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**Title:** Contested circular economy and mixed social implications from practice : A scoping review

**Year:** 2024

**Version:** Published version

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**Please cite the original version:**

Liu, K. (2024). Contested circular economy and mixed social implications from practice : A scoping review. Sustainable Development, Early online. <https://doi.org/10.1002/sd.3229>

## REVIEW ARTICLE



WILEY

# Contested circular economy and mixed social implications from practice: A scoping review

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**Funding information**

HORIZON EUROPE Marie Skłodowska-Curie  
Actions, Grant/Award Number: 955518

**Abstract**

‘Circular economy’ is a popular term used by various parties to refer to the necessary transition towards a sustainable future. Yet, there is still no consensus on its definition or application, the current discourse favours an approach that focuses on the technical improvement of material flows while neglects the social considerations. Consequently, despite circular economy's popularity, various social concerns have also been raised, including justice and equity. To better understand its social implications, this article reviews studies that reveal the social impacts of various practices that claim or are deemed to be circular economy. Using the scoping review method, the article finds that the categories most frequently reflected in these studies include livelihood, health, value, identity and community. However, the claimed impacts are often conditional and contradictory. These results suggest that circular economy still requires substantial theoretical and empirical development to better align it with the principle of sustainable development. Acknowledging the diversity of voices in the current circular economy field can be a starting point for stakeholders in terms of future research, policymaking and practice, while further transdisciplinary collaborations should also be explored.

**KEYWORDS**

circular economy, empirical evidence, social impact, social work, sustainable development

## 1 | INTRODUCTION

As the world faces increasing and intertwined environmental, economic, and social challenges, continual efforts have been made to seek possible paths to a more sustainable future. In this context, the term ‘circular economy’ (CE) has gained increasing popularity among academics, businesses, governments, and various stakeholders. However, despite its frequent use in literature and policy, there is still no consensus on its definition, and numerous interpretations exist. While most stakeholders agree that CE entails the combination of ‘reduce, reuse, recycle’ activities with the aims of economic prosperity and

improved environmental quality, its social aspects and long-term perspectives have received less attention (Kirchherr et al., 2017). Besides the conceptual bias, current circular discourses primarily focus on the practical and technical levels of actual physical flows of materials and energy, rather than giving equal attention to values, societal structures, cultures, and worldviews, indicating that the prevailing paradigm is ecological modernisation rather than holistic social-economic transformation (Friant et al., 2020; Korhonen et al., 2018).

Unsurprisingly, although CE is still frequently celebrated for its potential contribution to Sustainable Development Goals (SDGs) set by the United Nations (Schroeder et al., 2018), some have questioned

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the effectiveness and impact of a technocentric CE that does not comprehensively integrate the social dimension. For instance, various social issues can arise from trade-offs between the economic, environmental, and social dimensions, as well as from the shifting of burdens both between and within borders (Chen, 2021; Corona et al., 2019; Repp et al., 2021; Schröder et al., 2019; World Health Organisation, 2018, 2023). More importantly, as vulnerable groups and communities are at greater risk of being negatively affected by circular changes, equality, justice, inclusion, and other core principles of sustainable development (SD) seem to be directly challenged. However, as the field grows, circular narratives are also emerging that consider wealth, power, technology and knowledge as essential components of the circular transformation (Friant et al., 2020). Nogueira et al. (2019), for example, developed a system-thinking framework that incorporates human, social, political, cultural, and digital capital within the CE endeavour. Genovese and Pansera (2021) criticised the apolitical and technocratic tendency of existing CE discussions as a 'weak formulation' of CE, proposing instead a 'strong formulation' that questions not only the ownership and organising pattern of production units but also the governing structure of science, technology, and innovations. Hence, the CE field is at a crossroads, while competing narratives such as ecomodernism and holistic social-economic transformation still exist widely among its various stakeholders (Genovese & Pansera, 2021; Leipold et al., 2023).

This demonstrates vitality and an increasing social-political awareness of the topic, but contested CE visions and approaches present a challenge to defining what CE implies in practice. This further complicates understanding the actual implications of CE, especially regarding the social dimension, where divergent approaches are evident. Therefore, while there is a clear need for better understanding the relationship between CE and SD from a social perspective, a dynamic lens that acknowledges, encompasses and differentiates between distinct CE approaches is also critical.

There have been several attempts to clarify social discussions in the CE literature, which generally suggests that the overwhelming focus is on job creation as the major social benefit and that insufficient attention has been paid to other social aspects and critical perspectives, such as how the circular transition will deliver its often-promised benefits (Mies & Gold, 2021; Padilla-Rivera et al., 2020; Vanhuyse et al., 2021). While previous reviews have identified the focus and limitations of these social discussions on CE, there have apparently been no studies specifically examining the social impacts of existing CE activities or differentiating empirical studies of CE implementation from theoretical discussions. Little is therefore known about the focus and limits of current empirical evidence outside a limited number of studies. Meanwhile, the unbalanced knowledge accumulation is often accompanied by CE stakeholders' selective approaches that favour SDGs which can be conveniently achieved (Belmonte-Ureña et al., 2021). Therefore, it remains difficult to determine whether various practices conducted in the name of CE align with positive or negative theoretical speculations about their social implications as an often-neglected topic. This gap indicates the need to clarify how various CE activities affect people in real-life contexts

and how this has been demonstrated by research. Moreover, due to the predominant tech-centric focus in discussions surrounding CE, previous studies tended to favour interpretations centred on material flows rather than recognising circular transition as an evolving concept that encompasses broader transformations. This not only risks excluding more transformative perspectives but also impedes the comparison of potential differences arising from various CE approaches, a comparison which may be critical for the further theoretical and practical development of CE. This study therefore aims to fill these gaps by recognising the unique discourses and approaches underlying existing circular activities, while also examining their social implications.

Social work, as a practice-based discipline that advocates for social change and development, is uniquely placed to address these gaps. First, social work specialises in engaging with people and structures to address life challenges and enhance well-being through its insights from the social sciences and humanities (International Federation of Social Workers, 2014). This not only provides clear social focuses that are directly relevant to SD but also offers advantages in understanding the dynamics between social contexts and CE practices. Moreover, social work has recently expanded its transdisciplinary tradition to encompass SD topics, actively engaging with economic transitions through amplifying disruptive voices (Peeters, 2022). This feature of social work research is particularly suitable for exploring topics that are filled with diversified discourses, such as CE. Therefore, the social work perspective is well suited for filling the current gaps and achieving a better understanding of the social implications of CE, further enhancing the transdisciplinary knowledge base on the topic.

Given this context, this study conducts a scoping review of research examining the real-life social implications of different activities regarded as circular transition endeavours. It addresses two specific research questions (RQs):

**RQ1.** How has the current contested status of CE influenced empirical research investigating its social dimension?

**RQ2.** What social implications are presented by current practices considered by research as part of the CE?

**RQ1** aims to uncover the conceptual understanding and explanations adopted by CE researchers, as well as the types and focuses of the explored activities. **RQ2** delves deeper into how various CE practices interact with social relationships and affect people's lives.

By exclusively focusing on studies that provide relevant evidence, this review aims not only to determine if the direct impacts of existing CE practices can be considered socially sustainable in their respective contexts but also to enhance understanding of the CE transition's potential to contribute to broader social concerns, such as justice and inclusion. This article also explores how various CE practices, underpinned by different approaches, manifest in reality, thus providing insights for the future theoretical and practical development of the CE

field. The structure of this paper is organised as follows: Section 2 introduces the adopted method and study design, providing a comprehensive overview of the research process. Section 3 presents the main results of the review, highlighting key findings and insights. Section 4 offers an in-depth discussion of the main findings, exploring their implications for future research, practical applications, and policy development. Finally, Section 5 concludes the paper by summarising the key points and outlining potential directions for further investigation.

## 2 | METHOD

The scoping review method is the process of comprehensively summarising a range of evidence with the aim of establishing the extent, range, and nature of available knowledge on a topic (Arksey & O'Malley, 2005; Levac et al., 2010). This methodology was chosen because of its suitability for providing an overview of existing social evidence regarding CE as well as the advantages it offers for a diverse and emerging topic, compared with the traditional systematic review method. These advantages include the flexibility to cover a range of study designs and methods (O'Brien et al., 2016). It is an efficient tool for synthesising various types of research evidence while following a more transparent and rigorous process than a traditional literature review (Peters et al., 2015). This review followed a five-step process adapted from Levac et al. (2010): (1) defining the research question; (2) identifying relevant studies through a search strategy; (3) selecting studies based on eligibility criteria; (4) charting the data; and (5) collating, summarising, and reporting the results. The research question is delineated in Section 1 above, and the following section introduces the core concepts and describes steps 2 to 5.

### 2.1 | Identifying relevant studies through a search strategy

There are numerous interpretations and divergent visions of CE. What has mostly been agreed on appears to be a combination of principles related to CE rather than a specific, universally defined concept of it (Corvellec et al., 2021; Kirchherr et al., 2017). Consequently, previous CE literature reviews have used different search strategies. For instance, some consider 'CE' to be interchangeable with 'industrial symbiosis', 'closed-loop', 'cradle-to-cradle' and other material-based economic concepts (e.g., Aloini et al., 2020; Mies & Gold, 2021). While this approach can highlight research that reflects the material-use aspect of CE, it is essentially tech-centric and industrially focused, and may not help with conceptual clarification of CE because of the blurred boundaries between different concepts. Other reviews restrict their keyword to 'CE' (e.g., Khitous et al., 2020). This strategy gives the reviews a clearer scope and better represents the focus and characteristics of the literature surrounding the topic of CE; this article also adopts this strategy. However, to acknowledge the

further development of CE and include broader discussions related to the circular transition, this article treats CE as a novel and unique umbrella concept that embraces different discourses, albeit only including 'circular'-related terms (Table 1).

Similarly, there is currently no universally accepted definition of CE's social dimension, nor any standardised framework for incorporating various considerations of it (Padilla-Rivera et al., 2020). Furthermore, the concepts and measurements of 'social' vary between disciplines, cultures, and value systems (Dempsey et al., 2011; Maas & Liket, 2011; Magee et al., 2012; Vanclay, 2002). The diversity of current views presents a challenge for reconciling knowledge about the topic, whilst also offering an opportunity to extend and further develop the transdisciplinary tradition of CE. To encompass diverse perspectives from different disciplines engaged in circular discourses, this study deliberately selected inclusive and broad keywords, such as 'soci\*' and 'human'. Table 1 presents the keywords, strategy, and databases used for the search conducted on September 5, 2023. The search results from Web of Science and Scopus were consolidated in Endnote for subsequent screening. These two databases were chosen for their comprehensive coverage of relevant academic literature. They were also commonly used by previous studies on similar topics.

### 2.2 | Selecting studies based on eligibility criteria

In line with the study's objectives and the chosen search strategy, the selection criteria also apply to the two aspects of circular discourses and the social dimension. To guide the future development of the CE field and to avoid biased and suboptimized interpretations of CE, articles selected for this study had to have direct connection with circular concepts, rather than assumed connections through popular CE principles such as recycling. Also, unlike previous CE studies, this review takes a unique perspective grounded in the field of social work. This means that, while recognising the diverse interpretations of 'social', it only included studies offering insights into a better understanding of CE's potential for SD in terms of social relations and human welfare, such as equity, inclusion and well-being. The specific inclusion and exclusion criteria for the screening process are detailed in Table 2.

There were no restrictions regarding publication date or methodology. The initial search returned 3998 results from Web of Science and 5395 from Scopus. After the results were combined in Endnote, 3136 duplicates were identified and removed, leaving 6257 articles for screening. Selection was a two-step process. First, the titles and abstracts were examined for their relevance to both CE and the social aspects. Then, if an article was deemed relevant, the full text was retrieved and examined against the remaining criteria (Table 2). As a result, 39 articles were selected for review. Most of the identified articles were excluded due to irrelevance to the social dimension or because they did not provide empirical evidence. This low percentage of relevant articles aligns with the trend of neglecting the social dimension, as identified by previous studies. Figure 1 outlines the process in a PRISMA flow diagram adapted from Page et al. (2021).

**TABLE 1** Search strategy.

Database	Keywords	Filter	Article type	Language	Time
Web of Science	("circular economy" OR "circular society" OR "circular cit*" OR "circular transition" or "circular transformation") and (soci* or human)	Topic (searches title, abstract, author, keywords and keywords plus)	Article & proceeding paper	English	No limit
Scopus		Article title, abstract, keywords	Article & Conference Paper		

**TABLE 2** Eligibility criteria for article screening.

Inclusion criteria	Exclusion criteria
1. The article must be based on activities directly considered as CE by authors or investigated subjects.	1. Studies based on certain type of activities or strategies (e.g., recycling, waste management) but do not mention CE or other 'circular' terms in the main body.
2. The article must present CE activities' impacts on social relations or human welfare.	2. Studies that do not explore social aspects or only investigate how social elements affect CE practices or investigate the 'social' from a perspective outside the scope of the investigation (e.g., customer satisfaction).
3. The article must evaluate existing practices in real-life circumstances.	3. Theoretical discussions, laboratory experiments, economic models or scenario analyses.
4. The article's findings on social aspects must be supported by primary evidence.	4. Social-related discussions based entirely on secondary data or theoretical deductions.

## 2.3 | Charting the data

Data-charting is the process of logically identifying and recording key information from selected studies (Arksey & O'Malley, 2005; Peters et al., 2015). To answer the research question, the following data were extracted from the selected articles and charted in spreadsheets: (1) title, author(s), year of publication, geographical location; (2) the adopted circular concept and its relevant discussions; (3) the investigated activities and their connections with the circular concept; and (4) key empirical findings on the social impacts of CE practices and the factors influencing those impacts. As Levac et al. (2010) recommend, the charting was an iterative process, and the spreadsheet was continuously updated as results emerged from the reviewed articles.

## 2.4 | Collating, summarising and reporting the results

This step includes analysing the data, reporting the results and endowing them with meaning (Levac et al., 2010). Descriptive numerical summary analysis was used to characterise the data and present the reviewed studies' main features and trends. Then the inductive content analysis (ICA) approach was adopted to categorise the

identified social impacts of CE practices. Inductive content analysis is suitable for topics that lack an established theoretical base; its strength is that it identifies themes in fragmented data (Elo & Kyngäs, 2008; Vears & Gillam, 2022). The following process was adapted from Vears and Gillam (2022) in line with the purpose of this study and the characteristics of the data: (1) familiarisation with the data through repeated reading; (2) coding based on the raw data's core focus, and recoding based on newly emerged codes; (3) developing themes based on similar or relevant codes, and refining themes for further abstraction; and (4) interpreting and reporting the results. Section 3 outlines the results, the implications of which are discussed in Section 4.

## 3 | RESULTS

### 3.1 | The characteristics of reviewed studies

Overall, 39 studies met the eligibility criteria and were included for review. They are listed in the Appendix A. Three were conference papers, while the rest were published in peer-reviewed journals. Although the selection process did not impose restrictions by publication date, all the eligible studies were published between 2011 and 2023, with the majority (25 out of 39) appearing in 2022 and 2023 (Figure 2), indicating a significant growth of interest in CE's social dimension. In terms of distribution, the studies covered all major geographical areas (Figure 3). In terms of specific countries, Brazil, China, and Italy were the most frequently investigated, with four studies each. Additionally, four reviewed articles included data from more than one country in their study designs.

### 3.2 | Reviewed studies in the context of diversified discourses

This section presents the results related to the first aspect of the research question: how the current contested status of CE has influenced empirical research investigating its social dimension. Regardless of the use of different 'circular'-related keywords during the search, all the identified studies were connected to CE, suggesting that this concept remains the most widely adopted in current research on circular transitions. Although all the reviewed articles can be considered as studies within the CE field through having CE as their core topic,

FIGURE 1 Study selection process.

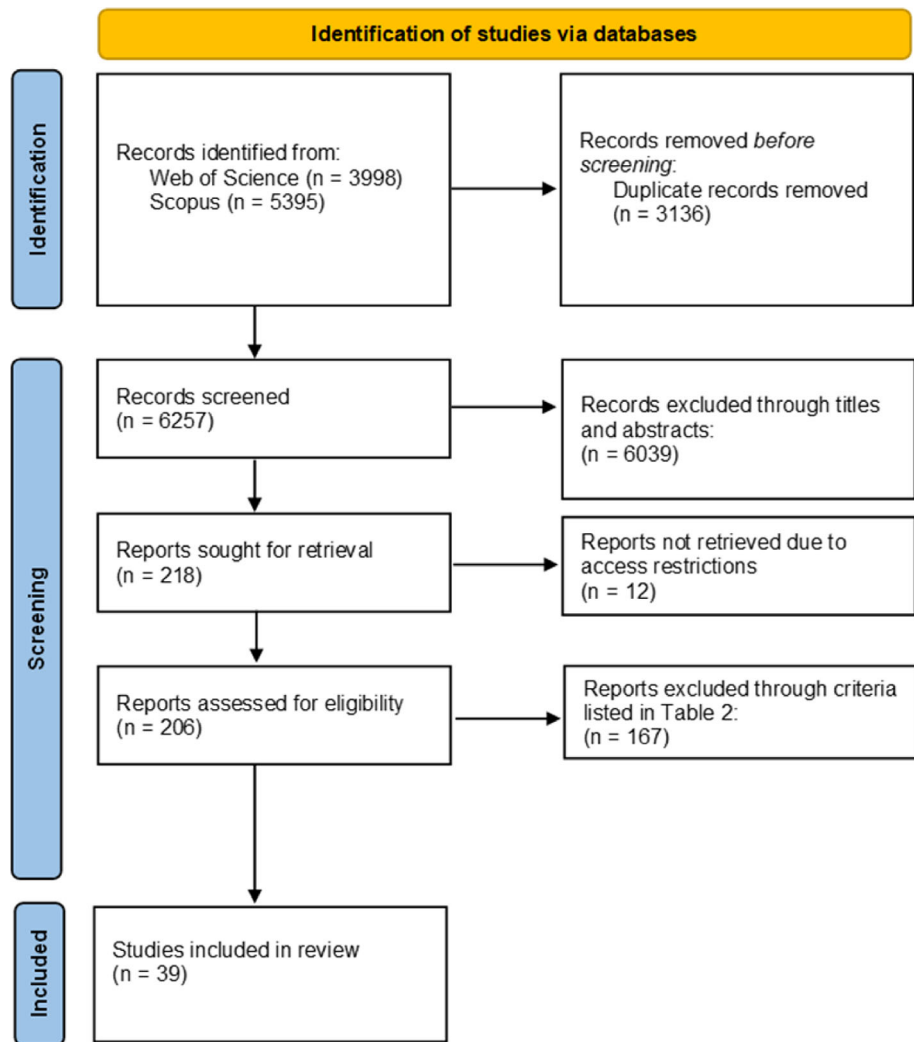
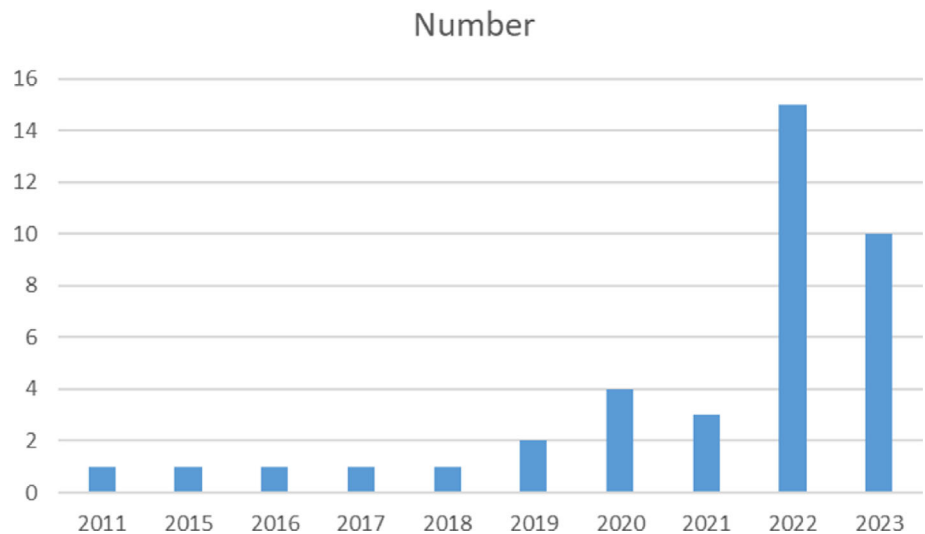


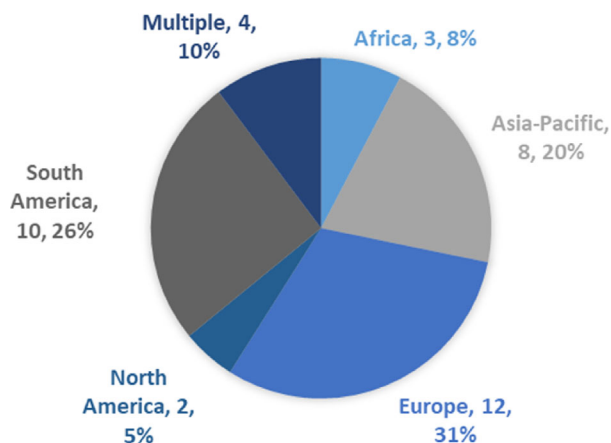
FIGURE 2 Publication years of reviewed articles.



the specific connections were established differently, possibly reflecting disparate attitudes and understandings of circular transition.

Just over half the articles ( $n = 21$ ) provided explanations of what CE means or entails to some extent. However, these explanations

varied significantly in both approach and content. Only 10 studies used existing definitions of CE, with Kirchherr et al. (2017) and the Ellen MacArthur Foundation (EMF) being the most frequently referenced sources, each being mentioned four times. Interestingly,



**FIGURE 3** Studied areas of reviewed articles.

although the definition from Kirchherr et al. (2017) is based on the reflection of previous conceptual debates, and improved the social dimension by adding social equity as part of CE's goals, its social-related contents were excluded by two of the studies that adopted it. Conversely, while the conceptual explanations from EMF do not integrate social concerns, two studies intentionally expanded their framework to include the social dimension, for example by inserting the Human Sphere into EMF's butterfly model of the technical cycle and the biological cycle (Criollo & Tapia, 2020). Furthermore, possibly due to the lack of a suitable or ideal CE framework, two studies proposed their own versions of CE, such as 'Locally Managed Decentralised Circular Economy' (Joshi & Seay, 2019). These findings suggest there is no broadly accepted CE concept, and that even the relatively more influential models are subject to value- and context-oriented modifications.

Rather than offering specific definitions, six studies provided explanations or references concerning the principles, strategies, or purposes of CE. For instance, Lambert et al. (2022, p.1) say CE is 'generally understood as an economic system which tries to "close the loop"... [and] aims to optimise the use of materials and energy... by extending the life of products and reusing them, and by recycling materials'. Similarly, Becerra et al. (2020, p.2) assert that CE 'is characterised, more than defined, as an economy that is restorative and regenerative by design, aiming to maintain products, components, and materials at their highest utility and value at all times'. While these descriptions vary in content, they generally align with popular perceptions of CE, yet the language used by these authors suggests an acknowledgment of diverse perspectives on CE and a reluctance to provide definitive definitions. Three studies took a similar approach of not directly defining CE, presenting relevant debates instead, but from a more critical perspective. By criticising the technocratic, anti-political, asocial, and simplified tendency of CE discourses, these studies (Morrow & Davies, 2021; Rosenbaum & Kehdy, 2022; Schulz & Lora-Wainwright, 2019) questioned the simplification of CE and deemed it a sociotechnical imaginary, indicating a strong social awareness from theoretical and conceptual perspectives.

Notably, despite the presence of clearly dissimilar and even conflicting standpoints on the circular transition, 18 studies explicitly adopted the term CE without providing any indications of its meaning within their study. Compared to the previously mentioned approaches, this group seems to reveal a more accepting attitude towards the mainstream circular discourse by treating CE as a recognised concept requiring no clarification.

Overall, the conceptual understandings presented by the reviewed studies suggest that current debates and contested visions of CE have direct impacts on CE research. Although the mainstream CE focused on material efficiency from a technological perspective seems prevalent among these studies, some researchers do not accept this as a matter of course and have started challenging it in various ways. This further implies that the social implications revealed by the reviewed studies should be understood differently, as the investigated CE practices are guided by distinct principles. This will be discussed below. Table 3 summarises the different types of conceptual introduction provided by the reviewed articles.

The investigated activities offered another important context for the reviewed studies. Although this review did not consider types of activities or sectors as a selection criterion, the majority of articles ( $n = 19$ ) focused on waste management practices, including general waste, electronic waste, food waste and wastewater. Other types of activity receiving relatively more attention are agriculture ( $n = 5$ ), built environment and construction ( $n = 5$ ), non-profit, community-based projects, and small businesses ( $n = 5$ ). In addition, one study examined consumer products, and one looked at the manufacturing side. There is also one article covering the unrelated activities of waste management and water resource management. As CE is perceived as a systematic shift in all economic activities, the distribution shown by the reviewed studies clearly shows limited breadth. More importantly, CE is argued to have multiple 'R' strategies; most of the investigated activities seem solely based on recycling, with a few exceptions that adopted repair (e.g., Bradley & Persson, 2022), reduction (e.g., Clube & Tennant, 2021), industrial symbiosis (Chancé et al., 2017), and multiple strategies (e.g., Kayaçetin et al., 2022). This suggests that the investigated practices, while promoted as a holistic approach, are often based on one or a few of the proposed strategies. The significance of this will be discussed later.

Overall, these findings present the characteristics and trends of the reviewed articles while shedding light on their placement within the context of diverse and contested circular discourses. This not only illustrates how CE research has been influenced by the current state of debates but is also crucial for understanding the findings of these studies. The next section delves into the findings related to specific social implications corresponding to RQ2.

### 3.3 | The social implications of the practices that are considered as circular economy

Although the reviewed literature is drawn from various disciplines and based on different activities, the reflected social implications can be

**TABLE 3** The types of conceptual introduction of reviewed articles.

Type		Number		
No Information	Did not provide any conceptual or theoretical explanation of CE.	18		
Without Specific CE Definitions	Introduced popular circular strategies or principles.	6		
	Introduced the conceptual debates and diverse views in the field.	3		
With Specific CE Definitions	Adopted existing concepts.	Directly used the concepts with social considerations.	2	
		Directly used concepts without social considerations.	3	
		Modified the concepts:	To insert 'social'.	3
			To exclude 'social'.	2
		Introduced new CE concepts with social considerations.	2	

categorised into three themes: livelihood, which focuses on the economic relationship and experience of people; health, including both direct impacts from CE activities and indirect impacts from the products and environment changed by CE operations; and changes in terms of value, community and social relationships.

### 3.3.1 | Livelihood: Opportunities, vulnerabilities and exploitations

Social effects in the context of economic changes stand out as the most discussed topics in the reviewed studies, yielding both promising outcomes and concerns. Current practices categorised as CE were found to encourage entrepreneurship, create jobs and an extra source of income, increase profits, and offer training and upskilling opportunities in various settings including waste management, agriculture, construction, fashion, and non-profit concerns. Moreover, improvements were observed in the quality of employment and partnerships, including increased trust between workers and employers, better work-life balance, and improved physical and psychological safety (Clube & Tennant, 2021; Gall et al., 2020; Gutberlet, 2023). Some studies presented the social inclusion potentials through the financial and emotional empowerment of marginalised and disadvantaged groups, such as people with disabilities, youth, immigrants, refugees, former convicts, and substance abusers (Ferreira et al., 2022; Gutberlet, 2023; Morrow & Davies, 2021).

However, there are also practices that do not offer improvements, especially in terms of job quality and inclusion levels. In some cases, the livelihood of people is even negatively connected to some essential links of current CE. This has been prominent in waste management related activities in developing countries, as income is low and often unstable while the working conditions are harsh (Bening et al., 2022; Hartmann et al., 2022). Meanwhile, workers lack access to basic benefits, such as adequate health protection, which not only endangers their health but also limits their ability to deal with crises (Sakamoto et al., 2021). In some cases, child labour was observed in these activities (Jagadale & Santos, 2021; Li et al., 2011). As the most vulnerable link in the value chain, informal workers and contractors not only lack official recognition, support, and protection, but also face exploitation from dealers and marketplaces (Hartmann

et al., 2022; Jagadale & Santos, 2021). Furthermore, administrative and regulative changes undertaken in the name of CE, such as CE park, forced grassroots stakeholders out of business and enabled local elites to gain more control and benefits (Schulz & Lora-Wainwright, 2019).

Hence, while some cases show positive relationships between CE practices and the social dimension, the negative dynamics cannot be overlooked. The differences seem to be highly influenced by the business models, types of activity, overall socioeconomic conditions of the groups involved, and the broader sociopolitical environment. Interestingly, contradictory findings can often be seen within the same type of activities, or even within the same cases. A locally adapted and socially oriented business in Kenya, for example, was found to offer higher and more stable income as well as a sense of belonging for the waste pickers working with them, yet none of the pickers was found to have exited poverty or informality, indicating limited impacts despite the improvements (Gall et al., 2020). Similar limitations were also evident in cases in Belgium, where various CE activities often rely on precarious contracts and unpaid labour regardless of good intentions for reintegration into the labour market. Therefore, how to improve currently precarious jobs without necessarily resorting to classic profit-oriented operations emerges as a key challenge (Lambert et al., 2022). These findings highlight both the potential opportunities and challenges for improving livelihoods through CE activities in various contexts.

### 3.3.2 | Health: Benefits, risks and uncertainties

As with livelihood, health-related indications from the reviewed studies show a similar mix of positive and negative examples. Some practices were found to contribute to less pollution and better adaptation to the environment for local communities through measures such as reducing waste and redesigning resource use, leading to better health conditions for residents (Becerra et al., 2020; Criollo & Tapia, 2020; Ghisellini et al., 2023; Pereira et al., 2022; Rosenbaum & Kehdy, 2022). In addition, the use of non-toxic bio-based materials also improved conditions for construction workers (Kayaçetin et al., 2022). However, the same study also pointed out that safety risks still emerge, as there are no adequate certification and



regulations on reused materials, and initial production of the materials had caused adverse health and safety impacts on the workers from the producer side. Expected and unexpected shifting of burdens between different stakeholders was also found in several other cases. In these instances, although CE offered environmental improvement for some it caused extra pollution and disturbance in the areas where the activities were conducted, sometimes reflecting pre-existing geographic inequalities (Ghisellini et al., 2023; Giustiniani et al., 2023; Morrow & Davies, 2021; Santos, 2022; Schulz & Lora-Wainwright, 2019).

Besides the direct human experience of working and living environments, product and material safety also emerge as potential concerns. For instance, products with recycled material were found to contain banned and toxic chemicals, especially when manufacturers are not selective about the purity of recycled plastic (Leslie et al., 2016). Examination of rotor blades from a dismantled wind turbine reused as a playground facility and crumb rubber used as infill of synthetic turf pitches worldwide revealed either direct safety concerns or health risks for young children after prolonged exposure (Graça et al., 2022; Medici et al., 2020). Although Fořt et al. (2022) did not find significant risks to human health in their investigation of rubber crumb applications, substantial environmental hazards to soil and water were identified. Furthermore, García-Valverde et al. (2023) emphasised the significance of monitoring and controlling soil that is continuously irrigated with reclaimed water. They noted the risk of high accumulation rates of certain organic contaminants, which could potentially migrate over multiple crop seasons. Despite confirming the safety of consuming fruits harvested from plants irrigated with reclaimed water, this highlights the presence of uncertainties associated with some CE measures in terms of their long-term effects.

### 3.3.3 | Value, identity and community

Besides the impacts on livelihood and health, CE was also found to influence less tangible social aspects such as value, identity and community. Possibly owing to the inherent environmental concerns of CE, various activities have facilitated and heightened the environmental consciousness of diverse stakeholders. For instance, these activities include raising consumers' awareness of consumption patterns, encouraging workers' environmental recognition, and fostering sustainable public consciousness of the issues (Baruque-Ramos et al., 2017; Bradley & Persson, 2022; Chancé et al., 2017; Mansilla-Obando et al., 2021). Meanwhile, through this expansion from mere economic relationships to encompassing the public interest, as emphasised by the environmental dimension, workers also felt a sense of contributing to society (Mansilla-Obando et al., 2021). The shift from traditional roles is illustrated by Bradley and Persson (2022), where citizens are no longer just passive consumers but active co-creators in do-it-yourself repair activities. Additionally, community compost initiatives transformed vigilant neighbours into caring ones sharing collective responsibilities (Morrow & Davies, 2021). Unsurprisingly, social fabric and solidarity were built and community

connections strengthened through non-market transactions and inclusive community collaborations (Criollo & Tapia, 2020; Rosenbaum & Kehdy, 2022; Torchia et al., 2023). Similar dynamics were also observed among small businesses, where industrial symbiosis created spaces and opportunities for tenants to share learning and to collaborate, thereby building both human and social capital (Chancé et al., 2017).

Although the social implications within this theme do not exhibit mixed or conflicting tendencies, as observed in livelihoods and health, certain challenges persist. For instance, in 'an example of a careful circularity, where material and labour flows are designed around principles of social justice and solidarity rather than efficiency and profit ... community composting is a kind of care work that is socially and environmentally necessary. However, like other forms of care work it is often undervalued' (Morrow & Davies, 2021, p.538). Similar concerns were also raised by Bradley and Persson (2022), who found participants experienced conflicts between modern lifestyle and commitment to the community-based and non-profit activities, which posed more fundamental questions about waged and non-waged work. These difficulties indicate that despite its potential for fostering social cohesion and community building, CE's impacts are often constrained by broader social-economic structures and cannot be addressed solely through applying socially oriented strategies within activities. As Morrow and Davies (2021, p. 543) put it, 'without changes in wider systems of food and waste governance and environmental ethics, these impacts will go unnoticed and uncounted'.

## 4 | DISCUSSION

Unlike previous CE review articles, this study acknowledged and confronted the conceptual debates and diversified perceptions in the CE literature while exploring the social dimension of its implementation. The results not only demonstrate how theoretical debates within CE have influenced relevant research and practice, but also reveal disparate social implications, both conflicting and shared. This section discusses these findings in connection with existing CE debates, before outlining the implications for future research, policy, and practice.

### 4.1 | The confusing status of circular economy and its challenges for the social dimension

In recent years, concerns have arisen regarding the potential collapse of the CE concept due to the variety of understandings of it. Continual efforts have been made from different perspectives to seek a clarified concept with more acceptance and less dispute (Alizadeh et al., 2023; Geisendorf & Pietrulla, 2017; Iñigo & Blok, 2019; Kirchherr et al., 2017, 2023; Nobre & Tavares, 2021). However, no single broadly recognised version was identified across the reviewed articles, suggesting such efforts have not yet significantly changed the fragmented perspective and confusing status of

CE identified by Rizos et al. (2017). The distinct attitudes of acceptance, doubt and opposition towards the mainstream CE understanding shown by the studies further verified the contested discourses identified by Friant et al. (2020). This is potentially a promising sign that the current conceptual ambiguity has created a flexible space allowing innovations and improvements in CE's social dimensions, as several reviewed studies have demonstrated. At the same time, however, this study found it poses fundamental challenges for the CE field.

First, it is hard to determine what should be considered as CE and its practice. As shown by the reviewed studies, sometimes the practice has a clear name such as CE park: although limited, it is clear for all the stakeholders that this falls within CE practices because of the connection established by policy or by formal practice. However, quite often it is researchers who apply their own CE lens to investigate activities that do not fall directly under the term of CE and its relevant discussions. Such connections are often made because these activities share one or several principles with CE, even though the activities existed long before CE and their practitioners are not necessarily aware of the term. These situations indicate CE as a blurred concept encompassing both 'new' and 'old' activities and it is up to researchers whether to establish the connections between the investigated practices and the term CE.

Consequently, it remains a challenge to grasp fully the true implications of CE. This difficulty arises from the current perception of CE, which includes both innovative endeavours that seek to disrupt linear models and traditional practices that have long coexisted with or even served as essential components of linear models. Furthermore, there is a lack of consensus on whether the social dimension should be an inherent aspect of CE innovation, leading to a diverse range of operating principles and impacts, as this study has revealed. This implies that, at least in terms of the social dimension, it may be impractical or even inappropriate to investigate the direct or indirect effects of CE practices from a macro perspective at this stage, even though such knowledge is critical for responsible policy formulation.

Moreover, the persistent ambiguity appears to have fostered an environment conducive to suboptimisation. Despite the diverse theoretical perspectives, there is general agreement that CE should encompass a systematic transformation involving all economic activities through a hierarchy of strategies prioritising 'reduction' (Nilsen, 2019). Consistent with the findings of previous reviews focused on the broader CE literature (e.g., Alcalde-Calonge et al., 2022; Alnajem et al., 2020; Meseguer-Sánchez et al., 2021), this study also observed that recycling emerges as the most frequently discussed topic and waste management as the primary area of practice. This suggests that the social implications of CE in real-world applications primarily stem from a limited range of strategies and sectors, regardless of whether they are considered as representative for CE or not.

Given these contexts, the following sections discuss how the mixed social implications have been presented by the practices considered within CE discourses as offering indications for the future development of the CE field, rather than attempting to draw

conclusions about what social implications CE as a phenomenon or movement entails.

## 4.2 | The contradictory and conditional social implications of circular economy practices

A few concerned voices aside, the discussions around CE are often filled with optimistic attitudes and speculations, while little is known about how the social dimension is demonstrated in practice or will be delivered in the future (Mies & Gold, 2021; Padilla-Rivera et al., 2020). By specifically examining real-life practices, this study addresses that gap, revealing conflicting and conditional social impacts from CE practices, especially regarding social inclusion and justice, which are prerequisites for reducing social inequality and achieving SD (Degryse & Pochet, 2020).

The first area of contradictions is shown in terms of the CE-related economic opportunities and their qualities. Among the current CE debates, optimistic opinions argue that CE will create new jobs and lower structural unemployment, while others doubt the labour intensity of different sectors as well as the quality of jobs (Aguilar-Hernandez et al., 2021; Drakulevski & Boshkov, 2019; Laubinger et al., 2020; Llorente-González & Deza, 2020). This review suggests both views are supported by empirical evidence to some extent, as activities adopting popular circular strategies, such as recycling and reuse, were found to create various income opportunities for marginalised groups and local communities. However, concerns arise about their quality due to low stability and income levels, difficult working environments, and a lack of benefits, recognition, and protection. As these activities are crucial and unavoidable links of CE, whether the social risks related to those activities can be effectively addressed may essentially determine if CE can be promoted as a transition that is compatible with SD from a comprehensive view.

Further, it is noticeable that varied social impacts can be observed among different cases in similar activities or sectors. These differences seem to originate from two main factors: the broader social environment and the specific operating strategies at the organisational level. For instance, political economy factors, including regulatory and technological differences, lead to distinct impacts on the health, safety, and precarity of people engaged in electronic waste management in the UK and Ghana, even though both can be considered as CE because they of 'Recycling' practices (Santos, 2022). Yet, despite lacking proper infrastructure in developing countries and being the lowest producers of electronic waste, most relevant burdens are undertaken by their informal sectors, where any material gains are offset by related environmental, health, and other social risks (Cornelis et al., 2024). On the one hand, the promotion of CE, especially among developed countries, has been perceived as an effort to reduce impacts on those regions. On the other hand, the geographical inequality of global circularity shows that CE is not exempt from an economic system based on exploiting economic and environmental value from the disadvantaged; rather, it is embedded in the same unsustainable patterns as the linear economy. Therefore, if CE

discourses continue to sideline social and political topics, such as equality and justice, they may serve as a technological distraction, delaying or avoiding the more fundamental socio-economic changes required to achieve SD.

Even though macro environments, such as infrastructure, governance, and policy determine how CE is imagined and implemented, micro-level actors can also challenge structural inequality and creatively address well-being, health, and justice with different principles and innovative approaches (Rosenbaum & Kehdy, 2022). Various measures taken at the organisational level, such as targeted inclusion for vulnerable groups and special attention to local needs, have been found to be applicable in different regions and types of activities. This evidences the possibility and merits of combining social principles with circular practices, despite these examples being inadequately represented at this stage. Still, these approaches often come with their own challenges and limits, such as upscaling and offering competitive compensations. To ensure an equal and inclusive circular transition, therefore, it may not be enough to focus solely on how the circular strategies are implemented. It is also critical to facilitate an enabling social environment that supports and promotes innovations with more comprehensive sustainability concerns rather than focusing solely on practices that prioritise economic interests.

Nevertheless, the distinct approaches and impacts of CE practices, as well as the broader environment they are situated in, suggest a critical angle for reflecting on what changes should be induced by the circular transition. This is especially pertinent regarding traditional activities around material circularity, such as recycling and waste management, which have existed long before the term CE was coined. Overall, the aforementioned contradictions not only highlight the importance of explicitly reflecting on the theoretical and practical connections between CE and the social dimension from macro to micro levels, but also suggest that the social implications of CE are highly conditional rather than categorical.

### 4.3 | Circular economy as social and technological change: Opportunities and constraints

Although CE itself has often been perceived as a social change, and changes in consumption patterns, participation, and collaborations are stressed as necessary conditions for achieving circularity, the social changes brought about by CE have been less investigated (Mies & Gold, 2021; Velenturf & Purnell, 2021). The integration of environmental values into economic activities not only raises participants' environmental awareness but also has the potential to enhance stakeholders' sense of contribution to each other and the environment. This leads to a social fabric not based solely on economic interest or necessity, suggesting mutually supportive dynamics between social change and CE. However, these findings are largely based on small-scale operations involving close collaboration between different parties, making it uncertain whether similar effects can be found in large enterprises or CE innovations that only include technological changes.

Furthermore, CE practices not built on market principles have shown contributions to promoting community building and enhancing inclusion through non-economic activities. However, the challenges they face, like balancing paid and non-paid work, indicate a broader challenge. Even though the goals of circularity often require multiple types of operation and effort, the current social-economic system may not be able to encourage non-market initiatives to fully realise their potentials. Therefore, despite current CE practices positively changing values, identity, and social connections, the mismatch between what CE requires and what the broader social contexts offer still prompts a reconsideration of what the concept should encompass.

In line with a tech-centric discourse and its major approach, CE has sometimes been discussed and studied solely in terms of technological changes in material and resource usage. Interestingly, these studies also demonstrated important social implications, even though no human participants were involved. However, in contrast to popular CE promotions, existing empirical evidence suggests that technological changes guided by circular principles have not always improved human welfare. For instance, hazardous materials are kept in the loop through recycling and reusing (Graça et al., 2022; Medici et al., 2020). Further, the limitations presented by material innovations, including uncertainties around safety and long-term appropriateness, suggest CE may lead to unintentional burden transfers between different stakeholders. Therefore, a CE that is often combined with prevailing economic interests and regulations that lag behind technological innovations may not only open doors for greenwashing but also bring various uncertainties to human welfare. Resolving these challenges requires not only knowledge sharing between different parties but also a redefinition of CE strategies (Medici et al., 2020). More importantly, as not all issues are technologically solvable, more 'radical' circular thinking, such as a circular society that integrates the circulation of knowledge and power (Friant et al., 2020), as well as other schools of thought, such as degrowth, may offer more constructive directions than the popular technocentric CE.

### 4.4 | Implications for future policy, practices and research

As a topic that is gaining increasing interest from various parties worldwide, CE has the potential to contribute to SD by reimagining and redefining economic activities. However, the findings from this study suggest that CE's relationship with the social dimension has not yet been adequately explored or assured, hindering the concept's explicitly constructive relationship with SD. Future policy, as an important force to influence and shape the transition, may need to address several areas to bridge this gap.

First, policies should expand their focus and targets to integrate social considerations as an inherent part of the circular transition. Current CE policies around the world seem to have rather narrow focuses on improving resource efficiency, and in some cases, the attention to measures even outweighs the actual impacts (Alberich et al., 2023; De

Melo et al., 2022; Zhu et al., 2018). However, it is clear from this review that increasing resource circularity does not naturally equate to improved human welfare. Policy biases have overlooked the social risks associated with various circular strategies, such as informality and vulnerability linked to necessary aspects of closing the loop, as well as health and safety issues arising from reusing or repurposing hazardous materials. Further, biased approach can offer new opportunities for powerful actors using advanced political positions to obtain greater economic interests, thereby excluding more disadvantaged groups (Schulz & Lora-Wainwright, 2019). As the core requirement of SD is about comprehensive consideration of different aspects, meaning progress in one area should not compromise another, the social dimension needs to be organically integrated with each CE strategy, regulation, evaluation framework and other policy instruments to ensure that human welfare and social equity is not once again a sacrificed area, as it has been in the linear economy.

Second, there is a clear need for global policymakers to strengthen collaboration and coordination in designing and implementing the future circular transition. Although different countries have developed circular transition plans based on their own needs and priorities, these bordered and segmented approaches not only contradict the fact that economic circularity operates on a global scale but also create obstacles for evaluating and managing social impacts across borders. Moreover, the current economic system is deeply rooted in both contemporary and historically unequal distributions of resources, benefits, and burdens, with circular activities embedded in this system through various channels, such as waste trade. To ensure that the circular transition is environmentally and ethically responsible, a coherent global framework is essential to avoid burden shifting and trade-offs. Additionally, sharing knowledge and resources to empower less equipped regions is crucial not only for addressing global inequality but also for ensuring that the circular transition is genuinely beneficial to the environment and climate, rather than merely easing individual countries' sense of resource and climate insecurities.

Third, future policy should pay balanced attention to both formal economic actors and innovative, community-based models. While the former is essential for a successful transition, the latter holds irreplaceable value in utilising local resources, knowledge, and human capital to strengthen social fabric, improve quality of life, and enhance social inclusion. Moreover, as practices not entirely driven by economic interests, these models address areas overlooked by the mainstream economy and represent circular paths distinct from tech-centric approaches, offering invaluable inspiration and experiences for exploring a more sustainable circular future.

Lastly, it is important to realise that social welfare cannot be ensured for anyone if the ecological and climate crises are not effectively addressed through the transition. At this stage, CE remains incremental, and despite significantly increased discussions, the global circularity rate has continued to decline over the past few years (Fraser et al., 2024). To ensure an effective and timely transition, policymakers may need to reflect on whether relying on technology-focused approaches and traditional institutions can deliver the

expected outcomes, while also reducing systemic obstacles and embracing radical and disruptive changes.

As previously indicated, the scale and forms of circular practices largely depend on how CE is understood. This means the range of practitioners and their specific roles in circular transition can be perceived differently as well. However, even when CE is narrowly defined as the circulation of materials without an explicit social or political agenda at policy level, this review found various stakeholders can still better align their practices with SD from a social perspective. First, this can be achieved by critically reflecting on the neglect and weaknesses of the current mainstream circular discourse and creatively developing circular models that address local social and environmental needs. Second, to avoid unintended burden shifting, it is crucial to collaborate with and involve diverse social groups throughout the design, implementation, and evaluation processes, particularly those who are typically excluded from decision-making. Third, since systemic injustice cannot be addressed solely through changes at the organisational or micro levels, collaboration with other stakeholders, including labour rights and environmental justice advocacy groups at local, national, and international levels, is essential to facilitate broader changes. Even for stakeholders less interested in engaging with social changes related to inclusion and justice, it remains crucial to ensure that the social dimension is not compromised in the pursuit of improved resource efficiency. Technological innovations, the most popular and valued approach in the current transition, play an important role in reducing pollution and raw material consumption. However, comprehensive and long-term considerations of the effects of these innovations on materials, products, and processes should be integrated, especially when policy frameworks focus on limited targets and regulations are not always available for new interventions.

Although CE-related research has been booming over the past few years, there are still many challenges and gaps for the future research to address. First, the conceptual clarity of CE still requires further exploration to provide a clearer understanding of and boundary to circular discourses. More importantly, such attempts need to aim at preventing the abuse and suboptimization of the concept. As the existing efforts are ignored by the majority and fragmented approaches are popularly adopted, exploring the reasons for this is also of interest. A more fundamental theoretical reflection of CE from comprehensive economic, environmental, and social perspectives may be beneficial in narrowing the divide between different discourses while addressing the various flaws shown so far. Meanwhile, researchers may specify their own theoretical standpoints for CE in respective rather than simply citing it as a popular term just based on their relevance to certain CE principles or strategies.

Simultaneously, the social dimension of circular transition still needs better understanding and exploration. An essential part of sustainability, it also provides an irreplaceable viewpoint for critical reflections beyond the social dimension. From a social perspective, this study suggests that empirical research is better suited for understanding the actual implications of CE than theoretical and model-based studies. This approach prevents perceiving CE as a phenomenon with unified expectations or simplified approaches.

Importantly, empirical research can better illustrate how CE interacts with various real-world contexts, thus providing essential knowledge for developing and improving future frameworks. Accordingly, it can be meaningful for future research to examine not only the social dimension but also the actual environmental and economic implications of CE practices, especially when the boundary between different dimensions is often blurred in practice.

Despite the irreplaceable value of empirical evidence, existing studies that relate to the social dimension seem to be extremely scarce so far, especially compared to the overall volume of CE research. Meanwhile, more specific gaps remain. For instance, the sectoral and geographical limits presented by the reviewed articles need addressing. Importantly, there is still not enough research directly into grassroots stakeholders' and vulnerable community members' experiences, opinions, and expectations of circular transition, which may hinder improving CE's potential for inclusion and justice. However, a deeper exploration of the social dimension of CE may require the CE field to extend its transdisciplinary perspective beyond technology, management and the economy and collaborate with broader fields such as social work. The enhanced disciplinary collaboration will not only balance the biased focuses but also can offer necessary methodological and empirical expertise to better evaluate and understand the social implications of circular transition.

#### 4.5 | Limitations

There are also some limitations presented by this study. Both CE and 'social' are highly debatable concepts. Although this review attempts to define clear boundaries through its search and selection criteria, controversy can still remain regarding the interpretation of specific contents. More importantly, CE is a rapidly developing field with contributions from diverse stakeholders, including a range of research evidence. As this review only systematically searched two academic databases, it does not include other evidence sources, including grey literature. However, as the chosen databases are considered relatively comprehensive and widely used by relevant reviews, the results should still be representative of the CE field. Additionally, empirical evidence published in languages other than English was excluded, which may limit the implications of the findings on a global scale, future research may address this gap as well.

### 5 | CONCLUSIONS

This review confronted the contested status of CE and examined the empirical evidence presenting social implications in its discourse. Although it has often been argued that CE will contribute to a number of SDGs, and even create a win-win-win scenario across the economic, environmental and social dimensions, reflection on the empirical social evidence suggests it is important to keep a realistic attitude towards CE and what it brings. This is especially the case when the

concept itself is at a confusing stage but still dominated by a depoliticised discourse. It is evident that no CE activity operates in a social vacuum, free from pre-existing social, economic, and political structures. Merely focusing on the circularity of materials and resources does not automatically address social challenges. Through a biased focus on improving material efficiency, the mainstream CE approach still presents some opportunities, albeit at limited scale and in restricted directions, yet it is likely there will also be a replication of the social consequences that often-accompanied linear models, such as trade-offs and exploitation. This issue cannot be solved simply by adding a few social goals to the concept: more fundamental reflection on the theory is needed. It would be ironic if the circular transition remained solely focused on maximising the value of all materials by challenging the 'use-dispose' attitude yet failed to consider people in the same manner. Future research and policy need to acknowledge the limits and opportunities presented by the current discourses and continue improving theoretically and practically. Reflections from a social perspective offer an invaluable angle for examining such changes. This review from social work perspective is an effort in that direction.

#### ACKNOWLEDGMENTS

The author would like to express special thanks to Professor Aila-Leena Matthies and Associate Professor Tiina Onkila for their expertise and feedback in this study.

#### CONFLICT OF INTEREST STATEMENT

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 955518.

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**How to cite this article:** Liu, K. (2024). Contested circular economy and mixed social implications from practice: A scoping review. *Sustainable Development*, 1–17. <https://doi.org/10.1002/sd.3229>



## APPENDIX A: FULL LIST OF REVIEWED ARTICLES

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