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Characteristics and implications of a diversified circular economy: the case of a Belgian not-for-profit cooperative

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Introduction: The circular economy as a resource sustainability strategy is both established and contentious in and beyond academia. This paper contributes to the growth-critical scholarship on circularity, starting from the premise that circular economic diversity is both a function of, and is required for, an economy beyond growth-dependencies. Exploring the question what this diverse circularity might look like on the ground, our paper inventories the wide range of circular activities and relationships taking place in a not-for-profit maker cooperative in Belgium and studies their main characteristics.

Methodology: We deploy the diverse economies (DE) framework, which presents us with theoretical concepts and qualitative-ethnographic methods (long-term observation, participation, depth interviews) that enable the study and classification of economic activity. It is designed to broaden the scope of the 'circular economic' by including non-market and informal practices.

Results: We found that many of the circular activities we observed (repairing, urban mining, reusing, dismantling, maintaining) are often overlooked in the literature on CE strategies, tend to involve a wider variety of materials than in the for-profit CE (unruly left-over materials, outdated furniture, bicycle components typically discarded), and occur within a wider range of economic dynamics (including informal and non-monetary encounters). We also identified four characteristics that pattern these diverse activities and relations: diversified material value and purpose, redefined work, social embeddedness, and resilience in the face of precarity.

Discussion: Based on these results, we make the case that a diversified circular economy might be crucial for our collective wellbeing in critical futures: it includes more diverse actors, is more materially creative, includes a wider skill-set and is more tethered to local community approaches to provisioning. Lastly, the paper highlights why and how structural barriers related to spatial planning and financial investment need to be overcome in order to support diverse circularities.

KEYWORDS

circular economy, postgrowth, diverse economies, cooperative, case study

1 Introduction

Over the course of a decade, the circular economy (CE) has grown into one of the main global political economic priorities ([Ellen MacArthur Foundation, 2021](#)), and is put forth by the EU as a means to realise its Green Deal ([European Commission, 2020](#)). Circularity is premised on the design and management of technical or biological loops that circulate products and materials at their highest value through 'R-strategies' like repair, refurbish, recycle and so forth ([Potting et al., 2017](#)). In so doing, the CE is said to have the potential to reduce waste, boost economic growth, mitigate price volatility and supply risks, create

employment opportunities, reduce carbon dioxide, and benefit consumers (European Commission, 2020; Ellen MacArthur Foundation, 2021). Even though the CE therefore appears to be a crucial economic project, its co-articulation of better social outcomes, reduced environmental impact, and sustained ('green') growth, merits critique. Whereas this 'triple-win' approach is commonly championed by leading institutions and the majority of the CE literature alike, the (green) growth 'win' is now increasingly challenged (Friant et al., 2020; Hobson, 2021; Corvellec et al., 2022), often based on more general critiques of growth.

A first line of critique challenges the feasibility of reducing the material footprint of high-income nations whilst pursuing economic growth (Parrique et al., 2019; Bauwens, 2021). Another line of critique warns against the geopolitical pressures and inequalities as consequences of continued economic growth: indeed, a CE reliant on growth still requires material extraction from non-domestic territories (Genovese and Pansera, 2020; Bolger et al., 2021; Marin et al., 2023). Another line problematises the CE's commodification of waste and its ecomodernist focus on technological innovation (Levidow and Raman, 2019; Schindler and Demaria, 2019). Yet another critique problematises the CE's fundamentally unchallenging position vis à vis the productivist and consumerist status quo (Moreau et al., 2017; Friant et al., 2020; Borrello et al., 2022). That critique is itself built on two more general critiques: one of 'growth-dependency' (Vogel et al., 2024), the other of the 'market society' (Parrique, 2019). Especially prevalent in Western capitalist societies, both are associated with the marginalisation of non-market and sufficiency-based forms of provisioning (Gibson-Graham and Dombroski, 2020; Beumer et al., 2022), as the dependencies on growth and markets put pressure on livelihood options and stability, which curtails communities' ability to provide for themselves in a variety of (non-market) ways or to control the wealth they generate (Hinton, 2021; Steinberger et al., 2024). Furthermore, it is also likely that climate change, and the ensuing social-ecological challenges, will further exacerbate these pressures (Vogel et al., 2024).

For this paper, we mainly build on the latter twin-critiques of growth- and market-dependencies. We do this by focussing on circularities that are 'postgrowth' (which we use as an umbrella concept—not seeking to eclipse other Global North and South growth-critical concepts or frameworks, but to capture the "ontological continuities" (Singh, 2019) that exist between them). Indeed, realising postgrowth circularity requires moving beyond (a) the market as the sole legitimate provisioning space (instead, markets exist *alongside* other 'legitimate' spaces), and (b) market-prompted profit-maximisation typically resulting in the exclusion of 'unprofitable' activities (instead, activities serve social and ecological justice and wellbeing when profitability is decentred). Subsequently, we contend that a diversification of both economic organisation (such as transactions, labour, or property, as discussed in 2.) and circular materiality and practice is crucial. 'Diversifying' the circular economy—or enacting the 'diverse circular economy/ies' or 'diverse circularity/ies'—thus implies the recognition of non-market circularities that decentre the logic of profit, as well as the inclusion of a wider range of circular economic actors, relations, practices or activities, and materialities.

Our research objective is subsequently to empirically examine what such a diversified circular economy might look like—in order to theorise its key characteristics as well as some implications for

post-growth circularity. We do this based on empirical analysis of existing practices and relations in a not-for-profit maker cooperative in Belgium (3.1), through the theoretical-methodological lens of the diverse economies (DE) framework (as per Gibson-Graham and Dombroski's (2020) handbook). Despite the overlap with its many relevant sister frameworks within social and solidarity economy scholarship, we opted for the DE framework for several reasons.

First, DE is centred around 'reading for difference' (identifying already-existing alternatives to capitalism and growthism) as opposed to 'reading for dominance' (identifying expressions of capitalism and growthism). This means that, in order to avoid what Gibson-Graham and Dombroski (2020) call 'capitalocentrism', the scholarship directs attention toward already existing (postgrowth) non-capitalist practices, which have the potential to demonstrate and generate 'possibility'. Whilst identifying possibility is key, research should of course also take into consideration the capitalist context that shapes and constrains the diverse practices. In the context of circularity, a DE perspective nevertheless aims to avoid a mere deconstruction of the CE, and instead enables us to engage with the CE in a generative way by identifying leverageable alternatives that exist alongside and *despite* capitalist and growth-dependent circularities. This is important for our objective to identify diverse circular economies and understand their postgrowth implications.

Second, DE provides an analytical method to study economic activity (cf. 2.), which, in the context of circularity, makes it possible to systematically map the wide range of existing, yet often ignored, circular activities.

Third, there is a rich, though still limited, body of research connecting CE and DE scholarships, which we want to contribute to. There are various key topics that have thus far been explored: One is the relevance of informal and community spaces and relations for diverse circularity (Hobson, 2016; Holmes, 2018; Vincent, 2022). Another is the importance of social and solidarity enterprise in the production of goods and services (Lekan et al., 2021; Pusztal et al., 2024; Aiken et al., 2020). A last topic (considered here) is the ambiguous role of (digital) technologies in socially inclusive and resource-sustainable circularity (Hobson and Lynch, 2016; Lekan and Rogers, 2020). In essence, this research highlights how economic diversity is more likely to address the social or human (and sometimes more-than-human) dimension of material circularity. However, we advance that more detailed empirics are needed on the intersection of, and dynamics between diverse economies, (diverse) circularity and postgrowth—and here we address this gap through empirical analysis of the diverse circular economies in a cooperative and its implications for postgrowth.

Some caveats and limits regarding the application of the DE framework have been highlighted in the literature. First, articulations of 'desirable' circularities for a sustainable future require a careful balance between the ethically normative and the pluralist (Berry et al., 2022). This is never straightforward, as using one particular normative framework (DE) inevitably implies a demarcation of limits and possibilities. However, as the framework does not outline practical implications of its ethical principles, we argue that this leaves space for various approaches and interpretations. Second, the scale to which DE theory is applied, is typically rather small (cf. Gómez, 2023)—and this is true in our case as well (cf. 5.4). Furthermore, research on small-scale prefigurative practices might also be prone to reproduce a siloed approach to localism (Kenis and Mathijs, 2014; Schmid and Smith,

2020; Smith, 2023). Highlighting the contextuality and complexity of these diverse circular practices, might avoid this ‘local trap’ thinking. Furthermore, it has been argued that DE disproportionately focuses on informal work, which we also do as part of the broader spectrum of economic activity. This focus has been problematised as informality is not simply a benign counter-strategy to capitalist employment (Samers, 2005) and might come with overwork, illegality, lack of safety, or marginalisation. Discussions of informality and alternative economy-making also need to take into account (racialised) power imbalances; subsequently requiring conscious acknowledgement that not everyone gets equal access to (building) these alternative economic spaces (Bledsoe et al., 2022; Naylor and Thayer, 2022).

2 Conceptual framework

“In diverse economies research, we are interested in foregrounding [diverse] economic practices which prioritize ethical interdependence (between humans, and between humans and the non-human world). We identify and highlight the ways that people are already engaged in these types of practices (albeit sometimes in nascent ways) and how research can play a practical role in helping to strengthen such economic practices” (Gibson-Graham and Dombroski, 2020, p. 511)

Our main theoretical lens is the ‘Diverse Economies’ (DE) framework, developed by feminist geographers Julie Graham and Katherine Gibson (a.k.a. J. K. Gibson-Graham). DE starts from what is *already present* in our economy, to find out what works, which opportunities for improvement can be found, as well as which strategies to overcome challenges. Contrary to many (orthodox) economic lenses, DE starts from and makes visible the rich and diverse landscape of practices and relations that already

exist—including those ‘under the surface’. The latter, despite being unrecognised, unvalued, or invisible, make up a significant part of the economy. Consequently, DE aims to ‘read for difference’, as opposed to for ‘dominance’. This approach is called ‘decentering capitalocentrism’, which is “an ethical intervention that has the effect of reducing the discursive dominance of capitalism and opening up the space of possibility in an economic pluriverse” (Gibson-Graham and Dombroski, 2020, p. 19). This implies that DE scholarship (as any other) is not ‘value-free’ but instead politicised, not only aimed at capturing economic diversity, but also at shedding light on those practices that provide tangible and actionable alternatives.

For this paper, we draw on what the DE framework terms ‘inventorying economic heterogeneity’, which is the action of mapping the diverse economic practices and dynamics that are present in any given research context. In our case, these are the diverse circular economic practices observed in the cooperative. We subsequently use this inventory to create a typology of diverse circularity to better understand the latter’s key characteristics and challenges, as well as its potential for realising postgrowth circularities.

As stated, the first step is to inventory the circular economic heterogeneity in the cooperative, making visible the wide variety of (often unacknowledged) economic activities. The diverse nature of economic activity is demonstrated in the inventory by virtue of two categories. The first one comprises the ‘economic dimensions’ of enterprise, labour, transaction, finance, and property (Table 1). These dimensions can then be placed on a spectrum of ‘social relations’, the second category, consisting of capitalist, alternative capitalist, and non-capitalist relations. The latter depict a *spectrum* and are not always neatly delineated concepts—indeed, economic activity is often hybrid in nature. Still, the opposing ends of the spectrum differ fundamentally from each other. The capitalist extreme is represented by traits such as profit-maximising enterprise, supply-driven logic, private ownership of resources and capital, and material extractivism. The non-capitalist extreme, at least in the DE

TABLE 1 Overview and definitions of inventory’s economic dimensions as basis for our analysis.

Economic dimensions	Definitions
Enterprise	• Locus of economic activity associated with production and profit making. • Primary context of new wealth generation and production, appropriation and distribution. • Involves the different relations between the workers and the production process, so between the means of survival (workers’ payment) and the means of production (surplus appropriation and distribution).
Labour	• That which makes and provides livings. • Involves expenditure of energy in the production of goods and services. • Different types of labour (and thus relationships) can be distinguished based on remuneration or compensation (monetary or non-monetary).
Transaction	• Core of all economic relationships and connecting economic units (individuals, communities, regions or nations). • Encounters where ethics, values, trust and certainty play out in a diversity of ways. • Can include equal and unequal exchanges, but also sharing, allocating, reciprocating, authorized taking and stealing. • Includes market transactions, commodity exchange and pricing mechanisms, but also non-market transactions without calculability or commensurability (different rules of encounter).
Finance	• Includes people’s wide variety of interactions with finance: how and when they save and invest, how and under what social relations they borrow and lend, and the different ways that financial returns are negotiated, distributed and contested. • Investment can take multiple forms.
Property	• Traditionally framed as something material or immaterial that can be ‘owned’ (e.g. building, land, machine, patent, computer code). • Can also be defined ‘relationally’, dealing with access regulation.

Source: own table; contents adapted from Gibson-Graham and Dombroski (2020, pp. 11–19).

framework, entails social-value oriented enterprise, sufficiency, commons and cooperative ownership, and non-extractive material use (whereas not every non-capitalist regime automatically subscribes to the values listed in Table 1, in DE, non-capitalism refers to an economic typology aligned with postgrowth values). When traits from both modes of economic organisation are present, we might speak of alternative capitalism. At the core of DE scholarship is a political motivation to go beyond capitalist and growth-driven modes of organisation, and replace them with community economies aligned with 'non-capitalism'. We will apply this inventorying method in the context of our case, the maker cooperative, to highlight the economic diversity of its (diverse) circular activity.

The second step, then, which is at the heart of this paper, consists of building a typology of diverse circularity: What is characteristic of the inventoried diverse activities and relations in the maker cooperative? And what are typically the struggles and challenges that come with these characteristics? The aim is not to be exhaustive, but to lay out a selection of characteristics that were strongly present in the data and which thus patterned the inventory (cf. 3.2 for coding process).

In the discussion section, we relate our findings to other literatures and highlight where more research is required. We also discuss practical and real-world implications of our findings, making it relevant for policy actors and other practitioners.

3 Methodology

In what follows, we will first discuss the empirical case that we studied, which is a cooperative society of makers and artisans in Belgium, and the relevance of, or motivations for, doing so. Then we discuss the methods used for data collection, coding and analysis of the results.

3.1 Case study: maker cooperative

Before introducing the cooperative, we highlight three main reasons why the cooperative as a case study context is useful for our research. (1) The cooperative connects DE theory and practice (Gibson and Graham, 2003; Gritzas and Kavoulakos, 2016) and embodies DE values—democratic and equitable ownership, socially useful production, economic cooperation between cooperants and external actors. (2) An emerging scholarship demonstrates the fruitful interaction between the CE and the cooperative model (Guerreschi and López, 2023; Villalba-Eguiluz et al., 2023; Ziegler et al., 2025). It merits mentioning that this is also closely related to, yet distinct from, the model of social enterprise often explored in other articles, which typically focus more explicitly on underprivileged communities (Lekan et al., 2021; Pusz et al., 2024). The cooperative society discussed in this paper is itself not a social enterprise (in Belgium, cooperative societies need to additionally apply with the Ministry of Economic Affairs to be recognised as a social enterprise), though some of its member-enterprises are social enterprises and social benefit is in any case a requirement to form a cooperative society. (3) The specific cooperative discussed here, merges various scales (i.e., consists of various enterprises and is part of a larger network of organisations

levels) and activities (formal and informal, circular as well as non-circular activity). Immersive fieldwork in such a context generates a deeper understanding of the dynamics 'on the ground'.

The cooperative in this case study came into being over the course of 2022–2023 and sits on the industrial outskirts of a Belgian city. Steadily growing in numbers, there are now more than forty creative member-enterprises, engaged in a combination of cultural, economic, and social activities. Whereas profit is 'allowed,' the main purpose of this cooperative entity is not (and ought not be) profit-seeking; instead, it is the development of its own activities, which often centre social benefit. It is also for this reason that we speak of a 'not-for-profit' cooperative—in line with the definition by Hinton (2021). Furthermore, before the cooperative, several of the members were part of a maker collective in a 'temporary use' location elsewhere in the city (cf. *infra*) and the foundation of the cooperative was also seen as a step to formalise and stabilise the community, and to create the conditions for 'ownership' over space.

We would like to address and acknowledge the specific positionalities of the participants. First, the participants enact diverse—including informal and non-market—circularities in a regional context of economic privilege and stability (Flanders, Belgium). This means that their livelihoods are less precarious because of some basic social provisioning infrastructure (as opposed to informal circularity in low-income and/or low-welfare contexts, see, e.g., Tucker and Anantharaman, 2020; Barford and Ahmad, 2021; Valencia et al., 2023). Furthermore, the participants belong to a relatively privileged group in Belgium (light skin tone, native speakers of the official language, in possession of cultural and/or social capital). Whilst we cannot verify through comparison in our case, it seems likely that people from different ethnic and cultural heritage and/or skin colour might have different experiences, cultural conceptions, risk and benefit assessments, ways of organising and operating, and self-definitions when engaging in circular activities, given the racialised dimensions of environmental injustice and waste geographies (Berry et al., 2022; Meira et al., 2022). The socio-material dynamics discussed throughout this paper should thus be considered in light of this situatedness.

To sufficiently render the complexity of the case, our empirics weave together three 'layers': first, a selection of individual cooperative members who are enterprise-owners or otherwise economic actors working with circularity in a variety of ways (e.g., for-profit, not-for-profit, social enterprise, limited liability company, etc.); second, the cooperative as an organisation structured by legalities, principles and logics; and finally, the broader network and context which the cooperative (members) are connected to and embedded in. The latter include professional networks of organisations and businesses (i.e., material and social ties with other urban alternative spaces), and the city departments that facilitate or obstruct the cooperative's activities. The interplay of these layers will be included in our analysis whenever relevant.

3.2 Data collection, coding and analysis

The first author did qualitative research, deploying ethnographic methods, over the course of 16 months, between March 2021 and March 2023. She selected the case based on her initial research-unrelated participation in a collective that existed prior to and later

morphed into the cooperative. The maker collective jointly rented an old factory, where she and her father built a house-on-wheels with reclaimed materials together. Spending time with the other makers made her realise that everyone involved in this collective put into practice what her research theoretically explored. She went on to document surrounding members' circular activities through informal observation and conversation, and then gradually created a more formal research process once the collective was in the process of setting up a cooperative. Even though the initial building of trusting relationships was an important stepping stone toward formal qualitative research (access would have otherwise been very challenging), there might be a risk of positive bias, which we aimed to navigate through triangulation.

Triangulation entails that the qualitative research comprises multiple data sources, collection methods, analysis methods and research approaches. Research participants were selected through a

combination of purposeful and snowball sampling. Participants' focus on circular activity and their diverse roles in or regarding the cooperative were two important selection criteria (cf. Table 2 for participant information). Most of these research participants were formally interviewed. Fourteen semi-structured interviews in Dutch were conducted in total, most which in-depth interviews (lasting 2 h on average). The majority of the interviewees were cooperative members, but three additional civil servants were interviewed, who were either involved in the funding of the cooperative or who were working in the realm of urban planning and circularity (as to contextualise the cooperative). Additionally, formal or informal observations were held during internal meetings or brainstorming (both during and after the formation of the cooperative), or during outreach events to attract funders or members.

A focus group was undertaken (November 2023) with the aim to invite participants' feedback on the analyses, but also to discuss the

TABLE 2 Anonymised research participant information (certain activities/roles might have changed by the time of publication).

Research participants	Professional activities	Role <i>WRT</i> cooperative	Research interactions
RP1	Carpenter Community organiser NGO (cultural sector)	Co-founder Director Board member Technician Fund raiser	2 In-depth interviews (of which 1 pre-cooperative) 4 Observations (meetings, outreach events) 3 Participatory observations (brainstorms) 9 months of coworking in pre-cooperative collective 1 focus group
RP2	Industrial designer Maker	Member enterprise Circular coordinator	1 In-depth interview 2 Participatory observations (brainstorms)
RP3	Technician/hacker NGO (social and technological sector)	Member enterprise Technician	2 In-depth interviews (of which 1 pre-cooperative) 2 Observations (meeting) 9 months of coworking in pre-cooperative collective
RP4	Specialised woodworker	Member enterprise	1 In-depth interview 1 Observation (meeting)
RP5	Carpenter Builder	No member (was part of pre-cooperative collective) Ongoing reciprocal relationship	1 In-depth interview 9 months of close collaboration in pre-cooperative collective
RP6	Woodworker Maker	Member enterprise	1 In-depth interview
RP7	Communication Project design	Communication officer Project and organisation connector Fund raiser	1 In-depth interview 1 Observation (brainstorm) 9 months of coworking in pre-cooperative collective
RP8	Civil servant—policy participation	Civil servant—funding application supervision	1 Interview
RP9	Organiser Business owner (cultural sector)	Co-founder Member enterprise Financial manager Board member	1 In-depth interview 1 Observation (meeting) 1 focus group
RP10	NGO (social sector)	Member enterprise	1 In-depth interview 1 Focus group
RP11	Civil servant—circular economy	No connection with cooperative	1 Interview
RP12	Civil servant—innovation and enterprise	No connection with cooperative	1 Interview
RP13	Business owner (cultural sector)	Co-founder Member enterprise Fund raiser	1 Participatory observation (meeting) 2 Observations (meeting, information outreach)

participants' experiences regarding the research intervention itself. We leveraged this focus group mainly as a way to verify our analyses and to connect with the members, rather than as a source to cite data from. The insights that were co-constructed or verified during this focus group, are however included in the results and discussion.

A last data source is a selection of relevant communications and formal documents produced by the cooperative and by the city departments. For the cooperative, emails, a statement of cooperative identity (i.e., principles and values), the cooperative rulebook and some governing board minutes were used. As to the city department documents, a selection of vision or purpose statements were consulted.

We used thematic-narrative analysis, working with (1a) *a priori* themes deduced from DE and CE literatures and paying attention to (1b) important narrative elements (crises, goals, values, etc.) in the data, as well as with (2) *emergent* themes induced from the various sources mentioned above. We used NVivo 12 for the abductive coding process, theme development, and data analysis—following two main steps: the first one consisted of coding all the observed and reported circularity-related activities in order to draw up an inventory of the cooperative's diverse circularity (4.1). The second step was to distil prominent characteristics that patterned the activities in the inventory and the participants' narratives. This was achieved through coding the most frequently recurring themes (which could be traits, challenges or values), of which similar themes were then aggregated until we had a manageable selection of codes. This led to four main clusters of characteristics (4.2) which is one of the central aims of this paper, and which serves as the basis from which to explore postgrowth implications.

4 Results

As the analytical process involves two steps, the first part (4.1) of this section inventories the diverse circularity found in the case study (visualised in a table), whilst the second part (4.2) deals with four observed characteristics of diverse circularity.

4.1 Inventorying diverse circularity

Our starting point for this analysis is a comprehensive inventory of the cooperative's diverse circularity-related activities. The results of this mapping exercise are outlined in Table 3. As explained, the inventory captures the cooperative's activities across its various economic dimensions (*x*-axis of the table) and social relations (on the *y*-axis). However, the inventory itself is not the analytical end-point; so rather than relating all the contents of the table, we simply use examples from the table in order to illustrate the characteristics, which are developed below.

4.2 Characteristics of diverse circularity

Based on patterns in the diverse circularity inventory and the participants' narratives, we identified four main characteristics: diversified material value and purpose (4.2.1), redefined work (4.2.2), social embeddedness (4.2.3), and resilience in the face of precarity (4.2.4). The various economic dimensions and social relations are

sometimes explicitly, but mainly implicitly, woven into the explanation of these characteristics.

4.2.1 Diversified material value and purpose

The first characteristic surfacing in the data time and time again, is the diversified approach to material value, which includes material use/purpose. Whereas value is commonly measured in monetary terms, reflecting market dynamics; the cooperative members tend to adopt perspectives that go beyond monetary value.

First of all, there is a noticeable divergence as to which kinds of materials are valued. Often these include materials deemed 'no longer (re)usable', 'not useful', or 'not worth saving' in most contexts. These would be the materials that no one notices or perceives as potentially useful, or are unthinkingly thrown away—when the quantities are small or when they are societally considered throw-away/single-use. Examples of such materials are plastic tubes, cables, metal components, left-over pieces of wood, insulation or roofing, and so forth. Members would often overtly critique the ecological impact of devaluing and throwing these intact or at least reusable materials.

Simultaneously, 'going circular' also goes beyond ecological ambitions. For instance, the capacity to 'see' the different functionalities and purposes of materials beyond merely the shape, colour or intended initial function (a process called 'affordance') is a meaningful and creative aspect of many members' circular work. As one member shared with excitement: "the whole world is filled with cd-towers. No one wants them anymore and the second-hand shops are littered with them. I see them and I have all sorts of ideas of how I can integrate them in future projects" (RP2). Another member builds playground infrastructure with upcycled wardrobes "that no one is interested in" (RP4), and links them by pieces of CNC-saw wood waste (cf. Figure 1). The value here thus resides in creatively finding new purpose for materials.

Also the context of trade or transaction reveals the members' different approach to value. Members might for instance suggest repair or maintenance of materials (components, objects, etc.) as forms of alternative payment. The positive intervention in the functionality or life span of materials is thus seen as equally legitimate as money. This could also be extended to the context of investment, where material and thus non-monetary investment—in a project, business start-up, property infrastructure—is recognised as a legitimate and useful contribution. As to the cooperative infrastructure, members generally lacked the ability to invest financially. But as members understood that the cooperative's functionality and infrastructural operability highly depend on materials, cutting costs by DIYing and valuing materials differently counted as a direct investment in the cooperative's existence.

Sometimes the valuing of materials takes on proportions that the members themselves shake their heads at. "Plain obsession" is what some have called it: always searching through containers on the street, sorting and storing identical components, hoarding endless amounts of "potentially useful" materials for future projects. Recurrent in the data were the strong emotional attachment to salvaging materials and the fact that the large stocks of saved materials tend to supersede any realistic immediate use of these materials. Sometimes, this storage even comes at their personal financial expense: "it's more important to save valuable stuff, ultimately costing us storage rent, than it is to throw it and let it be burnt somewhere" (RP4).

TABLE 3 Inventory of circular activities on cooperative and member-enterprise levels.

Social relations	Economic dimensions				
	Enterprise	Labour	Transaction	Finance	Property
Capitalist	<i>Member level</i> Capitalist Private unincorporated firm (with limited liability) Surplus appropriators Business owners	<i>Member level</i> Waged Part time Self-employed Forms of remuneration Protected wage Work examples Product design Furniture (remanufacturing) Circular playground infrastructure	<i>Member/coop level</i> Market exchange Regulated & 'free' market exchange Niche (circular product market) Economic commensurability (rules of encounter) State economic policy 'Laws' of supply and demand	<i>Member/coop level</i> Market (non/monetary) Business insurance Bitcoin stocks and shares Sweat equity (time / energy investment in property maintenance) Return (monetary) Premiums based on statistical risk Return from stocks and shares Lower costs on building Business sustenance or growth	<i>Member/coop level</i> Privately owned Renting private property from landlord => To pay total rent: members renting square metres corresponding to number of shares Access regulation Limited financial and use rights for cooperative members
Alternative capitalist	<i>Member level</i> More than capitalist Socially responsible firm with profit margin Social enterprise Self-employed with profit margin Surplus appropriators Board of directors Community stakeholders	<i>Member/coop level</i> Otherly remunerated Reciprocal labour Bartered Labour Intern labour Self-employed labour Self-provisioning labour Forms of remuneration Reciprocated labour In-kind payment Job experience + stipend Living expenses + savings Food and other goods Cooperative wage/share Work examples Furniture (repair, upcycling) Textile (repair, remanufacturing) Circular playground infrastructure Bikes (repair, upcycling)	<i>Member/coop level</i> Other market Ethical markets Barter Informal & hybrid market Food saving (from organic supermarket) External exchange Social commensurability (rules of encounter) Producer-consumer agreement Trader agreement Arrangement with supermarket (food pick-up)	<i>Member/coop level</i> Other market (monetary) State set subsidies for cultural activities Start-up funding Return (monetary) Government set interest	<i>Member/coop level</i> Collectively 'owned' No ownership as such, but some financial and use rights allowing for degree of collective management Resource commons and tool sharing Access regulation Cooperative law Cooperative values Member access
Non-capitalist	<i>Member/coop level</i> Non-capitalist Solidarity and community economy networks Self-employed without profit margin Member-controlled cooperative Surplus appropriators Cooperative shareholders (currently no surplus yet)	<i>Member/coop level</i> Unpaid Emotional labour Volunteering Forms of remuneration Non-monetary or none Work examples Coop outreach to neighbourhood Coop infrastructure maintenance Communal cooking with discarded food for members	<i>Member/coop level</i> Non-market Household material flows Gift giving (Il/legal) salvaging Incommensurability (rules of encounter) Intra-household negotiations Community norms of reciprocity Cooperative statutes Cultural norms around salvaging Perceived 'right of the have-not'	<i>Member/coop level</i> Non-market Sympathisers' donations Family lending Sweat equity (time / energy investment in property maintenance) Return None None or family claims Business sustenance or growth Functional infrastructure	<i>Member/coop level</i> Open access Open source intellectual property Access regulation Open for anyone to use and contribute

Adapted from tables by Gibson-Graham and Dombroski (2020, pp. 11–16).



FIGURE 1

Playground infrastructure made with discarded closets and leftover wood. (Source: participant's picture used with permission).

What is often challenging in negotiating material value and purpose are the blurry property relations. Salvaged materials from containers are often considered by the members as theirs to take and 'own' even though this waste is in fact legally the container company's property. This entitlement to access waste stems from an overt opposition to the business model behind container companies ("profiting from others' waste") as well as to the sheer existence of waste. Similarly, the cooperative's approach to 'urban mining' lays bare this challenge. Urban mining here entails stripping soon-to-be-developed infrastructure from its valuable technical components and materials. Despite the fact that this practice is in some situations illegal (theft), the appropriation often materially and financially benefits those members (and their networks) who do not have the means to set up or develop their own work space. One member shares how they salvaged several kilometres of functional cable from old factory buildings bound to be redeveloped, and distributed the cables in cultural organisations that would not otherwise have been able to afford them. Various members express a class justice and anti-capitalist sentiment with regards to powerful actors usurping value from the urban metabolism. This is also related to the members' prioritisation of materials' 'use value' over their 'exchange value', and their disapproval of the expected material downcycling by the developers.

4.2.2 Redefined work

Above, we briefly addressed the link between a divergent value system and creative purpose in work. We now want to deepen this theme. Indeed, what we found to be characteristic of diverse circularity, is that it is often a starting point for experimentation with different approaches to work, work culture, and the work environment. Members continuously negotiate and

redefine—together and on their own terms—how, where and how much they work, what they produce, to which end, whom they 'do business' with, and so forth. The throughline in this characteristic is the aspiration for economic empowerment and organisational autonomy.

One dimension where this clearly manifests itself, is the very enterprise structure of the cooperative. Members are encouraged to work in ways that benefit the larger cooperative (and thus all other members). Key examples of this are the circulation of surplus and left-over material stock, and the creation of co-working spaces and a tool sharing space (cf. Figure 2). Another is through movement-building work. One cycle repairer for instance leverages circularity (specifically dismantling, repairing, and refurbishing) as a way to engage more people in a cooperative economy: "I also teach them about cooperative organising, because that is important knowledge that is not taught in schools or anywhere else (...) My hope is to bring in these youth in our cooperative and give them the opportunity to empower themselves" (RP10).

Another manifestation of the link between 'redefined' work and diverse circularity, is that work is more generally seen as 'a way of provisioning' (for oneself and others), and is not only or simply defined based on income. This is why the various kinds of circular work we observed often involves transactions like material exchanges, gifts, or time investment exchanges (repair and maintenance), going beyond the currency of money.

But also the physical workplace challenges the image of a typical work environment—which is also linked to the members' circular 'politics'. Informality, negotiability, a politics of self-organisation and self-fabrication are expressed in the property's appearance. A large building, with office and warehouse areas, on a large terrain,



FIGURE 2

Part of the warehouse is transformed into tool-sharing workshop. (Source: participant's picture used with permission).

on the industrial outskirts of the city, it exhales a sense of possibility. Large parts of the building were transformed into a DIY-style ensemble of shared and segmented work, storage and social-gathering spaces. Several members refer to the space as their “playground” and many spend long hours (often almost daily) in the building—tinkering, working on various projects, socialising (cf. 4.2.3).

However, the current property relations at times constrain the members’ autonomy: the lack of ‘secured’ access to and control over the work environment (as the rent agreement could come to an end or because of an inability to continue paying rent) threatens circular activity in a number of ways. First, the risk of having to relocate the large quantities of materials stored on site, makes it challenging to assess storage needs and projects. As the members know all too well from the past, moving and rebuilding storage capacity for all their stocks, requires enormous amounts of time and energy (time not spent processing the materials). Another challenge was renovating the building to create adequate storage conditions (for, e.g., humidity-sensitive materials like wood, insulation materials, textiles) despite the lack of ownership. Thus, the cooperative’s explicit aim to collectively procure and own space within and around cities so as to work towards “empowerment of a network of makers, artists, artisans and tinkerers” (RP1) is therefore an important way to sustain and enhance circular activity.

4.2.3 Social embeddedness

The third characteristic of diverse circularity is that it is embedded in a social fabric—and in this case, one that extends beyond the cooperative. Operating in socially responsible and beneficial ways is hardwired in the very enterprise purpose of the cooperative, and thus

also informs the circular economic activities performed. The cooperative society itself was set up to democratically organise and mutually support the various member-enterprises, and in its early stages, the cooperative entity explicitly prioritised community-building and a good social basis for cooperation over “optimising revenue” (RP9). Indeed, care, belonging and trusting relations of reciprocity were repeatedly pointed to as crucial forms of investment in the cooperative (“it’s a way to survive”). Here, we want to specifically focus on how diverse circularity functions as a vehicle to realise these trusting and caring community relations.

One example is food waste distribution. Weekly, food ‘waste’ is picked up from an organic supermarket, whom the cooperative has a formal agreement with, and is then distributed amongst the members. In reality, this food ‘waste’ is actually unsold and therefore discarded food in quasi-perfect condition. Here, the members thus combine circularity and social provisioning. One member, a key actor in the redistribution, shared that “I’m not expecting any financial contribution or anything like that, but I do hope that people are grateful and that this inspires action towards the collective” (RP1) (cf. Figure 3).

Another example of circularity as a vehicle to generate care and inclusion, are the various circular ‘educational’ projects with vulnerable groups. Three instances are the dismantling and repairing of bikes (cf. Figure 4), the dismantling of fuse boxes (salvaging components), and the circular building of outdoor infrastructure as ways to give marginalised youth a training or occupation, but also to extend the circle of care and inclusion beyond the cooperative.

It becomes apparent that this ‘social circularity’ often takes on a socially and economically complex character. One key example is a member’s effort to salvage great numbers and amounts of materials



FIGURE 3

First author's share of the re-distributed food 'waste' from an organic supermarket. (Source: own picture).



FIGURE 4

Bike dismantling and repair with disadvantaged youth. (Source: participant's picture used with permission).

partially in order to supply their network with it. Some of it is gifted, when they considered the work behind it as a personal activity; some

of it at lower price ('mates' rates') in case the work is counted as labour for their NGO: "Especially electronics would be too expensive for [these artistic organisations] if they were acquired on the regular market. Through me, they have access to this stuff" (RP3). 'Care' in this example is expressed through enabling access to material assets in a context characterised by unevenly distributed capital.

In all of these examples, 'locality' is an important foundation, as physical proximity between cooperative members and their networks enables material flows between them. However, socially embedded circularity comes with its own set of challenges, such as the ongoing negotiation attached to diversified economic dynamics. This is because "it remains difficult and takes up a lot of headspace to negotiate prices—especially because a lot of people do not understand the value of materials and think 'second-hand' equals 'for free'" (RP2).

4.2.4 Resilience in the face of precarity

During the research process, it became apparent that the cooperative and its members faced substantial precarity. Whilst we do not consider precarity to be a general and necessary characteristic of diverse circularity, it is inextricably enmeshed with diverse circularity in this particular case study—and thus merits inclusion here. Nevertheless, we also integrate the cooperative's resilience in response to this precarity, as resilience is in our analysis equally entwined with diverse circularity. This often takes the form of material thrift, creativity and sufficiency, but, again, it is also important to highlight members' relative positional privileges in Flemish society (light skin tone, native ethnicity, native speakers of the official language, in possession of cultural and/or social capital), which make these material strategies more available.

A first example of the precarity-resilience dyad is many participants' reported "ongoing challenge" to make their own choices

and financially survive. They made explicit that going the unconventional way is hard work and effectively demands idealistic commitment that comes on top of the baseload of work. Indeed, over the course of the research, several people struggled significantly due to cycles of overwork and burnout—resulting in bad mental or physical health and in reduced quality or quantity of circular work being performed. Throughout the interviews and observations, it became clear that the members' activities verged on the border of self-exploitation at times. As one member notes: "The nature of our activities is such that boundaries are not clear and we just keep going" (RP3). This is related to reproductive work in and for the cooperative (unpaid physical or emotional work), but also in the case of specifically circular work, as circularity involves and requires a significant amount of 'extra' work that is hard to get compensated. The same member for instance shared that.

"It is so much work to dismantle [electric apparatus]. You know, 75 percent of the CE is cleaning. And then you have to test stuff, assess the life spans of parts and mean time between failure. It has to function another fourth of its life span. And for all that, you have to come up with a reasonable price. In a shop, it would cost thirty euros, on the wholesale website seven euros. Then the question arises: How can I go about this in a way that is (a) financially attractive for people, (b) actually compensates for all my labour, and (c) creates enough revenue after taxes. And honestly, that is difficult without falling into the old economic for-profit model." (RP3).

One strategy to deal with this tension, is by charging a price (range) that predominantly meets criteria b and c in the case of deals with 'bigger players' (i.e., actors having more financial means), and meets criteria a and b in the case of transactions with less financially powerful actors, i.e., at mates' rates.

Another example is the interaction between the cooperative's activities and the State-institutional logics that underpin financial support. This support is on the one hand desirable, as it would alleviate financial pressures, but it also brings about its own, and different, kinds of pressure on diverse circularity. For example, the current state funding mechanisms require a delineated scope of activity (i.e., the activity needs to be defined as cultural, *or* social, *or* commercial), which effectively de-complexifies their economic activity. Indeed, one civil servant who worked on the case of the cooperative, shared that the city departments' siloed approach to funding is problematic and limits the increasingly hybrid nature of circular and social activity. Another example is the city departments' continued focus on profit- and innovation-driven economic activity: the default view of what counts as 'economic' activity is a commercial enterprise with profit as a marker of business health. Even when members shared with the enterprise agencies in the city their desire to centralise socioecological values and rethink work conditions, members were 'encouraged' to be profitable and expand their business over time (RP4, RP9). As a result, various members felt they could not rely on institutional support without giving up the essence of their livelihoods.

The complex dance between financial precarity and resilience also manifests itself in the constraints around space access and ownership, which we also touched on in 4.2.2. Having a reliable home for their activities has been and continues to be a source of stress for the members. Many of the members spent years in Temporary Use (TU) buildings (prior to the cooperative), which is a contract deployed in the context of a building's pending development and which provides

little security for tenants. As one member put it: "you can do your thing and be creative, but you cannot really build a sustainable future" (RP1). Other members referred to a sense of "constant uprootedness and displacement" (RP10), or the experience that "each time you have to move out [of a TU], it feels like you have to recreate the community all over again" (RP7). Now, they were able to negotiate a 20 year tenancy contract with a multi-property landlord, but the members' ability to pay for the high rent is never certain, and as stated, the space itself needed a lot of energetic and financial input. The members also pointed to a continuous pressure on the availability and sufficiency of storage space. Pointing to the large quantities of material stock (waiting to be used), participants were joking about hoarding behaviours gotten out of hand, but they also acknowledged that a material stock—of salvaged components, parts and objects (cf. Figure 5)—is the very foundation of a truly circular economy: keeping materials in the loop requires space; the very thing that is difficult to access financially.

There are thus many challenges that the members and the cooperative need to deal with on a regular, if not daily, basis. Several of the people, in informal conversations, shared that they thought it was likely that their cooperative, and the diverse circular practices in particular, attracted a high number of people who "do not quite fit in this world," accounting for some of the extra struggles around economic precarity and mental health. Several emphasised that a place like this cooperative is where they felt they were able to thrive and contribute, and, conversely, that other workplaces had dulled their senses and diminished their spirits. The central role of social and ecological values and ethics in the cooperative is also what various members explicitly identified with strongly, making them determined to make things work, despite the many challenges.



FIGURE 5
Selection of circular components. (Source: participant's picture used with permission).

There is, however, “always this field of tension between necessity and principle. The principles [of circularity] are there, but in the end we are also always constrained by necessity” (RP1), as one member shares. Indeed, practices like tool and space sharing, or even material reuse in some projects, are not only rooted in values, but are also the expression of economic precarity, as most members would not be able to afford their own workshops, large equipment, or sometimes new materials to get certain jobs done.

5 Discussion

Our empirical results highlight that diversified circular economies are already being enacted, and that CE activity does not unavoidably need to reproduce capitalist logics in order to produce ‘value’. In this discussion, we lay out why and how we believe the concrete insights around diverse circularity can inform the development of a socially and ecologically sustainable circular economy. First, we will discuss the observed relationships between values and activities. Then, we discuss what can be learned from this case, that might inform processes of adaptation in times of resource-scarcity and social instability. Third, we address some systemic shifts that are required when planning for ecologically and socially sustainable circularity. Finally, we outline the limitations of this study. At the end of the section, [Table 4](#) summarises the characteristics in light of the three first discussion points.

5.1 Relation between values and diverse circularity

In the context of understanding and realising postgrowth circularity, it is useful to reflect on the dynamics between values on the one hand and concrete activities on the other. On the one hand, the four listed characteristics here are clearly driven by a value system that reflects the ones put forth in growth-critical scholarships. Examples

of value clusters in degrowth and postgrowth political economies are [Parrique’s \(2025\) sustainability, democracy, justice and wellbeing](#); or [Banerjee et al.’s \(2020\) frugal abundance, relocalisation, care, and conviviality](#). On the other hand, the various pressures described here might ‘force’ the cooperative to engage in certain practices and relations that end up matching (or reinforcing) certain values.

Predominantly, the cooperants seem to engage in non-market economic relations *as a consequence* of their different value systems. This is because many members believe that the market is not geared towards ecological and social sustainability and they instead explore non-market spaces for more ethical economic encounters—a logic also explored by, e.g., [Beumer et al. \(2022\)](#). Diverse circularity is often the result of the desire for a “joyful doing that negates alienated work” ([Chatterton and Pusey, 2020](#), p. 27) and livelihoods that are more “human-centric” ([Clube and Tennant, 2023](#)). This is also aligned with [Hobson’s \(2019\) ‘social circularity’](#), [Friant et al.’s \(2020\) ‘circular society’](#), [James’ \(2022\) ‘circles of social life’](#), or [Ziegler et al.’s \(2023\) socially-embedded circularity](#). This does however not mean that our case (the cooperative entity) focuses on social inclusion as a primary objective, as opposed to for instance [Lekan et al. \(2021\)](#) and [Pusz et al. \(2024\)](#). The cases discussed by the latter tend to focus on generating incomes and goods to support underprivileged communities. In my case, the members do account for social objectives, but mainly produce to financially sustain themselves and the cooperative (through diverse economic practices) and to create a more sustainable approach to production (through diverse materials and circular practices). Simultaneously, it is clear that navigating the cooperative’s many financial pressures requires specific ways of organising that might be read as a survival response, rather than the expression of a value system, such as reciprocity, sharing and trust (also cf. [Mishra et al. \(2019\)](#) and [Mechielsen \(2022\)](#) for their analyses of the role of trust and collaboration in the CE). However, equally plausible is that necessity *strengthens* values. For example, the cooperative’s relative necessity to economically diversify, might unwittingly strengthen their values pertaining to economic democracy. This analysis is also in line with [Michie et al. \(2017\)](#) and [Steinberger et al. \(2024\)](#), who highlight that diversity of provisioning systems and organizational forms may

TABLE 4 Recapitulation of the key characteristics of diverse circularity and their implications.

Characteristics diverse circularity	Key points and implications
Diversified material value and purpose	• Diverse economic relations closely tied to divergent value system • Prioritisation of use value over exchange value • Attribution of value to ‘unvalued’ materials as expression of creativity • Diversified-value approach to materials will be important in resource-scarce future
Redefined work	• Circularity as site for experimentation with different approaches to work, work culture and the work environment • Autonomy has material and managerial dimensions • Maintaining ‘inefficient’ crafts and skills might be critical for managing resources in the future
Social embeddedness	• Care work is inextricably part of circular work; careful circularities can tend to sociopolitical or ecological brokenness • Circularity is embedded in reciprocal relations of trust • Relocalising resource management is relevant to social circularity • Social cohesion in resource management is relevant in the face of future societal instability
Resilience in the face of precarity	• Space availability and affordability constraints put pressure on circularity • Moving beyond a growth-based circularity requires overcoming spatial and financial support barriers • Resilience is enhanced by strengthening social ties and solidarity • Informal circularity is both rooted in a divergent value system and a survival response to financial precarity

avert market-manipulation and power concentration, or diffuse social vulnerabilities and specific exploitations (as different provisioning systems deploy different actors). In conclusion, understanding which practices and activities either stimulate or discourage postgrowth values is relevant for further research on circular economic developments.

5.2 Lessons for adaptation

We want to emphasise that these circular economic developments do not take place in a vacuum. Fundamentally, we posit that exploring diverse circularity on the ground is crucial for understanding processes of adaptation to major ecological and social changes. Indeed, these changes might require some of the specific socio-material dynamics (cross-cutting the characteristics) observed in the cooperative—though these might be enacted differently by different socioeconomic and cultural groups (cf. 3.1).

One of these socio-material dynamics is that productive capacity is reconsidered in ways that are closely aligned with those described in postgrowth literatures. First, it prioritises production that is socially desirable and/or ecologically sustainable (Vincent and Brandellero, 2023). Second, materials are considered in ways that acknowledge their ‘intrinsic’ value and the (productive, extractive, creative) processes behind their coming-into-being—an approach that echoes what Lane and Watson (2012) call ‘stewardship of things’. Materials no longer seen as valuable from a mainstream circularity perspective, because they are not profitable, are considered valuable by organisations like the cooperative. Indeed, “[h]ow we define and account for what is *valuable* reflects a worldview about how economic and environmental systems as a whole are orchestrated, interact and reproduce themselves” and therefore have “profound practical implications” (Lowe and Genovese, 2022, p. 1). Third, the cooperative’s productive capacity involves activities generally deemed too labour-intensive (and *thus* not profitable and *thus* not valuable) in mainstream circularity. This is because these activities are not only regarded from an economic perspective; they are also maintained for their sociocultural value—i.e. skilful crafts, important for education, leisure, and creativity. We follow Carr and Gibson’s (2016) insistence on the importance of retaining and reviving (often laborious) traditional skills and crafts for what they call “volatile futures.” Indeed, the way production is being defined and enacted in the cooperative, might arguably be useful for a future in which resources are more constrained, and where creative and skilled ways of circulating value will thus be necessary.

Another socio-material dynamic, the investment in community-led (rather than market-led) circular experiments and solutions, might be important from a social adaptation perspective. With ecological changes challenging entire societies; democratic and socially functional communities will be essential. The cooperative’s operations, then, are relevant experiments in what it means to manage resources (including waste and discards) more collectively and democratically (cf. Ziegler et al., 2023, 2025). An important aspect of this, are the consciously and unconsciously cultivated values in the cooperative—such as self-reliance, care, trust, social belonging. Care, as we have shown, is often wrapped up in circular work. Specifically,

repair (Graziano and Trogal, 2017; Niskanen et al., 2021; Carr, 2022) and reuse (Crocker and Chiveralls, 2018) have been framed as an attempt to tend to and mend the brokenness of our world—be it socio-politically or ecologically. The role of care-full communities engaging in circular practices is thus what makes circularity less reductionist (Van Der Velden, 2021) and more in line with what Morrow and Davies (2021) call ‘careful circularities’.

5.3 Required systemic shifts

Enacting diverse circular economies that are not ‘profitable,’ poses significant challenges—for the cooperative; but likely also for any business, organisation, community, network etc. that aims to go beyond growth yet inevitably operates within the bounds of the current infrastructural interdependencies and lock-ins (Banerjee et al., 2020). The latter might include the available material infrastructure (i.e. buildings, land, technologies, production inputs) or immaterial infrastructure (i.e. organisational logics and legal frames, financial policies, urban planning)—which typically overlap and interact with each other. In-depth analysis falls outside of this article’s scope, but we address certain aspects that emerged from the data, which were mainly related to space, resource management, and economic and financial policy.

The question of ‘space’ (related to both material buildings and immaterial spatial planning) is essential for a circular economy, as circularity relies on the storage of dead stock. The urban environment presents a paradox in that way. On the one hand, as Savini (2019, 2023) and Savini et al. (2022) have extensively demonstrated, cities drive the majority of (excessive) resource-throughput and waste creation, and thus require circularity the most. On the other hand, cities are often insufficiently hospitable to circular activities due to constraints on space availability and affordability, thus challenging the project of a circular economy (Hult and Bradley, 2017; Zapata Campos et al., 2020; Graziano and Trogal, 2022). This is also what we observed in our case. Spatial constraint, often tied to the effects of economic growth, also poses a problem for cities themselves. Local governments therefore continuously seek to balance stimulating economic growth with ‘making space’ for less lucrative activities. This awkward balancing act became clear in our interviews with civil servants, where contradictory ambitions were expressed. On the one hand, we heard a lot of support for small, against-the-grain “innovative” local enterprises that focus on social or ecological benefit. Simultaneously, however, it was stated that “[w]e support the local startup (...) that wants to develop their business here and grow and get bigger. At the same time, if tomorrow a multinational company asks for (...) land (...) through which we can create employment? Of course we are not going to refuse that: everyone is looking to attract investors.” Because of these economic growth-determined choices, enterprises with less capital, like the cooperative, tend to lose out or get pushed to the margins of the city (often ‘industrial destination zones’ that come with restrictions on the economic activities that can legally take place there). Our data suggest that, in order to promote a more embedded circularity that involves a wider variety of actors and activities, it is important to make more buildings and land surface available to the storage and processing of circular materials.

A more place-based approach to circularity goes hand in hand with the relocalisation of resource management, which is both in line

with many cities' objective to rebuild or strengthen the local economy (as it is in our case), as well as with research suggesting that locality might improve circularity in supply chains and material exchange (Bloise, 2020; Hina et al., 2022). However, our case relies, as most other social and solidarity enterprises (and all mainstream companies) do, on what Lekan et al. (2021, p. 278) call "production inputs [that] embody complex and often exploitative (of labor and nature) social and material conditions of global production." This is the case *despite* the high degree of circularity and attention to social sustainability in our case. This thus implies that a lot of hard work will need to be done to address the unsustainability of most enterprises' (often global) supply chains. Achieving more socio-material sufficiency in resource use thus requires reorienting production. A first strategy could be to only rely on raw inputs that are required for socially necessary production (satisfying needs, not wants). This approach, however, would not automatically eliminate the reliance on exploitative supply chains, but would minimise it. A second strategy could be a commitment to only using raw inputs from ecologically or socially verifiable/verified sources. This would of course greatly impact what can be produced (or even repaired, refurbished etc.) and would likely—at least initially—increase social pressures. The latter would need to be alleviated by more institutional efforts to localise production as well as to verify 'longer' supply chains (e.g., stronger versions of the EU deforestation directive or the corporate sustainability due diligence directive).

This leads us to another aspect, given that the discussion around space and resource use can generally not be separated from the one around (immaterial) policy infrastructure. Throughout the data, the local government's inability to adequately support a more 'complex' organisation like the cooperative became apparent (especially when it comes to funding or financial support). Even when those civil servants involved in the file handling felt sympathetic to the cooperative, or similar 'innovations', they were often held back by various path-dependencies, insufficient integration of other policy objectives, and a growth logic that underpins their assessments of 'value creation'. This is also consistent with findings from other cases, specifically in urban environments, where funding prioritises more lucrative entrepreneurial and corporate developments (Kębłowski et al., 2020) or where the social and solidarity enterprises themselves compromise on their alternative 'circuits of value' (Lekan et al., 2021) due to financial constraints.

Although the cooperative's activities and aims in some ways challenge and shift the local government's perception of 'value', it is also clear that they simultaneously remain peripheral. More focused policy research is needed to understand the required infrastructural changes and the barriers that need to be overcome in order to proliferate and structurally support these kinds of initiatives (cf. Krueger et al., 2017; Kębłowski et al., 2020; Verga and Khan, 2022). However, some practical entry points can be outlined. One is to adopt alternative instruments to assess 'value' in more integrative ways, foregrounding social and ecological ambitions and outcomes (e.g., Community Economy Return on Investment (CEROI) or Common Good Reporting), which would require better integration of economic, cultural and social policy environments. Another is building more on existing R&D on urban development and postgrowth (cf. i.e. Postgrowth Lab, Metabolism of Cities, Postgrowth Cities Coalition). Yet another is devolving circular management responsibilities to a

wider variety of actors in society, including not-for-profit enterprises and (civil) communities. Enshrining this "right to metabolism" (Olsen et al., 2018)—which democratises, socially embeds and economically diversifies circularity—might be a powerful catalyst for a postgrowth circular economy.

Lastly, it is also worth pointing to the more general and foundational de/postgrowth policy recommendations that could support the kinds of activities found in the cooperative. Indeed, these policies could lay a groundwork for securing people's livelihoods—mitigating economic precarity—which then in turn might support all kinds of meaningful and creative (yet often informal and unpaid) economic activity (Fitzpatrick et al., 2022; Vogel et al., 2024). Examples of this are reduced formal employment (e.g., worktime reduction and job sharing within the context of a green job guarantee scheme) and the simultaneous valorisation and compensation of different forms of 'informal' work that are relevant to people and their communities (e.g., Universal Basic Services, Universal Basic Care Income, Unconditional Autonomy Allowance, etc.).

5.4 Empirical limitations and further research implications

Case studies always have limitations, and so does ours—in particular the scope (one cooperative society), and thus the subsequent empirical findings. Additional (and potentially comparative) case studies on diverse forms of circularity will be key to have a better overview of the viable alternatives as well as the structural hurdles that need to be overcome.

Furthermore, this study limitedly engaged with local and supra-local policy analysis. More research will be needed on the link between the promotion of diverse circularity on the one hand; and the existing and future (postgrowth) policies around spatial planning, project funding, and economic planning on the other—although some elements were outlined at the end of 5.3.

More topics came up during the research than we could explore here, such as the intersection of economic subjectivity and social inequality in the context of circularity. Further research would need to pay more attention to the different forms of circular subjectivity that might (co-)exist across a variety of social or cultural groups, with a particular focus on identifying psychosocial and material-economic barriers.

6 Conclusion

Through adopting a diverse economies (DE) perspective, we aimed to make visible the diverse circular economy based on a study of a Belgian maker cooperative. Concretely, we inventoried the cooperative's observed and reported circular activities and dynamics, including non-market and informal ones. Subsequently, we sought to identify recurrent characteristics across this inventory and in participants' narratives, as well some implications for circularity beyond growth. Thus, the research attempted to address the lack of thorough empirics on the link between diverse economies, (diverse) circularity, and postgrowth.

There are a number of key insights that are worthwhile recalling here. One is the relation between diversity of economic organisation (regarding i.e. transactions, labour, property) and of circular materials and practices: both are to some extent dependent on and expressed through the other—an insight that is echoed in the following ones.

The next, and arguably most fundamental, insight is that the characteristics outlined in this paper are rather *uncharacteristic* of the circularity referred to in the majority of the scholarly and public debate. The values that are enveloped in the characteristics are instead quite aligned with the spectrum of de/postgrowth understandings of a sustainable economy: a more resourceful approach to material use, increased autonomy and meaning-making in work, economic activity in service of social wellbeing, and collective resilience in the face of adversity and precarity (here specifically related to contemporary growthist economies).

Following from the previous point, these values are simultaneously vitally important for the future *and* continuously under pressure. The diverse circularity in this article imparts important ‘lessons’ that go beyond merely resource use, and instead also include dimensions of social wellbeing, as well as of purposeful reorganisation of work itself. It puts the circular economy back in its place: as a subset of a sustainable economy which in and of itself is embedded in social relations and, ultimately, within planetary boundaries. Even though the cooperative is not a ‘perfect’ blueprint for a ‘perfect’ circular economy, it does present us with some tangible insights into possibilities for different, and certainly more sustainable, approaches to circularity.

We would like to conclude by restating that there is a need to overcome the current im/material infrastructures that undermine the ability of entities like the cooperative to make unconventional projects work. In the discussion section, we outlined a series of ‘required systemic shifts’ (cf. 5.3) that could reduce or remove barriers. Ultimately, however, the globally established objective of economic growth governing the current material infrastructures, policies and institutions worldwide, will need to be dethroned. If the powers that be indeed seek to make resource use more sustainable, it will be key to financially support and make literal space for thriving diverse circular economies—serving not growth, but their local communities.

Data availability statement

The datasets presented in this article are not readily available because of the sensitive nature of the questions asked and responses given in this study. Research participants were assured raw data would remain confidential and would not be shared. Requests to access the datasets should be directed to irma.emmery@ugent.be.

Ethics statement

The studies involving humans were approved by the ethical committee of the Faculty of Political and Social Sciences (GDPR).

The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

IE: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Visualization, Writing – original draft, Writing – review & editing. EP: Conceptualization, Funding acquisition, Methodology, Supervision, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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