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A systemic approach to transitions towards circular economy: The case of Brighton and Hove

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ABSTRACT

To date, the literature on the circular economy has been dominated by closed-loop industrial practices, circular products, and business models. Lack of systemic perspective in the circularity debate limited the understanding of multi-actor and multi-pattern transitions. In this paper, we apply a co-evolutionary framework to investigate key dimensions of a socio-technical system -ecosystems, technologies, businesses, institutions, and user practices-in the city of Brighton and Hove (United Kingdom). We present the causal interaction between these systems based on the outcomes of semi-structured interviews with the local actors and documentary analysis of relevant policies and strategies. Exploring how each system evolves under own dynamics and influenced by the dynamics in the others leads us to identify the main drivers and barriers of a circular economy in the city. Our findings underline the necessity of systems-level change with a holistic vision, consideration of place-specific factors and engagement of multiple actors for a successful transition.

1. Introduction

The roots of circular economy (CE) can be traced back to the 1970s (Blomsma and Brennan, 2017). Since then, the contemporary understanding and practical applications of CE has evolved from a variety of disciplines, concepts, and strategies (Sauve et al., 2016). Discussions around improved waste management followed by cyclical material flows and evolved through preventive thinking with an emphasis on design (Blomsma and Brennan, 2017). There has been a dramatic increase in the number of publications in both academic and grey literature in the last decade (Reike et al., 2018) where closed-loop industrial practices, circular products and business models dominated the debate (Williams, 2019).

Kirchherr et al. (2017) carried out an extensive literature review on different definitions of the CE to reflect on various understandings in peer-reviewed journal articles, policy papers and reports. They systematically analysed the 114 definitions against a coding framework that relates to core principles, aims and enablers of CE (Kirchherr et al., 2017). Their findings show that CE mostly used within the 3R framework (Reduce, Reuse, Recycle) with recycling used in 79% of the definitions, followed by reuse by 75% and reduce by 55%. Nevertheless, a systemic perspective and a need for fundamental change were mentioned in only a few definitions (Kirchherr et al., 2017).

Critics for dominance of R-typology in CE discourse point out the over-simplification of the concept (see, for example, de Jesus and Mendonça, 2018; Reike et al., 2018). They argue that centring around firms creates ground for techno-fixing solutions to unsustainable consumption and production patterns. Focusing on “a bit twisting the status quo” (Kirchherr et al., 2017:229) rather than a systemic innovation does not reflect the requirements of a transformative change (Reike et al., 2018).

Techno-centric views and business dominated approaches also sparked debate about CE within the wider urban sustainability agenda (Pendeville et al., 2018). For example, Soukopova et al. (2015) criticized the purely functional interpretation of CE as a narrow remit of municipal waste management, while Vergragt et al. (2016) underlined the complexity that surrounds the idea of circular cities. They argued that grassroots innovations, science, growing sense of responsibility among firms and individual consumers all play important roles in changing structures within the main domains of a city.

Similarly, Fratini et al. (2019) reflected on the little attention given to the active role that public authorities can play. They stated that cities are multi-faceted places with various systems, networks, and agents where local governments have comprehensive knowledge and autonomy on urban planning, construction, transportation, waste, water and other...
resources and services. Thus, local policies, pilot projects, strategies and various support initiatives play an essential role to give directionality to local development (Ghisellini et al., 2016). Those activities not only mobilise firms, organisations and individuals but also legitimise the concept and principles, ensure continuity and stability so that all actors can take initiatives to transform through circular activities (Fratini et al., 2019).

In brief, the lack of systemic perspective in the circularity debate limited the understanding of multi-actor and multi-pattern processes at the urban level (Prendeville et al., 2018). Relatively little attention has been paid to the role of various stakeholders (e.g. consumers, local government), and interactions between them (Ghisellini et al., 2016). Although many cities are turning to circular approaches to create low-carbon, regenerative economies and to improve their urban living environments, the topic of circular cities is still not studied comprehensively. The existing transitions literature is lacking explicit, causal analysis of how place-specific factors matter (Coenen et al., 2012).

This paper aims to respond to the call for more attention to the systemic interconnections and the need for more place-based analysis of CE activities (Prendeville et al., 2018; Fratini et al., 2019), by examining the case of developments towards circularity for the city of Brighton and Hove in the United Kingdom (UK). To analyse how these interconnections are giving rise to drivers and barriers towards a CE transition, a framework based on the coevolution of ecosystems, technologies, institutions, business strategies and user practices (Foxon, 2011) is applied. Our findings underline that to achieve a sustainability transition to a CE, there need to be positive feedbacks between developments relating to technology, producers, consumers, and policy.

2. Theoretical framework

This research applies the co-evolutionary framework developed by Foxon (2011) for the analysis of low carbon transitions (Fig. 1). Co-evolution refers here to the mutual causal interactions of more than one element through variation, selection, and retention processes (Hannon et al., 2013). The framework aims at creating a ground for analysis of a transition to a sustainable low carbon economy, looking at ecosystems, technologies, institutions, business strategies, and user practices within a multi-level perspective. It provides a combination of insights from ecological economics, evolutionary economics, innovation systems and socio-technical transitions to address challenges of overcoming unsustainable production and consumption systems.

Definitions of each system are provided as starting points by Foxon (2011). First, ecosystems defined as “systems of natural flows and interactions that maintain and enhance living systems” (p.2262). Second, technological systems referred to as “systems of methods and designs for transforming matter, energy, and information from one state to another in pursuit of a goal or goals” (p.2262). Third, systems of institutions are defined as “ways of structuring human interactions” or “the rules of the game” (p.2262), including rules, regulations, property rights. Fourth, business strategies are regarded as “the means and processes by which firms organise their activities so as to fulfil their socio-economic purposes” (p.2262). Social purposes include the reputation of a firm which in turn would affect the primary economic purpose of making profits. Finally, user practices are referred to as “ routinised, culturally embedded patterns of behaviour relating to fulfilling human needs and wants” (p.2262) including consumption habits.

Overall, the framework suggests that transitions towards a sustainable low carbon economy occur through the coevolution of institutional changes, technological shifts, revised business strategies, lifestyle changes and their interaction with changes in the ecosystem. Each of the systems has roles for multiple actors such as policymakers, businesspeople, individuals, who actively influence and are influenced by the change and mutual stability between systems.

Several CE frameworks have been used in the literature. However, many of these frameworks focus on micro-level (i.e. products) or meso-level (i.e. eco-parks) and lack transferability in the city context (Prendeville et al., 2018). Addressing the gaps in the literature identified above, this framework allows for an explicit discussion on a systemic change towards a CE. It reflects the necessity of multi-dimensional change by looking at five different systems in a socio-technical setting and their interaction with each other. It also presents the acknowledgement of the role played by multiple actors. Detailed analysis of causal interactions within and between systems helps to provide a clear picture of drivers and barriers of CE transitions.

3. Material and methods

This research designed as a case study to gain a deeper understanding of a topic in a real-life setting, focusing on how the case influences and is influenced by its context (Yin, 2018). Case studies are often used to explore and understand emerging topics (Eisenhardt, 1989). Given the fact that the understanding of urban transitions towards CE are novel, case study research is deemed suitable to investigate this phenomenon following Prendeville et al. (2018) and Fratini et al. (2019) among others.

The city chosen for study is Brighton and Hove (B&H), where the City Council recently set a priority to create a CE framework (BHCC, 2018). Its latest economic strategy mentions the previous steps towards being “a sustainable city”, acknowledges the activity happening at the local level, states its commitment to collaborate and explore “new ideas and disruptive approaches” and reveals the aim for being a leading circular city (p.5). This aspirational agenda towards a CE makes B&H an interesting place to study transition processes.

For the exploration of the case study, documentary analysis and semi-structured interviews are utilised and the results are analysed against a coding framework. Secondary data is gathered through local policies, strategies, action plans, newspapers, and organisational websites. These resources are reviewed to create an in-depth understanding of the city identity and to explore the existing ground for CE transitions in B&H both in terms of policy and action. Additionally, the city’s approach to CE is discussed with the interviewees to foster a more integrative view.

Table 1
Main policy documents used as sources of secondary data.

<table>
<thead>
<tr>
<th>Name of the Document</th>
<th>Numeric Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brighton and Hove Economic Strategy (2018–2023)</td>
<td>D1</td>
</tr>
<tr>
<td>Brighton and Hove City Corporate Plan (2015–2019)</td>
<td>D4</td>
</tr>
</tbody>
</table>
provides the list and numeric codes of the policy documents used as main sources of secondary data.

Semi-structured interviews are used to gather focused data and create a comprehensive outlook on the case study (Yin, 2018). The interview protocol is formed of eleven guiding questions directed to the interviewees chosen through purposive sampling and snowball sampling. The network of Circular Brighton and Hove, which is the major multi-stakeholder platform dedicated to the CE with an aim to increase awareness, share knowledge, and facilitate action in the city, is utilised to identify key actors. Willingness to contribute to the study was high, as seven out of ten individuals we contacted responded positive and participated in the research. The sample of interviewees considered representative as it includes insights of the actors from various public, private, and civil society organisations who engage in relevant CE activities or actions in B&H. All interviews (60–90 min each, face-to-face) took place between June and September 2019.

Table 2 provides details about interviewees.

Finally, data analysis started with inductive work to build patterns and themes from the interviews. These themes turned into a coding framework to organise the data for analysis. As the analysis moved forward, the deductive analysis took place to identify more evidence to support each theme or to determine if additional information is needed (Creswell and Creswell, 2018). It is aimed to ensure that multiple perspectives from individuals are reflected.

4. Results and analysis

The results and analysis of this paper are presented in four main sections. Section 4.1 focuses on B&H city identity and place-specific characteristics. This followed by Section 4.2 with insights on the city's approach to the CE. Section 4.3 presents how five systems -ecosystems, technologies, institutions, business strategies and user practices-influence the circular transitions in B&H and reports on each system's dynamics in detailed subsections. Lastly, Section 4.4 summarises the main drivers and barriers towards CE in B&H building on the coevolutionary analysis.

4.1. Brighton and Hove city identity

B&H is located in south-east England, UK. It has a long-established reputation of being one of the most distinctive cities in the UK with its diversity of people, strong civil society, and liberal culture (D1). The city states its vision as being a connected, creative, dynamic, inclusive, and diverse city of people, strong civil society, and liberal culture (D1). The city reputation of being one of the most distinctive cities in the UK with its natural assets surrounding B&H, including the seafront and the South Downs National Park, are often referred to as the city's greatest and most recognised strength (D1). The city is the lead partner for the Living Coast Biosphere programme, which is one of the six UNESCO designated Biosphere Reserves in the UK, that pursues improvements in land use and recreation of wildlife across the wider area similar to the Greater Brighton region (see Fig. 2).

The city's environment and diverse cultural offers bring along a thriving visitor economy as a sector specialism (D1). The visitor economy is one of the largest employment sectors in B&H with extensive choices of independent shops, hotels, bars, and restaurants (D5). It welcomes over 9.5m day visitors each year (D5:3). The high volume of transient population, however, causes a massive carbon footprint and waste (D5).

Last but not least, B&H is the 4th most unequal city in the UK (D1:36). One in five children and young people in the city live in poverty, rising to one in two in the most deprived areas (D4:23). Access to affordable housing is one of the fundamental challenges (D1). Almost three-quarters of households cannot afford housing (either to buy or rent) without a subsidy or spending a disproportionate level of their income on housing costs (D4:14).

4.2. Brighton and Hove’s approach towards circular economy

Understanding how CE approached in the city is important. This is because varied interpretations play a significant role in the conceptualisation of the ideas, which in return gives directionality to the circular action and practices experienced at the local level. Creating a CE framework has been highlighted as a priority action in the latest economic strategy (2018), where CE presented as a “new and disruptive approach (…) which provides a real opportunity to nurture local sectors, skills development, and enterprise, at the same time reducing waste and pollution” (D1:43).

Although interviewees shared slightly different interpretations of what CE entails, they mentioned four elements in common. Firstly, CE is seen as a systemic agenda that leads to rethink existing consumption and production patterns (I1, I2). It presents a great opportunity for making a real step-change by challenging traditional perspectives (I1, I2, I4, I5) and aims to adopt a regenerative model rather than something linear, extractive and single-use (I1, I2, I5, I6, I7).

Secondly, CE creates a closed loop with the acknowledgement of everything has a value and everything has a place (I6). It is a matter of using resources efficiently and responsibly to minimize the impact on the natural world while maximizing economic prosperity (I2, I5, I7). Thirdly, CE puts reuse and reduce agenda on the top of the hierarchy, pushing recycling to the lower end (I2, I4, I5, I6, I7). Although the end-of-pipe treatment still plays a role on the CE agenda, most of the discussions revolve around design (I1, I2, I3, I5, I6, I7). It incorporates designing out waste (I1, I2, I3, I7) with an intention to repair, refurbish, remanufacture
Fig. 2. Map of Greater Brighton City Region. B&H is coloured in pink. Yellow dots show the Living Coast Biosphere border (source: B&H City Corporate Plan, 2015–2019:5). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Fig. 3. Coevolutionary analysis. This figure represents the drivers (coloured in blue) and barriers (coloured in red) identified through causal interactions and co-evolution of five elements, adopted from Foxon (2011) co-evolutionary framework. Please refer to Table 3 for correspondents of numerical coding. (Please note that curved arrows are added to the original figure to visualise evolutions of dynamics within each system.). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)
Table 3
Categorised list of main drivers and barriers identified in Brighton and Hove in transitions towards a circular economy.

<table>
<thead>
<tr>
<th>Main drivers identified at the local level</th>
<th>Main barriers identified at the local level:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ecosystems</strong></td>
<td>5. Transient population (i.e. tourists and students)</td>
</tr>
<tr>
<td>1. Tangible connections with the environment (seaside, national park)</td>
<td>10. Lack of interest in CE</td>
</tr>
<tr>
<td>2. Recognition as UNESCO World Biosphere Region as an international demonstration area for sustainability</td>
<td>11. Lack of funding</td>
</tr>
<tr>
<td>3. Key environmental challenges in the city</td>
<td>12. Lack of initiative on the actual impact</td>
</tr>
<tr>
<td>4. Climate emergency</td>
<td></td>
</tr>
<tr>
<td><strong>Technologies</strong></td>
<td></td>
</tr>
<tr>
<td>6. Existing research and development organisations</td>
<td>20. Limited resources: budget, time, personnel (worsened with the Covid-19 pandemic)</td>
</tr>
<tr>
<td>8. Growing digital services</td>
<td>22. Uncertainty around regulations</td>
</tr>
<tr>
<td><strong>Institutions</strong></td>
<td>24. Lack of multi-level integrated framework</td>
</tr>
<tr>
<td>13. Intention and progress towards a CE framework</td>
<td>25. Uncertainty around post-Brexit era (and green Brexit)</td>
</tr>
<tr>
<td>15. A holistic vision of creating a future-proof city</td>
<td></td>
</tr>
<tr>
<td>16. Awareness of economic, social, and environmental contribution of CE at the local level</td>
<td></td>
</tr>
<tr>
<td>17. Previous sustainability strategies: direct/indirect contributions to CE</td>
<td></td>
</tr>
<tr>
<td>18. Competition between cities: the goal of being a leading circular city</td>
<td></td>
</tr>
<tr>
<td>19. Collaboration opportunities in the Greater Brighton city region</td>
<td></td>
</tr>
<tr>
<td><strong>Businesses strategies</strong></td>
<td></td>
</tr>
<tr>
<td>27. The high number of SMEs: more flexibility to adopt CE practices</td>
<td>35. Lack of knowledge and skills on circular design and systems</td>
</tr>
<tr>
<td>28. High level of entrepreneurship on sustainability</td>
<td>36. Uncertainty around new business strategies</td>
</tr>
<tr>
<td>29. Increasing consumer demand for accountability and change</td>
<td>37. Risks: guarantee, health and safety</td>
</tr>
<tr>
<td>30. Reputational threats of unsustainable practices</td>
<td>38. Lack of incentives and/or disincentives, reliance of private investment</td>
</tr>
<tr>
<td>31. The growing interest in the economic benefits of CE</td>
<td>39. Lack of business collaboration platforms</td>
</tr>
<tr>
<td>32. Growing ethical considerations towards the environment</td>
<td>40. Lock-in</td>
</tr>
<tr>
<td>33. Existing second-hand, re-use, repair market</td>
<td>41. Lack of adequate infrastructure (e.g. for remanufacture, recycle)</td>
</tr>
<tr>
<td>34. The reputation of being a green city</td>
<td>42. The high value of land</td>
</tr>
<tr>
<td>35. The importance of local rethinking</td>
<td>43. High financial pressure due to the Covid-19 pandemic</td>
</tr>
<tr>
<td><strong>User practices</strong></td>
<td>50. Lack of knowledge around CE ideas and practices</td>
</tr>
<tr>
<td>44. High level of awareness among people about climate change, pollution and other environmental problems</td>
<td>51. Existing lifestyles with high levels of consumption</td>
</tr>
<tr>
<td>45. Culture of questioning the norm, critical mindset</td>
<td>52. Lack of trust in systems and products within CE (e.g. guarantees)</td>
</tr>
<tr>
<td>46. Diverse community with open culture</td>
<td>53. Socio-economic conditions (extra hardship due to Covid-19 pandemic)</td>
</tr>
<tr>
<td>47. High level of environmental activism</td>
<td></td>
</tr>
<tr>
<td>48. Community-level initiatives (e.g. Freegle)</td>
<td></td>
</tr>
<tr>
<td>49. Collaboration platforms (e.g. Circular economy club)</td>
<td></td>
</tr>
</tbody>
</table>

and repurpose (I1).

Finally, CE requires a multi-level transition that involves multiple actors: citizens, civil society organisations, businesses, local and national governments, universities, and other knowledge institutions. “There is a really significant role that different institutions play at different scale and different levels” (I2). Thus, it requires collaboration (I1,I2,I4,I7).

4.3. System dynamics and coevolutionary interactions

This section presents how the city’s characteristics and its approach towards CE evolve with the dynamics of five systems, namely ecosystems, technologies, institutions, business strategies, and user practices. The coevolutionary analysis, which is carried under the guidance of the theoretical framework, provided the opportunity to explore how the dynamics of one system may trigger the change in another. The overall findings created a powerful base to identify main drivers and barriers towards a CE transition in B&H. Fig. 3 visualises the co-evolutionary analysis carried out in this research, whilst Table 3 summarises the categorised list of drivers and barriers identified at the local level. The findings are discussed in more detail in the subsequent sections.

4.3.1. Ecosystems

“Nature by default has a flow of activity where all materials end up being the resource for the next process. (…) It is quite important in creating a circular system that we reflect on how nature does it and learn from that. (…) It is joyful evidence that we can design a system, that is efficient and circular.” (I5).

In the interactions between CE and ecosystems, biomimicry mentioned as an inspiration for circularity by all interviewees. Imitating how nature works allow creating a circular system, where one system’s waste is another system’s resource (I1,I3,I5,I6). However, the ecosystem’s causal influence on the CE is mostly relating to the problems we are facing today, from resource scarcity to climate change (I1,I2,I4,I6,17). These challenges are regarded as the drivers of a ‘local rethinking’ towards a CE (I2), where CE appears as a practical solution to the increasing resource problem through maintaining the value of materials in cycles (I3). The primary focus is on reducing the demand for virgin materials while making most of the resources B&H already have (I1,I6).

“Mine the Anthropocene, nurture natural resources. (…) I think we have mined enough stuff for the next 50–100 years. We just need to rework what we have got.” (I6).

Circular practices’ contribution to addressing climate change was also mentioned as a major driver (I1,I2,I5,I6,17). Lifetime extension of materials and products (I2,I3,I5) and digital sharing platforms (I1,I4,I6,I7) were given as example CE strategies, which directly help reduce the amount of carbon emissions released during different stages of production and consumption.

Lastly, the natural assets of the city are also indicated as important drivers towards circularity as they play a meaningful role in the public’s sensitivity and connection with the ecosystems.

“We are in the middle of the amazing countryside and an amazing ocean. That is why we have far more people concerned about the environment. It is much easier to promote an idea of something being regenerative for our local environment where people have that tangible connection” (I7).

4.3.2. Technologies

Technologies’ interaction with the CE highlighted the role of innovative design, business strategies, and collaboration in CE. Interviewees stated the crucial role of technologies in the development of novel methods to redesign products, services or business models to increase
resource efficiency, foster productivity and reduce costs (I1,I2,I4,I5,I6,I7). It is stated that making new solutions scalable, achievable and adaptable would trigger the speed of transitions towards a CE (I1,I6,I7).

“There is a real opportunity for having technological advancement and innovation to support how we achieve CE. The whole concept of CE brings lots of ideas to the table but also brings lots of challenges on how we can achieve that, what the solutions are. There is a real opportunity for engineers, for innovators to come up with solutions, help us deliver our CE priorities” (I2).

The role of digital technologies and platforms has been highlighted in terms of practical applications to closing the loops (I5,I7), facilitating collaboration among businesses (I6), and organizing campaigns through social media (I5,I7). An example on digital platforms given was a food-waste app that connects businesses like bakeries, restaurants, and shops, which have daily surplus food, with customers at a discount on retail price. The app also states an estimated carbon savings of the prevented food waste, creating not only financial but also motivational satisfaction (I7).

The city has extended capacity to carry out research and develop technologies with two universities and several innovation centres (I2,I3,I5,I7). Although this seen as an important driver, all interviewees stressed how existing technologies are utilised in terms of the creation of a CE. They mentioned that the research and knowledge ‘cemented in the universities’ needed to turn into practice to create a greater impact (I3,I5,I7) but lack of interest and funding around CE hinder the innovation potential (I5,I7).

4.3.3. Institutions

Many layers of institutions affect CE transitions (I1,I2,I6,I7). At the international level, Sustainable Development Goals and the Paris Climate Agreement could play a role in CE transitions (I1,I2). Although the European Commission’s CE policies are also influential at the international level, the post-Brexit era changes the governance arrangements. UK Government has already set a vision for a Green Brexit and presents this as a unique opportunity to design a set of environmental policies tailored to the needs of the UK that exceeding the EU ambitions (D6:113).

At the national level, the latest UK Waste and Resources Strategy (2018) seeks to “redress the balance in favour of the natural world through moving towards a more CE” (D6:4). The strategy provides a mix of policy and fiscal instruments with ambitious solutions to ensure infrastructure, information and skills are in place; to prevent waste at the first stage and extend business responsibilities to the post-use. Referring to waste as a “costly misuse of the natural capital” (D6:67), the UK Government is planning on fundamentally moving away from a focus on waste towards resources to better support to a more CE in which products and materials are reused, repaired, and remanufactured (D6:136).

Although the strategy delivers long-awaited proposals and has the potential to transform the management of waste and resources, the lack of robust regulatory and legal frameworks undermine the action and implementation phases. Interviewees mentioned how the lack of incentives for CE practices (I2,I5,I7), disincentives for harming practices (I1,I3) and ambiguity around standards, and indicators (I1,I2) create barriers to effective change.

“Although we (local authority) can help to facilitate and speed up achieving some of the things to achieve around CE, the national government have a significant role to play. There is only so much we can achieve as local authorities. We do rely upon our national government to put the frameworks, policies, and laws in place to help us achieve our CE goals” (I2).

At the local level, B&H City Council is working to create a CE framework with an aim to be a leading circular city (D1). Since 2018, the CE steering group of the Council has organised several workshops to explore the opportunity to further develop policy actions on the economic, social, and environmental contributions of CE.

“I think local councils have got a huge role to underline the importance and benefits of a circular economy to legitimize it. Otherwise, it might just look like a peripheral pursuit that a few people are doing. (...) I think It is hugely exciting that B&H City Council is taking it seriously and putting a lot of effort and resources into this. That will legitimize the concept and facilitate the realization of circular systems, which is really important” (I6).

Although the work of the engaged bureaucrats and councillors is appreciated (I5,I6,I7), limited power, budget, dedicated time and resources of the local authority is mentioned by all interviewees as critical barriers. The latest Corporate Plan (2015–2019) also states the pressure on the City Council services with a funding reduction by £102 million over this period, despite the increase in the population growth and demands (D4:4).

The Covid-19 pandemic also came with additional costs, losses, and exceptional expenses. The local budget deficit for 2021–22 is estimated to be in the range of £11 million to £27 million (Cisholm, 2020). Despite the high financial burden, the City Council sees the pandemic as an “opportunity” to shape the future of the city with a new approach, which “places community wealth building and the circular economy at its heart” (Cisholm, 2020).

4.3.4. Business strategies

The high proportion of SMEs, increasing number of sustainability start-ups and the existing second-hand, reuse, repair market in the local economy are strong drivers for a CE in B&H (I1,I2). There is an amplifying demand for environmentally responsible businesses, especially from younger generations in the city (I4). Consumers are willing to support ethically responsible and sustainable businesses, because “they believe in what they do” (I4) and want “to feel to be part of that” (I7). This started to challenge the existing practices and necessitate adopting innovative strategies which otherwise would bring reputational threats.

“There are really good examples of businesses that are trying to go an extra mile to make their shop as ethically sustainable as possible in B&H. They are using the CE as a kind of an appetite now; to challenge themselves and to present a better offer to the customer. (...) It makes more business sense to build on this (CE) approach at the earlier stage rather than respond to it later when they could be in danger of being criticised of being unsustainable” (I4).

Collaboration between businesses is regarded as a key element of creating circular systems, not only for closing the material loop locally but also for cross-fertilising novel ideas and encouraging business-led innovation. Digital network platforms were referred to as important mediums for businesses to utilise, either as knowledge sharing forums or material exchange tools.

“In order to grow the idea of the circularity, businesses have to start reaching slightly beyond their usual boundaries. (...) Businesses should not be afraid to work in bigger, independent circles where they need to. We can all work together, and it is mutually beneficial. I think that is part of the bigger idea of the circular economy” (I4).

However, the lack of knowledge around circular business practices creates barriers and the absence of such exchange platforms hinders collaboration in the city. This reveals the need for concrete examples and guidance for potential applications (I1,I2,I3,I4,I5,I7).

“There is a growing interest from the business sector to take up the opportunities that CE presents but not a lot of businesses know ‘how to’ exactly yet. So, there is an interest, but not always the capacity or the time for businesses to devote to this” (I1).

Although there are several local support programs for businesses to
adopt sustainable practices (e.g. the Green Growth Platform), there is no specific scheme introduced to support circular business initiatives. The City Council refers to itself as a facilitator rather than a financier of replacing unsustainable systems (I2,I5). Reliance on private investment creates a reluctance to change current business models where the cost of new initiatives (e.g. remanufacturing facilities) is relatively higher (I2). Moreover, it is yet difficult to justify health and safety requirements (I1), quality of secondary materials (I7), the financial savings (I4) or the positive environmental impact (I7) of certain CE practices. The absence of concrete policy measures and indicators addressing these concerns make it risky for businesses to invest in circular models (I1,I4,I7).

Lastly, a significant number of businesses are at risk as a consequence of the Covid-19 pandemic. 70 per cent of jobs are estimated to be adversely affected in B&H, as the visitor economy and independent retail, two of the mainstays of the local economy in B&H, are under considerable pressure due to coronavirus measures and restrictions (Chisholm, 2020).

4.3.5. User practices

Interviewees referred to two major roles of users in CE transitions in B&H (I1,I2,I4,I5,I7). The first one is individual-level behaviour or lifestyle change, which is defined as taking individual responsibility on carbon footprint (I5) and closing the personal loop (I4); as the volume of waste generated per household is high and recycling rates are low in the city, compared to the national average (D4:30). It is indicated that behavioural change can be achieved through questioning the need to purchase a product or a service (I2,I5); questioning the quality and impact of it (I1,I5,I7) and being mindful of the waste it will create (I3,I5).

Secondly, interviewees mentioned the users’ role in creating a demand for change through campaigning and lobbying, both at the corporate level and at the legislative level (I1,I2,I5,I7). It is indicated that there is an increasing questioning of the environmental accountability of businesses and growing demand for policy action towards a ‘radical change’, which are the major drivers at the local level (I2). Individuals can demand change through the way they spend their money (I1,I2,I4,I5,I7) or which policies or representatives they vote for (I4,I7).

“The role of a user is key. The biggest power you have as an individual is your vote and your money. Support good businesses, practices, and policies that you really believe in, nourish them. Vote with your money, vote with your feet” (I7).

Interviewees also mentioned various community-level initiatives (e.g. Freegle) and activism in B&H. They reflected on the public’s sensitivity to environmental problems and underlined the importance and power of collective action (I2,I5,I7).

“I think that any individual action is valuable because it adds up collectively to be quite powerful. It is what triggers business and government and institutions to change. Otherwise, they will never enact change that is a distraction from their existing models. (…) All the collective campaigns give governments and businesses the confidence to change the way they operate” (I5).

On the other hand, lack of information among the wider public is mentioned as a significant barrier (I3,I4,I5,I6,I7). The importance of raising awareness through educational campaigns and the role of public communications are highlighted (I2,I7).

“I think the facilitator is communications. We need to support our CE having much stronger communications on it whether it is through social media or organizational web sites. Making it part of everyday language, translating that concept into our day-to-day dialect is key” (I2).

Lastly, socio-economic conditions in B&H were mentioned as a critical barrier towards changing user practices (I4,I5,I7). There are persistent and diverse issues of poverty, homelessness, and inequality across the city, which is even worsened amidst the pandemic. That creates a condition where some groups of people have no or limited choice to change their day-to-day practices and priorities (I4,I7).

4.4. Summary of the main drivers and barriers towards a circular economy in Brighton and Hove

Our analysis of the ecosystems, technologies, institutions, business strategies, and user practices led to discovering how each system evolves under own dynamics and influenced by the dynamics in the others, providing a strong ground for uncovering the main drivers and barriers towards CE. This section summarises the findings in Fig. 3 and Table 3, building on the previous sections 4.1, 4.2 and 4.3.

ECosystems reflect the environmental motivation of users, businesses, and institutions in B&H: in the form of tangible connections, willingness to address grand challenges and growing ethical considerations. It also gives inspirations to design circular products, services, or closed-loop systems through technologies. Although there are qualified organisations to carry out research and a growing digital and ICT sectors in B&H, lack of funding, investment and interest in CE appear as important barriers.

Lack of public investment also creates reluctance for businesses to transform their operations to adopt circular strategies, thus intensifying the lock-in to unsustainable production and consumption patterns. Inadequate infrastructure and high value of land combined with a lack of incentives appear as significant barriers, especially for larger corporations. Uncertainty around national regulations and the effect of the post-Brexit era make it risky to change existing models. Moreover, the financial hardship and losses caused by the Covid-19 pandemic put businesses under significant pressure.

On the other hand, the mosaic of businesses in B&H, with many SMEs, high level of entrepreneurship in sustainability with ethical considerations towards the environment and existing reuse market, creates exceptional opportunities for a CE transition in the city. Furthermore, growing consumer demand for accountability and the direction towards reputational threats are driving factors for businesses to rethink their existing practices. Increasing awareness of the economic benefits of CE such as resource efficiency and increase in productivity seem to have started to trigger this process.

Lack of knowledge and technical skills around the circular design of products and services impede practical applications. The absence of collaboration platforms blocks further steps in learning, sharing and nurturing novelty around CE strategies and in the establishment of connected systems for businesses to exchange resources, waste, or surplus material for closed-loop processes.

Lack of knowledge around CE is also present in user practices. Existing consumption-oriented lifestyles and the transient population (i.e. students and day visitors) in B&H cause high volumes of waste and carbon footprint. However, open culture and critical mindset in combination with a high level of environmental activism are distinctive characteristics of B&H. Engaged public and well-established community initiatives in the city are promising to raise awareness among the public and demand change towards CE. Nonetheless, socioeconomic conditions and the high unemployment rates caused by the pandemic set different priorities and restrict the choices of many people in B&H.

In terms of institutions, engaged local council and political prioritisation by the Green and the Labour Party appear as key drivers. The City Council has a holistic vision to create a future-proof city since 2013, previous action plans and policies are already established as a suitable ground for CE. Developing a CE framework to utilise environmental, social, and economic contributions of CE at the local level with an aim to be recognised as a leading CE city is currently high on the agenda. Covid-19 pandemic referred to as an opportunity to accelerate these efforts at the local level.

Nevertheless, limited resources (i.e. budget, time, personnel) restricts the enthusiasm of the Council. Reliance on the national government for
multi-level integration is one of the critical barriers, as major steps towards CE requires changes in the national level regulations and robust policies which are not in force yet. Furthermore, perceptions of trade-offs with the main policy goals of increasing productivity and economic growth, emphasised under the strategic partnership in Greater Brighton City Region, could lead some councillors to doubt the CE framework.

5. Conclusion and policy recommendations

This research responds to the call for systems-level analysis in the CE literature. It applies the coevolutionary framework by Foxon (2011) and uncovers how key dimensions of a socio-technical system –ecosystems, institutions, businesses, technologies, and user practices - evolves under own dynamics and influence the others in a transition towards CE. Detailed analysis of causal interactions with a case study of B&H provides insights into complexities around CE and underlines the necessity for different actors to interact, collaborate and complement each other.

The case study presents driver and barrier factors of a potential CE transition in B&H, where CE understood as a multi-dimensional and efficient way to respond to economic, social, and environmental sustainability challenges. What is crucial to highlight is the context-specific factors (such as political vision, socio-economic situation, innovation potential, and geographical location) and how they conditioned with resources and (multi)stakeholder engagement for a possible CE transition in the city.

Considering our findings and expectations of interviewees for the upcoming CE framework we take the opportunity to make some policy recommendations:

1. Being pragmatic in establishing plans: Creating a roadmap with clear strategies, indicators, and timescale; providing guidelines with basic language, which serve as practical toolkits for communities and businesses to follow, could help overcome inefficiencies in action. Seeking opportunities to learn from other cities and practices would benefit saving time and resources. Building a centralised digital platform that serves as a CE information hub would help to reach wider audiences.

2. Quantifying and qualifying contribution of CE at the local level: Conducting baseline research that demonstrates potential economic (e.g. cost savings, increased efficiencies), social (e.g. job creation) and environmental (e.g. carbon savings) opportunities, as well as the contribution on urban resilience, long-term sustainability and SDGs, would help reinforce change while attracting the interest of stakeholders.

3. Focusing on understanding and managing resource flows: Data gathering on material stocks and other resources (e.g. food, waste) as well as their flows at the local level could contribute to creating self-sufficiency and an integrated closed-loop system. A potential CE information hub could also make data available about these assets which contribute to the scope for CE adaptation.

4. Prioritising sectors with a higher potential of minimising environmental impacts and with the bigger opportunity to trigger economic efficiency: Identifying the most resource and carbon-intensive sectors would benefit to generate greater impact on the environment while focusing on efficiency and productivity would help to utilise opportunities for most cost savings.

5. Facilitating city level collaborations with major urban stakeholders: Organising regular roundtables and establishment of collaboration platforms could promote the generation of knowledge, exchange of ideas, expanded networks as well as developing an understanding of the needs of stakeholders with up-to-date information.

6. Creating support schemes for businesses: Businesses could be supported through initiatives and financial incentives. Clear criteria for funding and grant schemes would help businesses to take up these opportunities. Providing support for existing circular businesses to move through the next steps and giving recognition to them could trigger the process. Utilising a potential CE information hub to illustrate success stories and provide case studies would help to build knowledge, encouragement, and inspiration for newcomers.

7. Creating an approach that is more inclusive to citizen and community: Communicating CE to the public through demonstrating how they might already part of wider CE practices (e.g. subscription models) and how CE could improve their quality of life (e.g. environmental, economic) would help to build public engagement. Establishing transparency and fostering visibility of circular initiatives through networking and publicity would improve public trust in new systems.

8. Support for changing consumer behaviours: Increasing awareness of the potential of CE to address sustainability challenges through educational campaigns and making it part of the everyday conversation would create a shift in existing lifestyles and trigger transitions towards CE.

All in all, although many recommendations could be seen as incremental, without any major steps to transform incumbent unsustainable production and consumption patterns, these are believed to be practical starting points at this earlier stage to turn enthusiasm and potential at the local level into action.

Finally, there are two relevant limitations to mention in this research which open opportunities for future research. First, CE transition is a relatively new phenomenon in the UK, and particularly in B&H. Therefore, empirical investigations reflect the initial steps in times of uncertainty. Future research can look at the period when robust national CE regulations come into force in the UK to explore their effect on the local transitions. Second, despite the single case study allows to explore the phenomena in-depth, a multi-case study with cross-case synthesis would have provided richer insights. Comparing cases would create a more comprehensive outlook on place-specific factors, different interpretations, and their impact on CE transitions. The findings of this work do not represent the process of transitions in other cities but might inspire and help them to draw their circular pathways.

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