goal of the government as well, but accomplishing it may be challenging, as a scientific researcher with Wageningen identified a metaphoric "hard border" between urban and rural areas where a city operates within its own "internal cycle" and does not "have a clue what is happening 5km further." The city is "just consuming land without integrating it" and for this reason, a number of his colleagues are working on how to integrate these areas through food systems as well as social services.

The issue of government agendas and regulations is complex, not least of all because sustainability and circular concepts have existed for a considerable period of time and keep resurfacing "over and over again but with different words attached and with different flavours," or as one informant put it. Governments can also struggle with the need for rules that balance safety with sustainable innovation, particularly after the BSE or "Mad Cow" crisis of the early 2000's, a point raised by the Wageningen researchers. For example, entrepreneurs who wish to raise black soldier fly larvae for chicken feed face stringent regulations governing what material may be used to feed the larvae that some European companies will go abroad to countries with looser regulations. As the Wageningen specialist in environmental technology noted, "of course, as a government you should [do] risk management, but here it's the other way…it's the other side of the spectrum. It should be in between." This sentiment was echoed by another informant, this time from an agricultural company, who remarked, "you have to realize the laws are not there for nothing, they are there for a purpose. But in some cases, they work against you and that is the hard part." Despite the challenges posed by regulations, there is an acknowledgement that regulations are a necessity, and, according to a researcher at the University of Groningen, they do not necessarily stifle innovation and may in fact inspire further creativity. According to him, Dutch farmers, particularly dairy farmers, are able to grow their sector as they "somewhat push

European rules" governing their industry. Moreover, new rules and policies stimulate ongoing learning and innovation in the agricultural sector.

Sometimes the political dimensions of Dutch CE are most apparent where national political connections are at their least visible. A number of informants pointed to the somewhat weaker political linkages between the main seat of government in cities like Amsterdam and Rotterdam and the Northern provinces, particularly Friesland. Instead of viewing this as a dynamic of centre-periphery in which the Northern provinces are neglected in favour of more populous regions, many within these areas believe there is opportunity for dynamic regional innovation that can in turn instruct the national government on new and effective ways of pursuing a circular agenda.

Interest in circularity is not limited to the national scale, as interviewees have pointed out. Many municipalities are becoming interested in CE as they are realizing it is something they should integrate into their practices as a focal point of policy by starting small. They may have been inspired by the Northern agricultural province of Friesland, which was one of the front runners in conducting a provincial material flow analysis (Cramer, 2020). Even if their involvement with CE begins "in a small paragraph in the policies they make" and even if they say "we don't really know what to do with it right now…hopefully it gets bigger and bigger," remarked the informant from the consulting company. Energy transition is one such topic gaining traction in municipalities, even if a full-scale CE transition is not currently feasible. Energy transition (ET) is a field that may be benefitted overall by entering into a dialogue with CE. Chen and Kim (2019) believe that while low carbon energy ET is being touted as a means of mitigating climate change, it focuses on fuels as energy, rather than as raw materials and their capacity for waste generation. Thus, ET could be expanded and enhanced by the incorporation of

CE into its framework to minimize natural resource wastage while also saving energy (Chen & Kim, 2019).

Friesland's status as a CE champion is a topic that warrants further discussion. According to one interviewee, Friesland seems to "want to move faster than the national line." This may be linked to the lack of attention received by the Northern provinces (Friesland, Groningen and Dhrenthe) from the national government, which is largely located in the west of the country in the cities of Amsterdam, Rotterdam and The Hague. He summarized the situation as follows: "we have a lot less people in the north and that's why the national government thinks we're kind of less important." The sentiment of perceived inattention by the national government was echoed by the informant from the Frisian waste company who observed that even though the Dutch government may consider Friesland to be a model for CE, "it takes a lot of work to show them and to invite politicians and when they get here, they are surprised by all the things that are happening here." As a result, Frisians are "trying to improve [their] own PR nationally because they [unclear who they are] say, well, the northern people are also like a modest people and…we should show more what we are doing here." Communicating the progress in Friesland is part of his job and he is "happy to tell" their story.

These statements by the informants reveal not only the sense of separation from the national policy agenda and lack of acknowledgement by the national government, but also a sense that there is something in the Northern character, that they are a "modest people" who want to get on with the matter at hand of creating a circular society in a quietly determined way that is less likely to attract national attention. Mindset along with personal and societal values are major contributors to the successes of sustainability agendas, an issue which transcends policy,

legislation and even technical solutions. This was remarked by another Wageningen researcher who asserted that

> the problem is part of legislation. The problem is also in people's minds…it's not only that easy as to use a new technology to change, the change is more than in technology, it's also about social structures and in the ways of how we consider or think about our own future.

If the question of a sustainable future resides largely in the social realm, what are the preconditions that make a society more amenable to an environmental ethos? As Friesland, followed by Groningen and Dhrenthe are accelerating their CE agendas, what conclusions may we draw about CE within largely rural areas and communities, specifically within the Dutch context? This question is focus of the final section of this paper. The question of rural circularity is one that preoccupies researchers and practitioners, and can be approached from a variety of perspectives, economic, practical and socio-cultural.

2.4.3 Rurality and Circularity

Wageningen researchers are tackling the various implications of rural circularity to determine what works best for those who will be impacted by its implementation, notably farmers. The two researchers working on the ACRES project within Wageningen, for instance, "are looking how in [a] rural economy you can use the space and the possibilities you have to make green energy or green products" such as biogas, bioethanol and protein for cattle and algae protein. These products are created by the use of anaerobic digestion, which is achieved in small, farm-scale digesters. The researchers are currently exploring the economic viability of these installations in order to allow farmers to adopt all or part of the circular technology. This concern

for the farmer's perspective on circular innovation was also top of mind for Agriculture and Society team informant within Wageningen who acknowledges that the farmer "has to fulfill a lot of requirements from society, the market, policy, etc., and has to work with a lot of things: researchers…companies…whatever."

The researcher considers farmers their target group and stakeholders and while farmers may not commission research projects themselves, they do participate as advisory boards for various projects or sometimes as participants. Here, the informant expressed a measure of surprise at the dedication and intellectual curiosity of farmers when it comes to researching new agricultural topics, so much so that he considers them "equal sparring partners for researchers almost." Importantly, however, he was unsure as to whether or not this behaviour is attributable to "societal engagement, or just curiosity." The attitude of farmers is therefore very important when it comes to the adoption of sustainable approaches. A positive predisposition towards sustainability is not necessarily tied to youthful farmers, as may perhaps be expected. Instead, it is necessary for a farmer, regardless of age, to possess a degree of idealism or at least curiosity. In addition to knowledge sharing with researchers, farmers also share knowledge with each other in commercial contexts, as the agricultural company informant explained to me that their company has a cooperative of 9000 farmers who have regular meetings where more successful farmers share their knowledge with the others in order to achieve maximum results, including essential biodiversity targets. Due to more efficient farming techniques and better crops, the company has reduced the number of their processing factories from 15 to 2. Some of this success is due to a Dutch tradition of farming excellence. The informant believes a Dutch farmer can get a greater yield from a hectare of land than other farmers due to their expertise, as well as the high

quality of the soil. Even their crop improvement is more traditional in nature as genetically modified organisms (GMO's) are banned, so hybridization is done through Mendellian crosses. An interview with a Canadian informant who is working in the agrifood context additionally cites the importance of working closely with farmers, not only to learn from their expertise, but also to understand their frustrations. As she stated, there are a variety of farmers, "all under different legislation and I think they all feel they're overregulated already, now how you fix…that without stirring it up too much." The technical expertise of farmers is much more sophisticated than some may assume and that can prove challenging to urban-based CE researchers and policy makers who may approach circular agriculture as a relatively easy fix. The informant noted that there is a data component that pushes against the rural food component as well:

> they [the farmers] are calculating, they're using nutritionists, they're using really sophisticated formulas so they can feed their animals so they can measure things. Like on a dairy farm, they're doing a lot of things for production, for milk, they're monitoring breathing, so it's a very different side of things I think from the city's first step into this, they're looking at things from a very technical side.

A spirit of rural cooperation can also help restore vitality to communities dealing with aging and declining populations, as well as environmental problems generated by intensive farming, such as excess manure. These problems persist, despite the fact that service industries have supplanted agriculture as the main employer in these areas. In addition, farmers have very little flexibility with their limited income and aren't able to invest in the necessary new equipment and "it's really easy for people to go bust," said the informant from Groningen. Local municipalities, typically rural ones, contact the consulting company, possibly following the lead of regions like Friesland, in order to capitalize on the socially and economically regenerative potential of CE. In order to be successful, however, the working definition of CE needs to expand beyond material

loops and focus “on the bigger picture.” For example, many local towns and villages are forming cooperatives companies to generate their own energy as opposed to paying a seemingly anonymous electrical company for their power. Citizens in those communities may decide to work with their neighbours to install solar panels on their homes in order to create their own “economic ecosystem and energy system.” Such an enterprise requires cooperation and “of course the social bonds,” the informant observed, “so that really helps in agricultural areas to have a community sense.” Rural communities, therefore, may be better positioned to adopt circular practices due to their pre-existing social cohesiveness, which facilitates the kind of behaviour necessary for such transitions. An informant interviewed about the Scottish CE offered a personal observation that seems to corroborate this notion. While he stated that his opinions should be taken “with a grain of salt,” he did offer that within rural areas, it is easier to “build of existing skills backgrounds” and that the sense of rural identity would be a strong asset in circular transitions. Likewise, a Canadian informant remarked on the strength of community social networks he had observed while in the Netherlands. What he saw was “not huge economic development…there were some really big scale things going on. But a lot of what I saw that was being supported was very community level economic initiative and kind of supporting a lot of just bubbling up small scale entrepreneurship.” Based on his own work in the Canadian context, he was able to determine that mid-sized and rural municipalities are often better targets of circular policy innovation because larger centres have “their own capacity…they’ve got their own context and research group stuff,” and are “not hungry for more information.” In contrast, rural and mid-sized spaces where more work is needed in order to help them manage natural assets and to improve their infrastructure. If we are to draw a cautious conclusion from his observations, it is that rural areas may represent spaces where expertise, community networks

and the desire for systematic change converge, making them fertile ground for CE experimentation. The existing assets of rural communities mean that researchers and policy makers should pay more attention to them, as they are potential spaces of deep, rich CE learning and dialogue as both external and internal actors can share expertise and gain greater understanding of the potential, as well as the challenges, of CE.

The case of Friesland is unique in that it represents a province with a strong and distinct sense of regional cultural identity and excellent educational institutions, in addition to relative isolation from the Dutch metropole, which allows for creativity and the initiative to craft regionally specific solutions. The informant from Frisian waste company explained that they are a founder and member of Circular Friesland (CF), an association comprised of roughly 40% of the companies in the province, all of which have a CE focus. The number of innovative companies and organizations in the North is "for our region really an advantage [as it allows us] to be able to create networks to stimulate the CE." CF's goals are to stimulate development of the province and it receives funding from the government, as well as contributions from the other Northern provinces, which the informant remarked, "is fine with us because at the end it is for a better world." The Northern approach to sustainability is distinguished for other significant reasons as well. The region is highly educated with a number of important knowledge institutions, such as the University of Groningen (which recently implemented a Master's in Circular Entrepreneurship) and a university of applied science or a "hogeschool". The informant also perceives something in the northern character that makes it amenable to innovation: "[t]here's also an attitude in the north that we're practical and we want to do things and think about it not too much." The combination of progressive companies, educational institutions and a disposition to hard work and practicality all "make in this country a unique centre for

sustainability and Circular Economy." "Unique" was a word repeated several times during the interview with respect to Friesland, as was the phrase "tradition of innovation." This tradition of innovation is particularly evident in the field of dairy, for which the region is famous. Regional character was also flagged as a significant attribute as adeptness in implementing circular models. He asserted, "you can compare [Friesland] a bit with Cataluña or the Basques. We are able to combine the tradition with a modern, innovative thing." Friesland has its own language and culture, distinct from the rest of the country, a point of pride within the region. The small, rural scale of the area also helps because "the lines are shorter, we know each other and it's easier to go a bit faster" when meeting new challenges. When people from the large cities like Amsterdam visit, they are often surprised by the pace and level of innovation in the area. The contrast between urban and rural was emphasized throughout the interview. The informant compared rates of waste separation (approximately 45% for Amsterdam and approximately 75% for Friesland), as well as general attitudes and awareness, for example, the origins of the food people consume. The informant believes that since "farmers, they live in nature" and live in rural areas, the Frisians are "more connected" with the natural and agricultural worlds. Their children "know where their milk comes from. In big cities they think it comes from the factory." The interconnectedness of rural communities also fosters a sense of trust not possible in cities. In Friesland, farmers can sell their products on the street, but in a city, "you can't do it because people will take it and they don't pay," he asserted. Here, "it's trust based."

The social cohesion can also help foster new attitudes towards sustainable practices and contradicts easy promises of purely technical solutions to social and environmental problems Echoing Marsden and Farioli (2015)'s notion that social innovation is as important as technological innovation in sustainable place-making, the informant acknowledges that CE is

"more like [a] social economic question, rather than [a] technology or innovation issue," and it is important to understand the behavioural motivations of people within this context. As a result, measuring productivity with a solely economic reading misses "all the other things that are happening." One such development is the proliferation of boutique-style secondhand shops that are "not commercial things, really" as they serve "more [of] a social role" and are designed to foster an "inclusive society" through employment of variously marginalized groups such an ex-inmates, recent immigrants and people with disabilities. These environments help to foster the self-esteem of their employees while also encouraging socially responsible consumer behaviour. The informant claims, "we have created…a new atmosphere in the shops and it's fashionable to do so [shop in them], it's a matter of really good behaviour" for customer to seek needed items second hand rather than getting products made from virgin materials.

The human/social aspect of CE was emphasized by several of the informants, as an essential component, not just in terms of adopting new technologies to meet the needs of users, but also in terms of overall receptivity (rooted in personal and societal values) to the concept and the necessary changes its implementation will entail. Sometimes these values are rooted in regional traditions, as in the case of Friesland. Even at the company scale, those companies who are better able to adapt to new sustainability models are ones with an established heritage of their own. According to the Gronignen informant, these companies are often small-scale (approximately 95% of the businesses in Friesland have fewer than 10 employees), family-owned companies who typically demonstrate very strong leadership and who have created "their own robust financial situations over many decades." They are not necessarily "filthy rich but they are well-to-do" and this wealth is due to (among other reasons) strong local connections and successful exportation of agricultural products. Companies that are successful in making the

circular transition are ones that are well established and therefore can afford to take the necessary risks to move their company forward.

Yet, despite the progress in the Netherlands, the informant cautioned that while there are hundreds of sustainable companies in the Netherlands, approximately 10% of businesses, "[t]o be honest, a lot of things remain mainstream and there is still an ongoing conversation." He admitted that the recipe for circular success in business modeling remains elusive because some of the technological solutions are so firm specific as to be non-transferable. In fact, his department expected to start a post-doctoral position focusing on this "difficult question" by the end of 2019.

There is also a danger that a respect for tradition may transform into a misplaced yearning for an imaginary, idealized past where sustainability was perceived to be integrated into daily life at many levels. As the informant from Wageningen's Agriculture and Society team observed, "for some people it's like nostalgia, in the past everything was better, we had mixed farms and we should return to the past." Yet, as "you move on in time and development, you lose things that are good, but you gain things that are good." Ultimately, the "past is not better or worse but it is different." This point is essential when it comes to CE discussions, particularly in rural areas, because while we can learn from the past and from tradition, we cannot return to it. The past also represents a completely different context that cannot be perfectly recreated in the present. As has been demonstrated in this paper, context and indeed, geography, is crucial to understanding how and why circular/sustainable practices take root. The same may be said of the urban/rural divide; a point made clear by one interviewee: "you can't talk about circularity without taking one or the other [urban and rural areas] into account. Circularity is about humans." While most humans do live in cities, those who produce the food for them live in

predominantly rural communities. The two spheres need to be better integrated to achieve true circularity because “you don’t only need the farmer to change,” you also need consumers to change.

2.5 Conclusion

The Dutch Government appears to be committed to the notion of building linkages between circular actors, asserting that beyond the material aspects, the CE “pertains to other work methods and processes within and between organisations, to people and social inclusion” (Gov NL, 2017). The importance of linkages and collaboration is borne out by the interview data, as perhaps the most salient conclusion from these interviews is that a blended approach, one that marries tradition and innovation, past and present, urban and rural, is what is most important when it comes to a workable, successful CE. A circular system is ultimately just that, a system made up of many component parts. These parts, regardless of how tiny and insignificant they seem, are inextricably linked. Sufficient attention must be paid to ideas, concepts and places that may appear peripheral or marginal within the broader socio-political context, particularly by political and educational bodies, who can foster and expand these linkages to make sure that these small pockets of excellence and innovation are not left in obscurity. These spaces are niches of innovation where circular experimentation may flourish in supportive environments, without the added stress of believing that these innovations are to be immediately implemented on a national scale. For example, Friesland is beginning to emerge as a centre for CE innovation in the Netherlands due to its serendipitous confluence of multiple factors that are not necessarily applicable elsewhere.

Returning to my question of how collaboration and networks of interrelationships operate to enhance the implementation of the Dutch CE, particularly the rural CE, it is clear from the insights from the interviews conducted in the Netherlands and beyond that that smaller spaces, particularly rural spaces, are invaluable to our broader understanding of what the CE is and how it operates, as well as its potential strengths and limitations. Rural spaces are not obscure geographic corners which lag behind more progressive urban regions. Instead, the existing Dutch rural CE represents the intersection of a variety of ideas, approaches and actors, where the value of these various perspectives is augmented through collaboration and multiplicity.

There are a number of Dutch academics who dedicate their careers to studying sustainable and circular agriculture, but they realize theirs is not the ultimate authority on the subject, as they seek collaboration with and input from farmers. This combination of academic and practical expertise can help to reveal deficiencies in existing policy approaches, as government officials may not have the sufficient knowledge and experience to understand the more granular details of CE transitions. Certainly, government actors are constrained by very real regulatory concerns, a fact that was acknowledged by the interviewees. These problems are not necessarily going to be resolved through increased collaboration, but it can certainly help stimulate much needed conversation. Additionally, rural actors can contribute to the circular dialogue with cultural and social insights as to why sustainability transitions work in some contexts more than others. While the context that these actors are operating in may be small, they are no less relevant to the overall circular conversation.

Small-scale innovations may indeed have the potential to be scaled up beyond the borders of their niches, but their smallness allows their potential efficacy to become more readily apparent before final decisions are made. While some of these initiatives will necessarily remain

small, that does not mean that they are not valuable within their respective contexts. The goal is not so much to replicate specific solutions exactly, but rather to learn how creativity can flourish within very specific context and that truly big ideas may often be, in fact, small ideas.

2.6 References

Anzar-Sánchez, J.A., Piquer-Rodríguez, M., Velasco-Muñoz, J. F. & Mazano-Agugliaro, F. "Worldwide research trends on sustainable land use in agriculture." *Land Use Policy, 87*(2019), 104069.

Barros, M. V., Salvador, R., Carlos de Fransicso, A. & Piekarski, C.M. (2020). "Mapping of research lines on circular economy practice in agriculture: From waste to energy." *Renewable and Sustainable Energy Review, 131*(October 2020), doi 10. 1016.

Bassi, F. & Dias, J. G. (2019). "The use of circular economy practices in SMEs across the EU. *Resources, Conservation & Recycling, 146*(July 2019), 523-533.

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.

Brenner, N. & Schmid, C. (2014). "The 'Urban Age' in question." *International Journal of Urban and Regional Research,* 38(3), 731-755.

Chen, W. & Kim, H. (2019). "Circular economy and energy transition: A nexus focusing on the non-energy use of fuels." *Energy & Environment, 30*(4), 586-600.

Ciani, A.,Gambardella, A & Pociovalisteanu, D. M. (2016). "Circular Economy And Sustainable Rural Development. Theory And Best Practice: A Challenge For Romania." *Annals - Economy Series, 1*(December), 52-56.

Coenen, L., Benneworth, P. & Truffer, B. (2012). "Towards a spatial perspective on sustainability transitions." *Research Policy, 41*(6), 968-979.

Cramer, J. M. (2020). "The function of Transition Brokers in the regional governance of implementing circular economy: A comparative case study of six Dutch regions." *Sustainability, 12* (12). DOI: 10.3390/su12125015

deMan, R. & Friege, H. (2016). "Circular economy: European policy on shaky ground." *Waste Management & Research, 34*(2), 93-95.

Del Borghi, A., Moreschi, L. & Gallo, M. (2020). "Circular economy approaches to reduce water-energy-food nexus." *Current Opinion in Environmental Science and Health, 13*(2020), 23-25.

Dimitrov, D. K. & Ivanov, M. (2017). "Trends is Organic Farming Development in Bulgaria: Applying circular economy principles to sustainable rural development." *Sustainable Development, 6*(1), 10-16.

Ellen MaArthur Foundation. (2016) *Intelligent Assets: Unlocking the Circular Economy Potential.*

Ellen MacArthur Foundation. (2019). *Cities and the Circular Economy for Food.*

European Commission. (2015). *Closing the Loop - an EU Action Plan for the Circular Economy. European Commission*, Brussels.

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*(2018), 974-989.

Geels, F. W. & Schot, J. (2007). "Typology of sociotechnical transition pathways." *Res. Policies, 36*, 399-417.

Geng, Y., Doberstein, B. (2008). "Developing the circular economy in China: challenges and opportunities for achieving 'leapfrog development'." *International Journal of Sustainable Development and World Ecology 15*, 231-239.

Gov NL. (2016). *National Agreement on the Circular Economy: Letter of intent to develop*
Grabher, G. (2018). "Marginality as strategy-Leveraging peripherality for creativity." *A Economy and Space, 38*(3), 1785-1794.
Gregson, N., Crang, M., Fuller, S. & Holmes, H. (2015). "Interrogating the circular economy: the moral economy of resource recovery in the EU." *Economy & Society, 44*(2), 218-243.
Grund, S., Van Genderen, E. & van Leeuwen, M. (2019). Circular Economy-Recycling at all costs? Zinc: unleashing valuable resources. *Proceedings of the European Metallurgy Conference.* Düsseldorf, Germany.
Halfacree, K. (2006). "Rural space: Constructing a three-fold architecture." In P. J. Clark, T. Marsden & P. H. Moony (Eds.), *Handbook of Rural Studies* (44-62). London: SAGE.
Hobson, K. (2015). "Closing the loop or squaring the circle? Locating generative Space for the Circular economy." *Progress in Human Geography, 40*(1). 88-104.
Hobson, K. (2019). "'Small stories of closing loops': social circularity and the everyday circular economy." *Climatic Change*. https://doi.org/10.1007/s10584-019-02480-z
Hobson, K., & Lynch, N. (2016). "Diversifying and de-growing the circular economy: Radical social transformation in a resource-scarce world." *Futures*, *82*, 15–25.
Hodson, M. & Marvin, S. (2010). "Can cities shape socio-technical transitions and how would we know if they were?" *Research Policy, 39*(4), 477-585.
Horlings, L. & Marsden, T.K. (2013). "Exploring the 'new rural paradigm' in Europe: Eco-economic strategy as a counterforce to the global competitiveness agenda." *European Urban and Regional Studies, 21*(1), 4-20.
Horvath, B., Khazami, N., Ymeri, P., & Fogarassy, C. (2019). "Investigating the current business model innovation trends in the biotechnology industry." *Journal of Business Economics and Management, 20*(1), 63– 85.
Jeffries, N. (2019, March 4). "Regenerative agriculture: how it works on the ground." *Circulate.* https://medium.com/circulatenews/regenerative-agriculture-how-to-grow-food-for-a-healthy-planet-9a5f637c0f3e
Jun, H. & Xiang, H. (2011). "Development of Circular Economy is a fundamental way to Achieve agriculture sustainable development in China." *Energy Procedia, 5*(2011), 1530-1534.
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." *8*(69), doi 10.3390.
Kalmykova, Y., Sadagopan, M. & Rosado, L. (2018). "Circular economy-From review of theories and practices to development of implementation tools." *Resources, Conservation & Recyclying, 135*, 190-201.
Korhonen, J. & Honkasalo, A.& Seppälä, J. (2018). "Circular Economy: The Concept and its Limitations." *Ecological Economics, 143*(C), 7-46.
Kristensen, D. K., Kjeldsen, C., & Thorsøe, M. H. (2016). Enabling Sustainable Agro-Food Futures: Exploring Fault Lines and Synergies Between the Integrated Territorial Paradigm, Rural Eco-Economy and Circular Economy. *Journal of Agricultural and Environmental Ethics*. https://doi.org/10.1007/s10806-016-9632-9
Levitt, T. (2018, February 16). "Dutch cow poo overload causes an environmental stink." *The Guardian.*
Lindgreen, E. R., Salomone, R. & Reyes, L. (2020). "A Critical Review of Academic

Approaches, Methods and Tools to Assess Circular Economy at the Micro Level." *Sustainability, 12*(12). ttps://doi.org/10.3390/su12124973
Mahon, M., McGrath, B., Ó Laoire, L. Collins, P. (2018). "Artists as workers in the rural: precarious livelihoods, sustaining rural future." *Journal of Rural Studies, 63,* 271-279.
Massey, D. (2005). *For space*. Sage: London.
Markard, J., Raven, R., Truffer, B. (2012). "Sustainability transitions: An emerging field of research and its prospects." *Research Policy, 41*(6), 955-966.
Marsden, T. K. (2003). *The Condition of Rural Sustainability.* Assen, NL: Royal van Gorcum.
Marsden, T. K. (2006). "Denial or diversity? Creating new spaces for sustainable development." *Journal of Environmental Policy and Planning, 8*(2), 183-198.
Marsden, T. & Farioli, F. (2015). "Natural powers: from the bio-economy to the eco-economy and sustainable place-making." *Sustainability Science, 10*(2), 331-344.
Masullo, A. (2017). "Organic waste management in circular economy approach: Rebuilding the link between urban and rural areas." *Ecological Engineering, 101*(2017), 84-90.
Mathews, J. A., & Tan, H. (2011). "Progress toward a circular economy in China: the drivers (and inhibitors) of eco-industrial initiative." *Journal of Industrial Ecology*, *15*(3), 435-457.
Mitchell, C.J.A. (2013). "Creative destruction or creative enhancement? Understanding the transformation of rural spaces." *Journal of Rural Studies, 32,* 375-387.
Muizniece, I., Zihare, L., Pubule, J. & Blumberg, D. (2019). "Circular Economy and Bioeconomy interaction Development as Future of Rural Regions. Case Study of Aizkraukle Region in Latvia." *Environmental and Climate Technologies, 23*(2), 129-146.
Paiho, S. Mäki, E., Wessberg, N., Paavola, M., Tuominen, P., Antikainen, M., Heikkili, J., Rozado, C.A., Jung, N. (2020). "Towards circular cities: conceptualizing core aspects." *Sustainable Cities and Society, 59*(2019). https://doi.org/10.1016/j.scs.2020.102143
Reike, D., Vermeulen, W.J.V. & Witjes, S. (2018). "The circular economy: New or Refurbished as CE 3.0? Exploring Controversies in the Conceptualization of the Circular Economy through aFocus on History and Resource Value Retention Options." *Resources, Conservation & Recycling, 135*(2018), 246-264.
Rli. (2015). *Circular Economy: From Wish to Practice.*
Salvia, R., Andreopoulou, Z.S. & Quaranta, G. (2018). "The circular economy: A broader perspective for rural areas." *Rivista Di Studi Sulla Sostenbilta, 2018*(1), 87-105.
Sikdar, S. (2019). "Circular economy: Is there anything new in this concept?" *Clean Technologies & Environmental Policy, 21*(2019), 1173-1175.
Smith, A., Voß, J. & Grin, J. (2010). "Innovation studies and sustainability transitions: The allure of the multi-level perspective and its challenges." *Research Policy, 39*(4), 435-448. 435-448.
Sonnino, R., Kanemasu, Y. & Marsden, T.K. (2008). "Sustainability and rural development." In van der Ploeg, J.D. and Marsden, Terry Keith (Eds.), *Unfolding webs: the dynamics of regional rural development, European perspectives on rural development* (29-52). Assen: Van Gorcum.
Taffel, S. (2018). "Hopeful Extinctions? Tesla, Technological Solutionism and the Anthropocene." *Culture Unbound Journal of Current Cultural Research 10*(2).163-184
Toop, T. A., Ward, S., Oldfield, L., Hull, M., Kirby, M.E. & Theodorou, M.K. (2017. "AgroCycle-Developing a circular economy in agriculture." *Energy Procedia, 123*(2017), 76-80.

Uvarova, I. (2019). CIRCULAR ECONOMY DRIVEN INNOVATIONS WITHIN BUSINESS MODELS OF RURAL SMEs. *Proceedings of the International Scientific Conference*, *6*, 520–530.

Van Buren, N.; Demmers, M.; Van der Heijden, R.; Witlox, F. (2016). "Towards a Circular Economy: The Role of Dutch Logistics Industries and Governments." *Sustainability*, *8*, 647.

Van den Berghe, K. & Vos, M. (2019). "Circular Area Design or Circular Area Functioning? A Discourse-Institutional Analysis of Circular Area Developments in Amsterdam and Utrecht, The Netherlands," *Sustainability, 11*(18), 1-20.

van der Ploeg, J.D., van Broekhuizen, R., Brunori, G., Sonnino, Roberta, Knickel, K., Tisenkops, T. and Oostendie, H. (2008). "*Towards a framework for understanding regional rural development".* In van der Ploeg, J.D. and Marsden, Terry Keith (Eds.), *Unfolding webs: the dynamics of regional rural development, European perspectives on rural development* (1-28). Assen: Van Gorcum.

Van Zanten, H. H. E., Van Ittersum, M.K., & De Boer, I. J. M. (2019). "The role of farm animals in a circular food system." *Global Food Security, 21*(2019), 18-22.

Williams, J. (2019). "Circular Cities." *Urban Cities, 56*(13), 2746-2762.

World Economic Forum. (2017). *Shaping the Future of Global Food Systems: A Scenarios Analysis.*

Zucchella, A. & Previtali, P. (2019). "Circular business models for sustainable development: A 'waste is food' restorative ecosystem." *Business Strategy and the Environment, 28*(2), 274-288.

Chapter 3: Renegotiating Circularity on the Periphery: Three Case Studies from Dundee, Scotland

Abstract: The Circular Economy (CE) is rapidly evolving into a widely accepted sustainability agenda. Emphasizing the cyclical use and reuse of materials in unending loops with as little depreciation in value as possible, the CE is poised to dramatically transform not only our material realities, but also our more intangible relationships with the "stuff" of our everyday lives. The lack of research of the socio-cultural implications of CE is a crucial omission from current literature. In my research I explore how nascent circular agendas are evolving in and around the city of Dundee, Scotland. Through semi-structured interviews and site visits, this paper investigates three aspects of social circularity that are currently observable in the location: the role of everyday practices and behaviours in fostering or impeding circular transitions; the potential of craft industries/production to transform consumers' material relationships; CE as a potential vehicle for a more just society. These case studies allow me to explore the emerging face of circularity in a peripheral setting, here, a small post-industrial city with a recent history of economic and social decline. Together, these narratives demonstrate how smaller, peripheral spaces and actors are engaging with CE in ways that transcend sweeping policy agendas, to tailor circular strategies to their unique circumstances by leveraging their particular strengths. The lessons learned are not meant to be didactic or universally applicable, but rather they demonstrate the need for flexibility and appreciation of the local context in the implementation of CE.

Keywords: Circular Economy; peripherality; social circularity; social sustainability; Dundee; sustainability practice; craft consumption; sustainability and social justice

3.1 Introduction

When I first arrived on a sunny September Sunday at the Edinburgh Airport on my slightly delayed KLM flight from Amsterdam, I struck up a conversation with two friendly Scotsman. Upon hearing that I was going to Dundee, they laughed knowingly and offered such sympathetic comments as, if this was my first time in Scotland, it could only go up from there. I was perplexed, not knowing of Dundee's reputation as the "black sheep of Scotland" (Geoghegan, 2015). When I arrived, however, I was surprised to find a city that, while demonstrating some indicators of privation and visible homelessness, was filled with beautiful

architecture from a variety of historical eras, as well as a creative, eclectic energy. I had travelled to Dundee (see Figure 2) to explore the implementation of a Scottish Circular Economy (CE) agenda, in order to understand how this powerful new trend in sustainability policy making was unfurling within the context of a small to medium sized city. Over the last decade, the CE has represented a key sustainability strategy and policy approach across much of Europe and has become an increasingly important part of the UK approach to building regional resilience and environmental action. Within the UK, Scotland is emerging as a CE leader and along with Southern England, the country has become a kind of living laboratory for circular experimentation; spaces where policy leaders, non-governmental organizations, entrepreneurs and local citizen group have taken on circular initiatives in a variety of key sectors. While these initiatives typically take a cities and regions approach to CE, it is usually the larger urban centres that receive the most attention meaning the important role of smaller cities as sites of experimentation may be largely overlooked.

Globally, CE leaders position this agenda in opposition to the current "take-make-dispose" economic model by focusing on closing production and consumption loops; a process that turns waste into recoverable resources (Gregson et al, 2015; Geng & Doberstein, 2008) (Figure 1). Ultimately, the CE's aim is to "[decouple]…environmental pressure from economic growth" (Ghisellini et al. 2016:11) through designing out waste from the production and consumption system (Kirchher et al., 2017). The Ellen MacArthur Foundation (EMF), a leading think tank defines the CE as "an industrial system that is restorative or regenerative…and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models" (EMF, 2013: 7).

Overall, there is growing set of concepts and terms that are used to define the CE. For instance, Merli et al. (2018) identify a number of related concepts, including: sustainability; industrial ecology; efficiency; bioeconomy; recycling/reuse and close-loop production. The concept is not entirely new, however, as it evolved out of concepts like "limits to growth," "cradle to cradle" design and the "spaceship earth" (Kalmykova et al., 2018; Cardoso, 2018; Winans et al., 2017; Prieto-Sandoval et al., 2018).

Given the wide-reaching nature of CE, there is increasing need to understand its meanings, implications and, indeed, geographies. This is particularly true as the agenda shifts from academic and abstract policy settings into more mainstream approaches by NGOs, environmental organizations and consultancies (Hobson & Lynch, 2016; Preston, 2012) and is being systemically adopted by national policy-makers as a sustainability and development goal, most notably by the Chinese government and, more recently, by the European Union (EU) (Matthews & Tan, 2011; Korhonen et al., 2018; deMan & Friege, 2016). One reason for its enthusiastic adoption is the perception that the CE is "an economically and politically palatable response to aspirations for sustainable growth" within the context of increasing concern over the strain on global resources (Hobson & Lynch, 2016:17). In this way, the rapid deployment of CE strategies, practices and tactics may mean that its implementation may be outstripping the pace of critical interrogation.

Human geographers and others in the critical social sciences point out that serious CE debates need to consider the social dimensions of circularity and ask questions about the role of citizens, as well as about consumption patterns, which should include discussions of diverse economies and post-capitalism (Gregson et al. 2015; Hobson & Lynch, 2016; Welch et al. 2017). Yet this is very frequently not the case, as Hobson (2016: 96) remarks, mainstream CE

proponents do not rethink the role of the consumer nor do they propose "recalibrated modes of engagement" with the economic system, "but rather rehearse the…norms of the linear economy." In the numerous 'road maps', white papers and technical reports produced by the EMF, for instance, the CE "largely replaces the concept of the consumer with that of the user" which will create a "new contract between business and their customers" (EMF 2013a: 7). The focus on the transformative importance of the consumer within the context of the CE is also potentially problematic due to the poorly defined role of the consumer within much policy documentation (Mylan et al,. 2016; Welch et al., 2017). Furthermore, little research explores the CE, and the CE consumer beyond large and global (or globalizing) cities to understand the quiet yet transformative circular processes that operate within smaller cities and other peripheral spaces.

With these ideas in mind, the following paper focuses on the case of Dundee and explores the ways in which key stakeholders, including program developers and practitioners, not only engage with the CE, but also how they modify and advance accepted thinking and policy making in a small/medium sized city. As a city that has long been seen as a space of socio-economic marginalization, Dundee offers unique insights into the operation of circularity within a context of peripherality. Dundee occupies a somewhat peripheral position (socially, economically and reputationally) within Scotland, yet it demonstrates great depths of creativity and forward thinking. And while Scotland itself is in a somewhat peripheral, albeit empowered, position, within the UK, it has a great deal of devolved authority, including with respect to the crafting of sustainability agendas. Yet there are other ways of thinking about circular peripherality, such as the recovery of heritage craft skill in the context of circular manufacturing or the capacity of CE to bring marginalized people into the social loop. Ultimately, the circular

narratives I uncovered in Dundee demonstrated the multifarious and ever-evolving face of CE within smaller, more localized contexts. These are the in-between narratives of CE, which bridge the gap between more sweeping policy statements and the on-the-ground reality of those places and organizations that operate on smaller scales.

This paper argues that the CE occurs across an increasing diversity of places, spaces and contexts. In particular, this work focuses on the socio-spatial margins, otherwise understood as the periphery, and highlights how the key stakeholders reveal crucial aspects of circularity, notably how the CE takes on a distinctly local quality depending on its context. In other words, 'peripheral circularity' represents the everyday, lived reality of the Circular Economy where circular practitioners mold and shape CE principles to fit the needs they perceive in their communities, while still maintaining a global mindset. Without close attention to these narratives, it is difficult for academic and/or policy makers to truly gauge the efficacy of these circular innovations and interventions and how circularity may be imbued into everyday practice. The lessons learned from peripheral circular economies are not meant to be didactic, indeed their site-specific nature is what makes them important. Through careful attention to the peripheral narratives of CE we can better understand how circularity takes root and evolves in localized contexts and specific geographies.

This paper begins with a two-part literature review, the first part of which explores the politics of consumption within the context of circularity and sustainability more broadly and the second delves into the concept of social and spatial peripherality, including within small and post-industrial urban spaces. Using Dundee as a case study, this chapter answers the question of what CE (or at least a small slice of it) looks like in this small, post-industrial city by applying three particular analytical lenses: daily practice; craft production and consumption; social justice.

The purpose of this research is to understand how these dynamics are in play at a micro level in order to better understand how the various actors are conceptualizing and stretching (or shrinking) the concept of CE in order to make it work for them in their particular contexts. In the conclusion, I explore how a renewed focus on the peripheral sites of circular experimentation can illuminate the ways in which these spaces are engaging with critical ideas, processes and policies of CE to craft agendas that are scaled to meet their particular needs. Peripheral CE actors are not limited by their marginal status and may in fact use it as a springboard for further creativity in reimagining our socio-material relations. Ultimately, the lessons learned from Dundee are not meant to serve as rigid, inflexible and universally applicable lessons, but rather demonstrate the useful malleability of circularity and its capacity for context-specific adaptability.

3.2 Consuming Circular Narratives and Re-centering the Consumer

One of the most pressing concerns in the context of CE policy and discourse is how best to craft a cohesive circular narrative that is broadly applicable across a variety of contexts while achieving definitional clarity. In all the recent enthusiasm for the CE, there is still a considerable degree of uncertainty as to what exactly *is* a CE, a kind of conceptual "[b]lurriness [that] means many different things to different people" (Kirchher et al. 2017: 221). At present, there is no academic consensus on the definition of CE, rather multiple definitions depending on the actors, points of view, and the geographies in which it is applied (Kalmykova et al. 2018). Understanding how the CE functions within particular contexts is contingent upon understanding what exactly the CE is. With many competing and potentially conflicting definitions, there is a

risk that the CE "may fall victim to dissonant views and consequently behind the potential attributed to it" (Reike et al., 2018: 259).

The definitional dissonance of CE may hinder its acceptance as a consumer strategy, an important consideration as the role of the consumer is stressed by many CE policy makers. Here, economic growth and material cycles remain much as they always were, but the emerging "green consumers" will be expected to shoulder the responsibility of ensuring the environmental sustainability of various production and consumption practices (Hobson & Lynch, 2016; Hobson, 2015; Lorek & Fuchs, 2013).

Despite the recognition of the essential role of consumption within the shift towards circularity (Lakatos et al., 2018; Jones & Comfort, 2018), consumption is routinely neglected within CE policy and research (Hobson, 2019; Mylan, 2015). Camacho-Otero et al. (2018) highlight the centrality of consumer attitudes/acceptance to the adoption of circular business models yet out of a survey of 1182 academic papers, only 10% focused on consumption in the context of circularity, with most focusing on specific solutions, such as collaborative consumption, Product Service Systems (PSS) and remanufacture.

Existing policy documents underline the essential function of consumers within the CE, yet they often woefully underexplore the actual role of the consumer. Welch et al. (2017) argue that policy makers assume a greater motivational commitment to change than these consumers are willing to undertake, all the while inadequately exploring how the transition from consumer to user would actually take place. Similarly, Hobson (2019: 3) suggests that current models of the CE are "operating under an impoverished theory of both human action and the contexts that are being transferred, given the complex entanglements of materials, capabilities, and meanings". Part of this impoverishment stems from the conception of consumers as "social entities" who

must enter into relationships with new circular business models in order to meet their needs and wants, when in fact our relationships with the goods and services we consume or use are "highly circumscribed by social, material, and cultural configurations" (Hobson, 2019: np).

What exactly then will be our relationship with household or other goods when we are no longer owners? How will our relationship with material resources change if consumers will no longer be at liberty to discard, recycle, and resell objects for which they have no further use? Such a transformation would have implications beyond the household level, as wide scale CE implementation stands to disrupt global production and material recovery flows.

3.2.1 The Ethics of Circular Consumption

As discussions of transitioning to circular modes of consumption involves transforming attitudes as well as practices, it is also necessary to understand the "contested concept" of ethical consumption and the ways in which it aligns with the value and behavioural shifts proposed by circular consumption (Autio et al., 2009). Jones and Comfort (2018: 165) consider the "'new circular paradigm'" of consumption to be growing alongside and gaining momentum from such potentially complementary emerging economic models as "peer-to-peer provisioning networks, alternative agro-food arrangements, community energy schemes, worker-owned co-operatives," among others. These models will need to be drastically up-scaled from the individual to the corporate and society scales, however, if they are to "challenge dominant socio-technical practices" (Jones & Comfort, 2018: 165).

Whenever consumers "buy into" ethical consumption, they are not just consuming a particular product or service, they are also "consuming narratives" of positive social and

ecological change (Bryant & Goodman, 2004: 344). Within this "alternative consumption" paradigm, consumption becomes "the new activism" where "the consuming body thus becomes the frontline as everyday acts - eating, bathing, shopping, or dressing…are political" (Bryant & Goodman, 2004: 344). As consumption is "both an intimate and a global act," it is a "useful entry point to consider issues of environmental change and global power dynamics" (Hawkins, 2012: 752).While some scholars critique the neo-liberal and individualistic (Bryant & Goodman, 2004; Autio et al.,, 2009) overtones of ethical consumption, Jones and Comfort (2018) find indications that, motivated by growing resource scarcity, economic stagnation and pressure from activists, governments may be considering deeper approaches to linking consumption to health and quality of life. . Additionally, Carfagna et al. (2014: 175) challenge the characterization of ethical consumption and ethical consumers themselves as elite and highly individualistic, determining that consumers embrace "collective, albeit relatively elite strategies" to create a so-called "eco-habitus" in which consumers are participating in a "practical, discursive, and everyday" shift towards a wider social movement in which sustainable ways of living become infused into daily life.

Interrogating the everydayness of ethical consumption is also key to the practice theory approach within sociology. Key to the concept of practice is the notion that people are engaged in various practices, in "doing" throughout their daily activities (including consumption), as practices are what people tend to describe when asked about their quotidian activities (Røpke, 2009). This theoretical lens can illuminate the challenges to widespread acceptance of ethical consumption as consumers' environmental concerns are undermined by other "core concerns" such as income, energy prices and labour market considerations (Røpke, 2009).

The production and consumption of craft goods, for instance, while not always considered under the same umbrella as other forms of ethical consumption, are frequently construed using their own moral framework. The term "craft" is challenging to define, and academics have long debated both the concept of craft as well as its opposition to the concept of art (Holmes, 2015). Recently, attention has turned more to the renaissance in craft production and contemporary crafting communities and movements. At the most basic level, "craft" consumption refers to a form of consumption in which a product, designed and created by one individual, is purchased by a discerning consumer who sees in the object a form of self-expression (Campbell, 2005). The real difference between craft goods and manufactured goods lies in the way consumers relate to the objects (Campbell, 2005). The replacement of artisanal work by industrialized labour signalled the end of the communal craft circle, with its organization around production and distribution, an ethic many contemporary crafters are endeavouring to recreate (Bratich & Brush, 2011). The 19th and 20th century Arts and Crafts movement that arose to challenge automated modes of production by combining political activism with craftwork, a similar approach is taken by contemporary "craftivists" (Elliott & Richardson, 2017). Within the current context, the concept of craft is not limited to the production of goods only, but also to the way consumers select and purchase various goods. Campbell (2005) suggests that there are two different modes of consumption and that craft consumption does not necessarily correspond to the consumption of craft goods, rather it related to a type of consumer who selects goods with specific intention to create a certain impression through the self-conscious manipulation of the symbolic meanings of the goods. Craft consumers bring "knowledge, judgement, love and passion" to their acts of consumption. By this measure, "much of the consumption that individuals undertake in contemporary western society should be

conceived of as a craft activity" (Campbell, 2005: 27). The emphasis here is on craft's renegotiation of the relationship between people and the goods they consume. These relationships can include expressions of forms of competence and expertise that are associated with these goods. Watson and Shove (2008: 27) remark that consumption studies have largely ignored "relations *between* consumer goods" as well as "*between* objects" or the "conceptually invisible *stuff* of consumption."

While craft consumption does not necessarily align directly with the objectives of ethical consumption, both movements posit a dramatic rethink of the ways we consume objects and encourage us to enter into new, more meaningful relationships with them. In this respect, both craft and ethical consumption movements may be seen to enter into a dialogue with the CE. As social sciences researchers advise us that the transition to circularity will require a dramatic renegotiation of our material lives, important insights into what this may look like can be gleaned from an examination of those bodies of scholarship focusing on ethical and craft consumption practices.

3.3 Locating the periphery: Geographical Realities, New Relationalities and a State of Mind

The CE by its very name, is embedded within economic structures, notably within systems of production and consumption. Yet, the CE is also geographic in nature, and the scale and interconnectedness of those geographies determine the particular character of circularity within specific contexts. At present, the majority of CE discussions, mirroring mainstream urban literature, focuses on large urban centers cities that are formally higher in the global urban hierarchy (e.g. London, Paris) – where CE innovation and experimentation are the most intense.

Smaller and medium sized cities, and especially those experiencing post-industrial economic change such as Dundee, are thus largely ignored as these spaces are perceived to lack the requisite financial, human and cultural (i.e. creative) capital to host circular initiatives. It is increasingly necessary, however, to understand how geographic scale factors into discussions of the CE and the periphery, especially as smaller and medium sized cities seek opportunities to build legitimate and lasting sustainability.

Geography is becoming an increasingly important discipline within the field of circular economy scholarship, with human geographers taking an interest in a number of underexplored aspects of circularity, including its implementation and functioning across spaces and scales. As Pollard et al. (2016:17) argue, there is a "central role for geography" in terms of understanding how "circular economy thinking might play out in practice." Accorsi et al. (2015) stress the importance of the environmental, economic and transport geographies to understanding the impacts of global supply chains and their enabling conditions in order to develop sustainable closed-loop systems. Jedelhauser and Binder (2018: 857) argue that geography is relevant to CE beyond the location of its sites because CE is "not only embedded in space but also impacts the spatial structure of both social, i.e. actors and institutions, and material, i.e. infrastructure and resource flows, system entities". The point, in short, is that if circularity is embedded across spatial structures, then to ignore the periphery is to ignore a crucial spatial element of the circular narrative as well as the lessons learned from a geographic understanding of CE. In order to examine the periphery, however, we must first understand how various scholars define and engage with this fundamental concept.

Peripherality is constantly shifting concept as globalization continues to roll out in messy and uneven ways (Massey, 2005). As Baldacchino (2015) observes, "former 'centres' get

downgraded to peripheries in a regional or international context" while at the same time, citing Harvey (1990), "peripheries benefit from a 'time/space compression.'" Nagy & Timár (2017: 6) find the notion of peripheralisation/peripherality to be a "flexible interpretative framework," a concept rooted in the "space-producing logic of capitalism that occurs constantly through flows, multiple institutional arrangements and practices, as well as discourses at" various interrelated scales, yet in different contexts.

The concept of scale is important to understanding the ways in which sustainability transitions occur at various levels and how these levels interact and reinforce one another. Coenen et al. (2012:972) define scale as "a territorial level at which significant relationships exist between actors: these relationships acquire a dynamic of their own through repeated interaction" and these dynamics are unique at different scalar levels (Coenen et al., 2012). An appreciation of scale allows us to understand how actors participate simultaneously in relationships on local and global levels, which local relationships are most likely to "upscale" to the global level, and that phenomena operating on different scales may appear distinct even though the same underlying processes are at work (Coenen et al., 2012). Moreover, localities have different effects on processes at other scales, that is, the local imbues the global geographical scale with its own particular "flavor", while at the same time being subjected to varying degrees of global influence (Coenen et al., 2012).

In this paper, I characterize Dundee as a peripheral space as this term best suits certain specific characteristics about the city that I observed in my research. First of all, Scotland itself is characterized by a "double peripherality" that is both physical and institutional (Monios & Wilsmeier, 2012: 207). The central British government, located to the south in England, dominates the transport sector, often neglecting to create policies that adequately serve Scottish

interests. This is particularly true when it comes to access to Scotland's geography, comprised as it is of extensive coastline and many small islands (Monios & Wilsmeier, 2012). While this kind of peripherality encompasses the whole of Scotland, Dundee's context is one of further peripheralization. While not geographically remote from the major centres of Scotland, Dundee does suffer from a kind of reputational peripherality within the minds of many Scots. As a small city, Dundee is in a unique position as it attempts to emerge from its socio-economic periphery. Interestingly, Dundee represents Grabher (2018:1792)'s notion of "betwixt and between" as both an urban space and as a peripheral space. Contrasting peripheral spaces with thriving urban centres, Rodrigues-Pose and Fitjar (2013: 355) characterize cities as benefitting from "the sheer concentration of economic actors in a limited geographical space, which attracts flows of capital, human resources and knowledge." In contrast to these urban agglomerations, peripheral spaces are more likely to succeed (if only tentatively) by interacting with local economic agents beyond their borders (Rodrigues-Pose & Fitjar, 2013). Dundee leverages the advantages of a city in terms of its concentration of creative individuals and industries, as well as its cultural assets. CE is a useful tool in terms of helping Dundee reach beyond its borders and make valuable connections, particularly within the network of Zero Waste Scotland.

The importance of such networks draws this discussion of Dundee's peripherality into conversation with Massey's notions of space and place. For her, space is "constituted through interactions, from the immensity of the global to the intimately tiny" (Massey, 2005:9). Indeed, the data I gathered in Dundee does corroborate that the city's circular vision is both global in its scope through its recognition of the need for dramatic, wide sweeping environmental changes, as well as both intimately tiny in its social applications. The deeply interactional nature of space means that space is always shifting and can never be a "coherent, closed system" (Massey,

2005:11). Massey asserts that instead of a closed holism, space is constituted of "loose ends and missing links. For the future to be open, space must be open too" (Massey, 2005:12). There is an openness to the CE in Dundee, as it strives towards, as one informant put it, "an optimistic future." Embracing the multiplicity and openness of what CE can be allows its participants to reimagine the city's future and ensure its sustainability.

I take a relational approach that understands peripherality as a relationship between those areas that have been largely neglected or overlooked by policy and decision-makers. This position is not necessarily one of subservience as the marginal position of peripheral locations "allows them to capture the specific position betwixt and between, inside and outside, mainstream and maverick" (Grabher, 2018: 1792). While these spaces may suffer acutely from the decline of traditional economies and resource bases, regional disparities, declining populations and a lack of developmental capacity (Vodden et al., 2015) and can struggle to "break out of the downward spiral induced by the double whammy of globalization and neo-liberal policies" (Baldacchino, 2015:41), there are advantages to peripherality. Peripheral spaces can leverage creativity and unique policy-making network-building strategies as they may be better positioned to experiment and innovate. Grabher (2018:1786) also views peripherality as an "asset to creativity" and that peripheral creativity can compensate for the "notorious deficiencies of peripheries" through short and longer-term mobility to access innovation and second, as well as through strategic collaboration with non-local actors whereby "cognitive and organization proximity" is substituted for physical proximity. Small cities may be considered to be peripheral locations due to their discursive positioning within academic and policy documents, as well as in the imaginations of their citizens and the world at large. According to Bell and Jayne (2004: 5), far "[t]oo many theorists have been wowed by spectacular urbanism" of large cities to notice the

small ones". Such cities have eluded the lens of many theorists, planners, managers, etc., yet to ignore the local and global processes that shape and operate within small cities is to ignore the "*smallness* of small cities and the *cityness* of small cities" (Bell & Jayne, 2004: 4). This smallness does not represent a "failure to be urban" (Bell & Jayne, 2009: 684) as small cities are distinguished not so much by population size but by their overall reach and influence. They may function as "important nodes" within various scalar networks between places, notably the rural and the urban, and by studying the local nature of small cities, urban theorists can better understand the "hierarchies of interpenetrating territorial scales" that operate across cities of all sizes (2009: 684).

Interestingly, small cities, including ones whose populations have shrunken due to post-industrialization (to be discussed further below), have a contribution to make to overall discussions of urban CE. While organizations like the EMF (2019) and the Urban Agenda for the EU (2018) laud the transformative role of cities as circular policy leaders and innovators, they may be missing an essential characteristic of urban spaces that complicates CE transitions. As and Paiho et al. (2020) observe, urban systems are deeply complex and characterized by interlinkages and networks that include both local and regional scales. Williams (2019) writes that as certain cities shrink, their urban systems will need to contract as well to support the new demographic. Viewing cities in a similar way to ecological systems helps us to see opportunities to optimize resource flows within urban ecosystems, a perspective that fits more neatly with CE than current urban approaches to circularity that often prioritize production over other aspects of the system (Williams, 2019). Williams (2019) writes of the need to localize resource flows within an urban context in order to maximize resource benefits locally while reducing negative externalities and making them more manageable. There is always a role for the local, even in

urban environments. Keeping resource loops small or right-sizing them to their specific urban contexts is a key component of successful circular urbanism. Examining how small urban spaces are implementing circular strategies is therefore a valuable exercise in determining how circularity is scalable across a variety of contexts.

Small cities are not the only urban spaces that occupy a peripheral position within the urban sphere. Post-industrial cities, such as Dundee, embody the socio-economic outcomes of the transition from manufacturing to knowledge/service-based industries. As industry decentralized and 'off-shored' throughout the 20th century and particularly post-WWII, managerial and professional activities redefined the city. With a focus on attracting middle class professionals and 'footloose' global capital, socially democratic ideals were supplanted by corporate welfare, deregulation, devolution and privatization, thus making post-industrialism "one trajectory to neoliberalism among many" (Neumann, 2016: 11). Though the impacts of the post-industrial period are still being borne out, there is increasing recognition that industrial decline, and indeed decline in general, is not a permanent state. Critical urban geographers are involved in documenting the emerging transformations of post-industrial cities and are now exploring the resurgence of diverse post-industrial communities, the new geographies of rural-urban boundaries, as well as the rapid creative reuse of vacant spaces (Pottie-Sherman, 2020; Gospondini, 2006). Gospodini (2006:312), for one, recognizes the importance of "avant-garde urban design" and built heritage in the making of creative post-industrial cityscapes in fostering a sense of place and in generating a sense of identity in post-modern, post-industrial urban society where identities and politics are shifting and management are increasingly entrepreneurial in nature. In this way, the post-industrial city can be viewed as a site of decline and uncertainty, but also as an incubator of creative spatial and cultural innovations.

While not highlighted directly as a regenerative strategy for declining urban spaces, CE has the potential to become part of an overall urban renewal/sustainability strategy. Indeed, CE advocates, particularly consultants, practitioners and policy-makers, laud its capacity for transformative and regenerative social and environmental change (Korhonen et al., 2010). The relationship between CE and sustainability is not uncomplicated, however, as sustainability is itself contested and the relationship between the two concepts remains somewhat ambiguous (Geissdoerfer, 2017). Moreover, CE may not be sufficient for an effective sustainability agenda on its own and its implementation needs to be tailored to specific situations (deMan & Friege, 2016), as well as its geographies. While these controversies are too important to ignore in any critical reading of the CE, it is necessary to first understand how circularity is understood as an enabler of various kinds of sustainability. To do so, we turn to Dundee, Scotland to explore how innovative circular ideas are taking root in a small post-industrial city that is beginning to emerge from the socio-economic margins.

3.4 Methodology

This paper investigates the way various CE practitioners challenge accepted notions of circularity, while developing their own unique approaches to the concept that best suit their local contexts. The focus on these interviews is largely on the practical and attitudinal considerations that will facilitate or hinder circular transitions. Methodologically, this paper is largely based on five principle interviews conducted in and around Dundee, Scotland, as well as over the phone from St. John's, Canada, between June and November 2019. The informants consisted of employees of Zero Waste Scotland (a government-funded organization focusing on policy development and the motivation of individuals and businesses to accept CE), who were variously

employed in aspects of CE implementation, as well as a craft designer/company founder and informants involved with the social entrepreneur/charitable sector. The data is corroborated or challenged by supplemental insights garnered from two other interviews conducted with informants in the Scottish North East, as well as two interviews with informants engaged with CE in the Canadian context and one Dutch CE practitioner. These interviews lasted between approximately 30 to 90 minutes. The informants were contacted primarily through email, as found on their organizations' websites, but also through personal introduction and, in one case, networking. All participants were given letters of introduction/research objectives as well as informed consent forms.

The interviews focused on a range of key themes developed from a literature review, including existing and emerging challenges concerning CE development outside of major urban centres; central policy and strategic tools; the nature of circular platforms and networks; key CE models and technologies; the meaning of CE for the individual organizations and the importance of communication of CE ideas to individuals and households. In order to preserve the anonymity of the informants, I have removed their names, although I have kept the names of their organization in most cases since they are so specific that it would be difficult to obscure them.

The interview data were transcribed and analyzed qualitatively. I transcribed the interview data using ExpressScribe software and then carefully coded the transcripts to uncover salient, unifying themes and then highlighted all the data pertaining to those themes, which include CE and daily practice, craft consumption and social justice. Furthermore, the research also integrates data derived from the textual analysis of relevant academic literature which takes a social sciences approach to CE, as well as various aspects of ethical consumerism, in addition to a number CE policy 'road-maps' and other documents created by circular organizations.

These documents are vital to understanding how various stakeholders interpret, integrate and synthesize new ideas and strategies in the emerging sphere of CE policy and practice.

3.5 Scotland and the Circular Economy

Scotland prides itself on its robust sustainability and CE policy-making and in 2016, the Scottish Government launched its first CE policy documents entitled *Making Things Last*, along with their manufacturing strategy, *A Manufacturing Future for Scotland*, which iterated the economic advantages of a Circular Economy. *Making Things Last* characterizes the CE as "an economic, environmental and moral necessity" and the report's authors prioritize four main areas: food and drink, the bio-economy; remanufacture; construction and the built environment; energy and infrastructure (Scottish Government, 2016: 2). While the technical aspects of the CE, including those that pertain to larger industries, are highlighted in the report, considerable attention is paid to the social dimensions of CE, as "it is the choices made by consumers-the public-that will ultimately determine success" (2016:1) and the ultimate goal is to make circular practices "commonplace," and "*communicating* with people in a way that helps them see the value in the products and materials they use," thereby "ending our 'throwaway culture'" (2016:6) and making practices like recycling "routine" (24).

Despite acknowledging that the global economy is still at the beginning stages of the CE, the authors believe that their strategy will build on Scotland's "advantages," as it is in "a strong position to move quickly and take advantage of our scale and connectedness" (Scottish Government, 2016: 7). Many of Scotland's circular connections, particularly at the entrepreneurial level, are coordinated by the government-funded business network Zero Waste

Scotland (ZWS). This network distills the CE into the following definition: "an all-encompassing approach to life and business where everything has value and nothing is wasted" (ZWS, n.d.). Under this ambit, Zero Waste Scotland prioritizes an urban and regional approach, targeting these spatial scales since they are not only sites with an abundance of resources, but also feature as spaces with "regional specialism" and diversity (ZWS, 2018). ZWS targets four cities and regions with specific programmes to explore their circular potential, including the Tayside region where the city of Dundee is located. The ZWS argues that a regional approach is important to CE since it "offers significant economies of scale that make opportunities that would not be possible at a small, more local level," which is where the CE principles tend first to be adopted (ZWS, 2018). It is this interconnected, networked approach to the CE that characterizes Scotland's circular policy. In other words, Scottish CE policy is just that, *Scottish*, as it builds on the unique strengths of the country and its regions.

ZWS emphasizes the uniqueness of Scotland's historical and geographical position, claiming it is "well placed for innovating for a circular economy…after all, we have a grand history of innovation," (ZWS, n.d.). Thus, ZWS draws on history and heritage to create a sense of pride in Scottish innovation, which then acts as a motivator not only for further circular innovations, but also as a vehicle for greater public acceptance. Dundee, in particular, has its own unique place in Scottish history with both a rich heritage, a more recent history of economic and social marginalization and an even more recent history of urban regeneration. These conditions make Dundee a unique location to study the development and experimentation of locally specific circular project and policy landscape.

3.5.1 Dundee, From Black Sheep to Creative Cool?

With a population of around 142,000 (McLaughlin, 2017), Dundee is Scotland's fourth largest city and is located on its north-east coast and was once the country's most important east coast trading port (Lloyd, 2004; McLaughlin, 2017). Once known as the city of "jute, jam and journalism," Dundee was hit hard by the 20th century decline in traditional manufacturing, turning it into a so-called "black sheep of Scottish cities" (Geoghegan, 2015: n.p.). In recent decades, this decline turned the city into a "hotbed for social deprivation, unemployment and drink and drug abuse" (McLaughlin, 2017: n.p.). By the early 2000s, Dundee experienced population decline and property vacancies (Lloyd, 2004). Seeking to reverse course, the Dundee municipal authority, along with business and volunteer sectors, launched a major revitalization project: a £2 billion overhaul to the city's image and physical infrastructure focusing on the city centre and the waterfront, along with long-term investments in the retail and cultural sectors (Lloyd, 2004). According to McLaughlin (2017), just over fifteen years on, the benefits of the plan are starting to appear. In 2014, Dundee became the only UK city to be named a UNESCO City of Design and in 2018, the first ever non-London branch of the celebrated Victoria and Albert Design Museum (V&A) opened on the city's waterfront. While such accolades, as well as the 2015 designation by *GQ* magazine as "Britain's coolest little city" (*Dundee Local Development Plan 2019),* do not come with direct funding, they do represent valuable marketing opportunities that opening the door to building networks with designers and organizations in the UK and beyond (McLaughlin, 2017). Overall, creativity has been a hallmark of Dundee's rebirth, and as McLaughlin (2017: n.p.) claims "[d]esign has been one of the main driving forces" behind its transformation.

Dundee's story is also one that underlines the importance of the social aspects of urban revitalization. The focus is part of a nation-wide approach to planning that emphasizes economic

growth while holding a commitment to social justice at its core through the stressing of fairness of outcomes and the spatial redistribution of opportunities (Lloyd, 2004). The City Council's recent development plan includes a commitment to tackling "the root causes of social and economic exclusion, creating a community which is healthy, safe, confident, educated and empowered" and emphasizes livability and sustainability on economic, social and environmental levels (2019:8).

Given Dundee's emerging status as a site of creative regeneration, it makes sense that its approach to circular innovation would be characterized by a similar spirit of creativity and experimentation. Dundee's attempts to rewrite its story, from languishing decline to exuberant revitalization allows it to engage with CE in a way that fits the city and surrounding area's unique heritage, resources and positioning within the country. Tailoring circularity to best fit a particular context requires an understanding of not only the available resources and supports that are in place, but also the kind of practices amenable to circularity. Where such practices do not currently exist, the challenge is to cultivate the thinking and strategies that facilitate them.

3.6 Practicing the Circular Economy

In this section I explore how CE proponents and practitioners, within Dundee and beyond, understand the importance of embedding circularity within the daily practice of individuals and organizations. An understanding of practice within a circular, or more broadly, sustainability context allows us to understand how consumers interact with various sustainability theories and values in ways that illuminate the nuances of their acceptance, rejection or modification of these notions. Cultivating a greater understanding of the everyday material practices and attitudes of those who will be asked to "buy into" the CE is essential as this is a big

ask, since it requires a complete renegotiation of consumer relationships with the objects and practices that are part of daily routines. As Hobson (2019: np) remarks, "we think through and with the 'stuff' of the everyday," and consumers may not yet be ready or willing to relinquish their "stuff" in the name of sustainability.

How have ZWS and other practitioners conceived of CE as a practice, or indeed a series of practices, that inform daily life and behaviours in ways that are meaningful and environmentally beneficial. Interviews with key informants revealed that these actors consider the importance of the human/social level of CE transitions, with particular attention paid to the messaging/branding of CE, as well as the need for behavioural change, at both individual and firm level. Scale, context, and space, in other words, geography, underlie these developments as an important mitigating factor.

As Scotland's main CE hub, ZWS also plays a key role in the messaging around CE. According to one informant, until 2013 the ZWS mission centred more on innovative business models and market development and when it came to their messaging, "[w]e weren't really badging it as CE but that happened quite quickly after that." Within her role, the informant is part of a business support team that also aims to influence local authorities and the public sector on a strategic level to communicate the benefits of CE and to encourage the adoption of circular approaches. With consumers, however, "the messaging isn't about CE necessarily, it's more about recycling for Scotland and reuse and food waste reduction and so on." When asked why ZWS was not taking the CE line directly with consumers, the interviewee responded:

> We've had lots of debates between the team about this. CE is … not quite a policy term, but it's not the kind of language consumers would be speaking necessarily. They'll understand reusing something, so it's just breaking it down like any sector we work with, it's about … translating it into language that's meaningful to them.

Clearly, ZWS understands that CE is not part of the everyday language of most people and in order to make it more palatable, they have chosen more conventional sustainability language, using terms like recycling and reuse, while also appealing to national pride through the idea of "recycling for Scotland."

The need for linguistic clarity is not limited to the household level, however, as the informant remarked that part of ZWS's work is with local authorities who she remarked, "are declaring a climate emergency, and they'll go 'oh, what's that mean, what do we actually do?'" Thus, recognition of a problem does not necessarily translate into a clear course of action. Individuals and organizations cannot be expected to adopt a circular agenda if they do not understand what exactly it means and how they can make the necessary shifts in behaviour to enact such an agenda.

Concerns about the clarity of CE messaging and its potential to influence the uptake of circular practices extend beyond Dundee and the Tayside region. An interview with the project manager for Circular North East (Circular NE) revealed the rather slowly growing awareness of CE within the region's small and medium sized enterprises (SME's). When the Circular NE project, whose objectives include circular waste reduction and the coordination of funding for SME's interested in making the transition to CE, initially began, only 30% of businesses surveyed knew what the CE concept meant and at the time of the interview, that figure had increased to 50%. While it is not clear if Circular NE's sample was representative, the informant noted that "it does give you an idea of the low level of understanding" of the concept.

Not only is awareness low, but raising that awareness poses its own challenges. Unlike an energy awareness campaign, where the messages may be as simple as turning off lights or heat, CE "means something totally different to a fish processor, compared to an oil and gas company,

compared to a construction company, so it's really hard to have any generic messaging around this."

Constructing generic messaging around CE is challenging, but even the messaging woven into the narrative of a particular product may not be sufficient to ensure behavioural change. An interview with an entrepreneur from a circular artisanal cashmere company revealed the limitations of ethical product messaging. The informant, who also managed a publication called *The Green Consumer*, is acutely aware of the complexities of consumer motivation with respect to environmental issues, arguing that there is a lingering stigma surrounding recycled goods:

> [o]ften people associate recycled products with underperformance at some level, whatever they say to you. If I said to you that that's recycled, at some level in your mind you might make an ethical choice but you would accept that it mightn't be as high performance as something that's engineered for performance.

According to one of the informants, the ethical convictions of the producer are typically not sufficient to convince consumers as, "you can't expect everyone to approach the world the way you do." Retailers cannot "expect people to buy based on what you think is right. [It's] not the basis, because only a small segment of society will do that." As marketers of sustainable products, he cautioned, "you can't expect everyone to see the world the way you do …the secret to marketing [is to] reach out [to the consumer] with your product to sell the best characteristics to them." Such changes are often influenced by demographics, as the informant has observed that older customers are more inclined to favour virgin cashmere, whereas millennial customers are "looking with open eyes at it" and are more interested in a garment that has an ethical dimension. If consumers en masse are to ultimately start changing their behaviour with respect to the products they consume, it will take "a generation to establish."

The issue of ethical motivations for changes in consumption behaviour is somewhat murky. Shaw et al. (2015) identify an ethic of care as central to consumer's thinking about ethical consumption, yet it is not always sufficient in guaranteeing changed behaviour. The apparent inconsistencies between attitudinal disposition and action may be explained by the many practical and financial constraints that consumers encounter every day (Shaw et al., 2015). Hassan et al. (2016) also identity a gap between behaviour and intention in ethical consumption patterns, which they believe can be moderated if there is a planning stage between intention and action. Once again, consumer behaviour and practice are highlighted as key targets of ethically-minded producers. Cultivating positive dispositions towards more environmentally friendly consumer goods is only the beginning stage, as true change requires concrete actions that follow through on these attitudes.

Behaviour and routine were also stressed during an interview with a manager of Circular Tayside, as highly important, yet often somewhat intractable factors that must be considered when implementing CE both on personal level, as well as on a business level. This point was raised by ZWS's Cities and Regions programme manager, who is based in Dundee and works though the Dundee and Angus Chamber of Commerce. Her mandate is to mobilize existing business networks between regional SME's to educate these organizations about CE.

The informant stressed the need for legislative change as a remedy for the lack of action on meaningful implementation of CE. At the time of the interview, the Scottish Government had recently announced a bill that would make it legally binding for businesses to follow a CE model. According to the interviewee:

> [g]enerally, I think [one of the central strategies] of CE within a policy context [is] that legislation has to change because a lot has been tried with behavioural changes, but behavioural changes, unless they make a profit for an SME or unless they are easy for an individual, they're not going to happen.

The implication here is that CE implementation requires more than helpful nudges in the right direction. Indeed, concrete legislation is necessary to overcome behavioural, financial and structural hurdles. Embedding sustainable practices into a company's structure can also facilitate more seamless circular transitions, as is the case of ZWS where staff are permitted to work from home and are required to take the train or bus instead of flying when traveling and even the temperature of the office spaces is monitored in order to minimize carbon emissions.

Based on the interviews, one of the biggest obstacles to CE is the general lack of understanding about the concept, the availability of options, routine and levels of trust. Even for those who live in urban areas with greater access to CE resources and business models, "you have very innovative business models that people don't understand or trust." This informant offered the example of a car rental service that allows subscribers to receive a card which allows access to any of the company's cars that are parked around the city of Dundee. The objective is to disengage people from the concept of car ownership by giving them the ability to rent a car without having to worry about insurance or other problems. Yet, as the interviewee remarked,

> while it is a very circular model and in theory it works well, in practice however, the majority of people don't know about it. It's about people opening the mind and adopting new business models and making them a new routine.

In this particular scenario, it is not so much a question of lack of innovative business models or even the availability of those models, but rather awareness, routine, attitude and trust. There are a variety of reasons why people make the decision they do with respect to sustainability, not all of which are readily apparent. Hobson (2019: n.p.) mentions our deep

attachment to everyday objects, which means that "replacing them with dematerialized services may neither appeal nor always be feasible."

Finally, an interviewee pointed to some of the misapprehensions about recycling and CE, which is in keeping with the statement on ZWS's website that "[m]any people think of the circular economy as 'just getting better at recycling,'" though it goes much further (ZWS, n.d.). Offering a personal observation, she remarked that "people don't see the waste hierarchy as a whole and the first step is waste prevention," despite the assumption by many that recycling is the first step. This can sometimes do more harm than good. For example, scores of businesses interested in the CE tend to close single waste streams and as a result develop often unforeseen externalities, in that "they come up with ideas that are circular but they're not necessarily environmentally friendly." Such was the case of a company that dealt with cherries and had a lot of cherry pits as waste. They decided to process the pits into an exfoliant, and in so doing, were burning fossil fuels, creating packaging and distributing the exfoliant, thus "it just became a product like any other." The pits were perfectly biodegradable and, in this case, just allowing them to rot would have been the more environmentally friendly option. This observation fits with the findings of Horvath et al. (2019) who caution that current CE metrics focus on input indicators like material consumption and resource productivity, while neglecting the issue of waste generation, and in fact, the CE can actually *encourage* high waste generation.

Beyond the misunderstandings that characterize some circular experimentations, there are the very real obstacles to the practicability of the CE that businesses may encounter. As the informant from Circular NE stated, while new companies may be very actively engaged with CE, "trying to change the way existing businesses work, it is a major challenge, because it's hard for them to move because they are part of a supply chain" and thus may be constrained by the

demands of their clients or their suppliers. In the informant's opinion, "the lack of available options within the market that are genuinely circular makes it hard for a lot of businesses to actually do a lot." Another interviewee in the North East who works with Aberdeenshire Council's Sustainability and Climate Change team echoed the difficulty in shifting supply chains, particularly with respect to procurement contracts. The informant stressed that in order for circular initiatives to succeed, "you can't just do it on your own" and that you need links with community organizations and businesses. The informant cited the example of the UK-wide Circular Office Initiative, which recruits various organizations to work on making their workplaces more circular during office moves and refurbishment.

Sometimes collaboration can come from unexpected places, as an informant with a business consulting company in the Scottish North East illustrated with an example of a sustainable wastewater treatment program for the fishing industry. The informant's company conducted a feasibility study for regional fish harvesters and suggested a collaborative stakeholder approach to wastewater management. While these companies are competitors and are "normally at each other's throats," because the informant's company was seen as an "honest broker" in the situation, the harvesters were able to work together on this one initiative, even if they continue to compete on all other fronts. If implemented correctly, the CE may be able to disrupt certain established routines and practices by engaging disparate actors to work together to achieve a common goal. Here, the CE stresses an integrative, multi-actor approach and the insights offered by the informants suggest that successful circular initiatives already have a collaborative element to them, a potential positive indicator of future CE projects. Geography plays a role in both the type of business and the acceptance of CE models.

While ZWS did not yet have enough of a portfolio to determine a pattern in the type of businesses for which CE models tended to fit most readily, the interviewee from Circular Tayside offered her own observation. Tayside is a largely rural area with a lot of agriculture and the informant believed that food and agricultural businesses were a more natural fit than construction or oil and gas. Additionally, she observed that rural businesses tend to be more established and traditional, and that "extremely rural economies are more circular by nature," even though bigger cities have greater access to resources. Her sentiments were echoed by the Aberdeen-based informant who remarked that, while expressing his personal opinions which should be "taken with a grain of salt," he believed that rural communities were well ahead of other regions in terms of making the most of their resources. The strong sense of community and place in these rural areas may also facilitate the cultivation of local level circular networks. The informant additionally stressed the essential role of transportation networks if resources are to be shared efficiently and easily in a circular model. Overall, the above interviews revealed important directions of CE policy makers and practitioners need to take if the CE is to truly have a meaningful impact by becoming part of daily practice and routine. It is essential that its practitioners and proponents are able to offer clear messaging around CE, not just to encourage its adoption, but to avoid any potential pitfalls. Of equal importance are the supports that must be offered to reinforce the messaging and to ensure meaningful behavioural change.

These interviews clearly demonstrate that, in many respects, CE has yet to truly exist either as a mainstream policy or enter into the daily lexicon of people, even in a country with a relatively robust CE agenda like Scotland. There are some promising indicators, however, that some circular practitioners are thinking about the potential shortcomings of their messaging and ways in which these deficiencies may be mitigated. Changing habits and behaviours is a

potential positive side effect of cultivating a smaller scale, localized CE. According to Williams (2019), not only does the localization of resource flows in a circular environment maximize benefits and reduce negative externalities, but the tighter feedback loops can also act as catalysts for behaviour changes that can lead to more environmentally beneficial outcomes.

If a CE forces us to re-examine and recalibrate our daily practices, nowhere is this more deeply felt than in our relationships with the material "stuff" of our daily lives. Just how effective a circular agenda will be in transforming our material realities is unclear, but insights gained from those involved in circular craft may illuminate some of the creative strategies that could play role in changing the stories we tell about the objects in our lives, thus transforming the way we value and relate to them.

3.7 Crafting the Circular Economy

The culture of craft production, and the subsequent consumption of those crafted goods, is a particular kind of ethical consumption that connects with various threads of politics, ideology and identity in ways that attempt to recalibrate the relationship between creator/consumer/object. Craft culture emphasizes slow production and personal expression against a backdrop of rapid mass-production and, as such, critiques contemporary technological regimes and "the culture of speed" (Bratich & Brush, 2011:235-6). By creating a "slow space" to contrast regimes of "hyperproduction," crafting "ruptures the seamlessness of the technological present" (Bratich & Brush, 2011:236).

It is this ideological and material opposition to current systems of production and accumulation that gives many contemporary crafting movements an overtly political dimension. Despite the emphasis on recovering and revalorizing "old time" heritage skills and approaches,

so-called “craftivists” frequently express progressive political beliefs, adopting both global and local perspectives and resources to further agendas of ethical production (Williams, 2011). This often includes the use of thrifted and recycled materials as a means of resisting “mass circulation” and excessive consumption. Craftivists are thus engaged in a “contemporary memory project that reconstitutes the past as much as they are participating in “a social justice-oriented movement concerned with modifying the present and shaping the future” (Williams, 2011: 307).

Bruach Cashmere, a Dundee and Angus Chamber of Commerce (DACC) member, is a CE-based fashion design company that blends traditional craft techniques with a contemporary environmental ethos. As their profile in the DACC magazine *Connected* states: “Bruach’s studio has combined the best of old and new, luxury and ethics in a contemporary way” (DACC, 2018:9). While it would be inaccurate to characterize Bruach as a “craftivist” enterprise, the company is clearly aligning itself with many of their values, such as the recovery of heritage crafting techniques, an environmental agenda, and the reduction of mass circulation of materials through the use of recycled ReVerso cashmere yarn sourced from Italy. An interview with Bruach’s manager/founder/director revealed his engagement not only with circularity, but also with the complexity of consumer motivation and commercial viability. The interview followed two main thematic strands: the first being the importance of production techniques that respect heritage skills yet are scalable in a contemporary context and the second being the importance of consumer motivation in both and acquisition and preservation of garments.

The company, from its name onwards, is indebted to Scottish tradition and heritage. The word “bruach” is Gaelic for riverbank, where woolen mills would have been located. The garments are produced through the traditional knitting technique of *intarsia*, which appeals to the

informant, an industrial designer and artist who, at the early stages of the company's development thought, "should we just look at them [traditional artisanal skills] … as a curiosity from the past, or are they something that can be part of an optimistic future?" Interestingly, Bruach's production model includes machine intarsia, as it allows for larger scale production, even though hand intarsia allows for a greater variety of patterns. What is crucial about this process is the notion that "you're working with the machine not the other way around." Concerns about the supposed inauthenticity of machine produced goods, in contrast to the supposed authenticity of handicrafts have been part of the craft movement since 19th century industrial capitalism's usurpation of the craft movement in favour of a mechanized model of production (Banks, 2010).

Despite the somewhat idealistic notions of early craft movement proponents, as well as the beliefs of modern day crafters who see an ethic that has been "perverted" by means of mass production, there remain doubts as to whether small scale craft production is a viable economic force for change and whether it is accessible to all (Elliot & Richardson, 2017). Bruach is attempting to negotiate realistically between smaller and larger craft production scales, which brings their work into conversation with the CE. The interviewee observed that:

> [with] the Circular Economy, you talk about geographic links, if you're establishing a manufacturing industry, realistically you're looking at economies of scale. You can't just say we hand make a garment; it can be done, but you're pricing yourself into a [unclear] sector. You'll make an impact, but a small one.

In this way, Bruach's vision of circularity reveals itself to be firmly located in the local but with a more global reach when it is necessary. Honouring Scottish techniques while also adhering to their environmental commitments means that the company needs to think strategically about what parts of their operation are scalable and which are not. In this case, a completely handmade

model would be impracticable and would sacrifice the company's environmental/circular ethos for a supposed veneer of artisanal authenticity.

Bruach's pragmatism also extends to their choice of material and techniques. This business model made sense for its particular location, since "it just so happens that in Scotland there are people who have intarsia skill, which creates something relevant to Scotland…Scotland's known for cashmere so therefore it makes sense to harness those skills." Yet the cashmere they are using is sourced from Italy, as that is the only feasible source at this time. These choices show that the company is thinking and acting locally when possible, but also that they are willing to go beyond the limited local scale when necessary. Scale matters, as does scalability, although that does not "preclude smaller workers from having a part of that process." With a broad manufacturing base, a company can have a "pixelated capacity" that allows for more diffuse production facilities, rather than just one large factory. This vision of circular production allows for actors operating on various scalar levels to participate meaningfully to the process while ensuring the overall operating model is practical and effective. Communication and transportation are the essential elements in forging connections between remote and rural crafters who are frequently the living repositories of heritage skills, although "everything…is both a weakness and an opportunity in equal measure" since "often traditional people are the least connected to modern technology." Establishing a workers' collective can overcome this obstacle, even in remote areas where you are "geographically distant but quite close because you are connected through your work."

Crafting is not just about heritage skill and techniques, however, it is also about recalibrating the consumer's relationships with the objects being consumed. This process can involve a drastic change in mindset and values, which is not always easily achievable. Nor does

it necessarily imply luxury as artisanal industries and circular craft can exist at the very micro level. An informant who is the founder and manager of a skills training/vegan café social enterprise discussed the 'crafty' aspects of circularity within her enterprise. As part of the enterprise's skills programming for people with additional needs, the informant teaches craft classes and uses donated materials as much as possible. She remarked, "I don't think we've bought fabric ever" and "we're always asking people not to throw out bed sheets or even towels, which we can cut up to make face scrubs, which in turn provide a skill development for individuals who are facing barriers and taking away from landfill." Here, craft is employed for the double purpose of teaching a skill to marginalized individuals while also reducing material waste.

The café portion of the enterprise also offers the potential for craft opportunities, as the glass jars that products such as mayonnaise come in can be used in the craft classes. The informant also told me that the café recently received a large donation of fruit that they used to make jam which was in turn used in their cakes or bottled in reused jars and sold at craft sales. The proceeds of these sales go towards buying new craft materials, if necessary.

The informant also participates in the local Gate Church Carbon Saving Project workshops, which focus on sustainable crafting such as homemade hand wash, disinfectant sprays and wax food wrap. Additionally, the informant cited the growing number of sustainability-focused craft markets in Dundee, particularly around Christmas time, such as the one in which her enterprise would be participating. These markets ban plastic and focus on handmade, sustainable products. While these examples are small in scale and may not signal dramatic societal change, their existence and the thinking that underlie them demonstrates shifts towards a creative re-evaluating of material waste. That they are a source of income for the

enterprise indicates that craft production could be used to supplement the income of various businesses, even if they are not focused specifically on crafting. This idea is corroborated by research conducted in the Netherlands with an informant working to integrate circular spaces into the fabric of a Frisian community (see also Chapter 3). One such initiative is the flowering of second-hand shops that offer a more boutique-like shopping experience, in order to de-stigmatize thrifting. These shops also sell new products like bags make of recycled textiles. Such products are not only a revenue generator, but also serve to cultivate and enforce the idea of circular goods as fashionable and discerning choices.

It is worth mentioning that while I was unable to arrange an interview with Arbikie Distillery, an artisanal spirit producer, the business was mentioned to me as a potential circular business. The owner of Arbikie is an ambassador for Circular Tayside as the business prides itself on being a "farm-to-distillery" operation, employing a sustainable and traceable approach to its production (*Circular Tayside*, n.d.). In this case, the sustainability/circular angle of the business is leveraged as a sign of quality and exclusivity, recalling craft production and consumption's appeal to discerning and thoughtful consumer mindsets. Such an approach may not always be feasible, as Arbikie was established on a family farm with centuries of heritage behind it. Other distilleries may not be able to replicate this model. As the informant from Circular North East observed, many circular operators are still working on a very low level and "it may not be economic for every single whiskey distillery to have its own piece of equipment." While not referring specifically to Arbikie, the informant correctly acknowledged the challenge of integrating circular technologies into a specific craft industry. Just how much of a role circularity can play in Scottish artisanal industries is uncertain, as these developments are in their infancy. The small scale of craft industry may make them more appealing targets of circular

innovation, however, as craft industries stress the care and attention that go into the creation of their products. The smallness of these operations is what makes them marketable and it is reasonable to assume that circularity could be integrated as another such artisanal production technique.

3.8 Towards a Socially Just Circularity

The discussion of the social dimensions of CE extends beyond a renegotiation of daily practice and material relationships brings us to a little discussed aspect of the CE: its potentially transformative power to create a more just and inclusive society. While there is a paucity of literature on the subject, it is worth considering how CE aims may be harnessed to a social justice agenda. When researchers such as Gregson et al. 2015, Hobson & Lynch, 2016 and Welch et al. 2017 call on CE practitioners and proponents to consider more diverse and non-traditional economies as part of their circular agendas, the Social Circular Economy may be one such option, as it challenges both CE and social enterprise to dig more deeply and to compensate for their respective deficiencies.

My interview with the founder and manager of the social enterprise Uppertunity and its offshoot vegan café, Serendipities, revealed a commitment to positive social outcomes within the context of circularity. As articulated by the informant, the CE should have both intangible and material benefits. While small in scale, the case study of Uppertunity and Serendipities offers valuable insights into the ways in which circular principles can be harnessed as part of an overall progressive social agenda.

According to a report of the same name by the Social Circular Economy foundation, there is a strong potential to unite CE with social enterprise, a business model where entrepreneurial acumen is harnessed in the service of societal good and positive change (Robinson, 2017). A so-called "social circular economy unites the Circular Economy and social enterprise concepts to deliver benefits for people, planet and profit" (Robinson, 2017: 4). The benefits of combining the two concepts is that one can compensate for the deficiencies of the other. Practitioners of the CE may be so focused on maximizing resource value that they overlook the "negative externalities created by a capitalistic model" (2017:5). Similarly, social enterprise practitioners may concentrate so much on both social progress and financial profit that they fail to attend to the "*negative environmental externalities created by a capitalistic model*" (2017:5). Thus, by merging the two, one is able to "'fill in the gaps'" (2017:14) that may arise when either of the models operates in isolation. Uppertunity is a social enterprise that aims to help adults with additional needs gain life and employability skills, which includes volunteering at Serendipities. The informant and her husband were inspired to start the enterprise by their previous experiences working with individuals with additional needs in other sectors. Feeling frustrated that the skills of these individuals were not being harnessed, "we thought, there's just wasted talent here, so we decided to create our own model."

The informant came to the CE in an almost inadvertent way. While she and her husband were aware of their impacts on the environment, as well as their "effect as human beings in our community and that was kind of a positive driving force of the concept and the model," the "actual term Circular Economy came later or perhaps [it was] a new concept for us," even though "the idea was always there." Material sustainability is part of the ethos of Uppertunity/Serendipities, as they use repurposed materials in crafting classes and donations of

surplus food in their café (they also donate their excess food to a community fridge), it is the "intangible and social stuff" that is the "real focus" for the informant. As she stated, "Circular Economy goes a bit further for us, rather than just physical goods. *It's about individuals being part of the community and having a say in how community runs.*" She stressed cultural and intergenerational mixing as a key part of her vision of a sustainable/circular community where "sharing resources, sharing skills, supporting one another can make a difference." This could be something as simple as volunteers telephoning or delivering food to older individuals who are dealing with isolation. The model that Uppertunity/Serendipities have cultivated is one that blends physical/material with social/emotional in unique and surprising ways.

The café part of the enterprise is vegan, a choice they made because "we believe in equality for every living being, so animals and any individuals facing barriers and the second part was creating a sustainable future and a plant-based diet is a big factor is that." The healthfulness of a vegan diet is also a motivating factor because "if individuals are healthier, less strain on public services. All of these things molded to a physical and emotional Circular Economy. I don't know what other word you would use for it, the non-physical part." The holistic nature of the interviewee's vision of CE allows her to make connections that may not be immediately apparent to other CE practitioners. When asked if CE could help those who fall through social cracks or gaps, she responded, "the foundation of Circular Economy is to get rid of these gaps and these shortfalls and all these things just dropping away so individuals and communities that are dropping away and that aren't even in the loop yet, [you] can get them into the loop." Closing the loop, in this context, is not so much about the material loops of production or consumption so much as it is about creating an inclusive social network where no one is allowed to fall through the cracks, because, in the model she is imagining, such cracks are non-

existent. This is perhaps of particular importance in Dundee, due to its recent history of social deprivation.

The insights from Dundee are corroborated by a Dutch informant who is working on shifting attitudes towards circularity. In his community there are seven second-hand shops that aim to show consumers that donating to and shopping at these establishments is an ethical and socially desirable choice. As the informant stated, "you don't have to throw everything away, you can make another one happy with that." Beyond considerations of the happiness of others, the shops also employ people with disabilities, recent immigrants and other marginalized people to build their self-esteem and to give them the skills and confidence to (re)integrate into society. For the CE proponents, "that's not a commercial thing, really, that's more a social role and also how we want to create…an inclusive society."

While the Dundee and Netherlands informants were clear in their articulation of their desire to employ CE to foster social inclusion, CE may not always be positioned to deliver such an outcome. Koumparou (2017: 7) cautions that "it is not clear how circular economy will contribute to social equality" as it is fundamentally a business model and its main challenge is be workable as such. Even if the CE model "has the best of intentions and leads to the right direction, the missing link of social sustainability is very weak or at least sounds vague" (7). Similarly, Schröder (2020) emphasizes the need for a so-called "just transition" within CE, whereby environmental concerns are considered alongside social and human issues. If not, the CE "will not deliver on important social goals" such as health, reduced inequality and the future of work (Schröder, 2020: 28). There are lingering questions about the ethical and social commitments of CE practitioners, as underlined by the consultant from Scotland's North East, who cited a local company that sells dried fish heads and spines (considered waste product in the

Scottish fishery) to Nigeria where they are used to make soup. While this enterprise serves an important social purpose, the motivations for doing so were not completely humanitarian in nature, as the company saw a gap in the market that they could fill and from which they could make a profit. The financial sustainability is still the primary concern for circular companies, regardless of their apparent commitment to social and environmental agendas.

Understanding the limitations of CE's socially inclusive capacity is essential for those who see it as a potentially beneficial strategy for empowering marginalized populations. Without such considerations, there is a risk that socio-economic inequalities could be reinforced. Two interviews in the Canadian context raised this possibility. An academic researcher studying CE in rural Québec remarked that policies and practices that lengthen the duration of use of products was found to help promote inclusion. She attributed this phenomenon to the fact that the repair jobs necessitated by this model were "not very good jobs," meaning that they opened employment opportunities for unemployed or other marginalized people. If these jobs are rejected by the rest of society, however, there is a risk that (at least certain) CE jobs will reinforce existing social divisions. Even on the consumer front these inequalities can be heightened by CE. A Canadian informant working on economic development, Smart Cities and CE, with a specific focus on food, commented that in the move to prevent edible food from becoming waste, "it turns into a demographic issue because you don't always want to say this extra food or this food we don't want, it can go to these people because they can use it." The informant stated, "there needs to be an even playing ground for food. It shouldn't be that I can afford to buy the best looking thing and I but that and I leave the gross looking stuff for someone else because they can afford it." Within the CE, there are clearly outstanding social, economic

and material concerns that remain unsolved and that point to potential weaknesses in the circular model.

Within this context, the smallness of Dundee is to its advantage as it allows for the establishing and maintaining of healthy community connections and networks that facilitate a social circularity that may not be possible in larger centres, although larger centres have larger resource bases on which to draw. The informant recognized the advantages and challenges of operating in Dundee, observing that:

> it has its pros and cons. Networking-wise it's good, it's easier to network, however, you tend to meet the same people, so I think maybe you're not being challenged enough in smaller cities, whereas in a bigger city you've got…more of a diverse amount of individuals.

Ultimately, for the informant, despite the potential drawbacks, the "spirit of cooperation is greater" in smaller centres and:

> Dundee, for being a small-medium city, there's more spirit than in Edinburgh. I think that's one of the pros of being small: you get to know people…maybe you don't get challenged with as many ideas but…you do tend to support each other.

The socio-material elements of CE are also apparent in the networks in which Uppertunity/Serendipities is involved, starting with their location in The Circle, a hub for social enterprises and charities that offers space for co-working, meetings and rentals, which also houses Uppertunity, including its teaching kitchen, crafting space and garden. Calling itself a "'More Than Profit' hub for charities, community groups and socially aware businesses in Dundee" (The Circle, n.d.). The offer affordable office, co-working, community as well as meeting and event spaces (The Circle, n.d.). The Circle's vision corresponds well with Serendipities' mission, as it aims to "contribute to a vibrant, enterprising and sustainable community, with improved quality of life, which allows the whole community the opportunity to

fulfill their social aspirations through upskilling, work, volunteering, social, educational and leisure opportunities" (The Circle, n.d.).

During my time in Dundee, I was able to visit The Circle and speak with a number of staff. Originally built as a campus-style government skills training centre in the 1960's, the building was later taken over by a social enterprise. When the social enterprise went into liquidation approximately four years previous to our conversation, the current Circle administrators repurposed their office supplies. The Circle serves a doubly regenerative purpose because it is repurposing an out of use building (including its furnishings) and also through its accommodation of, and support for, organizations that are working to build and strengthen healthy community ties.

The insights offered by the informant show the vital importance of thinking small, as well as thinking big, when it comes to CE. Building connections across smaller geographical areas is key to their iteration of circularity. As social issues "reside by their nature with people," "localized and distributed models" are necessary to meet the needs of people within communities (Robinson, 2017:16). Uppertunity/Serendipities is engaged in exactly this kind of outreach, further evidence that their somewhat idiosyncratic and highly specific form of CE allows for a kind of forward thinking, inclusive form of circular thinking that may allow smaller practitioners to better meet the needs of their communities without strict adherence to prescribed circular agendas. Socially conscious CE practitioners are, by the very nature of their enterprises, heeding the call for a more socially engaged form of CE. The founder of Uppertunity/Serendipities is engaging with CE in a way that makes sense for her, which entails a thoughtful intersection of the social and material aspects of sustainability where one cannot be divorced from the other.

3.9 Conclusion

The CE concept continues to gain popularity as an all-encompassing 21st century sustainability strategy. As it gains ever more traction, however, it is outstripping the pace of necessary critical interrogation. Much of this interrogation needs to come from social sciences researchers (Hobson & Lynch, 2016). If the CE model is to achieve universal adoption, it is essential to understand the ways in which CE operates across *all* geographic scales and contexts. Smaller and more peripheral spaces have much to teach us about the critical innovation and creativity being shown in the reshaping and reimagining of circular narratives.

I return now to my main research question of what does the CE look like in Dundee when we apply the lenses of daily practice, craft production and consumption and social justice. The purpose of this research is to understand how these dynamics are in play at a micro level in order to better understand how the various actors are conceptualizing and stretching (or shrinking) the concept of CE in order to make it work for them in their particular contexts. Additionally, I strive to understand what factors facilitate or inhibit the adoption of CE. What I learned is that the CE in Dundee looks like the CE in many other locations, i.e., it emphasizes the importance of waste reduction and the need to change routines and build trust in new product and service models. It also looks distinctly like a CE that is emerging from the particular cultural and geographical context of Dundee and its surrounding areas. There are elements of this CE that are highly specific in nature, such as the model developed by Bruach, that has grown out of Scotland's artisanal heritage skills or Serendipities' community minded enterprise that aims to serve individuals with additional needs.

The circular narratives I discovered in Dundee reveal important insight into the ways in which local actors shape and tailor CE policy and practice to "right scale" it to their unique

contexts. The lessons learned here are not meant to be directly transferable to other places, as they are intensely local and site-specific in nature. It is this characteristic, however, that makes these local lessons most universal. Peripheral spaces, such as Dundee, offer us the opportunity to explore those in-between narratives of circularity that occur along the line between policy making in major urban metropoles and their application in the everyday, lived reality of those who will be asked to participate in the CE (ultimately, everyone in that society). Peripheral spaces are unique sites of sustainability experimentation that are both acted upon by and acting on national policy initiatives. Operating at a small-scale allows local actors to take an idea and engage with it in unique and creative ways that reveal the potential of CE to shape and be shaped by the sites of its application. In this way, we can better understand what a local CE might look like if it is crafted to meet the needs of those in the sites of its application. These actors are attempting to shape Dundee into a model of the holistic circular city described by Williams (2019) in which practices and consumption patterns are changed in order to shift away from material to service provisioning, all in the name of a more circular society. Within this shift, it is essential that individual citizens buy into the circular narrative that is proposed, meaning the value and ultimate outcomes of such an approach need to be clearly articulated.

The CE practitioners and proponents I interviewed in and around Dundee revealed two major insights into the starting points of the circular conversation in smaller spaces. The first is the capacity of CE to transform our relationships with our material goods, as well as our daily practices, necessities in the shift towards circularity. The renegotiation of these relationships is challenging and it requires clear messaging from all who are invested in CE, from those drafting circular agendas to those selling sustainable goods, to those involved in community outreach. In order to draw citizens and customers into the CE narratives, the motivation for doing so must be

made clear and individuals need to see how circular practices can benefit themselves, their communities and societies in general. These transitions are not simple and straightforward, therefore true, sustained engagement with circular principles and their promotion is key.

Secondly, the case study of Dundee revealed how peripherality/marginality (social, economic or geographic) can be a springboard for creativity and problem solving. Rather than being defeated by challenges, peripheral actors may become more motivated to find and fit circular solutions to their circumstances. An experience of marginality may also awaken the desire to craft a more just, inclusive vision of the CE. Here, environmental sustainability intersects with community sustainability in sometimes surprising ways. An inclusive model of the CE emphasizes the social aspects of the practice that are sometimes sidelined in the wider conversations that focus on the environmental and economic aspects of the practice.

Ultimately, the circular narratives involved in Dundee reveal the human face of CE. A circular economy is not located solely in manufacturing and industry, but also in the everyday behaviours and interactions that characterize daily life. Insight from the circular periphery reveal a more holistic vision of the CE, one that is pragmatic and materialistic, but also humane and inclusive.

3.10 References

Accorsi, R. R. Manzini, C. Pini & S. Penazzi. (2015). "On the design of closed-loop networks for product life cycle management: Economic, environmental and geography considerations."*Journal of Transport Geography 48*(2015), 121–134.

Autio, M.; Heiskanen, E.; Heinonen, V. Narratives of 'green' consumers—The antihero, the environmental hero and the anarchist. J. Consum. Behav. 2009, *8*, 40–53.

Baldacchino, G. (2015). "Placing Identity: Strategic Considerations for Rebounding Peripheries." In K. Vodden, R. Gibson & G. Baldacchino (Eds.), *Place Peripheral: Place-Based Development in Rural, Island, and Remote Regions,"* St. John's: ISER Books, 41-63.

Banks, M. (2010). "Craft labour and creative industries." *International Journal of Cultural Policy,16*(3), 305-321.

Bratich. J.Z. & Brush, H.M. (2011). "Fabricating activism: Craft-work, popular culture, gender." *Utopian Studies, 22*(2), 233-260.

Bryant, R. L. & Goodman, M.K. (2004). "Consuming narratives: the political ecology of 'alternative consumption.'" *Transactions of the Institute of British Geographers, 29*(3), 344-366.

Camacho-Otero, J., Boks, C. & Pettesrsen, I. N. (2018). "Consumption in the Circular Economy: A Literature Review." (2018). *Sustainability, 10*(8), https://doi.org/10.3390/su10082758

Campbell, C. (2005). "The Craft Consumer: Culture, Craft and Consumption in a Postmodern Society." *Journal of Consumer Culture, 1*(5), https://doi.org/10.1177/1469540505049843

Cardoso, J. L.(2018). "The circular economy: historical grounds". In A. Delicado, N. Domingos & L. de Sousa (Eds.), *Changing Societies: Legacies and Challenges. Vol. iii. The Diverse Worlds of Sustainability,* Lisbon: Imprensa de Ciências Sociais, 115-127.

Carfagna, L. B., Dubois, E. A., Fitzmaurice, C., Ouimette, M. Y., Schor, J. B., Willis, M., & Laidley, T. (2014). An emerging eco-habitus: The reconfiguration of high cultural capital practices among ethical consumers. *Journal of Consumer Culture*, *14*(2), 158–178.

The Circle (n.d.). *About.* https://thecircledundee.org.uk/about/

Circular Tayside. (n.d.). *Iain Stirling, Arbikie Distillery.* https://circulartayside.co.uk/ambassador/iain-stirling-arbikie-distillery/

deMan, R. & Friege, H. (2016). "Circular economy: European policy on shaky ground." *Waste Management & Research, 34*(2), 93-95.

Dundee and Angus Chamber of Commerce. (Winter 2018). "Embracing the Circular Economy in Style." *Connected,* Issue 1.

Dundee City Council. (February, 2019). *Local Development Plan*.

Edbring, E.G., Lehner, M., Mont, O. (2016). "Exploring consumer attitudes to alternative models of consumption: Motivations and barriers."*Journal of Cleaner Production, 123*(1), 5-15.

Ellen MacArthur Foundation. (2013a). *Towards the Circular Economy - Economic and Business Rationale for an Accelerated Transition.*

Eliott, S. & Richardson, M. (2017). "Maker culture and the possibilities of attached consumption. *Arena Journal, 47/48*, 213-231.

Fitjar, R.D & Rodríguez-Pose, A. (June 2011). "Firm collaboration and modes of innovation in Norway." *Research Policy, 42*(1), 128-138.

Geng, Y., Doberstein, B. (2008). "Developing the circular economy in China: challenges and opportunities for achieving 'leapfrog development'." *International Journal of Sustainable*

Development and World Ecology 15, 231-239.
Geoghan, P. (2015, June 22). "Dundee: from black sheep of Scottish cities to 'living cultural Experiment." *The Guardian.* https://www.theguardian.com/cities/2015/jun/22/dundee-scotland-design-v-and-a-culture-regeneration-minecraft-grand-theft-auto
Ghisellini, P., Cialani, C. & Ulgiati, S. (2016). "A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems." *Journal of Cleaner Production, 114*, 11-32.
Gospodini, A. (2006). "Portraying, classifying and understanding the emerging landscapes in the post-industrial city." *Cities, 23*(5), 311-330.
Grabher, G. (2018). "Marginality as strategy-Leveraging peripherality for creativity." *A Economy and Space, 38*(3), 1785-1794.
Gregson, N., Crang, M., Fuller, S. & Holmes, H. (2015). "Interrogating the circular economy: the moral economy of resource recovery in the EU." *Economy & Society, 44*(2), 218-243.
Hassan, L.M., Shiu, E. & Shaw, D. (2016). "Who says there is an intention-behaviour gap? The empirical evidence of an intention-behaviour gap in ethical consumption." *Journal Of Business Ethics, 136*(2), 219-236.
Hawkins, R. (May 2012). "Shopping to save lives: Gender and environmental theories meet Ethical consumption." *Geoforum, 43*(4), 750-759.
Hobson, K. (2015). "Closing the loop or squaring the circle? Locating generative Space for the Circular economy." *Progress in Human Geography, 40*(1). 88-104.
Hobson, K. (2019). "'Small stories of closing loops': social circularity and the everyday circular economy." *Climatic Change*. https://doi.org/10.1007/s10584-019-02480-z
Hobson, K., & Lynch, N. (2016). "Diversifying and de-growing the circular economy: Radical social transformation in a resource-scarce world." *Futures*, *82*, 15–25.
Hobson, K., Lynch, N., Lilley, D., and Smalley, G. (2018). Systems of practice and the Circular Economy: Transforming mobile phone product service systems, *Environmental Innovations and Societal Transitions*, *26*, 1-11.
Holmes, H. (2015). "Transient craft: reclaiming the contemporary craft worker." *Work, employment and Society, 29*(3), 479-495.
Jedelhauser, M & Binder, C. (2018). "The spatial impact of socio-technical transitions – The case of phosphorus recycling as a pilot of the circular economy." *Journal of Cleaner Production, 197.* DOI: 10.1016/j.jclepro.2018.06.241
Jones, P. & Comfort, D. (2018). "Major European retailers and the circular economy." *Geography, 103*(3), 162-166.
Kapp, P. H. & Armstrong, P. J. (2012). *SynergiCity: Reinventing the Postindustrial City.* University of Illinois: DOI: 10.5406/j.ctt3fh3d7
Kalmykova, Y., Sadagopan, M. & Rosado, L. (2018). "Circular economy-From review of theories and practices to development of implementation tools." *Resources, Conservation & Recyclying, 135*, 190-201.
Kirchher, J., Reike, D., & Hekkert, M. (2017). "Conceptualizing the circular economy: An analysis of 114 definitions." *Resources, Conservation & Recylcing, 127*(2017), 221-232.
Korhonen, J. & Honkasalo, A.& Seppälä, J. (2018). "Circular Economy: The Concept and its Limitations." *Ecological Economics, 143*(C), 7-46.
Koumparou, D. (2018). Circular Economy and Social Sustainability, *Proceedings of Solid Waste Management & its Contribution to Circular Economy*. Athens, Greece.
Lakatos. E. S., Cioca, L-I., Dan, V., Ciomos, A. O., Crisan, O. A., Barsan, G. (2018). `` Studies

and Investigation about the Attitude towards Sustainable Production, Consumption and Waste Generation in Line with Circular Economy in Romania." *Sustainability, 10*(865), doi 10.3390

Lloyd, G., McCarthy, & Peel, D. (2004). "The re-construction of a small Scottish city: re-discovering Dundee." In David Bell and Mark Jayne (Eds.), *Small Cities: Urban Experiences Beyond the Metropolis* (pp. 105-120). Oxon: Routledge.

Lorek, S. & Fuchs, R. (2013). "Strong sustainable consumption governance-preconditions for a degrowth path?" *Journal of Cleaner Production, 38,* 36-43.

Massey, D. (2005). *For space*. Sage: London.

Mathews, J. A., & Tan, H. (2011). "Progress toward a circular economy in China: the drivers (and inhibitors) of eco-industrial initiative." *Journal of Industrial Ecology*, *15*(3), 435-457.

McLaughlin, A. (June 19, 2017). "How Dundee is driving social change through design." *Design Week.* https://www.designweek.co.uk/issues/12-18-june-2017/dundee-driving-social-change-design/

Merli, R., Preziosi, M. & Acampora, A. (2018). "How do scholars approach the circular economy? A systematic literature review." *Journal of Cleaner Production, 178*(20), 703-722.

Monios, J. & Wilmsmeier, G. (2012). "Port-centric logistics, dry ports and offshore logistics hubs: strategies to overcome double peripherality?" *Maritime policy and management, 39*(2), 207-226.

Mylan, J., Holmes, H. & Paddock, J. (2016). "Re-Introducing Consumption to the 'Circular Economy': a Sociotechnical Analysis of Domestic Food Provisioning." *Sustainability, 8*(794), 1-14.

Nagy, E. & Timár, J. (2017). "The (Re-)Production of Peripherality in Central and Eastern Europe." *European Spatial Research and Policy, 24*(2), 5-16.

Neumann, T. (2016). *Remaking the Rust Belt: The Postindustrial Transformation of North America.* U of Pennsylvania Press: Philadelphia.

Paiho, S. Mäki, E., Wessberg, N., Paavola, M., Tuominen, P., Antikainen, M., Heikkili, J., Rozado, C.A., Jung, N. (2020). "Towards circular cities: conceptualizing core aspects." *Sustainable Cities and Society, 59*(2019). https://doi.org/10.1016/j.scs.2020.102143

Parker, N. (2008). "A theoretical introduction: Space, center and margins." In Noel Parker (Ed.) *The Geopolitics of Europe's Identity: Centers and Boundaries.* (3-24). New York: Palgrave MacMillan.

Pollard, S., Turney, A., Charnley, F. & Webster, K. (2016) "The circular economy – a reappraisal of the "stuff" we love." *Geography, 101* (1),17–27.

Pottie-Sherman, Y. 2020. 'Rust and reinvention: Im/migration and urban change in the American Rust Belt'. *Geography Compass,* 14(3), https://doi.org/10.1111/gec3.12482

Preston, F. (2012). "A Global Redesign? Shaping the Circular Economy." *Energy, Environment and Resource Governance,* Chatham House, Report, EERG BP 2012/02

Prieto-Sandoval, V., Jaca, C. & Ormazabal, M. (2018). "Towards a consensus on the circular economy." *Journal of Cleaner Production, 179*(1), 608-617.

Reike, D., Vermeulen, W.J.V. & Witjes, S. (2018). "The circular economy: New or Refurbished as CE 3.0? Exploring Controversies in the Conceptualization of the Circular Economy through aFocus on History and Resource Value Retention Options." *Resources, Conservation & Recycling, 135*(2018), 246-264.

Robinson, S. (2017). *Social Circular Economy: Opportunities for People, Planet and Profit.* Social Circular Economy.
Røpke, I. (2009). "Theories of New Inspiration for Ecological Economic Theories." *Ecological Economics, 68*(10), 2490-2497.
Scottish Government. (2016). *Making Things Last: A Circular Economy Strategy for Scotland.*
Schröder, P. (2020). *Promoting a Just Transition to an Inclusive Circular Economy.* Chatham House.
Shaw, D. & McMaster, R. & Newholm, T. (2015). "Care and commitment in ethical consumption: An exploration of the 'attitude-behaviour gap.'" *Journal of Business Ethics, 136,* 251-265.
Vodden, K., Baldacchino, G. & Gibson, R. (2015). "Development in Place: A View from the Periphery." In K. Vodden, R. Gibson & G. Baldacchino (Eds.), *Place Peripheral: Place-Based Development in Rural, Island, and Remote Regions,"* St. John's: ISER Books, 3-23.
Watson, M., & Shove, E. (2008). Product, competence, project and practice: DIY and the dynamics of craft consumption. *Journal of Consumer Culture*, *8*(1), 69–89. https://doi.org/10.1177/1469540507085726
Welch, D., Keller, M. & Mandich, G. (March-April 2017). "Imagined Futures of Everyday Life In the Circular Economy." *Interactions: Special Topic,* XXIV(2), 47-51.
Williams, J. (2019). "Circular Cities." *Urban Cities, 56*(13), 2746-2762.
Williams, K. A. (2011). "Old Time Mem'ry: Contemporary Urban Craftivism and the Politics of Do-It-Yourself in Postindustrial America." *Utopian Studies, 22*(2 Special Issue Craftivism), 303-320.
Zero Waste Scotland. (October 2018). *Circular Economy Opportunities: Tayside.*
Zero Waste Scotland. (n.d). *What is the Circular Economy?*
https://www.zerowastescotland.org.uk/circular-economy/what-it-is
Zero Waste Scotland. (n,d). *How a Circular Economy can help Scotland Build Back Better.* https://www.zerowastescotland.org.uk/circular-economy/content/how-a-circular-economy-can-help-Scotlan-Build-Back-Better

Chapter 4: Discussions and Conclusion

4.1 Summary

This project examined the dynamics of CE within the periphery in both the Netherlands and Scotland through qualitative interviews with 14 key informants. The principal findings of the study indicate that the CE is diverse, multifaceted and creative. Indeed, even on the periphery, in places outside of the urban/sustainability 'mainstream', the CE is designed and implemented in various and important ways. In both cases, the CE is also characterized by small-scale innovations and operations that are influenced by national policy agendas and site-specific resources and necessities. Informants recognized the need to engage with and mold CE policy and practice in order to make it accessible and adoptable across their various geographies. Their insights further emphasized the need for greater focus on the social and human elements of CE implementation. Much of CE practice is rooted in attitudinal and behavioural predispositions of its adoptees.

In the first manuscript, I explore the rural face of the Dutch CE in order to understand how networks of linkages between actors and institutions at various scalar levels are shaping the application of circularity in practice. Through interviews with scholars, corporate sustainability actors and consultants, I illustrate the importance of rurality as a testing ground for CE transitions and experimentations. The key takeaway of this manuscript is that smaller, more peripheral spaces (here, rural spaces in particular) are sites of great circular experimentation and through collaboration and linkages, specifically with political and educational bodies, valuable lessons about the overall dynamics of CE can be learned in these contexts.

In the second manuscript I explore how the CE plays out in and around Dundee, Scotland, a city that was once a central place in Scottish trade and industry before falling into a state of national marginalization. Beset by the forces that diminished many post-industrial cities in the UK and beyond, it is only now beginning to emerge as a centre of creativity, innovation and artistic expression. The manuscript focuses on both individuals involved in strategic CE implementation and entrepreneurship. These groups are united in their commitment to circularity/sustainability principles and in their desire to understand how and why circularity can become adopted into daily practice, consumption patterns, as well as being mobilized to create a more just society. The key takeaways of this manuscript is that CE practitioners and proponents in and around Dundee are using their peripherality as a springboard for circular creativity as a means of transforming people's relationships with material goods.

4.2 Discussion

Overall, this project illuminates the ways in which engagement with CE practices and principles look differently on the periphery than they do in major urban cores. Whether peripherality means the economic and social marginalization that tend to follow post-industrial transformations, as is the case of Dundee, or whether it is tied to rurality and the relative neglect of some of those spaces and regions by the national government, as is the case in the Netherlands, the lessons learned in these contexts have value far beyond their borders.

While the social dimensions of the CE are crucial to all of its iterations, social circularity takes on a particular importance in small, peripheral spaces. Being small means a greater chance for collaboration and it also means that local and regional specializations can be mobilized more

readily when actors share values and goals, as well as a common local culture and heritage. This thesis argues that small-scale stories of CE are of vital importance to the larger narratives as the function as microcosms of circularity where the underlying dynamics are more readily apparent.

After examining the multifaceted, unique and indeed, exciting face of peripheral circularity, I appeal to future researchers to pay more attention to small-scale circular narratives. What I have uncovered through my research represents but the tiniest slice of existing circular initiatives, and we are but on the cusp of the CE. Regardless of whether the circular initiatives are large or small, it is important to remember that CE as a whole is still very much in its infancy. Therefore, any circular initiative is more or less an experiment. Crucially, the lessons learned within the Scottish and Dutch contexts are not meant to be didactic, universally applicable scripts. Instead, they serve a more generally instructive purpose, whereby we can learn how various local contexts engage with, question, adopt, reject or modify circular strategies. Small-scale circular stories cannot teach us what sweeping policy initiatives are necessary except insofar as they can demonstrate that for circular policy to be effective, it must be sufficiently flexible to allow for localized adaptations. Ultimately, all circular stories are small, as the goals of CE policy is to make it acceptable on the individual and household level. The smaller the scale at which we examine how CE functions, the more we are able to determine what factors facilitate or inhibit its acceptance with greater clarity. CE, therefore, should be seen as something that is constructed out of many component parts.

Returning to my initial research questions from Chapter 1, my research has demonstrated to me that peripheral CE looks much like CE in other areas, although it certainly has its own unique features, depending on the particular context. Of course, this is also true of non-peripheral CE, but what distinguishes CE on the periphery is the general proximity of institutions and

individuals who are either driving policy application or interrogating it to the spaces of that application. Additionally, peripheral actors may be more willing to take risks with their CE policy, as their somewhat marginal status makes them more amenable to experimenting with creative solutions, while also pre-disposing them to be more critical of sweeping policy agendas from the metropole. Peripheral CE actors are attempting to right-scale circular technology and initiatives in a variety of ways.

In Friesland and other Dutch northern provinces, circularity makes the most of the regions' agricultural resources and rural social cohesiveness. In Scotland, a waste free social enterprise and café envisions circularity as a means of getting vulnerable individuals into the social "loop" and a circular cashmere company attempts to negotiate between rural and remote artisans and scalable technological innovations. The factors that facilitate or inhibit circularity are perhaps the most recognizable across the CE spectrum. As always, financial considerations are top of mind, as are political and institutional and political roadblocks or short sightedness. The logistical capacity to implement circular systems is a certainly a concern as well, and one that varies greatly depending on the particular circumstances of a region.

Finally, and perhaps most crucially, are the behavioural considerations of the shift towards circularity. No amount of well-intentioned policy and technological investments will be enough if they are not accepted or trusted by those who are being asked to adopt them. Once again, we are reminded to the vital importance of keeping the human dimensions of CE always at the forefront. My last question concerned what lessons can be learned from these small narratives of CE and their applicability. I will consider this further in 4.4, Final Thoughts, but for now, it is sufficient to say that the lessons learned are in no way meant to be directly transferable to other contexts. They are applicable insofar as they alert us to the multitude ways in which CE

is being considered and implemented across a variety of scalar levels and that an appreciation for the local context is key. Exploring CE on the periphery can also help us to understand how circularity can help integrate all actors and regions into a greater web, where the negative aspects of peripherality and marginality are diminished. Closing the loops within a CE should have a much broader application than merely to material loops. If executed properly, a truly circular economy should be socially inclusive as well, ensuring that people and regions are not left behind because of their non-central status. As one of the Scottish informants stated, "the foundations of Circular Economy is to get rid of these gaps and these shortfalls and all these things that are dropping away, and that aren't even in the loop yet, [you] can get them into the loop." An inclusive CE offers the opportunity for participants of small and peripheral actors because it is constructed out of many component parts, of varying size, all of which are intimately linked. The system is thus unable to function without any of these components.

This thesis therefore suggests that researchers, governments and other policy makers put greater emphasizes on the human and social dimensions of CE if they wish to craft a truly just vision of circularity. As it is, CE is fundamentally based in business and engineering concepts and even when its proponents are well-intentioned, it very often lacks adequate attention to social sustainability (Koumparou, 2017). By increasing attention paid to small stories of CE, we are better able to understand the contributions individuals and smaller regions are making to the circular conversation and that valuable ideas and lessons are to be found everywhere.

5.3 Future Research and Further Considerations

As previously stated, this research represents a very small portion of the peripheral CE story. It could not be otherwise, as the work necessitated a richer, focused examination of particular spaces of circular innovation. From a practicality standpoint, it was also dependent on the availability of participants and the complexities of scheduling interviews within the two week period I was in Europe. I believe my work underscores the need for future research that builds on principles discussed here. Future research can contribute to our understanding of circularity by casting the widest net possible to uncover unexpected stories of small-scale innovation across a broad variety of geographical spaces.

One regrettable, but ultimately necessary omission from the work is the Canadian context. At present, the Canadian CE landscape is only starting to emerge and due to the time, financial and logistical constraints of the project, attempting to explore the nascent CE agenda in Canada would have been too great a challenge. That is not to say that it is impossible or that it is not a rich area for future inquiry. One of my Canadian-based informants, studying CE initiatives in rural Quebec offered valuable insights into the key role of linkages between rural areas and projects. At the same time, she observed a greater spirit of cooperation and collaboration within rural areas, another valuable means of support for emerging CE initiatives. Another informant mentioned Northern and remote Indigenous communities as sites of potential inquiry, due to their geographical necessity of reuse and repair of goods, as well as their potential cultural and attitudinal dispositions that may make these communities more amenable to CE. All of these ideas are fascinating and will surely provide fertile ground for future researchers.

As the CE is becoming less of an abstraction and more of a concrete reality for so many countries, understanding what peripheral spaces of CE have to teach us about how individuals, communities and regions interpret and implement the concept. Greater focus on peripheral CE

can not only ensure that these spaces and actors are not left out of national policy decisions, but they can offer testimonials of the real, lived experience of what it means to engage in circular experimentation and can "speak back" to those centres of CE policy-making about what they are missing and how to expand their vision to make it truly inclusive. Other considerations that I was not able to cover here are the complicated relationship between CE and sustainability, the role of legislation in promoting and strengthening CE application and the role of small-scale CE innovation in a world that needs radical change.

Both sustainability and CE are gaining increased attention from governments, civil society and the business and financial sectors. Sustainability largely emphasizes the integration of social, economic and environmental outcomes to achieve positive outcomes for future generations, while CE is often seen as a means of achieving sustainability, but with a narrower focus on resource and economic efficiency (Pieroni et al., 2019). From a business perspective, both circularity and sustainability require companies to change the ways they generate value, as well as the way they understand and conduct business, although their application strategies are beginning to diverge somewhat (Pieroni et al., 2019). Geissdoerfer et al. (2017:207) identify the frequently overlapping uses of the terms "Circular Economy" and "sustainability" in existing literature in ways that lead to "blurring" of these concepts that does not make their similarities or differences explicit. I recognize that I may have been guilty of similar blurriness at times, as it is quite challenging to tease apart these terms, particularly when speaking to informants who often discuss sustainability and CE in the same breath. Both terms do emphasize a global perspective on, and inter and intragenerational commitments, to environmental issues and they do often integrate multi- and interdisciplinary approaches in order to better integrate non-economic factors into their development (Geissdoerfer et al., 2017). The authors observe that CE

discussions are often narrower than the conversations about sustainability, often at the expense of the social implications of CE (Geissdoerfer et al., 2017). This deemphasizing of the social aspects of CE has been noted throughout this thesis and it is valuable to consider how focusing on the social in the circular context may indeed overstretch the concept. It may be that existing CE models are unable to adequately integrate social dimensions into their operations. If so, future researchers will need to reconsider the definitions of circularity and develop new models that may operate alongside, or perhaps as supplements to, the material and economic CE systems. The academic journal *Circular Economy and Sustainability* takes an interdisciplinary approach to CE and sustainability as they are not viewed as separate, but instead synergistic concepts. Moreover, they view CE as necessary to the promotion of sustainable development.

The question of the need for circular legislation is also pertinent to the overall CE conversation. Kyriakopoulos (2021) believes that circular legislative tools should emphasize the shared responsibility of producers, consumers and governments throughout products' life cycles, although the effectiveness of this legislation is limited by factors such as unclear definitions, conflicting interests and lack of access to information and overall lack of transparency (Kyriakopoulos, 2021). In a study of China's CEPL (Circular Economy Promotion Law), Hu et al. (2018) conclude that circular transitions could be accomplished through the policy system and government action, rather than legislation and that the CEPL could best be amended by adding provisions to regulate people's resource utilization behaviour. These authors reinforce two key issues raised in this paper, namely the need for clear and coherent messaging around CE, as well as the need to understand the human element of circular transitions. Legislation and policy are useful tools, but on their own they will not accomplish a seamless transition to a CE. The agenda of CE proponents would be better served by definitional clarity, as well as a clear and accessible

articulation of the roles of those who are being asked to participate in the CE. Once again, we return to the need to construct an ample and broad-ranging definition of the CE, and also to the need for greater attention to people's behaviour and practices within the context of CE.

Finally, the question of the value of small in a world that needs big, dramatic transformations is a tricky one. On the one hand, I have spent this thesis advocating for the need for small-scale circular innovations, as both testing grounds and as sources of non-didactic lessons from which we can learn how the CE concept can be stretched or shrunken, massaged and adapted to fit its particular contexts. On the other hand, I realize that we live on a planet where ecological problems are becoming increasingly more acute and there is less and less time for inaction. This has become even clearer in the context of the current pandemic, a situation I could not have foreseen when I was initially researching this paper. I do not have an answer to this question, although I still firmly believe in the value of thinking small when it comes to CE. Sweeping policy changes will be rather toothless if they are unsuitable and unworkable in many localized contexts, so a nuanced understanding of the many localities in which CE will be applied is key. In a way, my argument echoes Massey (2005) who claims that the response to globalization is not simply to reassert the local, as the local has no meaning outside of its specific frame of reference. The value of a constellation of small or local CE may ultimately lie in their collective power to affect global change when they are taken together as parts of a diffuse, but ultimately coherent, whole.

4.4 Final thoughts

"[Y]ou can't expect everyone to approach the world the way you do," cautioned a Scottish informant, the founder of a circular cashmere company. While he was referring to consumers'

choices and their motivations (or lack thereof) to purchase ethical products, this sentiment can be extended to all sustainability initiatives. When CE proponents craft their policy initiatives, are they too focused on what they think is right, what they think their particular vision of sustainability should look like? Multiple informants stressed the need, not only for clear messaging around CE, but also that it represents something that can make an appreciable difference in the lives of those being asked to accept it.

The circular policy audience is diverse and the approach taken by its proponents needs to be as well. The human/social side of CE cannot be ignored, as it is the human actors of our societies that are being targeted by policy makers, not just mechanistic models of production. Previous research has noted the lack of social sciences engagement on the part of CE experts and the impoverishment of such an approach (Gregson et al., 2015; Hobson & Lynch, 2016; Lynch, forthcoming; Welch, 2017). While this concern may seem to be a purely academic one, not a single one of my informants was unaware of, or unconcerned about, the social face of CE. Achieving clarity and meaning within their CE messaging was deeply important to them and I was rather unprepared for the ways in which the observations of some of the informants squared so beautifully with some of the articles I had read for my literature review that I almost wondered if they had read them too! The necessity to craft a social CE narrative is a genuine concern for those directly involved in circular projects and it is a necessity that requires ongoing attention and examination as the socio-cultural landscape continues to shift and the needs and attitudes of individuals along with it.

Of equal importance to my research is the role of scale in CE initiatives. In this way, my work aligns with sustainability transitions scholarship, which examines the complex interaction of the social and technological factors that underlie shifts towards sustainability (Markad et al.,

2012; Coenen et al., 2012; Smith et al., 2010). In particular, Coenen et al., (2012) emphasize the spatial dimensions of these shifts in order to understand the role of technological, cultural and educational supports, as well as the role of local niches, which foster innovation and the scalar relations that allow actors to participate simultaneously on global and local levels. This line of inquiry can illuminate those relationships that are most likely to upscale beyond the intensely local to the national or even international contexts. The potential lack of scalability of certain initiatives does not invalidate their worth within their respective contexts. For example, it is difficult to imagine how the life-skills training and circular vegan café in Dundee could possibly be expanded beyond its current operation. That does not mean that it does not serve an important role in that community. Nor does it mean that the lessons learned from it, such as the social justice implications of CE, the commitment to sustainable and ethical materials sourcing, and the ability to effect meaningful change at a small scale, are not more broadly applicable. When we approach CE with a mind open to how truly multifarious in nature it can be, as well as with a careful attention to detail, we can become better attuned to the invaluable lessons from the circular periphery. What I have learned from my research is that the CE might best be seen as an anthology of short chapters by a multiplicity of authors, rather than one long document with a single author.

5.5 References

Accorsi, R. R. Manzini, C. Pini & S. Penazzi. (2015). "On the design of closed-loop networks for product life cycle management: Economic, environmental and geography considerations."*Journal of Transport Geography 48*(2015), 121–134.

Anzar-Sánchez, J.A., Piquer-Rodríguez, M., Velasco-Muñoz, J. F. & Mazano-Agugliaro, F. "Worldwide research trends on sustainable land use in agriculture." *Land Use Policy, 87*(2019), 104069.

Autio, M.; Heiskanen, E.; Heinonen, V. Narratives of 'green' consumers—The antihero, the environmental hero and the anarchist. J. Consum. Behav. 2009, *8*, 40–53.

Baldacchino, G. (2015). "Placing Identity: Strategic Considerations for Rebounding Peripheries." In K. Vodden, R. Gibson & G. Baldacchino (Eds.), *Place Peripheral: Place-Based Development in Rural, Island, and Remote Regions,"* St. John's: ISER Books, 41-63.

Banks, M. (2010). "Craft labour and creative industries." *International Journal of Cultural Policy,16*(3), 305-321.

Barros, M. V., Salvador, R., Carlos de Fransicso, A. & Piekarski, C.M. (2020). "Mapping of research lines on circular economy practice in agriculture: From waste to energy." *Renewable and Sustainable Energy Review, 131*(October 2020), doi 10. 1016.

Bassi, F. & Dias, J. G. (2019). "The use of circular economy practices in SMEs across the EU." *Resources, Conservation & Recycling, 146*(July 2019), 523-533.

Bell. D. & Jayne, M. (2004). "Conceptualizing small cities." In David Bell and Mark Jayne (Eds.), *Small Cities: Urban Experiences Beyond the Metropolis* (pp. 1-18). Oxon: Routledge.

Bell, D. & Jayne, M. (2009). "Small cities? Towards a research agenda." *International Journal of Urban and Regional Research, 33*(3), 683-699.

Bell, D. (1976). "Welcome to the post-industrial society." *Physics Today, February*, 46-49.

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.

Bratich. J.Z. & Brush, H.M. (2011). "Fabricating activism: Craft-work, popular culture, gender." *Utopian Studies, 22*(2), 233-260.

Brenner, N. & Schmid, C. (2014). "The 'Urban Age' in question." *International Journal of Urban and Regional Research,* 38(3), 731-755.

Bryant, R. L. & Goodman, M.K. (2004). "Consuming narratives: the political ecology of 'alternative consumption.'" *Transactions of the Institute of British Geographers, 29*(3), 344-366.

Camacho-Otero, J., Boks, C. & Pettesrsen, I. N. (2018). "Consumption in the Circular Economy: A Literature Review." (2018). *Sustainability, 10*(8), https://doi.org/10.3390/su10082758

Campbell, C. (2005). "The Craft Consumer: Culture, Craft and Consumption in a Postmodern Society." *Journal of Consumer Culture, 1*(5), https://doi.org/10.1177/1469540505049843

Cardoso, J. L. (2018). "The circular economy: historical grounds". In A. Delicado, N. Domingos & L. de Sousa (Eds.), *Changing Societies: Legacies and Challenges. Vol. iii. The Diverse Worlds of Sustainability,* Lisbon: Imprensa de Ciências Sociais, 115-127.

Carfagna, L. B., Dubois, E. A., Fitzmaurice, C., Ouimette, M. Y., Schor, J. B., Willis, M., & Laidley, T. (2014). An emerging eco-habitus: The reconfiguration of high cultural capital practices among ethical consumers. *Journal of Consumer Culture*, 14(2), 158–178.

Chen, W. & Kim, H. (2019). "Circular economy and energy transition: A nexus focusing on the non-energy use of fuels." *Energy & Environment*, 30(4), 586-600.
The Circle (n.d.). *About.* https://thecircledundee.org.uk/about/
Circular Tayside. (n.d.). *Iain Stirling, Arbikie Distillery.* https://circulartayside.co.uk/ambassador/iain-stirling-arbikie-distillery/
Coenen, L., Benneworth, P. & Truffer, B. (2012). "Towards a spatial perspective on sustainability transitions." *Research Policy, 41*(6), 968-979.
Cramer, J. M. (2020). "The function of Transition Brokers in the regional governance of implementing circular economy: A comparative case study of six Dutch regions." *Sustainability, 12* (12). DOI: 10.3390/su12125015
Crang, M., Hughes, A., Gregson, N., Norris, L. & Ahamed, F.U. (2013). "Rethinking governance of value in commodity chains through global recycling networks." *Transactions of the Institute of British Geographers, 38*(1), 12-24.
deMan, R. & Friege, H. (2016). "Circular economy: European policy on shaky ground." *Waste Management & Research, 34*(2), 93-95.
Del Borghi, A., Moreschi, L. & Gallo, M. (2020). "Circular economy approaches to reduce water-energy-food nexus." *Current Opinino in Environmental Science and Health, 13*(2020), 23-25.
Dimitrov, D. K. & Ivanov, M. (2017). "Trends is Organic Farming Development in Bulgaria: Applying circular economy principles to sustainable rural development." *Sustainable Development, 6*(1), 10-16.
Dundee and Angus Chamber of Commerce. (Winter 2018). "Embracing the Circular Economy in Style." *Connected,* Issue 1.
Dundee City Council. (February, 2019). *Local Development Plan.*
Edbring, E.G., Lehner, M., Mont, O. (2016). "Exploring consumer attitudes to alternative models of consumption: Motivations and barriers." *Journal of Cleaner Production, 123*(1), 5-15.
Ellen MacArthur Foundation. (2013a). *Towards the Circular Economy - Economic and Business Rationale for an Accelerated Transition.*
Ellen MaArthur Foundation. (2016) *Intelligent Assets: Unlocking the Circular Economy Potential.*
Ellen MacArthur Foundation. (2019). *Cities and the Circular Economy for Food.*
Eliott, S. & Richardson, M. (2017). "Maker culture and the possibilities of attached consumption. *Arena Journal, 47/48*, 213-231.
European Commission. (2015). *Closing the Loop - an EU Action Plan for the Circular Economy. European Commission*, Brussels.
European Commission. (2018). *A sustainable Bioeconomy for Europe Strengthening the connection between economy, society and the environment Updated Bioeconomy Strategy*.
European Economic and Social Committee Employers' Group. (2015). *The Reindustrialisation of Europe: Food Manufacturing, Innovation and Circular Economy*.
Fernandes, S. & Makarychev, A. (2019). "Studying European margins in the illiberal turn: a spacio-normative approach." *Journal of Contemporary European Studies, 27*, 389-393.
Fitjar, R.D & Rodríguez-Pose, A. (June 2011). "Firm collaboration and modes of innovation in Norway." *Research Policy, 42*(1), 128-138.
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*(2018), 974-989.
Geels, F. W. & Schot, J. (2007). "Typology of sociotechnical transition pathways." *Res. Policies, 36*, 399-417.
Geissdoerfer, M. Savaget, P. Bocken, N. & Hultink, E. J. (2017). "The Circular Economy-a new sustainability paradigm?" *Journal of Cleaner Production, 143*, 757-768.
Geng, Y., Doberstein, B. (2008). "Developing the circular economy in China: challenges and opportunities for achieving 'leapfrog development'." *International Journal of Sustainable Development and World Ecology 15*, 231-239.
Geoghan, P. (2015, June 22). "Dundee: from black sheep of Scottish cities to 'living cultural Experiment." *The Guardian.* https://www.theguardian.com/cities/2015/jun/22/dundee-scotland-design-v-and-a-culture-regeneration-minecraft-grand-theft-auto
Ghisellini, P., Cialani, C. & Ulgiati, S. (2016). "A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems." *Journal of Cleaner Production, 114*, 11-32.
Gospodini, A. (2006). "Portraying, classifying and understanding the emerging landscapes in the post-industrial city." *Cities, 23*(5), 311-330.
Gov NL. (2016). *National Agreement on the Circular Economy: Letter of intent to develop*
Grabher, G. (2018). "Marginality as strategy-Leveraging peripherality for creativity." *A Economy and Space, 38*(3), 1785-1794.
Gregson, N., Crang, M., Fuller, S. & Holmes, H. (2015). "Interrogating the circular economy: the moral economy of resource recovery in the EU." *Economy & Society, 44*(2), 218-243.
Grund, S., Van Genderen, E. & van Leeuwen, M. (2019). Circular Economy-Recycling at all costs? Zinc: unleashing valuable resources. *Proceedings of the European Metallurgy Conference.* Düsseldorf, Germany.
Halfacree, K. (2006). "Rural space: Constructing a three-fold architecture." In P. J. Clark, T. Marsden & P. H. Moony (Eds.), *Handbook of Rural Studies* (44-62). London: SAGE.
Hassan, L.M., Shiu, E. & Shaw, D. (2016). "Who says there is an intention-behaviour gap? The empirical evidence of an intention-behaviour gap in ethical consumption." *Journal Of Business Ethics, 136*(2), 219-236.
Hawkins, R. (May 2012). "Shopping to save lives: Gender and environmental theories meet Ethical consumption." *Geoforum, 43*(4), 750-759.
Hobson, K. (2015). "Closing the loop or squaring the circle? Locating generative Space for the Circular economy." *Progress in Human Geography, 40*(1). 88-104.
Hobson, K. (2019). "'Small stories of closing loops': social circularity and the everyday circular economy." *Climatic Change*. https://doi.org/10.1007/s10584-019-02480-z
Hobson, K., & Lynch, N. (2016). "Diversifying and de-growing the circular economy: Radical social transformation in a resource-scarce world." *Futures*, *82*, 15–25.
Hobson, K., Lynch, N., Lilley, D., and Smalley, G. (2018). Systems of practice and the Circular Economy: Transforming mobile phone product service systems, *Environmental Innovations and Societal Transitions*, *26*, 1-11.
Hodson, M. & Marvin, S. (2010). "Can cities shape socio-technical transitions and how would we know if they were?" *Research Policy, 39*(4), 477-585.
Holmes, H. (2015). "Transient craft: reclaiming the contemporary craft worker." *Work, employment and Society, 29*(3), 479-495.
Horlings, L. & Marsden, T.K. (2013). "Exploring the 'new rural paradigm' in Europe: Eco-

economic strategy as a counterforce to the global competitiveness agenda." *European Urban and Regional Studies, 21*(1), 4-20.
Horvath, B., Khazami, N., Ymeri, P., & Fogarassy, C. (2019). "Investigating the current business model innovation trends in the biotechnology industry." *Journal of Business Economics and Management, 20*(1), 63– 85.
Hu, Y., He, X. & Poustie, M. (2018). "Can legislation promote a Circular Economy? A material Flow-based evaluation of the circular degree of the Chinese economy." *Sustainability,10* (990). doi:10.3390/su10040990
Jedelhauser, M & Binder, C. (2018). "The spatial impact of socio-technical transitions – The case of phosphorus recycling as a pilot of the circular economy." *Journal of Cleaner Production, 197. DOI: 10.1016/j.jclepro.2018.06.241*
Jeffries, N. (2019, March 4). "Regenerative agriculture: how it works on the ground." *Circulate.* https://medium.com/circulatenews/regenerative-agriculture-how-to-grow-food-for-a-healthy-planet-9a5f637c0f3e
Jones, P. & Comfort, D. (2018). "Major European retailers and the circular economy." *Geography, 103*(3), 162-166.
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." *8*(69), doi 10.3390.
Kapp, P. H. & Armstrong, P. J. (2012). *SynergiCity: Reinventing the Postindustrial City.* University of Illinois: DOI: 10.5406/j.ctt3fh3d7
Kalmykova, Y., Sadagopan, M. & Rosado, L. (2018). "Circular economy-From review of theories and practices to development of implementation tools." *Resources, Conservation & Recyclying, 135*, 190-201.
Kirchher, J., Reike, D., & Hekkert, M. (2017). "Conceptualizing the circular economy: An analysis of 114 definitions." *Resources, Conservation & Recylcing, 127*(2017), 221-232.
Korhonen, J. & Honkasalo, A.& Seppälä, J. (2018). "Circular Economy: The Concept and its Limitations." *Ecological Economics, 143*(C), 7-46.
Koumparou, D. (2018). Circular Economy and Social Sustainability, *Proceedings of Solid Waste Management & its Contribution to Circular Economy*. Athens, Greece.
Kristensen, D. K., Kjeldsen, C., & Thorsøe, M. H. (2016). Enabling Sustainable Agro-Food Futures: Exploring Fault Lines and Synergies Between the Integrated Territorial Paradigm, Rural Eco-Economy and Circular Economy. *Journal of Agricultural and Environmental Ethics*. https://doi.org/10.1007/s10806-016-9632-9
Kyriakopoulos, G. L. (2021). "Environmental legislation in Europe and international contexts: Legal practices and social planning towards the Circular Economy." *Laws, 10*(1). https://doi.org/10.3390/laws10010003
Lakatos. E. S., Cioca, L-I., Dan, V., Ciomos, A. O., Crisan, O. A., Barsan, G. (2018). `` Studies and Investigation about the Attitude towards Sustainable Production, Consumption and Waste Generation in Line with Circular Economy in Romania.`` *Sustainability, 10*(865), doi 10.3390
Levitt, T. (2018, February 16). "Dutch cow poo overload causes an environmental stink." *The Guardian.*
Lindgreen, E. R., Salomone, R. & Reyes, L. (2020). "A Critical Review of Academic Approaches, Methods and Tools to Assess Circular Economy at the Micro Level." *Sustainability, 12*(12). ttps://doi.org/10.3390/su12124973

Lloyd, G., McCarthy, & Peel, D. (2004). "The re-construction of a small Scottish city: re-discovering Dundee." In David Bell and Mark Jayne (Eds.), *Small Cities: Urban Experiences Beyond the Metropolis* (pp. 105-120). Oxon: Routledge.
Lorek, S. & Fuchs, R. (2013). "Strong sustainable consumption governance-preconditions for a degrowth path?" *Journal of Cleaner Production, 38,* 36-43.
Mahon, M., McGrath, B., Ó Laoire, L. Collins, P. (2018). "Artists as workers in the rural: precarious livelihoods, sustaining rural future." *Journal of Rural Studies, 63,* 271-279.
Markard, J., Raven, R., Truffer, B. (2012). "Sustainability transitions: An emerging field of research and its prospects." *Research Policy, 41*(6), 955-966.
Marsden, T. K. (2003). *The Condition of Rural Sustainability.* Assen, NL: Royal van Gorcum.
Marsden, T. K. (2006). "Denial or diversity? Creating new spaces for sustainable development." *Journal of Environmental Policy and Planning, 8*(2), 183-198.
Marsden, T. & Farioli, F. (2015). "Natural powers: from the bio-economy to the eco-economy and sustainable place-making." *Sustainability Science, 10*(2), 331-344.
Massey, D. (2005). *For space*. Sage: London.
Masullo, A. (2017). "Organic waste management in circular economy approach: Rebuilding the link between urban and rural areas." *Ecological Engineering, 101*(2017), 84-90.
Mathews, J. A., & Tan, H. (2011). "Progress toward a circular economy in China : the drivers (and inhibitors) of eco-industrial initiative." *Journal of Industrial Ecology*, *15*(3), 435-457.
McLaughlin, A. (June 19, 2017). "How Dundee is driving social change through design." *Design Week.* https://www.designweek.co.uk/issues/12-18-june-2017/dundee-driving-social-change-design/
Merli, R., Preziosi, M. & Acampora, A. (2018). "How do scholars approach the circular economy? A systematic literature review." *Journal of Cleaner Production, 178*(20), 703-722.
Mitchell, C.J.A. (2013). "Creative destruction or creative enhancement? Understanding the transformation of rural spaces." *Journal of Rural Studies, 32,* 375-387.
Monios, J. & Wilmsmeier, G. (2012). "Port-centric logistics, dry ports and offshore logistics hubs: strategies to overcome double peripherality?" *Maritime policy and management, 39*(2), 207-226.
Muizniece, I., Zihare, L., Pubule, J. & Blumberg, D. (2019). "Circular Economy and Bioeconomy interaction Development as Future of Rural Regions. Case Study of Aizkraukle Region in Latvia." *Environmental and Climate Technologies, 23*(2), 129-146.
Mylan, J., Holmes, H. & Paddock, J. (2016). "Re-Introducing Consumption to the 'Circular Economy': a Sociotechnical Analysis of Domestic Food Provisioning." *Sustainability, 8*(794), 1-14.
Nagy, E. & Timár, J. (2017). "The (Re-)Production of Peripherality in Central and Eastern Europe." *European Spatial Research and Policy, 24*(2), 5-16.
Neumann, T. (2016). *Remaking the Rust Belt: The Postindustrial Transformation of North America.* U of Pennsylvania Press: Philadelphia.
Paiho, S. Mäki, E., Wessberg, N., Paavola, M., Tuominen, P., Antikainen, M., Heikkili, J., Rozado, C.A., Jung, N. (2020). "Towards circular cities: conceptualizing core aspects." *Sustainable Cities and Society, 59*. https://doi.org/10.1016/j.scs.2020.102143
Parker, N. (2008). "A theoretical introduction: Space, center and margins." In Noel Parker (Ed.) *The Geopolitics of Europe's Identity: Centers and Boundaries.* (3-24). New York:

Palgrave MacMillan.
Pieroni, M.P.P., McAloone, T.C. & Pigosso, D.C.A. (2019). "Business model innovation for circular economy and sustainability: A review of approaches." *Journal of Cleaner Production, 215,* 198-216.
Pollard, S., Turney, A., Charnley, F. & Webster, K. (2016) "The circular economy – a reappraisal of the "stuff" we love." *Geography, 101* (1),17–27.
Pottie-Sherman, Y. 2020. 'Rust and reinvention: Im/migration and urban change in the American Rust Belt'. *Geography Compass,* 14(3), https://doi.org/10.1111/gec3.12482
Preston, F. (2012). "A Global Redesign? Shaping the Circular Economy." *Energy, Environment and Resource Governance,* Chatham House, Report, EERG BP 2012/02
Preston, F. & Lehne, J., 2017. *A Wider Circle? Circular Economy in Developing Countries,* Chatham House Briefing, online: *www.chathamhouse.org/2017/12/wider-circle-circular-economy-developing-countries*
Prieto-Sandoval, V., Jaca, C. & Ormazabal, M. (2018). "Towards a consensus on the circular economy." *Journal of Cleaner Production, 179*(1), 608-617.
Reike, D., Vermeulen, W.J.V. & Witjes, S. (2018). "The circular economy: New or Refurbished as CE 3.0? Exploring Controversies in the Conceptualization of the Circular Economy through aFocus on History and Resource Value Retention Options." *Resources, Conservation & Recycling, 135*(2018), 246-264.
Rli. (2015). *Circular Economy: From Wish to Practice.*
Robinson, S. (2017). *Social Circular Economy: Opportunities for People, Planet and Profit.* Social Circular Economy.
Rodriguez-Pose, A. & Fitjar, R.D. (2013). "Buzz, archipelago economies and the future of intermediate and peripheral areas in a spiky world." *21*(3: The New Urban World), 355-372.
Røpke, I. (2009). "Theories of New Inspiration for Ecological Economic Theories." *Ecological Economics, 68*(10), 2490-2497.
Salvia, R., Andreopoulou, Z.S. & Quaranta, G. (2018). "The circular economy: A broader perspective for rural areas." *Rivista Di Studi Sulla Sostenbilta, 2018*(1), 87-105.
Scottish Government. (2016). *Making Things Last: A Circular Economy Strategy for Scotland.*
Schröder, P. (2020). *Promoting a Just Transition to an Inclusive Circular Economy.* Chatham House.
Shaw, D. & McMaster, R. & Newholm, T. (2015). "Care and commitment in ethical consumption: An exploration of the 'attitude-behaviour gap.'" *Journal of Business Ethics, 136,* 251-265.
Sikdar, S. (2019). "Circular economy: Is there anything new in this concept?" *Clean Technologies & Environmental Policy, 21*(2019), 1173-1175.
Smith, A., Voß, J. & Grin, J. (2010). "Innovation studies and sustainability transitions: The allure of the multi-level perspective and its challenges." *Research Policy, 39*(4), 435-448. 435-448.
Sonnino, R., Kanemasu, Y. & Marsden, T.K. (2008). "Sustainability and rural development." In van der Ploeg, J.D. and Marsden, Terry Keith (Eds.), *Unfolding webs: the dynamics of regional rural development, European perspectives on rural development* (29-52). Assen: Van Gorcum.
Taffel, S. (2018). "Hopeful Extinctions? Tesla, Technological Solutionism and the Anthropocene."*Culture Unbound Journal of Current Cultural Research 10*(2).163-184

Toop, T. A., Ward, S., Oldfield, L., Hull, M., Kirby, M.E. & Theodorou, M.K. (2017. "AgroCycle-Developing a circular economy in agriculture." *Energy Procedia, 123*(2017), 76-80.

Uvarova, I. (2019). CIRCULAR ECONOMY DRIVEN INNOVATIONS WITHIN BUSINESS MODELS OF RURAL SMEs. *Proceedings of the International Scientific Conference*, *6*, 520–530.

Van Buren, N.; Demmers, M.; Van der Heijden, R.; Witlox, F. (2016). "Towards a Circular Economy: The Role of Dutch Logistics Industries and Governments." *Sustainability*, *8*, 647;,https://doi.org/10.3390/su8070647

Van den Berghe, K. & Vos, M. (2019). "Circular Area Design or Circular Area Functioning? A Discourse-Institutional Analysis of Circular Area Developments in Amsterdam and Utrecht, The Netherlands," *Sustainability, 11*(18), 1-20.

van der Ploeg, J.D., van Broekhuizen, R., Brunori, G., Sonnino, Roberta, Knickel, K., Tisenkops, T. and Oostendie, H. (2008). "*Towards a framework for understanding regional rural development".* In van der Ploeg, J.D. and Marsden, Terry Keith (Eds.), *Unfolding webs: the dynamics of regional rural development, European perspectives on rural development* (1-28). Assen: Van Gorcum.

Van Zanten, H. H. E., Van Ittersum, M.K., & De Boer, I. J. M. (2019). "The role of farm animals in a circular food system." *Global Food Security, 21*(2019), 18-22.

Vodden, K., Baldacchino, G. & Gibson, R. (2015). "Development in Place: A View from the Periphery." In K. Vodden, R. Gibson & G. Baldacchino (Eds.), *Place Peripheral: Place-Based Development in Rural, Island, and Remote Regions,"* St. John's: ISER Books, 3-23.

Watson, M., & Shove, E. (2008). Product, competence, project and practice: DIY and the dynamics of craft consumption. *Journal of Consumer Culture*, *8*(1), 69–89. https://doi.org/10.1177/1469540507085726

Welch, D., Keller, M. & Mandich, G. (March-April 2017). "Imagined Futures of Everyday Life In the Circular Economy." *Interactions: Special Topic,* XXIV(2), 47-51.

Williams, J. (2019). "Circular Cities." *Urban Cities, 56*(13), 2746-2762.

Williams, K. A. (2011). "Old Time Mem'ry: Contemporary Urban Craftivism and the Politics of Do-It-Yourself in Postindustrial America." *Utopian Studies, 22*(2 Special Issue Craftivism), 303-320.

Winans, K., Kendall, A. & Deng, H. (2017). "The history and current applications of the circular Economy concept." *Renewable and Sustainable Energy Reviews, 68,* 825-833.

World Economic Forum. (2017). *Shaping the Future of Global Food Systems: A Scenarios Analysis.*

Zucchella, A. & Previtali, P. (2019). "Circular business models for sustainable development: A 'waste is food' restorative ecosystem." *Business Strategy and the Environment, 28*(2), 274-288.

Zero Waste Scotland. (October 2018). *Circular Economy Opportunities: Tayside.*

Zero Waste Scotland. (n.d). *What is the Circular Economy?* https://www.zerowastescotland.org.uk/circular-economy/what-it-is

Zero Waste Scotland. (n,d). How a Circular Economy can help Scotland Build Back Better. https://www.zerowastescotland.org.uk/circular-economy/content/how-a-circular-economy-can-help-Scotlan-Build-Back-Better

Appendices

Appendix One: Recruitment Letter for Key Informants

Date:

Participant's name:

Dear ,

My name is Rebecca LeDrew and I am a Master's student in the Department of Geography at Memorial University specializing in human geography and rural sustainability research. I am currently conducting a research for a study called, "Closing the Loop Between Past and Present: Exploring the Possibilities for a Rural Circular Economy in Newfoundland," and I am writing to see if you would be willing to speak to me about your potential interest/involvement in rural Circular Economy initiatives through your work in [insert institution/project]. The goals of this project are to examine the challenges and benefits of the Circular Economy, a relatively new and comprehensive sustainability agenda that informs business models and technologies in the built environment sector as well as in community and regional development agendas. Your participation would be vital to my investigation of these questions and would be appreciated greatly. Participation involves a 30 to 45-minute interview, consisting of a series of formal questions. The interview would be conducted by myself by telephone, or in person at your office.

I am also interested in site/neighbourhood visits and participating in local meetings pertaining to Circular Economy initiatives, where possible. If this can be arranged and meets [your organization's] regulations, I would be happy to schedule an appropriate time. If you are interested in participating in this study, please contact me and we can arrange a meeting time.

Please see below for more information about the project. In addition, if you know anyone who may be interested in participating in this study, please give them a copy of this information.

Thank-you in advance for considering my request.

Rebecca LeDrew

Master's student Department of Geography

Memorial University of Newfoundland

email: r.ledrew@mun.ca

phone: 709.770.8789

NOTE: The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Appendix Two: Informed Consent Form

Informed Consent Form Title: Closing the Loop Between Past and Present: Exploring the Possibilities for a Rural Circular Economy in Newfoundland

Researcher: Rebecca LeDrew, MA student, Department of Geography, email: r.ledrew@mun.ca; phone: 709.779.8789; supervisor: Dr. Nicholas Lynch, Assistant Professor, Department of Geography, email: nicholas.lynch@mun.ca; phone: 709.864.8413.

You are invited to take part in a research project entitled "Closing the Loop Between Past and Present: Exploring the Possibilities for a Rural Circular Economy in Newfoundland."

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information given to you. Please contact the researcher, Rebecca LeDrew, or my supervisor, Dr. Nicholas Lynch, if you have any questions about the study or would like more information before you consent. It is entirely up to you to decide whether to take part in this research. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

Introduction: My name is Rebecca LeDrew and I am a Master's student in the Department of Geography at Memorial University specializing in human geography and rural sustainability research. I am currently conducting research for my thesis called, "Closing the Loop Between Past and Present: Exploring the Possibilities for a Rural Circular Economy in Newfoundland."

Purpose of Study: This research explores the potential for the development of a rural Circular Economy agenda in rural Newfoundland. In particular, I am interested in the implementation of the Circular Economy as a relatively new and comprehensive sustainability agenda that informs business models and technologies, in the built environment sector and within community/regional sustainability agendas. My research seeks to understand how neighbourhoods, communities and stakeholders are adopting and adapting to Circular principals. In particular, this research investigates the potential, limitations, and broader implications of the Circular Economy agenda in the built environment sectors. I seek to trace the evolution of this agenda and conduct a structured case study analysis of CE rural initiatives (so called 'living laboratories') in two European contexts: (a) Circular Friesland in the Netherlands and (b) Circular Glasgow in Scotland.

What You Will Do in this Study: Participation involves an interview consisting of a series of questions. If you are an industry official or policy expert, I will ask you about the challenges and opportunities of adapting to Circular Economy practices or adopting Circular Economy models. If you are a CE practitioner, I will ask you about your company's use of particular Circular

Economy models and technologies in the built environment sector or at the community/regional level. If you are a CE Community participant, I will ask you about how your community has been effected by the transition to Circular Economy models. You may choose to answer any or all questions.

Length of Time: Participation involves a 30-45 minute interview. The length of the interview would depend on your level of interest in my project.

Withdrawal from the Study: Participation is entirely voluntary and you may refuse to participate or withdraw from the study at any time without jeopardy to you. If you choose to withdraw your participation during the data collection, I will destroy any data collected from you. Please note that data cannot be removed from the study after participation has ended, which will occur on approximately October 1st, 2019.

Possible Benefits: The results of the research will be made available to you. My findings and their dissemination will build awareness about the challenges and societal benefits of the Circular Economy in Canada and more specifically, Newfoundland, as well as Europe. It is imperative that we have a research-based understanding of the Circular Economy that intersects with various stakeholders in the process.

Possible Risks: The risks associated with this research are minimal, however, all information you provide will be treated confidentially.

Confidentiality: The ethical duty of confidentiality includes safeguarding participants' identities, personal information, and data from unauthorized access, use, or disclosure. The data from this research project will be published and presented at conferences; however, your identity will be kept confidential. This means that your name will not appear in any publication stemming from the research, nor will it be associated with any information you provide. Although I will report direct quotations from the interview, you will be given a pseudonym, and all identifying information (i.e. name of firm, job title, etc. will be removed from my report). While I will make every reasonable effort to ensure confidentiality, there are limits to confidentiality in some situations. Because the participants for this research project have been selected from a small group of people, many of whom are known to each other, it is possible that you may be identifiable to other people on the basis of what you have said. In light of the specificity of the target sample and the relatively 'small' geographic area within which this study is being conducted, when reporting the data I will aggregate the results from Friesland and Glasgow so that that particular workers and firms are less likely to be identified. This means that when I write about or presented the information collected here, I will refer to Canadian/provincial regions or Dutch and Scottish region as a whole.

Anonymity: Anonymity refers to protecting participants' identifying characteristics, such as name or description of physical appearance. Every reasonable effort will be made to ensure your anonymity; and you will not be identified in publications unless you indicate that you would like to be. For example, some participants may prefer not to be anonymous – this option is available as long as it does not negatively affect and/or identify other participants who do wish to remain anonymous.

Recording of Data: The interview will be recorded with your permission. The recordings will be used to transcribe the text verbatim. Having a transcript of the text allows me to analyze the information I collect through a process known as 'coding'. You may request to stop the recording at any point during the interview. Both I and my supervisor will have direct access to the recording. Please note that the research assistant will also sign a confidentiality agreement.

Storage of Data: I will have access to the raw data (audio recordings). These files will be password protected and the transcriptions will be identified by a code. Our University's policy on Integrity in Scholarly Research requires me to store the data collected here for a minimum of five years. Your consent form will be stored in a locked filing cabinet, separate from the data. Any data records (audio recording of your interview and transcript) will be password protected on my computer hard drive. After the five-year retention period, I will shred paper copies of the interview transcripts and will delete the audio recordings.

Reporting of Results: The data will be disseminated through an academic conference presentation and later published in an academic journal. Additionally, the thesis will be available at Memorial University's Queen Elizabeth II library, and publically accessible at http://collections.mun.ca/cdm/search/collection/theses. In these dissemination venues, I may use direct quotations from interview participants, but will not use personally identifying information.

Sharing of Results with Participants: When the project is complete, all participants will have access to a 700-word summary of the findings via email should they wish a copy (email: r.ledrew@mun.ca or nicholas.lynch@mun.ca).

Questions: You are welcome to ask questions at any time before, during, or after your participation in this research. If you would like more information about this study, please contact: Rebecca LeDrew, Department of Geography, Memorial University, Phone: 709-770-8789 or my supervisor, Dr. Nicholas Lynch, Department of Geography, Memorial University, Phone: 709-864-8413.

Consent: Your oral consent means that:

• You have read the information about the research.

• You have been able to ask questions about this study.

• You are satisfied with the answers to all your questions.

• You understand what the study is about and what you will be doing.

• You understand that you are free to withdraw participation in the study without having to give a reason, and that doing so will not affect you now or in the future.

• You understand that if you choose to stop participating during data collection, any data collected from you up to that point will be destroyed.

• You understand that if you choose to withdraw after data collection has ended, your data can be removed from the study up to October 1st, 2019.

You agree to be audio-recorded Yes ☐ No ☐

You agree to the use of direct quotations Yes ☐ No ☐

By signing this form, you do not give up your legal rights and do not release the researchers from their professional responsibilities. Your Signature Confirms: I have read what this study is about and understood the risks and benefits. I have had adequate time to think about this and had the opportunity to ask questions and my questions have been answered. I agree to participate in the research project understanding the risks and contributions of my participation, that my participation is voluntary, and that I may end my participation. A copy of this Informed Consent Form has been given to me for my records.

_____ _____ Signature of Participant/ Date Researcher's Signature: I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in being in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

_____ _____ Signature of Principal Investigator/ Date

NOTE: The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861

Appendix Three: Interview Design

Interview Design:

Closing the Loop Between Past and Present: Exploring the Possibilities for a Rural Circular Economy in Newfoundland

The following interview design outlines the approximate and non-exhaustive questions that will be posed to the four groups identified for research in the Circular Economy (CE): i) Non-governmental organizations and interest groups ii) CE practitioners and consultancies; iii) policy makers and local authorities; iv) CE community groups. This is a semi-structured and open-ended interview format. Interviews will last between 30-45 minutes. You are free to skip any questions you do not wish to answer.

Interview Group 1: Non-governmental organizations and interest groups Includes individuals from NGOs, charity groups, think tanks, and social enterprises. These interviews focus on the development and management of CE platforms, networks, business models and technologies; views of what counts in developing the CE; how CE knowledge is valued, shared, disseminated in the network; how CE networks are constructed and what relationships exist.

• What are the central aims/goals of your organisation?

• What are your responsibilities in the organisation?

• How has your organisation come to be involved in the CE?

• What does the CE mean for your organisation? Or, depending on the context, would their organization consider becoming involved in the CE?

Developing and managing CE platforms and networks:

• What are the central aims and goals of your CE platform/network?

• Who is included in this platform/network? (other NGOs, practitioners, academics, policy makers)

• How are other organisations included in this network/platform?

• What are the central challenges in fostering CE thinking and collaboration?

Implementation of CE Models and Technologies:

• What forms of CE business models and technologies are essential to developing an integrated rural CE?

• What are the central challenges in adopting CE technologies to the rural scale; to the household level? • What actors are essential in making the switch to CE practices possible?

Interview Group 2: CE Practitioners and Consultancies

Includes individuals from NGOs, consultancies, and social enterprises. These interviews focus on: the development and delivery of CE innovations and strategies; views on the role of CE platforms and networks in building CE knowledge and explores existing relationships with other stakeholders in the CE.

• What are the central aims/goals of your organisation?

• What are your responsibilities in the organisation?

• What does the CE mean for your organisation?

• How is your organisation involved in the CE? And, what specific aspects of the CE is your organisation involved in?

• Who are your CE 'clients' and what types of services do you provide?

Relationships with CE platforms and networks:

• Which CE platforms and networks is your organisation involved in? Or, which would you consider becoming involved in?

• How did you get involved with CE platforms/networks?

• What value do these platforms/networks have for your organization; for advancing your view of the CE?

• What types of collaborative relationships has your organisation made in this process?

• How has being involved in the CE network/platform influenced your work in the CE?

Implementation of CE Models and Technologies:

• What forms of CE business models and technologies are essential to developing an integrated rural CE?

• What are the central challenges in adopting CE technologies to the rural scale; to the household level?

• What actors are essential in making the switch to CE practices possible?

Interview Group 3: Policy Makers and Local Authorities

Includes individuals from local and regional governments, and governmental agencies. These interviews focus on: the development and delivery of CE policies and strategies; views of what counts in developing CE policy frameworks; how CE policy networks are constructed and what relationships exist.

• What are the central aims/goals of your organisation?

• What are your responsibilities in the organisation?

• How has your organisation come to be involved in the CE?

• What does the CE mean for your organisation?

• What are the central strategies of CE that are the most important within a policy context?

Relationships with CE platforms and networks:

• Which CE platforms and networks are you involved in?

• How did you get involved with CE platforms/networks?

• What value do these platforms/networks have for policy development and/or for advancing public sector views of the CE?

• What types of collaborative relationships have you (and your organization) made in this process?

• How has being involved in the CE network/platform influenced your work in the CE?

Implementation of CE Models and Technologies

• What forms of CE business models and technologies are essential to developing an integrated Urban CE?

• What are the central challenges in adopting CE technologies to the urban scale; to the household level?

• What actors are essential in making the switch to CE practices possible?

Interview Group 4: CE Community Groups

Includes individuals from local and CE neighbourhoods. These interviews focus on the on the ground implementation and impact of everyday lives and the CE.

• What are the central aims/goals of your community group?

• How has your community come to be involved in the CE?

• What does the CE mean for your community?

• What are the central strategies of CE that are the most important within a policy context?

Implementation of CE Models and Technologies:

• What forms of CE business models and technologies are essential to developing an integrated rural CE?

• What are the central challenges in adopting CE technologies to the rural scale; to the household level?

• What actors are essential in making the switch to CE practices possible?

• Has the CE enhanced your life in the community? Are there any central tensions or challenges in your everyday life with respect to the CE?