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Social, Technological, Economic, and Policy Factors in the Circular Economy Transition in Brazil

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ABSTRACT

A well-functioning circular economy (CE) integrates resilience across economic, environmental, and social dimensions. This study identifies key drivers and barriers to Brazil's CE transition through 20 semi-structured interviews with stakeholders. Major sociocultural barriers include inadequate education and limited CE awareness, while growing environmental consciousness and traditional reuse practices act as drivers. Policy barriers stem from the absence of dedicated CE regulations, though national sustainability efforts offer opportunities. Technological limitations arise from insufficient research, but efficiency-enhancing innovations and digital business models show promise. Economically, high transition costs hinder progress, whereas resource efficiency boosts competitiveness and job creation. Key priorities for advancing CE include raising public awareness, integrating CE into education, supporting waste pickers, developing decentralised regulations, improving waste management, fostering innovation hubs, and providing financial incentives for circular business models. Stakeholder engagement—particularly policymakers, civil society, and private enterprises—remains essential to accelerating CE adoption in Brazil.

1 | Introduction

Increased environmental damage, rising social inequality and its far-reaching implications for sustainable development (Fanning et al. 2021) have made shifting the current production and consumption model essential to reduce ecological impacts and promote social progress (Jungell-Michelsson and Heikkurinen 2022; Richardson et al. 2023) while ensuring the needs of future generations (Mensah 2019). To address these and other sustainability issues, the Circular Economy (CE) has recently gained importance on the agendas of policymakers, offering a shift from a linear to a circular production and consumption system (Geissdoerfer et al. 2017; Velenturf and Purnell 2021). Emerging from ecological economics, a CE builds on longstanding environmental paradigms to balance the relationships among economy, environment, and society through a model inspired by natural cycles (Korhonen et al. 2018; Schöggl et al. 2020). A CE focuses on designing products/services to

minimise waste, maximise resource efficiency, increase resource circulation, and foster regenerative systems (Figge and Thorpe 2023; Kirchherr et al. 2023).

BRICS countries (Brazil, Russia, India, China, and South Africa) hold considerable influence in the Global South. Currently, the BRICS account for about 35% of the global Gross Domestic Product in Purchasing Power Parity terms, surpassing the share held by the G7 nations (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) (Fatima et al. 2024; Yao et al. 2023). Their (BRICS) exports are dominated by manufactured goods (particularly China and India) and agricultural, fossil fuel, and mineral commodities (Brazil, Russia, and South Africa) (BRICS JSP 2024). Recent studies suggest that, if strategically harnessed, BRICS countries could benefit from the ongoing global energy and sustainability transitions (Asif et al. 2024; Chen et al. 2024). This shift presents opportunities to mitigate environmental challenges (such as reducing CO_2 emissions and limiting the exploitation of mineral resources) (Fan and Wang 2024; Umar et al. 2024), accelerate "green" finance (Udeagha and Ngepah 2023; Yao et al. 2023), and provide a pathway to addressing social inequalities and enhancing educational outcomes (Dong et al. 2024; Yeboah et al. 2024). However, BRICS countries face several common challenges, including inadequate infrastructure, a lack of financial incentives, and competing governmental priorities (Fan and Wang 2024; Tian et al. 2024).

Therefore, transitioning to a CE offers BRICS countries a promising opportunity to align economic prosperity with environmental protection and social benefits, including improved conditions for workers by using non-toxic bio-based materials (Liu 2025). The integrative approach of a CE to resource use can reveal synergies and trade-offs, fostering innovation while strengthening governance and trade partnerships (Adebayo et al. 2023; Dong et al. 2024; Mominur Rahman et al. 2024). Recently, Wang, Li, et al. (2024); Wang, Zhen, and Wang (2024) analysed the influence of natural resource management and environmental policies on CE adoption in BRICS countries. Their findings reveal that environmental policy innovations and natural resource protection positively drive a CE, while natural resource depletion and non-renewable energy consumption impede its progress. Notably, resource depletion exhibits a nonlinear effect, with higher levels causing increasingly severe harm to the environment. This underscores the critical need for resource conservation and a shift to renewable energy. Therefore, to fully harness the potential of a CE, the BRICS must overcome domestic barriers and enhance international cooperation in an increasingly complex geopolitical landscape (Fatima et al. 2024; Liu and Zhang 2024). Bolstered by its robust agricultural sector, wealth of natural resources, leadership in biofuel production, and high percentage of renewable energy sources, Brazil is strategically positioned to not only accelerate cooperation but also to actively drive the transition towards a CE within the BRICS (Bertelsmann Institute 2024; Salvador et al. 2022). Thus, this article focuses on Brazil as a representative of the CE potential in BRICS countries.

A CE could play a crucial role in advancing international collaboration and sustainable development in Brazil. With its vast size, rich biodiversity, tropical climate, large population, and abundant natural resources, Brazil is well-positioned to transition to a CE, particularly in areas like agribusiness, bioeconomy, and regenerative systems (Bertelsmann Institute 2024; Ferraz and Pyka 2023; Salvador et al. 2022). However, challenges such as threats to ecosystem integrity and the pronounced social and economic inequalities pose considerable obstacles (BRICS JSP 2024; Lapola et al. 2023). Several authors have made contributions towards contextualising and understanding the potential of a CE in Brazil. This includes investigations on the valorisation of coal mining waste (Acordi et al. 2023), waste foundry sand (Machado et al. 2023), laying hen manure (Ribeiro et al. 2016), iron ore tailings (Vilaça et al. 2022), waste cooking oil (de Soares Carvalho Freitas et al. 2022), silk cocoons (Barcelos et al. 2021), and cassava residues (Cruz et al. 2021); a CE potential in the construction (de Souza and Pacca 2023; Doussoulin and Bittencourt 2022), forest (Sell et al. 2023; da Silva et al. 2020; Tedesco et al. 2022), textile (Galatti and Baruque-Ramos 2022), and chemical (Monteiro et al. 2024) sectors; and its role in solid waste (Lima et al. 2021; Oliveira Silva and Morais 2021; Paes et al. 2024; Rebehy et al. 2023), plastics (de Oliveira et al. 2019; Pimentel Pincelli et al. 2021), and electronics (de Souza and Pacca 2023; Guzzo et al. 2022; Xavier et al. 2021) management. Additionally, the creation of circular ecosystems has also been explored in Brazil (Barros et al. 2023; Gomes et al. 2024; Guarnieri et al. 2023). However, none of these studies have analysed CE from a national perspective, focusing on the drivers, barriers, and opportunities for Brazil's transition toward a CE.

Therefore, this article aims to explore the main driving and hindering factors for a potential transition of Brazil towards a CE. The article builds on Dubey et al.'s (2016) theoretical framework by further focusing on how institutional theory, top management commitment, information sharing and behavioural uncertainty can support/hinder the transition towards a CE. Even though CE research in Brazil is advancing, a holistic study that identifies drivers, barriers, and opportunities for adopting a CE in Brazil is still absent. The novelty of this research lies in being one of the first comprehensive and holistic examinations of a BRICS country's perspective on a CE, following semi-structured interviews with local experts in the field. Following this aim, the paper is structured as follows: Section 2 provides the theoretical background for the study, followed by the methodology used to interview Brazilian participants in Section 3. Detailed results from these interviews can be found in Section 4, followed by Section 5 with a discussion of the main findings. Lastly, Section 6 presents the main conclusions of the study.

2 | Theory

As indicated, this article is based on Dubey et al.'s (2016) theoretical framework, which combined institutional theory in the form of isomorphism, top management commitment, information sharing, and reduction in behavioural uncertainty to shape a theory to explain sustainable consumption and production (SCP) (Figure 1). This research goes further by focusing on CE transitions in Brazil as an outcome of the framework, as opposed to SCP.

Isomorphism is the external pressure that may influence the decision-making process inside an organisation to, here,

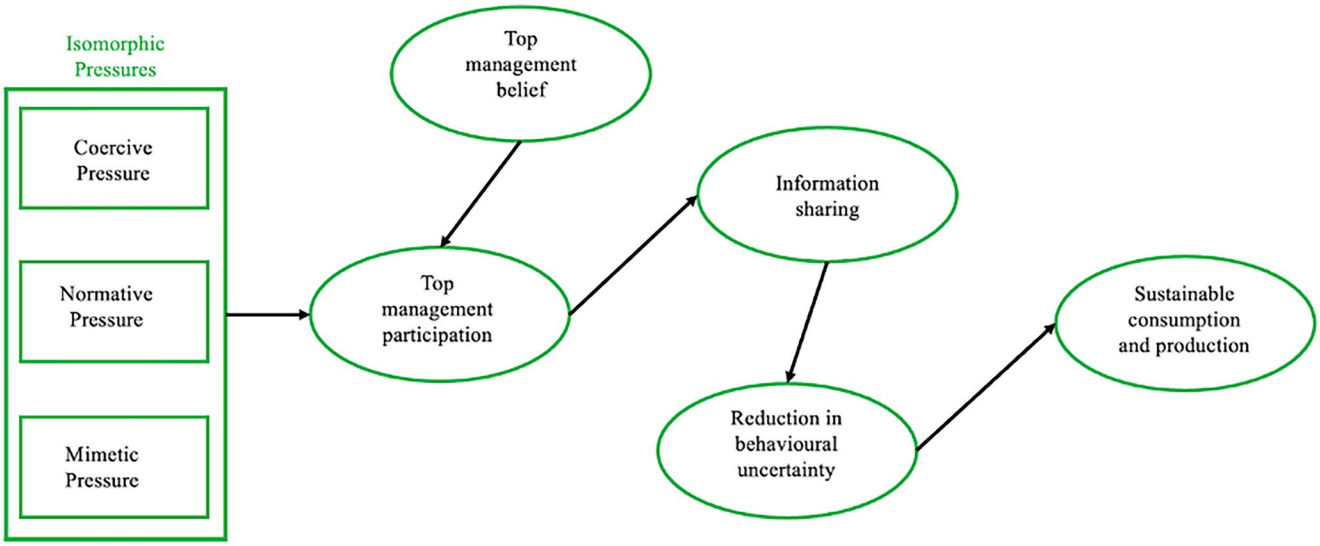

FIGURE 1 | Research model towards a theory of sustainable consumption and production (adapted from Dubey et al. 2016).

implement practices that support the transition towards a CE (Dubey et al. 2016). Isomorphism can be divided into three distinct pressures: coercive, normative, and mimetic (Alqershy et al. 2024; Kauppi 2013). Coercive pressure implies that a third party exerts their power on organisations that depend on it to follow through with making changes, which may further align with what society is expecting of these organisations. These can be either through formal measures or voluntary ones (Kauppi and Luzzini 2022). To explain, the government and/or supranational organisations (e.g., UN, EU) may enforce rules that organisations need to follow, or large companies may exert pressure on their suppliers to align with their (organisations') favourable practices (Ingersoll et al. 2024; Liu et al. 2010; Zhu et al. 2005). A noteworthy point that needs to be made here is that coercive pressures usually lead to the adoption of different practices but may not always support efficiency (Miemczyk 2008). Normative pressure implies that within an industry, a baseline is set; thus, all organisations within this sector need to deal with problems in a similar manner and also filter information similarly (DiMaggio and Powell 1983; Lin et al. 2020; Zhang et al. 2024). Mimetic pressure implies that organisations may look to other organisations for best practices and thus mimicking their actions (e.g., practices) to avoid the risk of failure (Kauppi 2013; Lee et al. 2020). Although isomorphic pressures originate within the institutional theory, and thus have predominantly been applied within an organisational context, they can also impact countries as a whole (Gallego-Schmid et al. 2024), with, for example, supranational organisations 'enforcing' regulations that can impact an entire industry sector and an economy at large. According to Gallego-Schmid et al. (2025), isomorphic pressures can have an impact on transitioning towards a CE, thereby confirming Dubey et al.'s (2016) assumptions. What currently remains unexplored is whether other factors can hinder and/or foster the transition process.

Within the literature (e.g., Agyabeng-Mensah et al. 2022; Al Rawashdeh et al. 2024; Bertassini et al. 2021; Selseng and Gjertsen 2024), it is well documented that the commitment of management is essential to drive a sustainability agenda, including the transitioning process towards a CE. Management commitment and isomorphism are strongly interlinked (Agyabeng-Mensah et al. 2022; Dubey et al. 2016; Gallego-Schmid et al. 2025). Within their research, Dubey et al. (2016) distinguish between top management belief, which refers to how these managers think and feel about here CE practices, and top management participation, which refers to the actions taken to foster/hinder here CE transitions. This has further been confirmed by research conducted by Al Rawashdeh et al. (2024), who focused on the relationship between CE adoption in small- and medium-sized enterprises through top management commitment.

Information sharing is a vital aspect that can enhance collaborations, improve practices, and create trust (Bag et al. 2024; Dubey et al. 2016; Selseng and Gjertsen 2024). Technologies, such as blockchain, can create closer bonds between organisations and their suppliers and/or other networks by sharing key data and thus creating transparency (e.g., Schmidt et al. 2024). The latter can have both positive and/or negative implications: on the one hand, transparency can foster trust, as information is presented and shared; on the other hand, companies may not be inclined to be fully transparent due to the risk of losing their competitive edge (Akter et al. 2024; Chrimes 2024). What remains underexplored is how information sharing in the current age can foster/hinder CE transitioning and what the role of information sharing is in helping top management to align with external (isomorphic) pressures to foster CE transitioning.

Authors (e.g., Dubey et al. 2016; Globig and Sharot 2024; Keller et al. 2020) highlight that information sharing reduces behavioural uncertainty. To explain, information sharing can create trust through transparency, thereby overcoming uncertainty that may be associated with implementing practices that foster a transition towards a CE (e.g., Weisz et al. 2025; Xue et al. 2021).

Although Dubey et al.'s (2016) work has been cited in reference to institutional theory and the CE (e.g., Ranta et al. 2018; Rossi et al. 2025), to the authors' knowledge, the model has not been utilised to explore transitioning towards a CE.

3 | Methodology

This article relies on a qualitative data set consisting of 20 semi-structured interviews that were conducted between May and June 2024, with different stakeholder groupings that have an invested interest and/or are shaping the CE transition in Brazil. Table 1 provides a summary of the stakeholders interviewed, which are split across the following four primary groups: academia, policymakers, businesses, and non-governmental organisations (NGOs). To gain a more holistic overview, participants for this project were drawn from various levels; for example, policymakers included representatives from state, regional, and municipal governments. Semi-structured interviews were deemed appropriate as these allow for core questions to be asked, whilst at the same time providing flexibility in exploring additional topics of interest (Easterby-Smith et al. 2012; Flick 2009). This method enabled interviewees to provide detailed insights into their experiences and the challenges they encountered while engaging with CE initiatives in Brazil.

TABLE 1 | Profile of the interviewees and duration of the interviews.

Group/abbreviation	Duration (h:min:s)
Academics	
A1	54:29
A2	1:01:45
A3	53:05
A4	1:20:54
A5	41:40
A6	1:20:31
Policymakers	
P1	57:48
P2	1:16:21
P3	53:32
P4	46:40
P5	37:07
Businesses	
B1	1:22:07
B2	51:14
B3	39:29
B4	54:12
B5	1:09:19
Non-Governmental Organisations	
N1	58:02
N2	56:36
N3	1:16:13
N4	49:54

Before conducting any interviews, a research protocol was developed—based on prior studies (Mendoza et al. 2017; Peña et al. 2021; Schröder et al. 2020)—to guide the interview process. The full protocol is available in Appendix S1. To overcome challenges commonly associated with qualitative research (e.g., bias), the research protocol underwent rigorous validation by five CE experts.

This research employed a purposive sampling technique (Valerio et al. 2016). Additionally, participants were encouraged to recommend other potential interviewees who could offer further insights into the research (snowball sampling). Interviews were conducted in Portuguese or English, either face-to-face or online, and were recorded. All Portuguese interviews were transcribed verbatim and translated into English, followed by a back-translation into Portuguese to ensure semantic accuracy. The study adhered to ethical standards, with necessary approvals obtained before data collection (Ref no.: 2024-18271-32729). Anonymity was guaranteed to promote open dialogue, and participation was entirely voluntary with informed consent secured from all participants.

The analysis followed Easterby-Smith et al.'s (2012) seven-step framework, which includes familiarisation, reflection, conceptualisation, cataloguing, re-coding, linking, and re-evaluation. This approach involved establishing a priori *codes* and developing an initial coding structure agreed upon by the research team. To ensure intercoder reliability, the team separately coded parts of the data set and reviewed these as a team. Discrepancies were carefully reviewed and discussed as a group, thereby focusing on the interpretations and meanings of the individual sections. In some instances, the research team went back to the interviewees for discussion and confirmation. Once all discrepancies were reviewed and re-coded, the entire framework was meticulously reviewed to enhance intercoder reliability. This process facilitated the grouping of a priori *codes* into in vivo *codes*, allowing for the clustering of themes and patterns (van de Vijver 2010). The primary coding structure was developed by the lead author to maintain consistency throughout the analysis. Multiple iterative coding cycles were performed, during which codes were systematically categorised into themes and patterns that emerged organically from the dataset. Data collection ceased upon reaching theoretical saturation (Charmaz 2006). In this study, saturation was deemed to have been achieved when recurrent patterns and thematic consistencies were observed across multiple interviews, and no substantively new categories or themes emerged from subsequent data. This aligns with methodological literature suggesting that the majority of salient themes tend to surface within the initial stages of data collection. For instance, Guest et al. (2006) identified saturation by the twelfth interview, while Hennink and Kaiser (2022) reported that saturation typically occurs between 9 and 17 interviews, depending on the complexity of the topic and the heterogeneity of the sample. Creswell and Poth (2024) recommends conducting between 5 and 25 interviews to gain saturation. Furthermore, when participants are domain experts or key stakeholders, each interview is likely to be rich in contextual and conceptual information, thereby reducing the number of interviews required to reach saturation (Malterud et al. 2016). Accordingly, conducting 20 strategically selected, in-depth interviews with experts spanning diverse sectors can be

considered methodologically robust and sufficient for generating comprehensive, national-level insights. Within this research, no new themes were found after interview 17, which implies that interviews 18–20 supported themes already created throughout the in vivo *codes*, but did not lead to new insights being produced.

In addition to primary data from interviews, secondary sources, including public policies, government reports, and environmental statistics, were consulted and referenced to support triangulation and contextualise interviewees' perspectives.

4 | Results

The interview data show four key areas that are linked to Brazil's transition to a CE: (i) culture, education and society; (ii) policy and regulations; (iii) technology and data; and (iv) economy. The main barriers, drivers, strengths, and opportunities for these areas are summarised in Table 2 and analysed in detail in the following sections.

4.1 | Culture, Education and Society

The awareness of environmental issues is growing in Brazilian society, but there is still a limited understanding of CE concepts (A1; A2; A3; B1; B2; N1; N2; N3; P1; P2; P3): "People who begin to understand the topic think that circular economy is recycling" (P3), which can be explained as recycling has been identified in the core of sustainable practices for many years (Murray et al. 2017). This narrow interpretation impacts decision-making across sectors, levelling the Brazilian industry at the bottom of CE practices, often with lower-value pathways (e.g., energy recovery) rather than more effective circular strategies (B1). Besides lacking the information and knowledge needed to make environmentally conscious choices, a significant portion of the Brazilian population remains unable to afford sustainable products (A1; B4; N4). "There is a concern for survival above environmental needs" (B2), thus basing purchase decisions solely on price (A6), where cheap new products are often preferred over, for example, repairing, thus perpetuating a culture of consumerism (B3). Contradictorily, while Brazilians still associate purchasing new products with better living conditions and happiness (A2) (Aquino and Natividade 2024), the rising cost of goods has sparked a slow but growing second-hand market, as many say "I can't keep buying new products anymore" (B2). Encouragingly, reuse and recycling habits are increasing, especially via digital platforms like Facebook Marketplace, where second-hand goods (e.g., children's clothing) are traded (N2). Data support the notion that lack of information sharing can lead to behavioural uncertainty (Dubey et al. 2016), whereas the survival instinct enhances the notion of reclaiming traditional knowledge and participating in second-hand consumption and repairs, which is currently missing from Dubey et al.'s (2016) framework.

Though, as aforementioned, contemporary business models have steered consumers toward excessive consumption, the social fabric in Brazil remains conducive to CE practices, grounded in traditions of reuse, repair, and resourcefulness (A4; A6; B3; P4; P3; A2). Communities frequently share or donate surplus items, such as food or clothing, reflecting deep social bonds: "What no longer serves me, be it fruit that might spoil or clothes I've outgrown, is commonly passed along to family, friends, or neighbours. It's cultural" (B2). Scarcity strengthens this culture of sharing, "when you have little, you know others have even less" (A1). Additionally, a vibrant culture of repair, supported by skilled cobblers and seamstresses, extends the lifespan of everyday goods (B3; P3; P4). Resourcefulness is especially evident in lower-income communities and favelas, where materials are often repurposed or upcycled to overcome limited resources (A3). An example is Brazil's leadership in aluminium recycling, reaching more than 97% recovery of aluminium beverage cans (Canmaker 2025), which stems largely from an active informal workforce (B1; N2) (Dias and Bouvier 2021), that maintains a cycle of intra-generational and inter-generational poverty, affecting people's living conditions and health (e.g., growing mental health inequity) (Merino-Salazar et al. 2023). Lastly, indigenous and traditional groups also exemplify minimal-waste lifestyles that value nature (N3; P4). These examples support the notion that knowledge embedded in culture and tradition can support a transition towards a CE. Key skills (e.g., sewing, recycling) can be seen as a driving force that enables the transitioning process and indirectly influences the creation of an economy that is supportive of a CE, as swap shops and second-hand outlets are becoming more commonplace. Thus, it could be argued that knowledge embedded in culture and tradition acts as a stimulus for "information sharing" in a broader sense, and thus can support a CE.

Climate change impacts, such as catastrophic rains and floods in Rio Grande do Sul in May 2024, and the deforestation and decline in biodiversity have started to elevate public concern about sustainability (B3; P3; P4; P5). Consequently, consumers are increasingly aware of the environmental impact their purchasing decisions have. Although discrepancies between the Global North and South persist, as "the planet can't cope with the consumption pattern of a citizen of a developed country" (P4), awareness is gradually driving demand for more sustainable products. Thus, businesses are beginning to adopt CE principles (A4; P4), with start-ups emerging as catalysts for sustainable innovation (A4). This is a clear example of management commitment: with increased awareness of sustainability, new companies emerging have sustainability at heart, paving the way for circular business models (e.g., Al Rawashdeh et al. 2024; Bertassini et al. 2021).

Brazil's natural resources are providing economic opportunities for local communities and businesses to implement CE strategies (N1). The country boasts "the largest biodiversity on the planet" and one of the world's cleanest energy matrices, circa 90% renewable (A1; A3; B2; B3; N1; P1; P2; P3; P4; P5) (Fernández 2025). In addition, government training programs led by the Ministry of Science, Technology, and Innovation can further facilitate the uptake of a CE nationwide (P2) and start to equip the existing workforce with innovative skills, generating income and entrepreneurship opportunities (N1). Brazil's long expertise in shaping public perception and running large-scale campaigns (B1) can underpin these shifts toward circularity. This can be linked to coercive pressures, as governments act as a driving force to either encourage the uptake of circular strategies or mandate

TABLE 2 | Key areas for CE transition in Brazil and main barriers, drivers, strengths, and opportunities.

Category	Culture, education and society	Policy and regulations	Technology and data	Economy
Barriers	– Educational deficit and lack of awareness of a CE. – Culture of disposability and consumerism.	– Lack of a specific regulatory framework for a CE. – Lack of enforcement mechanisms and penalties for non-compliance with existing regulations. – Regulatory uncertainty for businesses, hindering investments in the CE.	– Lack of infrastructure and technology for efficient waste management and recycling. – Limited research on the CE. – Absence of reliable monitoring systems, statistics and data on waste collection.	– High initial costs for transitioning to CE practices and business models. – Lack of economic incentives and financing mechanisms for circular practices. – Absence of well-established markets for waste, compounded by outdated economic metrics.
Drivers	– Visible consequences of climate change increase the urgency for environmental actions. – Adoption of CE principles by some businesses. – Growing consumer awareness in Brazil regarding the environmental impact of their purchasing decisions.	– Commitment of the recent government (2023) to advance sustainability and CE agendas. – Efforts to integrate informal waste collectors into the formal recycling process.	– Increasing use of blockchain to support CE practices.	– Influence and international demand for CE products and actions. – Economic benefit to companies by achieving resource efficiency in their practices.
Strengths	– Cultural tradition of reuse, repair, and sharing linked with creativity and resourcefulness. – Traditional knowledge which maintains sustainable living practices, generating minimal waste.	– Some regulatory framework that fosters CE (e.g., National Reverse Logistics Program).	– Strong technological capabilities to enhance efficiency and minimise waste, particularly in the agricultural sector.	– Private sector commitment to CE.
Opportunities	– Enhance social equality through the integration of different societal sectors. – CE initiatives recognise the importance of traditional communities.	– Establishment of repair hubs. – Enhance local governance in CE by implementing small pilot projects.	– New digital business models and solutions through technologies.	– Enhance competitiveness and create jobs. – Local supply chain initiatives can promote reverse logistics and research centres.

them when programs become mandatory (e.g., DiMaggio and Powell 1983; Kauppi and Luzzini 2022).

Policy-related barriers (see Section 4.2) and economic challenges (see Section 4.4) further exacerbate ingrained cultural behaviours, including inadequate waste sorting (B2; N1; N4), ultimately hindering end-of-life recovery processes (de Campos et al. 2021). From an industrial perspective, despite greater awareness of a CE, a common language is missing (P1). Many existing practices, repair, reuse, and refurbishment, are carried out under different names, but stakeholders across government and industry still struggle to see their efforts as part of an interconnected CE strategy (B3). Although Brazil's education system has begun to address CE awareness, particularly among professionals (B3), there remains a need for comprehensive education and awareness campaigns (A1; A3; B2; N2; P1; P2), as even in formal academic environments this is reported that: "environmental aspects, economy, the sustainable sector, it is still very low" (A3). This supports the notion that a successful transition towards a CE can only be achieved if 'management commitment' is guaranteed. Here, management commitment is defined loosely in that it can include commitment by the government to drive forward a CE agenda (e.g., Agyabeng-Mensah et al. 2022; Dubey et al. 2016; Gallego-Schmid et al. 2025).

Finally, the integration of various societal sectors, cooperatives, researchers, cultural centres, and young people, offers a pathway to greater social equality (A1; B4; N1; P5), as has also been recommended by Payne and Kwofie (2024). Additionally, a CE includes and values traditional communities in the supply chain: "a value chain that places greater value on traditional communities, those that care for environmental resources for supply, I believe we have a whole proposal that could be explored" (B4). Although some attention is needed regarding the integration of small circular organisations with large-scale industries, it is important to note that while efficiency increases, it can also negatively affect worker welfare (Payne and Kwofie 2024). Thus, supporting cooperatives is a key recommendation by Payne and Kwofie (2024) to protect the safety and welfare of producers. In addition, supporting research and development (P2) to incorporate local knowledge and resources into CE solutions could position Brazil at the global forefront of inclusive, sustainable innovation.

From a theoretical point of view, it becomes apparent that not only does 'management commitment' play a crucial role within a CE transition, but the effectiveness and success in terms of buy-in are also reliant on knowledge embedded in culture and tradition, which has previously not been included in a model. Moreover, aside from 'traditional isomorphic pressures' (coercive, mimetic, normative), the informal sector emerges as a key driving force that puts pressure on the economy (see Section 4.4).

4.2 | Policy and Regulation

A key barrier to implementing CE principles in Brazil lies in the absence of a specific regulatory framework. While Brazil has been praised for its environmental laws (Merkus 2024), including the National Solid Waste Policy (National Congress 2010) (PNRS, acronym in Portuguese), these regulations are often seen by some as insufficient (A2; B2). A similar context was identified by Kirchherr et al. (2018) for the European Unit, where lacking policies in support of a CE transition is also mentioned as one of the main barriers. Many interviewers also outline that stronger enforcement mechanisms and penalties for non-compliance are needed (A1; A2; A5; B1; B2; N1; N4; P1; P2; P5). This view is reiterated by the country's long-standing focus on economic performance over sustainability, the government wants to "reach the economic peak and only then see what to do next" (A1), where industry interests frequently overshadow environmental regulations, reinforced by intense lobbying that shapes policy (A1; B2; P5). Effective monitoring remains challenging, partly due to gaps in data and material traceability (see Section 4.3), further compounded by the absence of requirements for imported goods to comply with CE principles (A4; B5). This supports the notion that isomorphism and, more specifically, isomorphic pressures can foster a transition towards a CE (Dubey et al. 2016; Gallego-Schmid et al. 2025). Within Brazil, it seems that especially coercive pressures could positively contribute to the transitioning process, as guidelines and regulations could impact management commitment.

Insufficient collaboration among government agencies, businesses, and civil society (A3; A4; N1; P2; P6) also often undermines policy development and implementation throughout the value chain. Many misaligned or contradictory policies hinder inter-industry cooperation, emphasising the need for a more participatory, consensus-driven approach to regulation (A4; P3). This policy gap fosters uncertainty and deters investment in circular solutions. Brazil, however, is increasingly observing international best practices, especially from Chile, Colombia, and other global sustainability leaders, to inform its evolving CE regulations (A5). "Brazil is a country that looks to other countries to learn lessons that have worked or gone wrong" (A5). This would support that mimetic pressures are an effective tool in fostering transitions (e.g., Ashworth et al. 2007; Bag et al. 2024) in that Brazil is looking at neighbouring countries to avoid challenges and learn from best practices.

Although hindrances are common in the regulatory and policy arena, Brazil shows a few highlights. Despite the PNRS (National Congress 2010) (A4; B3; B5; N2) not being fully aligned with CE principles, it does offer incentives for recycling and promotes reverse logistics (A4), providing a foundational framework for future CE initiatives (Presidência da República 2023). The government of President Lula da Silva (since 2023) "is more favourable than the previous one in terms of sustainability and the circular economy" (P1), potentially heralding a broader green economic policy (B3; N3). Heightened urgency from climate change and environmental concerns has driven new momentum for green legislation, with government involvement deemed critical for robust regulations.

This direction is evident through industrial recycling plans and the anticipated National Circular Economy Strategy (ENEC) (National Congress 2024) (B3: P1; P3), which was introduced in June 2024 and emphasises efficient resource use, waste reduction, and environmental regeneration, as well as aims to stimulate market growth (N2). The ENEC also created the National Circular Economy Forum, designed to oversee the transition toward sustainable economic growth (P4). The

effective implementation of these policies, potentially bolstered by economic incentives, could yield additional revenue streams for businesses, benefiting both the social and environmental spheres (P1). Although literature has revealed some conflicting and conditional social impacts from CE practices (Liu 2025). Aligned with Brazil's first CE bill, an opportunity arises to create new regulatory frameworks, including a legal framework for CE data (N4).

Furthermore, start-ups focused on waste management are emerging to help industries meet legal recycling targets (N2). Brazil's Ministry of Industry is crafting a new industrial policy that integrates economic growth, environmental sustainability, and social development (P3). "So, this means that the industry is going to change. It needs to change and it will change" (P3). Concurrently, the Ministry of Finance's ecological transformation plan includes financial incentives for green initiatives (P1; P3). Another governmental initiative, "the New Industry Brazil", aligns environmental and industrial policies while emphasising circular supply chains as core objectives (P1). This links to a previous point raised in Section 4.1, in that the informal sector can act as an additional pressure to foster the transitioning process towards a CE.

The interviewees' emphasis on regulatory gaps aligns with findings from the ENEC (2024), which highlights the need for decentralised frameworks and improved enforcement mechanisms. Despite the aforementioned political challenges, a minority of the interviewees stated that Brazil's environmental legislation is considered strong (B3; N2), noted as "well-organised and comprehensive" (P2), and features a suite of regulations promoting a CE, among which interviewees identified the PNRS, the National Reverse Logistics Program (Presidência da República 2023), and the ENEC (National Congress 2024) as the most relevant. The PNRS (National Congress 2010) set principles for integrated solid waste management and made waste generators accountable for recycling a minimum percentage of the packaging they produce (A2; P4) and established shared responsibility, meaning that everyone involved in the product life cycle has responsibility for the management and proper disposal of waste. In 2023, the National Reverse Logistics Program (Presidência da República 2023) emerged to modernise waste management, stimulate the recycling chain, and enforce transparency, mandating reverse logistics for certain sectors of the economy in Brazil and thereby spurring companies to rethink product design and durability (P5). Together, the requirements of the PNRS (National Congress 2010) and the Reverse Logistics Program (Presidência da República 2023) supported formalising shared responsibility and recycling credit systems.

4.3 | Data, Technology and Innovation

A central challenge for a CE in Brazil is the limited infrastructure and technology supporting efficient waste management and recycling (A2; A3; B4; N1; N2; P1; P2; P4). "Many regions in Brazil lack the necessary infrastructure for proper waste collection and recycling" (B1). The low technology readiness level of locally available systems calls for greater investment in research and innovation, particularly for management at the end-of-life stage (A2; P1). Even though governmental initiatives increasingly acknowledge the importance of subsidising research for sustainability (A3), the overall volume of CE-focused research remains limited (A2).

Reliable data on waste collection is scarce (A2), hindering the design of an effective reverse logistics system. "Monitoring is still very weak" (A5), especially for waste management (B3). Material traceability (N2) is also constrained by Brazil's geographic expanse and lack of standardised reporting systems, making it challenging to assess the impact of CE initiatives (N1). Digital technologies, such as smartphones, could address these issues by improving data availability, monitoring, and tracking (A3; N1; P2; P4); however, many small and medium-sized enterprises (SMEs) lack the resources to adopt such solutions (A4). Moreover, insufficient education and training (see Section 4.1) exacerbate these gaps, limiting the workforce's ability to effectively use CE-enabling technologies. This further outlines the importance of information sharing, which includes data management and having a sufficient infrastructure. The latter is not mentioned in the theoretical framework and could thus be seen as a key contribution.

However, despite these significant challenges, Brazil also presents notable technological opportunities and strengths that can drive the transition toward a CE (A3; A4; P2; P3), and attention has been growing, both in Brazil and in Latin America as a whole (Equinix 2025; TI Inside 2025). The ethanol and sugar sector illustrates a technical circular agro-business by converting sugarcane juice into ethanol or sugar, using bagasse for cogeneration and second-generation ethanol, and recycling agricultural waste (A4). Additional innovations include livestock-crop integration and agroforestry models that foster closed-loop agricultural systems (B2; P4). Emerging digital tools like blockchain are also increasingly used for waste certification, reverse logistics, and social currencies that reward communities for recycling (A2). Smartphones have opened up new possibilities for digital business models and solutions conducive to CE (N3), linking consumers to waste collectors, such as *Cataki* in São Paulo, which facilitates the pick-up of recyclable materials and negotiates payment to collectors or cooperatives (A2). "You (...) want to recycle your sofa. Then you track down the nearest co-operative or waste picker... you pay for the recycling process..." (A2).

What becomes apparent here is that technology is an additional driver that enables the transitioning process, with blockchain being one example that allows for monitoring and tracking all areas along the supply chain. Currently, technology is not included in Dubey et al.'s (2016) model, which could be explained because it was developed before blockchain became a buzzword. Yet, without technological drivers, the transitioning process towards a CE could be seen as being more challenging.

4.4 | Economy

High initial costs for transitioning to CE practices and circular business models prevent many companies in Brazil—particularly SMEs—from financing the required technologies and processes (see also Section 4.3) (A1; A2; A3; A6; B1; B2; B5; N1;

N2; N3; N4; P1; P2; P3). Additionally, "colonel-ism" still shapes national economic priorities, meaning large landowners support CE initiatives only when their immediate benefits are clear (A1). On the other hand, the lack of targeted economic incentives perpetuates linear models (A6; N2; P2), which remain profitable due to cheap raw materials and low disposal costs (A6). Although there are some public and private funding lines, particularly focusing on solid waste and urban mining (A4; P1), many financial institutions remain unfamiliar with risks and returns on circular models (P3), resulting in few accessible funding mechanisms (A1; A2; A3; A5; B2; N1; P3). Brazil's ongoing tax reform is expected to usher in a new era for businesses, with implications for circular economy adoption. The reform includes provisions that may streamline taxation for circular products and services, encouraging investment in sustainable innovation (Biar 2025). As mentioned in Section 4.1, there is still limited consumer demand for secondary materials and refurbished products (A2; B5; N2; P1; P2; P4). This suppressed market discourages investment in a CE and is compounded by outdated accounting practices, such as double taxation on waste repurposed as raw material (A2; A6), which conceals the true economic benefits of circular strategies (A3; B3; N1; P1; P2; P3). Recent changes in Brazil's fiscal and tax frameworks are beginning to address some of these barriers. For instance, the government has revised rules related to incentive treatment, aiming to simplify and modernise the system to better support more sustainable business models (EY 2024). These reforms could potentially reduce double taxation on recycled materials and improve the financial viability of circular practices. Furthermore, a new federal tax is under discussion to be introduced to discourage the consumption of products considered harmful to health and the environment, thereby promoting sustainable production.

International trade significantly influences Brazil's shift to a CE (A1; A3). "Brazil is a major exporter of products and raw materials; if there's a demand to export more sustainable, more circular raw materials, Brazil will have to meet these demands" (B1). As global players tighten sustainability requirements, Brazilian operations must align with a CE to stay competitive (A4; N3). "The Northern hemisphere... always interferes in the underdeveloped countries in the Southern hemisphere. We're always trying... to meet the demands of the Northern hemisphere" (A3). European multinational companies, for example, impose new guidelines (A2; B3), including product adaptations to secure international certifications (A2; P3). According to B5, "sometimes market demands are more important to companies than the law. A company that doesn't comply with the law is subject to a fine. But it fulfils what its client is demanding of it, the investor". Within Brazil, private-sector responses have seen large companies collaborating with smaller ones (A2) to adopt Environmental, Social, and Governance (ESG) standards (N4, N1). Beyond corporate initiatives, Brazil's Ministry of Industry steers toward circularity, as "industry (...) it's going to be the main sector that internalises this [circular economy] for us to be able to move forward (...) because talking about the circular economy means changing the production, and we need to rethink this production, thinking of it as a way of generating more jobs, reducing costs and increasing our exports" (P1).

As mentioned in Section 4.1, Brazil's unique biodiversity propels CE adoption, and resource conservation is starting to be a priority (N1; P3). The industrial sector increasingly practices water reuse and minimises virgin material extraction to reduce costs (A3), "there is an awareness in the industry. What you see here in Brazil is a proposal that is coming from the industry to the government, so that we can create this reality, so that it actually happens. So, I think we've reached a moment of maturity, of the need for this change." (B4). On the other hand, Brazil's agriculture sector is a cornerstone of its economy, contributing significantly to the national gross domestic product (Rodrigues et al. 2024). This sector is starting to be aligned with CE principles by implementing innovative and sustainable solutions that minimise waste and optimise resource use (B2; P4).

Notably, Brazil has significant opportunities to advance, leveraging its strengths to generate economic, social, and environmental benefits. Its robust mineral processing infrastructure positions the nation to manage electronic waste, potentially absorbing e-waste from other Latin American countries (P2). Enhanced CE practices could further boost competitiveness (P4) and create jobs (A2; A4; A5; B3; N4). These new markets, along with the potential to repair or rethink production systems (N3; P1), promise fresh business models (A3; A4; N3) in rentals, repair, or resale (N3) and foster a network of SMEs to supply larger companies (A2). Moreover, two additional waste recovery examples are the use of the açaí seeds as a source of energy in cement production (A3) and the reuse of perfume bottles in some stores (B3). As such, local supply-chain efforts, especially in the Amazon, can spur reverse logistics and research centres (N1), creating urban and rural employment opportunities (N3). Capitalising on Brazil's labour availability and creativity could add value to these products and further embed CE across the economy (N3).

4.5 | Key Stakeholders

The stakeholder analysis was categorised into five primary groups: policymakers, civil society, private sector, academia, and international cooperation, based on their respective affinities (Figure 2).

All interviewees consider the federal government as the main stakeholder in the transition towards a CE in Brazil, establishing regulations, overseeing, and generating incentives (A1; B3; N2; P4), like the New Industry Brazil program (CNDI 2024). Key ministries include Environment and Climate Change (B4; N2; P1; P2; P3; P4), Industry (B4; P1; P3; P4), Science, Technology and Innovation (P1; P3), and Finance (P3), supporting regulatory frameworks and inter-institutional coordination (P4). Additionally, progressive regulation monitoring is crucial (P1), as "if the government, state, and municipal bodies demand more, the industry will change with regulations" (A3). Similarly, municipalities and regional states aid regulation implementation by aligning with local businesses and civil society, allowing an approach appropriate to each context, such as the creation of local waste infrastructure (A3; A6; B1; B3; B5; N4; P3; P5). On the other hand, national agencies provide some incentives and oversee CE compliance with their regulations (P2), like the Brazilian Development Bank granting credit lines for circular projects (P4) and the Environmental Company of the State of São Paulo overseeing environmental activities in this state (P5).

FIGURE 2 | Key stakeholders identified in the interviews. The numbers next to each stakeholder represent how often they were mentioned by interviewees, with the size of the coloured circles also corresponding to this frequency. BNDES, Brazilian Development Bank; CNI, Brazilian National Confederation of Industry; CONAMA, National Environmental Council; FINEP, Funding Authority for Studies and Projects; MCTI, Ministry of Science, Technology and Innovation; MDIC, Ministry of Development, Industry, Trade and Services; MF, Ministry of Finance; MMA, Ministry of Environment and Climate Change.

Regarding civil society, the role of consumers was mentioned by all interviewees. B5 stated "we [consumers] are the ones who have to go and knock on the doors of the city hall, the government, and the entities. People have to talk about this". Understanding the concept of circularity is the basis for more specific actions at the population level, such as proper waste sorting at home (N4). Moreover, their inclusion in decision-making is important so that their needs and concerns are reflected in the regulations (B5). A specific group that is frequently mentioned is the informal waste workers. Their work helps divert various waste types from landfill and allows materials to be reintegrated into a production process (A4). Their knowledge of the local context of each area is valuable for improving waste sorting processes, so it is important to include them in decision-making and improve their working conditions (N2).

In the case of the private sector, the interviewees highlight the role of large companies in leading the transition efforts due to

the influence they can have on consumers and smaller companies (A1; B1; N3). However, SMEs and startups must also be taken into account as they play a role in innovation and focus on offering sustainable and circular alternatives (A6; N2). This contribution should come from the main economic sectors of Brazil, including agro-export (A5; B2; B3; P1; P4) and manufacturing (A3; B2; P3). This is further enhanced by the inclusion of various industry associations that can more effectively promote CE initiatives, including the Brazilian Foreign Trade Association (B5) and the Brazilian National Confederation of Industry (CNI, acronym in Portuguese) (B1). However, industry associations could also have a negative effect on transition progress if they lobby to avoid changes (A6; P5). The private sector's involvement must focus on achieving substantial improvements rather than superficial measures, which can be perceived as "greenwashing" (A3).

Similarly, academia is usually identified as a key stakeholder for the CE transitions (A5). Most of the interviewees agree that universities (A2; A3; A4; A6; B2; N2; N3; P5) and research centres (B3; B4; B5; N1; P2) will be "the baseline along the government through the creation of circular economy public policies needed for Brazil" (A5). This support is also currently reflected in competitive funds from federal projects such as the National Council for Scientific and Technological Development (CNPq) or the Brazilian Coordination for the Improvement of Higher Education Personnel (CAPES). In this way, innovative projects generated by academia can help to cover the main priorities (see Section 4.3) from CE in Brazil (A6). Furthermore, the participation of other stakeholders is strengthened by the interdisciplinary collaboration that characterises academia (N5).

Finally, Brazil takes into account circularity policies applied in other countries (see Section 4.2). The influence of the European Union is the one that has the greatest impact on Brazil (N2; N4; P5). The main reason is the increasingly strict regulations and policies in its member countries (B5; P3). Besides, there is active involvement of countries from the Global North with circular projects in Brazil. Some interviewees highlight the initiatives from Germany in the energy sector (B2), the United States to establish federal regulations like the environmental crimes law (P2), and Japan advising on the reuse of electronic waste (P2).

What becomes apparent here is the fact that 'management commitment' within the transitioning process needs to be broadened to include stakeholders in more general terms. Without buy-in from all areas, a transitioning process is not possible. It is important to note here also that the informal sector can act as a pressure group for the formal sector. A push-pull model force can be identified, in which the informal sector pushes the formal to change, whilst the formal sector seeks to regain control. This kind of power dynamics within an economy is relatively unique to the Global South context, in which informal economies are more commonplace compared to their Global North counterparts.

4.6 | Priorities

This section outlines the main priorities based on their significance as indicated by the interviewees, categorised into political, socio-cultural, technological, and economic aspects. The percentage in Table 3 reflects the frequency of each topic, and only the main priorities have been included. Other less frequent priorities are presented in Table S1.

4.6.1 | Policy and Regulation

The implementation of a CE in Brazil requires a comprehensive approach led by robust public policies and adaptive legislation, where laws and enforcement drive change (A2; A3; A4; A5; B1; B3; B4; N2; N4; P3; P4; P5). B3 stated, "in Brazil, this is particularly relevant because we have a marked tendency to rely on the law." Another specific aspect is the implementation of adequate legal frameworks for waste management (A5; B1; B5; N1), incorporating fiscal and tax incentives to promote the use of secondary materials over virgin raw materials (A2; A3; A4; B2; B5; N1; N4; P1; P2). As noted by A2, "there is no fiscal incentive for recycling waste reuse." Furthermore, the integration of cooperatives for recyclable material management is critical (A5), with mandatory waste segregation for both the industrial sector and the general population (N2; N4).

The comprehensive legal, political, and legislative approach must enable coordination and shared responsibility among all key stakeholders (see Section 4.5) (B1; B3; N3; P3), with active participation from the industrial sector. As P3 states, "if we do not involve the private sector, civil society, and the government, we will continue having linear thinking... the Ministry of Industry is key because one thing we understood here is that if the productive sector does not take on this agenda and get involved, we will not succeed." Therefore, key industrial sectors such as mining, automotive, energy, petrochemical, and food industries should be included.

4.6.2 | Culture, Education and Society

Public awareness of the CE is crucial to shifting societal culture and behaviours (A4; B1; B4; N2; P3). In Brazil, large-scale public sector campaigns, such as those reducing tobacco consumption, have been successful. This precedent should be leveraged to promote behaviour change, as society remains focused on recycling, neglecting broader aspects of the CE (see Section 4.1) and the behaviour required for a holistic circular model (N2).

Environmental and social education should be integrated from childhood, with topics included in school curricula through educational policies (A2; B2; P3). Dialogue spaces should be created for businesses and society to understand these concepts before making commitments (B5; P3; P5). As B5 states, "you cannot ask a businessperson to do something if they don't even know what it is. We must invite them to listen to a talk about waste and circularity".

Interviewees highlighted the importance of social integration, especially for informal waste pickers, a key group in Brazil (A2; N2; P1; P5). Providing training during the transition will help them adapt to new roles in recycling and bioeconomy (A2; P3). Thus, the CE must go beyond environmental sustainability to improve quality of life, addressing Brazil's economic and social

TABLE 3 | Main priorities highlighted by interviewees.

Aspect	Percentage	Main priorities	ID
Policy and regulation	41%	Establish a cross-sectoral and decentralised regulatory framework that includes mechanisms to ensure compliance	(A2; A3; A4; A5; B1; B2; B3; B4; B5; N1; N2; N3; N4; P1; P2; P3; P4; P5)
		Use legal frameworks to increase the efficiency of waste management	(A3; A5; B1; B2; B5; N1; N2; N4)
		Enhance political commitment with a clear definition of responsibilities	(A1; A5; N2; N4; P3)
Culture, education and society	27%	Raise awareness of the circular economy concept	(A4; A6; B1; B4; N2; P3)
		Use circular economy for social integration with a particular focus on waste pickers	(A1; A2; B4; N2; P1; P5)
		Incorporate circular economy into education and increase specific training	(A2; B2; B5; P3; P5)
Data, technology and innovation	16%	Deploy technologies to facilitate the adoption of circular practices	(A4; B3; N2; N4; P4)
		Create research and innovation hubs	(A3; A4; N1; N4; P2)
Economy	16%	Provide financial support and economic incentives to circular business models	(A3; A4; B3; B4; N3; N4; P2; P3; P4; P5)

disparities (A1; A2; B4; P5). "The circular economy must not only be good for sustainability, but also for the economy, for people, and for the environment" (A1).

4.6.3 | Data, Technology and Innovation

The transition to a CE in Brazil requires an integrated approach, focusing on technological advancements (A4; B3; N2; P4) to strengthen the recycling industry (N4; P4). Therefore, N4 proposes as a priority the establishment of a primary public recycling program with adequate infrastructure for selective waste collection, stating that "a good system must be in place, with properly sized vehicles and well-planned routes to ensure that there are no conflicts between them and that the service is properly contracted by the municipal public authority." Additionally, industrial technology should enable more efficient material extraction, reduce resource demand during the production process, and extend product life cycles. This should be achieved through the integration of technologies across the entire production chain to improve overall system efficiency and minimise associated risks (B3; N2; P4).

Research and innovation centres should be established in both urban and Amazonian regions to foster youth training and expand knowledge in materials and bioeconomy, thereby promoting business creation and investment (A3; A4; N1; P2). In urban areas, emerging priorities include optimising resource consumption, increasing the value of material and energy flows, and delivering improved social and environmental outcomes (Brglez et al. 2024); nevertheless, the Latin American region continues to face obstacles in adopting energy-efficient technologies, even in high- and middle-income neighbourhoods (Izurieta et al. 2025). Investing in research is key to developing CE markets, promoting university-led projects that provide practical tools for businesses (A3; A4). Additionally, research plays a crucial role in gathering data to support robust CE actions, as N4 states: "good public policy is made with data that people consider valid".

4.6.4 | Economy

According to the analysis conducted, the Ministry of Finance should prioritise developing a specific financing model for CE actions. This model should not only originate from private initiatives but also position the public sector as a key actor, both as a source of funding and for its capacity to intervene in driving the transition to a CE (N3; N4; P2; P3; P4). As N3 pointed out, the Brazilian government has a proven track record of financing large-scale development projects, highlighting its potential to support high-impact initiatives that promote the shift toward a

CE. The financing model should focus on fiscal incentives (e.g., tax reductions, exemptions, or credits) and funding programs to promote the transition to circular business models (A4; B3; B4; P2; P3). As B3 stated, "this would encourage companies to see the CE as an opportunity for innovation and investment, not just an obligation to avoid fines". The model should also incentivise research, development, and demand creation for circular products and services (P2). Additionally, Brazil's specific needs must be addressed by incentivising energy transition, reverse logistics, and CE-related technologies (A4; P5). The model should prioritise improving recyclers' livelihoods, treating recycling as a service, and ensuring fair compensation (N4; P4).

5 | Discussion

In this section, the principal findings of this study are examined in relation to prior scientific evidence, with particular emphasis on the novel contributions these results bring to the existing body of knowledge.

5.1 | BRICS

A review of existing research on BRICS nations reveals some similarities with the findings of this study. Shared drivers for CE are: (i) pressure on natural resources (Fan and Wang 2024; Wang, Li, et al. 2024; Wang, Zhen, and Wang 2024); (ii) the adoption of greener policies (Asif et al. 2024; Sachan et al. 2023; Udeagha and Ngepah 2023); and (iii) technology innovation in the energy sector (Asif et al. 2024; Fan and Wang 2024; Udeagha and Ngepah 2023). In general, most BRICS countries face common barriers such as weak regulatory enforcement and corruption within their own governance systems. As observed in the results, Brazil faces similar institutional and technological barriers to those found in other BRICS countries (Haas et al. 2023; Mvelase and Ferrer 2024; Kurniawan et al. 2022; Sengupta et al. 2022; Sohal et al. 2022; Wang, Li, et al. 2024; Wang, Zhen, and Wang 2024; Wang and Huang 2023). However, when considered as a block, challenges arise from their considerably different economic, social, and political structures and strategies, as well as the internal complexities within each nation that hinder the formation of a unified political alliance for smoother governance (Bertelsmann Institute 2013; Liu and Zhang 2024).

This paper offers context-specific insights into the internal barriers limiting Brazil's collaborative CE initiatives within BRICS. Despite efforts to align with international best practices, sociocultural factors—such as entrenched consumerism, income inequality, and a limited understanding of CE principles—hinder widespread adoption. Additionally, deep-rooted social disparities create challenges for CE partnerships, as immediate economic needs often drive short-term priorities over long-term sustainability, diminishing the attractiveness for foreign capital. Moreover, lingering historical influences like "colonel-ism" exacerbate this issue by prioritising short-term economic gains—undermining the sustained financial support necessary for thriving circular business (Galvão et al. 2022; Salvador et al. 2020). In this regard, main areas for collaboration among BRICS nations include sharing technology and policy expertise, particularly in renewable energy and bioeconomy sectors (Asif et al. 2024; Udeagha and Ngepah 2023; Wang, Li, et al. 2024; Wang, Zhen, and Wang 2024); and capacity-building initiatives and the dissemination of best practices in mining and waste management could further reinforce this cooperative framework (BRICS JSP 2024; Fan and Wang 2024; Halog and Anieke 2021).

Brazil's strong position in resource management gives it the potential to emerge as a global leader in metal (e.g., aluminium) and e-waste recycling by fostering an interconnected recycling ecosystem across Africa, the Americas, Europe, and Asia. Such leadership could help close global metal loops and enhance Brazil's role in sustainable resource management. In this sense, CE's potential to alleviate political tensions and mitigate supply chain bottlenecks underscores its broader significance for global trading and sustainable development (Longo et al. 2024; Schroeder et al. 2018).

5.2 | Latin America and the Caribbean

Persistent environmental challenges in the Latin America and the Caribbean (LAC) region continue to hinder the CE transition (Gallego-Schmid et al. 2024; Ospina-Mateus et al. 2023). The results align with previous studies highlighting regulatory and financial constraints as major barriers to CE implementation in LAC (Betancourt Morales and Zartha Sossa 2020; Gallego-Schmid et al. 2024; Ospina-Mateus et al. 2023; Salvador et al. 2022). Additionally, the cultural barrier is significantly relevant in LAC (Betancourt Morales and Zartha Sossa 2020; Ospina-Mateus et al. 2023; Andrade Carrasco and Tonon Ordoñez 2023). For example, in Chile, the impact of social inequalities on CE adoption, cultural resistance, and excessive consumerism (also in Brazil) are the main concerns during the transition (Gallego-Schmid et al. 2025). In Brazil, for instance, sustainability is often deprioritised due to socioeconomic conditions and a cultural preference for new products over repaired or refurbished ones, revealing deep-rooted structural and perceptual challenges.

Concerning drivers for the transition, the literature about LAC suggests that governmental support and political influence are important for advancing waste management (Gallego-Schmid et al. 2024), and economic benefits for increasing circularity in the bioeconomy sector (Weber et al. 2020), commitment to international environmental agreements, and the influence of international commerce as the case of Chile (Gallego-Schmid et al. 2025). Brazil is still looking at international examples for guidance on a CE (e.g., Chile, Colombia) and global leaders; however, the government of President Lula Da Silva has an explicit commitment to move sustainability and a circular agenda forward (Bertelsmann Institute 2024).

5.3 | Brazil

Previous studies identified a lack of public awareness and engagement, coupled with slow and inconsistent policy implementation, as barriers to CE adoption in Brazil (de Oliveira et al. 2019; Paes et al. 2024; Xavier et al. 2021). The market for circular products and business models is limited, and the high

costs associated with transitioning to cleaner technologies further impede progress (de Souza and Pacca 2023; Galatti and Baruque-Ramos 2022; Guarnieri et al. 2023). Additionally, there is tension between the country's consumerist culture and existing practices of recycling and reuse (Rebehy et al. 2023; da Silva et al. 2020). A lack of collaboration among stakeholders and a tendency towards reactive strategies further contribute to the problem (Gomes et al. 2024; Guarnieri et al. 2023). Regional disparities in infrastructure and development add to the complexity of implementing a CE effectively (Guarnieri et al. 2023). Overcoming these barriers requires a systemic approach that addresses both the technical and socio-cultural aspects of this transition and includes a greater focus on proactive CE strategies (Guarnieri et al. 2023; Rebehy et al. 2023). Some of these aspects have been evaluated and contextualised in Europe (Kirchherr et al. 2018), and further research in this regard is essential to address Brazil's unique complexities, with this work providing a nuanced and substantial foundation for future research. The interviewees largely agree on these and provide new insights regarding barriers to Brazil's CE transition: (i) the absence of a specific legal framework (which creates uncertainty and impedes investment); (ii) the lack of fiscal and tax incentives favouring secondary materials over virgin raw materials; (iii) the absence of requirements for imported goods to comply with CE principles; (iv) outdated accounting practices (such as double taxation on waste repurposed as raw material); (v) and the need for dedicated financial mechanisms.

Drivers for CE transition mentioned by the interviewees and literature include addressing climate change, biodiversity protection concerns, and international trade—particularly through its influential agribusiness sector (Guarnieri et al. 2023; Tedesco et al. 2022). Interestingly, while the latter was mentioned as an important driver, it has been cited as a barrier in South Africa (Haas et al. 2023). Given the socioeconomic similarities between Brazil and South Africa, this contrasting finding highlights the need for further research into the role of international trade for CE transition in Brazil (see, for instance, Lapola et al. 2023). The literature identifies key enablers for Brazil's CE transition, including fostering symbiosis among industries, cooperatives, and researchers while ensuring the inclusion of underprivileged populations and regions in CE initiatives (Guarnieri et al. 2023; Oliveira Silva and Morais 2021; Salvador et al. 2022), although these have yet to be fully mapped. The PNRS of 2010 is consistently cited in the relevant literature as a main driver of the CE in Brazil, establishing shared responsibilities for waste management among stakeholders. However, its implementation is often criticised for lacking progress in key areas, such as closing inadequate disposal sites and increasing recycling rates (Oliveira Silva and Morais 2021; Paes et al. 2024; Rebehy et al. 2023). The interviewees emphasised that collaboration between large and small companies, along with governmental bodies, is driving Brazil toward greater circularity.

Current opportunities in Brazil's CE path identified by interviewees are found in literature, such as growing consumer awareness, job creation, environmental education, increasing recognition of circularity solutions within the industrial sector, and fiscal incentives for secondary materials (Gomes et al. 2024; Monteiro et al. 2024; Tedesco et al. 2022). Moreover, the role of national culture and traditions (e.g., minimal-waste lifestyles, reuse-repair-sharing culture, and traditional knowledge) is emphasised by interviewees and briefly mentioned in the literature (Lima et al. 2021; Puglieri et al. 2022; Rebehy et al. 2017). Finally, the Brazilian federal government's commitment to sustainability, as demonstrated by the ENEC (National Congress 2024), is recognised for the first time here as a significant opportunity for CE initiatives in Brazil. Despite the challenges in the PNRS implementation, the ENEC is seen as a critical step toward improving circular solid waste management, fostering industrial symbiosis and promoting inclusivity. Hence, if opportunities are channelled and their effectiveness is demonstrated by the government (e.g., job creation, technology solutions), circularity can be perceived as a socio-economic advantage and not just an environmental one. Furthermore, the interviews highlight the significance of international involvement, noting that the European Union, along with countries such as the United States and Japan, plays a crucial role in advancing circularity initiatives in Brazil.

Startups and technological innovations are emerging opportunities for Brazil's CE transition, with significant potential to promote environmentally conscious consumer behaviour (Galatti and Baruque-Ramos 2022; Gomes et al. 2024) as well as transform industry, supply chains, and business models (de Souza and Pacca 2023; Gomes et al. 2024; Puglieri et al. 2022; Tedesco et al. 2022). Both interviewees and the literature highlight that Brazil's progress in digitalisation can support waste picker inclusion while improving recycling and reverse logistics, strengthening its position as a circular economy innovator (Gomes et al. 2024; Rebehy et al. 2017). However, regional disparities, particularly in solid waste management, underscore the need for targeted research to fully unlock the country's potential (de Oliveira et al. 2019; Rebehy et al. 2023). Solid waste management is a key topic in developing and transition countries as unsustainable management of SW is a common practice (Ferronato et al. 2023). Thus, the interviewees mentioned that CE priorities in Brazil include raising awareness, inclusive policies, tax incentives, financial support, economic incentives to circular business models, and ensuring fair compensation for recyclers.

5.4 | Theoretical Contributions

As outlined, this paper draws on Dubey et al.'s (2016) theoretical model, which focuses on sustainable production and consumption as an outcome. Within this research, it was demonstrated that isomorphism still plays a role within the CE transitioning process, thereby confirming Dubey et al.'s (2016) study. What is new is the addition of a bottom-up pressure, namely the informal economic sector (Figure 3). Their knowledge and expertise in taking on circular approaches force the formal sector to react, as the latter feels increasingly threatened by the expertise. These unequal power dynamics form an interesting backdrop to overall 'management commitment', which in this case has been updated to include all stakeholders. Without the buy-in of all stakeholders, a transitioning process is impossible, as all benefits and drawbacks need to be considered. Each stakeholder identified in this research is in a unique position to drive (or hinder) the agenda. A prime example that can be given here is the change in government that can have implications for beliefs and thus make or break the transitioning process. Due to the weak

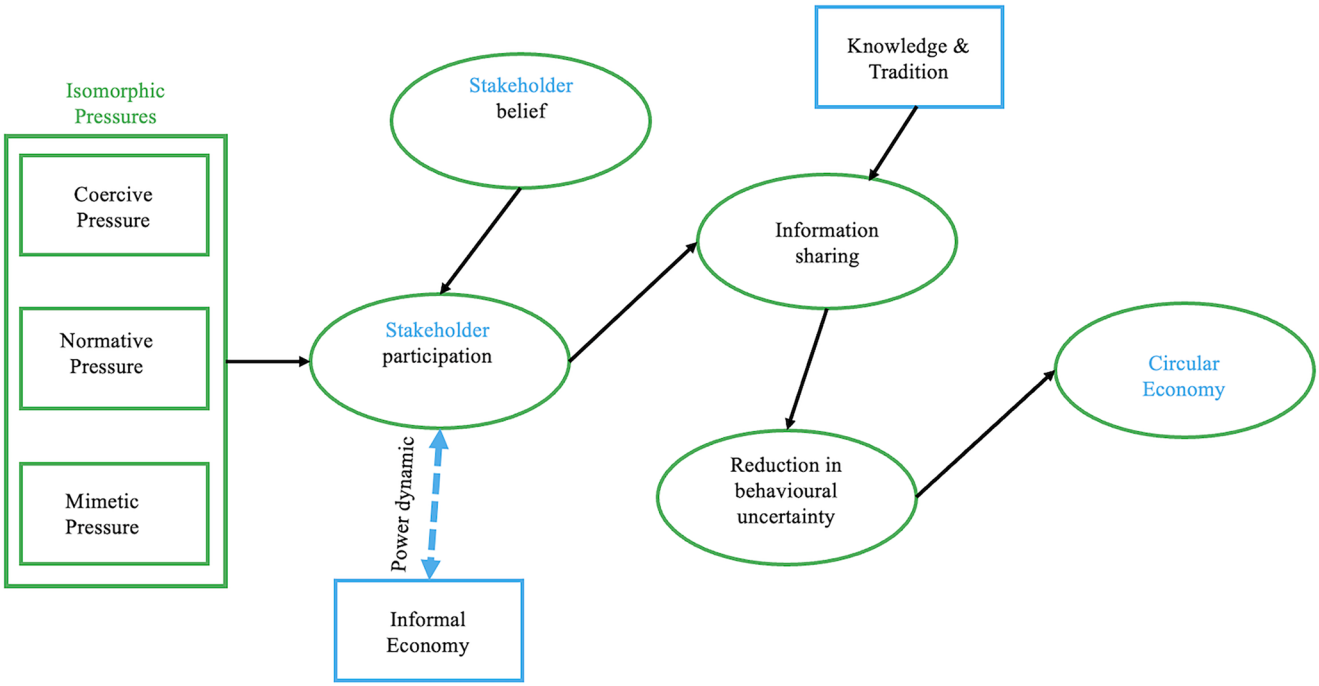

FIGURE 3 | Research model towards a theory of Circular Economy (adapted from Dubey et al. 2016).

policy frameworks identified, isomorphism is seen to be less influential in fostering the transitioning process.

Information sharing is further influenced by knowledge and tradition. From the interview data, it was apparent that even though individuals may not have been as familiar with the CE concept, CE practices are deeply rooted in the everyday life of Brazilians, and as such, are acted upon. Familiarity with practices can lead to trust and has an impact on behavioural uncertainty. For example, the informal recycling sector has been operating for a long time and is effective; as such, consumers and other stakeholders rely on their engagement and trust that they can move the agenda forward.

6 | Conclusions

This work is a pioneer in the comprehensive assessment of the circular economy progress in Brazil, based on results obtained from 20 semi-structured interviews with experts from academia, policymakers, businesses, and non-governmental organisations. Culture, education, and society; policy and regulations; technology and data; and economy were analysed, identifying drivers, barriers, strengths, opportunities, and stakeholders of the circular economy in Brazil.

While Brazil shows some awareness and growing interest in circular economy principles, multiple barriers hinder its widespread adoption and implementation. Cultural behaviour, such as the preference for new products over repaired ones and a lack of understanding of the circular economy beyond recycling, limits the effectiveness of practices, for example, second-hand markets. Economic constraints further exacerbate the challenge, with high initial costs and insufficient financial incentives for businesses, especially small and medium-sized enterprises, to transition to circular models. Inadequate policy frameworks and weak regulatory enforcement create an environment of uncertainty, while technological limitations, particularly in waste management infrastructure and data collection, prevent effective monitoring and traceability. In addition, the lack of coordination among stakeholders hampers the development of practical solutions. To overcome these barriers, Brazil needs more comprehensive education and awareness campaigns, stronger regulatory frameworks, targeted investment in infrastructure and innovation, and the development of economic incentives that make circular practices more attractive. This will enhance the integration of different societal sectors, fostering social equality, creating repair hubs, increasing competitiveness, creating new jobs, fostering new digital business models and solutions through technologies, and promoting reverse logistics and research centres through local supply chain initiatives. Only through concerted efforts across cultural, economic, policy, and technological domains will Brazil be able to successfully transition toward a circular economy.

Despite these challenges, Brazil's deeply ingrained culture of resourcefulness, reuse, and repair provides a strong foundation for circular economy practices. Public awareness of environmental issues, spurred by climate change impacts and deforestation, is fostering a cultural shift towards sustainability, including the rise of second-hand economies, more environmentally conscious consumer behaviour, and carbon-neutral policies. Governmental initiatives, such as training programs and the development of supportive policies like the National Solid Waste Policy and National Circular Economy Strategy, are playing a crucial role in promoting the circular economy. Additionally, Brazil looks at international examples for guidance, with increasing pressure from global trade demands and multinational companies pushing for more sustainable practices. Technological innovations, including blockchain for waste

tracking and reverse logistics, are enhancing the efficiency of circular economy systems. Economically, the country is leveraging its rich biodiversity and seeking to balance development with conservation, while also adjusting its industrial practices to meet global sustainability standards. However, continued collaboration across government, industry, and civil society will be key to ensuring the long-term success and scalability of these efforts.

Furthermore, these stakeholders can also be considered the target audience of this study. Academics can use the research as a source of current and relevant information on circular economy readiness in the country. Policymakers can understand from this study the possible paths of a circular economy in Brazil and use this to develop and update legislative and regulatory requirements. In addition, companies can be inspired by practical examples of a circular economy, seeking to improve innovation and sustainability in the industrial sector.

As alluded to, this article used Dubey et al.'s (2016) model to develop a framework towards a theory for a transition towards a CE. Various key contributions have been made. First, aside from isomorphic pressures, the informal economy is a key driver towards the transitioning process. Data revealed an interesting power dynamic in that the formal sector feels under a lot of pressure, as it needs to catch up on practices already integrated in the informal sector. Second, knowledge and tradition have emerged as a key theme, in that culturally embedded knowledge on, for example, recycling and reuse, as well as traditions, such as the second-hand economy, shape and influence the transition process. With Brazilians already accustomed to enacting a variety of CE practices, the buy-in is quicker and the overall process is seen to be less problematic. Third, unlike in Dubey et al.'s (2016) model, it is not the commitment of the managers, but rather stakeholders, that is essential to make a CE transition possible. Underpinned by cultural nuances of already participating in some CE practices, stakeholders overall are more inclined to work towards a CE if they believe they will gain economic benefits.

This study is not without limitations. One limitation was the research protocol designed to guide the interview process. Although the study assessed several factors of circular economy implementation, namely sociocultural, technological, economic, and political, it is possible that other relevant factors fell outside the scope of the analysis. Additionally, the interviews were conducted with key stakeholders involved in the circular economy, including academics, policymakers, businesses, and non-governmental organisations. However, it is possible that other important stakeholders were not involved. Finally, the study's reliance on semi-structured interviews, while allowing flexibility in data collection, may have led to inconsistencies in the depth and focus of responses depending on the interviewee.

Author Contributions

The list of authors accurately reflects those who made significant intellectual contributions to this work. All individuals listed as authors meet the criteria for authorship as defined below: (1) they have made substantial contributions to the conception and design of the study, or the acquisition, analysis, or interpretation of data; (2) they have been involved in drafting the manuscript or revising it critically for important intellectual content; (3) they have approved the final version to be published and have participated sufficiently in the work to take public responsibility for appropriate portions of the content; and (4) they have agreed to be accountable for all aspects of the work by ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Conflicts of Interest

The authors declare no conflicts of interest.

References

Acordi, J., L. Simão, M. N. S. Faraco, et al. 2023. "Waste Valorization of Coal Mining Waste From a Circular Economy Perspective: A Brazilian Case Study Based on Environmental and Physicochemical Features." *Resources Policy* 80: 103243. https://doi.org/10.1016/j.resourpol.2022.103243.

Adebayo, T. S., A. Samour, A. A. Alola, S. Abbas, and M. Ağa. 2023. "The Potency of Natural Resources and Trade Globalisation in the Ecological Sustainability Target for the BRICS Economies." *Heliyon* 9: e15734. https://doi.org/10.1016/j.heliyon.2023.e15734.

Agyabeng-Mensah, Y., E. Afum, C. Baah, and D. Essel. 2022. "Exploring the Role of External Pressure, Environmental Sustainability Commitment, Engagement, Alliance and Circular Supply Chain Capability in Circular Economy Performance." *International Journal of Physical Distribution and Logistics Management* 52, no. 5/6: 431–455. https://doi.org/10.1108/IJPDLM-12-2021-0514.

Akter, M., T.-F. Kummer, and O. Yigitbasioglu. 2024. "Looking Beyond the Hype: The Challenges of Blockchain Adoption in Accounting." *International Journal of Accounting Information Systems* 53: 100681. https://doi.org/10.1016/j.accinf.2024.100681.

Al Rawashdeh, S., M. Nasaj, and S. Z. Ahmad. 2024. "Driving Circular Economy Adoption Through Top Management Commitment and Organisational Motivation: A Quantitative Study on Small- and Medium-Sized Enterprises." *International Journal of Organizational Analysis* 33: 2004–2025. https://doi.org/10.1108/IJOA-04-2024-4449.

Alqershy, M. T., Q. Shi, and D. R. Anbar. 2024. "Analysing the Interplay of Isomorphic Pressures, Perceived Benefits and Top Management Support on Social Responsibility Performance of Belt and Road Megaprojects." *Engineering Construction and Architectural Management* 32: 4074–4099. https://doi.org/10.1108/ECAM-11-2023-1169.

Andrade Carrasco, M. E., and L. B. Tonon Ordoñez. 2023. "The Path to Circularity: A Literature Review of Its Application in Latin America." *Economía & Negocios* 5, no. 1: 272–287. https://doi.org/10.33326/27086062.2023.1.1547.

Aquino, S. D., and J. C. Natividade. 2024. "Se Você Está Contente, Compra Coisas? O Poder Preditivo Do Bem-Estar Subjetivo Sobre Compras Materiais." *Revista CES Psicología* 17, no. 1: 17–37. https://doi.org/10.21615/cesp.7065.

Ashworth, R., G. Boyne, and R. Delbridge. 2007. "Escape From the Iron Cage? Organizational Change and Isomorphic Pressures in the Public Sector." *Journal of Public Administration Research and Theory* 19, no. 1: 165–187. https://doi.org/10.1093/jopart/mum038.

Asif, M., J.-Q. Li, M. A. Zia, et al. 2024. "Environmental Sustainability in BRICS Economies: The Nexus of Technology Innovation, Economic Growth, Financial Development, and Renewable Energy Consumption." *Sustainability* 16, no. 16: 6934. https://doi.org/10.3390/su16166934.

Bag, S., G. Srivastava, A. Cherrafi, A. Ali, and R. K. Singh. 2024. "Data-Driven Insights for Circular and Sustainable Food Supply Chains: An Empirical Exploration of Big Data and Predictive Analytics in Enhancing Social Sustainability Performance." *Business Strategy and the Environment* 33, no. 2: 1369–1396. https://doi.org/10.1002/bse.3554.

Barcelos, S. M. B. D., R. Salvador, M. V. Barros, A. C. de Francisco, and G. Guedes. 2021. "Circularity of Brazilian Silk: Promoting a Circular Bioeconomy in the Production of Silk Cocoons." *Journal of Environmental Management* 296: 113373. https://doi.org/10.1016/j.jenvman.2021.113373.

Barros, M. V., R. Salvador, A. Gallego-Schmid, and C. M. Piekarski. 2023. "Circularity Measurement of External Resource Flows in Companies: The Circular Flow Tool." *Waste Management* 158: 136–145. https://doi.org/10.1016/j.wasman.2023.01.001.

Bertassini, A. C., A. R. Ometto, S. Severengiz, and M. C. Gerolamo. 2021. "Circular Economy and Sustainability: The Role of Organizational Behaviour in the Transition Journey." *Business Strategy and the Environment* 30, no. 7: 3160–3193. https://doi.org/10.1002/bse.2796.

Bertelsmann Institute. 2013. "Governance Capacities in the BRICS." *Sustainable Governance Indicators*: 9. https://www.sgi-network.org/docs/publications/Governance_Capacities_in_the_BRICS.pdf.

Bertelsmann Institute. 2024. BTI 2024 Country Report—Brazil. https://bti-project.org/en/reports/country-report/BRA.

Betancourt Morales, C. M., and J. W. Zartha Sossa. 2020. "Circular Economy in Latin America: A Systematic Literature Review." *Business Strategy and the Environment* 29, no. 6: 2479–2497. https://doi.org/10.1002/bse.2515.

Biar, L. 2025. Brazil's Tax Reform: A New Era for Businesses and the Economy. https://www.rsm.global/latinamerica/en/insights/brazils-tax-reform-new-era-businesses-and-economy.

Brglez, K., M. Perc, and R. K. Lukman. 2024. "The Complexity and Interconnectedness of Circular Cities and the Circular Economy for Sustainability." *Sustainable Development* 32, no. 3: 2049–2065. https://doi.org/10.1002/sd.2766.

BRICS JSP. 2024. BRICS Joint Statistical Publication 2024. https://brics.ibge.gov.br/publicacao.html.

Canmaker. 2025. *Brazil Maintains Its Record Beverage Waste Input*. Canmaker. Retrieved from. https://canmaker.com/brazil-maintains-consistent-record-in-beverage-can-recycling-rate/.

Charmaz, K. 2006. "Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis (Introducing Qualitative Methods Series)." *International Journal of Qualitative Studies on Health and Wellbeing* 1: 96–121.

Chen, Q., G. Gozgor, H. Padhan, et al. 2024. "How Does Energy Resource Diversification Affect Economic Development? Evidence From BRICS Economies." *Resources Policy* 98: 105286. https://doi.org/10.1016/j.resourpol.2024.105286.

Chrimes, C. 2024. "The Role of Blockchain in Facilitating the Transition to a Circular Economy: A Critical Review of Current Applications in the Fashion Industry." In *The Palgrave Handbook of Sustainability in Fashion*, edited by C. E. Henninger, P. Alevizou, D. Ryding, and H. Goworek, 347–369. Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-69682-4_25.

CNDI. 2024. "Nova Indústria Brasil – Nova Indústria Brasil – forte, transformadora e sustentável: Plano de Ação ara a neoindustrialização 2024-2026." *Conselho Nacional de Desenvolvimento Industrial*. https://www.gov.br/mdic/pt-br/composicao/se/cndi/plano-de-acao/nova-industria-brasil-plano-de-acao.pdf.

Creswell, J. W., and C. N. Poth. 2024. *Qualitative Inquiry and Research Design*. SAGE. https://uk.sagepub.com/en-gb/eur/qualitative-inquiry-and-research-design/book266033.

Cruz, I. A., L. R. Santos Andrade, R. N. Bharagava, et al. 2021. "Valorization of Cassava Residues for Biogas Production in Brazil Based on the Circular Economy: An Updated and Comprehensive Review." *Cleaner Engineering and Technology* 4: 100196. https://doi.org/10.1016/j.clet.2021.100196.

da Silva, F. A., F. J. Simioni, and D. N. Hoff. 2020. "Diagnosis of Circular Economy in the Forest Sector in Southern Brazil." *Science of the Total Environment* 706: 135973. https://doi.org/10.1016/j.scitotenv.2019.135973.

de Campos, E. A. R., M. Tavana, C. S. ten Caten, M. Bouzon, and I. C. de Paula. 2021. "A Grey-DEMATEL Approach for Analyzing Factors Critical to the Implementation of Reverse Logistics in the Pharmaceutical Care Process." *Environmental Science and Pollution Research* 28, no. 11: 14156–14176. https://doi.org/10.1007/s11356-020-11138-8.

de Oliveira, C. T., M. M. M. Luna, and L. M. S. Campos. 2019. "Understanding the Brazilian Expanded Polystyrene Supply Chain and Its Reverse Logistics Towards Circular Economy." *Journal of Cleaner Production* 235: 562–573. https://doi.org/10.1016/j.jclepro.2019.06.319.

de Soares Carvalho Freitas, E., L. H. Xavier, L. B. Oliveira, and L. L. N. Guarieiro. 2022. "System Dynamics Applied to Second Generation Biofuel in Brazil: A Circular Economy Approach." *Sustainable Energy Technologies and Assessments* 52: 102288. https://doi.org/10.1016/j.seta.2022.102288.

de Souza, J. F. T., and S. A. Pacca. 2023. "A Low Carbon Future for Brazilian Steel and Cement: A Joint Assessment Under the Circular Economy Perspective." *Resources, Conservation & Recycling Advances* 17: 200141. https://doi.org/10.1016/j.rcradv.2023.200141.

Dias, S., and M. Bouvier. 2021. "Waste Pickers in Brazil: A Statistical Profile (WIEGO Statistical Brief No. 29)." *Women in Informal Employment: Globalizing and Organizing*. https://www.wiego.org/wp-content/uploads/2021/12/WIEGO_Statistical_Brief_N29_Brazil_WPs.pdf.

DiMaggio, P. J., and W. W. Powell. 1983. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48, no. 2: 147. https://doi.org/10.2307/2095101.

Dong, R., J. Song, T. Jiang, and M. A. Baloch. 2024. "Environmental Sustainability Across BRICS Economies: The Dynamics Among the Digital Economy, Education, and CO2 Emissions." *Journal of the Knowledge Economy* 16: 4125–4145. https://doi.org/10.1007/s13132-024-02154-x.

Doussoulin, J. P., and M. Bittencourt. 2022. "How Effective Is the Construction Sector in Promoting the Circular Economy in Brazil and France?: A Waste Input–Output Analysis." *Structural Change and Economic Dynamics* 60: 47–58. https://doi.org/10.1016/j.strueco.2021.10.009.

Dubey, R., A. Gunasekaran, S. J. Childe, T. Papadopoulos, S. F. Wamba, and M. Song. 2016. "Towards a Theory of Sustainable Consumption and Production: Constructs and Measurement." *Resources, Conservation and Recycling* 106: 78–89. https://doi.org/10.1016/j.resconrec.2015.11.008.

Easterby-Smith, M., R. Thorpe, and P. R. Jackson. 2012. *Management Research*. 4th ed. SAGE.

Equinix. 2025. The Digital Pulse of Latin America: Brazil's Rise as a Global Tech Innovator. https://blog.equinix.com/blog/2025/05/07/the-digital-pulse-of-latin-america-brazils-rise-as-a-global-tech-innovator/.

EY. 2024. Brazilian Government Changes Rules Related to Incentives Treatment. https://www.ey.com/en_gl/technical/tax-alerts/brazilian-government-changes-rules-related-to-incentives-treatme.

Fan, L., and D. Wang. 2024. "Natural Resource Efficiency and Green Economy: Key Takeaways on Clean Energy, Globalization, and Innovations in BRICS Countries." *Resources Policy* 88: 104382. https://doi.org/10.1016/j.resourpol.2023.104382.

Fanning, A. L., D. W. O'Neill, J. Hickel, and N. Roux. 2021. "The Social Shortfall and Ecological Overshoot of Nations." *Nature Sustainability* 5, no. 1: 26–36. https://doi.org/10.1038/s41893-021-00799-z.

Fatima, N., Z. Yanting, N. Guohua, and M. K. Khan. 2024. "The Dynamics of Green Technological Innovation and Environmental Policy Stringency for Sustainable Environment in BRICS Economies." *Natural Resources Forum*. https://doi.org/10.1111/1477-8947.12563.

Fernández, L. 2025. Renewable Energy in Brazil – Statistics & Facts. https://www.statista.com/topics/12389/renewable-energy-in-brazil/.

Ferraz, D., and A. Pyka. 2023. "Circular Economy, Bioeconomy, and Sustainable Development Goals: A Systematic Literature Review." *Environmental Science and Pollution Research*: 1–30. https://doi.org/10.1007/s11356-023-29632-0.

Ferronato, N., A. Maalouf, A. Mertenat, et al. 2023. "A Review of Plastic Waste Circular Actions in Seven Developing Countries to Achieve Sustainable Development Goals." *Waste Management & Research: The Journal for a Sustainable Circular Economy* 42, no. 6: 436–458. https://doi.org/10.1177/0734242X231188664.

Figge, F., and A. S. Thorpe. 2023. "Circular Economy, Operational Eco-Efficiency, and Sufficiency. An Integrated View." *Ecological Economics* 204: 107692. https://doi.org/10.1016/j.ecolecon.2022.107692.

Flick, U. 2009. *An Introduction to Qualitative Research*. 4th ed. SAGE.

Galatti, L. G., and J. Baruque-Ramos. 2022. "Circular Economy Indicators for Measuring Social Innovation in the Brazilian Textile and Fashion Industry." *Journal of Cleaner Production* 363: 132485. https://doi.org/10.1016/j.jclepro.2022.132485.

Gallego-Schmid, A., C. López-Eccher, E. Muñoz, et al. 2024. "Circular Economy in Latin America and the Caribbean: Drivers, Opportunities, Barriers and Strategies." *Sustainable Production and Consumption* 51: 118–136. https://doi.org/10.1016/j.spc.2024.09.006.

Gallego-Schmid, A., L. Vásquez-Ibarra, A. B. Guerrero, C. E. Henninger, and R. Rebolledo-Leiva. 2025. "Circular Economy in a Recently Transitioned High-Income Country in Latin America and the Caribbean: Barriers, Drivers, Strengths, Opportunities, Key Stakeholders and Priorities in Chile." *Journal of Cleaner Production* 486: 144429. https://doi.org/10.1016/j.jclepro.2024.144429.

Galvão, G. D. A., S. Evans, P. S. S. Ferrer, and M. M. de Carvalho. 2022. "Circular Business Model: Breaking Down Barriers Towards Sustainable Development." *Business Strategy and the Environment* 31, no. 4: 1504–1524. https://doi.org/10.1002/bse.2966.

Geissdoerfer, M., P. Savaget, N. M. P. Bocken, and E. J. Hultink. 2017. "The Circular Economy – A New Sustainability Paradigm?" *Journal of Cleaner Production* 143: 757–768. https://doi.org/10.1016/j.jclepro.2016.12.048.

Globig, L. K., and T. Sharot. 2024. "Considering Information-Sharing Motives to Reduce Misinformation." *Current Opinion in Psychology* 59: 101852. https://doi.org/10.1016/j.copsyc.2024.101852.

Gomes, L. A. d. V., A. S. Homrich, A. L. F. Facin, et al. 2024. "Enablers for Circular Ecosystem Transformation: A Multi-Case Study of Brazilian Circular Ecosystems." *Sustainable Production and Consumption* 49: 249–262. https://doi.org/10.1016/j.spc.2024.06.009.

Guarnieri, P., A. Bianchini, J. Rossi, et al. 2023. "Transitioning Towards a Circular Economy Under a Multicriteria and the New Institutional Theory Perspective: A Comparison Between Italy and Brazil." *Journal of Cleaner Production* 409: 137094. https://doi.org/10.1016/j.jclepro.2023.137094.

Guest, G., A. Bunce, and L. Johnson. 2006. "How Many Interviews Are Enough?" *Field Methods* 18, no. 1: 59–82. https://doi.org/10.1177/1525822X05279903.

Guzzo, D., V. P. Rodrigues, D. C. A. Pigosso, and J. Mascarenhas. 2022. "Analysis of National Policies for Circular Economy Transitions: Modelling and Simulating the Brazilian Industrial Agreement for Electrical and Electronic Equipment." *Waste Management* 138: 59–74. https://doi.org/10.1016/j.wasman.2021.11.017.

Haas, W., D. Virág, D. Wiedenhofer, and H. von Blottnitz. 2023. "How Circular Is an Extractive Economy? South Africa's Export Orientation Results in Low Circularity and Insufficient Societal Stocks for Service-Provisioning." *Resources, Conservation and Recycling* 199: 107290. https://doi.org/10.1016/j.resconrec.2023.107290.

Halog, A., and S. Anieke. 2021. "A Review of Circular Economy Studies in Developed Countries and Its Potential Adoption in Developing Countries." *Circular Economy and Sustainability* 1, no. 1: 209–230. https://doi.org/10.1007/s43615-021-00017-0.

Hennink, M., and B. N. Kaiser. 2022. "Sample Sizes for Saturation in Qualitative Research: A Systematic Review of Empirical Tests." *Social Science and Medicine* 292: 114523. https://doi.org/10.1016/j.socscimed.2021.114523.

Ingersoll, A. R., C. Glass, and A. Cook. 2024. "Institutional Isomorphic Pressures: The Impact for Women on Boards." *Corporate Governance: The International Journal of Business in Society* 24, no. 4: 865–881. https://doi.org/10.1108/CG-01-2023-0008.

Izurieta, V., V. Guerra, M. E. Urresta, and M. A. Guerra. 2025. "Planning for City Resilience: Barriers and Incentives for Energy Transitions in High- and Middle-Income Neighborhoods in Latin America." *Journal of Architectural Engineering* 31, no. 4. https://doi.org/10.1061/JAEIED.AEENG-2077.

Jungell-Michelsson, J., and P. Heikkurinen. 2022. "Sufficiency: A Systematic Literature Review." *Ecological Economics* 195: 107380. https://doi.org/10.1016/j.ecolecon.2022.107380.

Kauppi, K. 2013. "Extending the Use of Institutional Theory in Operations and Supply Chain Management Research: Review and Research Suggestions." *International Journal of Operations & Production Management* 33, no. 10: 1318–1345. https://doi.org/10.1108/IJOPM-10-2011-0364.

Kauppi, K., and D. Luzzini. 2022. "Measuring Institutional Pressures in a Supply Chain Context: Scale Development and Testing." *Supply Chain Management* 27, no. 7: 79–107. https://doi.org/10.1108/SCM-04-2021-0169.

Keller, A. M., H. A. Taylor, and T. T. Brunyé. 2020. "Uncertainty Promotes Information-Seeking Actions, but What Information?" *Cognitive Research: Principles and Implications* 5, no. 1: 42. https://doi.org/10.1186/s41235-020-00245-2.

Kirchherr, J., L. Piscicelli, R. Bour, et al. 2018. "Barriers to the Circular Economy: Evidence From the European Union (EU)." *Ecological Economics* 150: 264–272. https://doi.org/10.1016/j.ecolecon.2018.04.028.

Kirchherr, J., N.-H. N. Yang, F. Schulze-Spüntrup, M. J. Heerink, and K. Hartley. 2023. "Conceptualizing the Circular Economy (Revisited): An Analysis of 221 Definitions." *Resources, Conservation and Recycling* 194: 107001. https://doi.org/10.1016/j.resconrec.2023.107001.

Korhonen, J., A. Honkasalo, and J. Seppälä. 2018. "Circular Economy: The Concept and Its Limitations." *Ecological Economics* 143: 37–46. https://doi.org/10.1016/j.ecolecon.2017.06.041.

Kurniawan, T. A., A. Maiurova, M. Kustikova, E. Bykovskaia, M. H. D. Othman, and H. H. Goh. 2022. "Accelerating Sustainability Transition in St. Petersburg (Russia) Through Digitalization-Based Circular Economy in Waste Recycling Industry: A Strategy to Promote Carbon Neutrality in Era of Industry 4.0." *Journal of Cleaner Production* 363: 132452. https://doi.org/10.1016/j.jclepro.2022.132452.

Lapola, D. M., P. Pinho, J. Barlow, et al. 2023. "The Drivers and Impacts of Amazon Forest Degradation." *Science* 379, no. 6630. https://doi.org/10.1126/science.abp8622.

Lee, H., K. Shin, and J.-D. Lee. 2020. "Demand-Side Policy for Emergence and Diffusion of Eco-Innovation: The Mediating Role of Production." *Journal of Cleaner Production* 259: 120839. https://doi.org/10.1016/j.jclepro.2020.120839.

Lima, P. d. M., M. F. de Morais, M. A. Constantino, P. L. Paulo, and F. J. C. Magralhães Filho. 2021. "Environmental Assessment of Waste Handling in Rural Brazil: Improvements Towards Circular Economy." *Cleaner Environmental Systems* 2: 100013. https://doi.org/10.1016/j.cesys.2021.100013.

Lin, J., Z. Luo, and X. Luo. 2020. "Understanding the Roles of Institutional Pressures and Organizational Innovativeness in Contextualized Transformation Toward e-Business: Evidence From Agricultural Firms." *International Journal of Information Management* 51: 102025. https://doi.org/10.1016/j.ijinfomgt.2019.10.010.

Liu, K. 2025. "Contested Circular Economy and Mixed Social Implications From Practice: A Scoping Review." *Sustainable Development* 33, no. 2: 2154–2170. https://doi.org/10.1002/sd.3229.

Liu, H., W. Ke, K. K. Wei, J. Gu, and H. Chen. 2010. "The Role of Institutional Pressures and Organizational Culture in the Firm's Intention to Adopt Internet-Enabled Supply Chain Management Systems." *Journal of Operations Management* 28, no. 5: 372–384. https://doi.org/10.1016/j.jom.2009.11.010.

Liu, S., and H. Zhang. 2024. "Governance Quality and Green Growth: New Empirical Evidence From BRICS." *Finance Research Letters* 65: 105566. https://doi.org/10.1016/j.frl.2024.105566.

Longo, S., M. Cellura, L. Q. Luu, T. Q. Nguyen, R. Rincione, and F. Guarino. 2024. "Circular Economy and Life Cycle Thinking Applied to the Biomass Supply Chain: A Review." *Renewable Energy* 220: 119598. https://doi.org/10.1016/j.renene.2023.119598.

Machado, D. M., B. Gambalonga Júnior, L. Simão, et al. 2023. "Valorization of Brazilian Waste Foundry Sand From Circular Economy Perspective." *Journal of Cleaner Production* 407: 137046. https://doi.org/10.1016/j.jclepro.2023.137046.

Malterud, K., V. D. Siersma, and A. D. Guassora. 2016. "Sample Size in Qualitative Interview Studies: Guided by Information Power." *Qualitative Health Research* 26, no. 13: 1753–1760. https://doi.org/10.1177/1049732315617444.

Mendoza, J. M. F., M. Sharmina, A. Gallego-Schmid, G. Heyes, and A. Azapagic. 2017. "Integrating Backcasting and Eco-Design for the Circular Economy: The BECE Framework." *Journal of Industrial Ecology* 21, no. 3: 526–544. https://doi.org/10.1111/jiec.12590.

Mensah, J. 2019. "Sustainable Development: Meaning, History, Principles, Pillars, and Implications for Human Action: Literature Review." *Cogent Social Science* 5, no. 1. https://doi.org/10.1080/23311886.2019.1653531.

Merino-Salazar, P., A. A. Assunção, M. Amable, F. G. Benavides, and D. G. R. de Porras. 2023. "Informal Employment as a Fundamental Determinant of Mental Health in Latin America and the Caribbean." *Lancet* 402, no. 10410: 1309–1311. https://doi.org/10.1016/S0140-6736(23)02051-2.

Merkus, E. 2024. "The Economic Consequences of Environmental Enforcement: Evidence From an Anti-Deforestation Policy in Brazil." *World Development* 181: 106646. https://doi.org/10.1016/j.worlddev.2024.106646.

Miemczyk, J. 2008. "An Exploration of Institutional Constraints on Developing End-Of-Life Product Recovery Capabilities." *International Journal of Production Economics* 115, no. 2: 272–282. https://doi.org/10.1016/j.ijpe.2008.04.013.

Mominur Rahman, M., M. Golam Faruque, and M. Emran Hossain. 2024. "Does Good Governance Intensify the Impact of Energy Finance on Globalization? Evidence From BRICS Nations." *Research in Globalization* 9: 100264. https://doi.org/10.1016/j.resglo.2024.100264.

Monteiro, A. G. d. A., G. Scur, C. A. Mattos, and M. C. de Oliveira. 2024. "Circular Economy in the Brazilian Chemical Industry: A Proposal for a Circularity Index." *Cleaner Engineering and Technology* 19: 100730. https://doi.org/10.1016/j.clet.2024.100730.

Murray, A., K. Skene, and K. Haynes. 2017. "The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context." *Journal of Business Ethics* 140, no. 3: 369–380. https://doi.org/10.1007/s10551-015-2693-2.

Mvelase, L., and S. Ferrer. 2024. "The Economywide Impact of Bioethanol Production in South Africa." *Energy Conversion and Management: X* 24: 100729. https://doi.org/10.1016/j.ecmx.2024.100729.

National Congress. 2010. Law No 12,305, National Policy of Solid Waste [Política Nacional de Resíduos Sólidos] of 22 August 2010. https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12305.htm.

National Congress. 2024. Law No 12,082 Estratégia Nacional de Economia Circular of 27 June 2024. https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2024/decreto/D12082.htm.

Oliveira Silva, W. D., and D. C. Morais. 2021. "Transitioning to a Circular Economy in Developing Countries: A Collaborative Approach for Sharing Responsibilities in Solid Waste Management of a Brazilian Craft Brewery." *Journal of Cleaner Production* 319: 128703. https://doi.org/10.1016/j.jclepro.2021.128703.

Ospina-Mateus, H., L. Marrugo-Salas, L. Castilla Castilla, et al. 2023. "Analysis in Circular Economy Research in Latin America: A Bibliometric Review." *Heliyon* 9, no. 9: e19999. https://doi.org/10.1016/j.heliyon.2023.e19999.

Paes, M. X., J. A. Puppim de Oliveira, S. D. Mancini, and J. Rieradevall. 2024. "Waste Management Intervention to Boost Circular Economy and Mitigate Climate Change in Cities of Developing Countries: The Case of Brazil." *Habitat International* 143: 102990. https://doi.org/10.1016/j.habitatint.2023.102990.

Payne, A., and E. M. Kwofie. 2024. "Unleashing Circular Economy Potential in Agriculture: Integrating Social Impact Assessment With the ReSOLVE Framework as a Tool for Sustainable Development." *Sustainable Development* 32, no. 5: 5074–5089. https://doi.org/10.1002/sd.2952.

Peña, C., B. Civit, A. Gallego-Schmid, et al. 2021. "Using Life Cycle Assessment to Achieve a Circular Economy." *International Journal of Life Cycle Assessment* 26, no. 2: 215–220. https://doi.org/10.1007/s11367-020-01856-z.

Pimentel Pincelli, I., A. de Borges Castilhos Júnior, M. Seleme Matias, and E. Wanda Rutkowski. 2021. "Post-Consumer Plastic Packaging Waste Flow Analysis for Brazil: The Challenges Moving Towards a Circular Economy." *Waste Management* 126: 781–790. https://doi.org/10.1016/j.wasman.2021.04.005.

Presidência da República. 2023. Decreto No 11.413, de 13 de Fevereiro de 2023. https://www.planalto.gov.br/ccivil_03/_Ato2023-2026/2023/Decreto/D11413.htm.

Puglieri, F. N., R. Salvador, O. Romero-Hernandez, et al. 2022. "Strategic Planning Oriented to Circular Business Models: A Decision Framework to Promote Sustainable Development." *Business Strategy and the Environment* 31, no. 7: 3254–3273. https://doi.org/10.1002/bse.3074.

Ranta, V., L. Aarikka-Stenroos, P. Ritala, and S. J. Mäkinen. 2018. "Exploring Institutional Drivers and Barriers of the Circular Economy:

A Cross-Regional Comparison of China, the US, and Europe." *Resources, Conservation and Recycling* 135: 70–82. https://doi.org/10.1016/j.resconrec.2017.08.017.

Rebehy, P. C. P. W., A. L. Costa, C. A. G. B. Campello, D. de Freitas Espinoza, and M. J. Neto. 2017. "Innovative Social Business of Selective Waste Collection in Brazil: Cleaner Production and Poverty Reduction." *Journal of Cleaner Production* 154: 462–473. https://doi.org/10.1016/j.jclepro.2017.03.173.

Rebehy, P. C. P. W., A. P. Salgado Junior, A. R. Ometto, D. d. F. Espinoza, E. Rossi, and J. C. Novi. 2023. "Municipal Solid Waste Management (MSWM) in Brazil: Drivers and Best Practices Towards to Circular Economy Based on European Union and BSI." *Journal of Cleaner Production* 401: 136591. https://doi.org/10.1016/j.jclepro.2023.136591.

Ribeiro, E. M., R. M. Barros, G. L. Tiago Filho, et al. 2016. "Power Generation Potential in Posture Aviaries in Brazil in the Context of a Circular Economy." *Sustainable Energy Technologies and Assessments* 18: 153–163. https://doi.org/10.1016/j.seta.2016.10.009.

Richardson, K., W. Steffen, W. Lucht, et al. 2023. "Earth Beyond Six of Nine Planetary Boundaries." *Science Advances* 9, no. 37. https://doi.org/10.1126/sciadv.adh2458.

Rodrigues, M., M. D. N. Rodriges, R. P. Borges, W. C. de Azevedo Junior, and Â. A. Ebling. 2024. "Determinants of Greenhouse Gas Emissions by Brazilian Agricultural Sector." *Anais da Academia Brasileira de Ciências* 96, no. suppl 1. https://doi.org/10.1590/0001-3765202420240345.

Rossi, D., F. H. Lermen, and M. E. Echeveste. 2025. "Circular Product Development Strategies for Sustainable Production and Consumption Based on Waste Valorization." *Management of Environmental Quality: An International Journal* 36, no. 2: 470–490. https://doi.org/10.1108/MEQ-04-2024-0179.

Sachan, A., U. K. Sahu, A. K. Pradhan, and R. Thomas. 2023. "Examining the Drivers of Renewable Energy Consumption: Evidence From BRICS Nations." *Renewable Energy* 202: 1402–1411. https://doi.org/10.1016/j.renene.2022.11.080.

Salvador, R., M. V. Barros, L. M. da Luz, C. M. Piekarski, and A. C. de Francisco. 2020. "Circular Business Models: Current Aspects That Influence Implementation and Unaddressed Subjects." *Journal of Cleaner Production* 250: 119555. https://doi.org/10.1016/j.jclepro.2019.119555.

Salvador, R., R. B. Pereira, G. F. Sales, V. C. V. de Oliveira, A. Halog, and A. C. De Francisco. 2022. "Current Panorama, Practice Gaps, and Recommendations to Accelerate the Transition to a Circular Bioeconomy in Latin America and the Caribbean." *Circular Economy and Sustainability* 2, no. 1: 281–312. https://doi.org/10.1007/s43615-021-00131-z.

Schmidt, J. L., S. Sehnem, and J. D. Spuldaro. 2024. "Blockchain and the Transition to the Circular Economy: A Literature Review." *Corporate Social Responsibility and Environmental Management* 31, no. 3: 2010–2032. https://doi.org/10.1002/csr.2674.

Schöggl, J.-P., L. Stumpf, and R. J. Baumgartner. 2020. "The Narrative of Sustainability and Circular Economy - A Longitudinal Review of Two Decades of Research." *Resources, Conservation and Recycling* 163: 105073. https://doi.org/10.1016/j.resconrec.2020.105073.

Schröder, P., M. Albaladejo, A. Ribas, M. Macewen, and J. Tilkanen. 2020. The circular Economy in Latin America and the Caribbean Opportunities for Building Resilience. https://www.chathamhouse.org/2020/09/circular-economy-latin-america-and-caribbean/01-introduction.

Schroeder, P., P. Dewick, S. Kusi-Sarpong, and J. S. Hofstetter. 2018. "Circular Economy and Power Relations in Global Value Chains: Tensions and Trade-Offs for Lower Income Countries." *Resources, Conservation and Recycling* 136: 77–78. https://doi.org/10.1016/j.resconrec.2018.04.003.

Sell, L. G., M. Tedesco, F. J. Simioni, S. Sehnem, J. F. Soares, and L. M. Coelho Junior. 2023. "Circular Economy Practices Using the ReSOLVE Framework: An Assessment by Sector and Scale in the Brazilian Planted Tree Industry." *Journal of Cleaner Production* 433: 139780. https://doi.org/10.1016/j.jclepro.2023.139780.

Selseng, T., and A. Gjertsen. 2024. "What Drives Sustainable Climate Change Adaptation at the Local Level? Approaching Three Knowledge Gaps." *Sustainable Development* 32, no. 6: 6504–6519. https://doi.org/10.1002/sd.3043.

Sengupta, D., I. M. S. K. Ilankoon, K. Dean Kang, and M. Nan Chong. 2022. "Circular Economy and Household e-Waste Management in India: Integration of Formal and Informal Sectors." *Minerals Engineering* 184: 107661. https://doi.org/10.1016/j.mineng.2022.107661.

Sohal, A., A. A. Nand, P. Goyal, and A. Bhattacharya. 2022. "Developing a Circular Economy: An Examination of SME'S Role in India." *Journal of Business Research* 142: 435–447. https://doi.org/10.1016/j.jbusres.2021.12.072.

Tedesco, M., F. J. Simioni, S. Sehnem, J. F. Soares, and L. M. Coelho Junior. 2022. "Assessment of the Circular Economy in the Brazilian Planted Tree Sector Using the ReSOLVE Framework." *Sustainable Production and Consumption* 31: 397–406. https://doi.org/10.1016/j.spc.2022.03.005.

TI Inside. 2025. Brazil Opens Innovation Hub for Mayors and Cities. https://tiinside.com.br/en/07/04/2025/Brazil-opens-innovation-hub-for-mayors-and-cities/.

Tian, P., H. Zhong, X. Chen, et al. 2024. "Keeping the Global Consumption Within the Planetary Boundaries." *Nature* 635, no. 8039: 625–630. https://doi.org/10.1038/s41586-024-08154-w.

Udeagha, M. C., and N. Ngepah. 2023. "The Drivers of Environmental Sustainability in BRICS Economies: Do Green Finance and Fintech Matter?" *World Development Sustainability* 3: 100096. https://doi.org/10.1016/j.wds.2023.100096.

Umar, M., N. Mirza, Z. Umar, and T. Sokolova. 2024. "Green Recovery in BRICS Economies: The Role of Mineral Resources, Energy Productivity, and Green Innovation in Sustainable Development." *Resources Policy* 98: 105353. https://doi.org/10.1016/j.resourpol.2024.105353.

Valerio, M. A., N. Rodriguez, P. Winkler, et al. 2016. "Comparing Two Sampling Methods to Engage Hard-To-Reach Communities in Research Priority Setting." *BMC Medical Research Methodology* 16, no. 1: 146. https://doi.org/10.1186/s12874-016-0242-z.

van de Vijver, F. J. R. 2010. "Emic–Etic Distinction." In *Encyclopedia of Cross-Cultural School Psychology*, 422–423. Springer US. https://doi.org/10.1007/978-0-387-71799-9_158.

Velenturf, A. P. M., and P. Purnell. 2021. "Principles for a Sustainable Circular Economy." *Sustainable Production and Consumption* 27: 1437–1457. https://doi.org/10.1016/j.spc.2021.02.018.

Vilaça, A. S. I., L. Simão, O. R. K. Montedo, A. P. Novaes de Oliveira, and F. Raupp-Pereira. 2022. "Waste Valorization of Iron Ore Tailings in Brazil: Assessment Metrics From a Circular Economy Perspective." *Resources Policy* 75: 102477. https://doi.org/10.1016/j.resourpol.2021.102477.

Wang, Z., and Y. Huang. 2023. "Natural Resources and Trade-Adjusted Carbon Emissions in the BRICS: The Role of Clean Energy." *Resources Policy* 86: 104093. https://doi.org/10.1016/j.resourpol.2023.104093.

Wang, X., Y. Li, R. Zhou, Q. Yang, and C. Shi. 2024. "How China Can Promote the Outer Circular Economy Under Policy Uncertainty." *International Review of Economics and Finance* 96: 103615. https://doi.org/10.1016/j.iref.2024.103615.

Wang, Y., J. Zhen, and B. Wang. 2024. "Analyzing the Role of Environmental Policy Innovations and Natural Resource Management in Driving Circular Economy Forward: Evidence From BRICS

Economies." *Journal of Environmental Management* 371: 123252. https://doi.org/10.1016/j.jenvman.2024.123252.

Weber, C. T., L. F. Trierweiler, and J. O. Trierweiler. 2020. "Food Waste Biorefinery Advocating Circular Economy: Bioethanol and Distilled Beverage From Sweet Potato." *Journal of Cleaner Production* 268: 121788. https://doi.org/10.1016/j.jclepro.2020.121788.

Weisz, E., D. M. Herold, N. K. Ostern, R. Payne, and S. Kummer. 2025. "Artificial Intelligence (AI) for Supply Chain Collaboration: Implications on Information Sharing and Trust." *Online Information Review* 49, no. 1: 164–181. https://doi.org/10.1108/OIR-02-2024-0083.

Xavier, L. H., M. Ottoni, and J. Lepawsky. 2021. "Circular Economy and e-Waste Management in the Americas: Brazilian and Canadian Frameworks." *Journal of Cleaner Production* 297: 126570. https://doi.org/10.1016/j.jclepro.2021.126570.

Xue, X., J. Dou, and Y. Shang. 2021. "Blockchain-Driven Supply Chain Decentralized Operations – Information Sharing Perspective." *Business Process Management Journal* 27, no. 1: 184–203. https://doi.org/10.1108/BPMJ-12-2019-0518.

Yao, S., T. Li, and Y. Li. 2023. "Promoting Sustainable Fossil Fuels Resources in BRICS Countries: Evaluating Green Policies and Driving Renewable Energy Development." *Resources Policy* 85: 103990. https://doi.org/10.1016/j.resourpol.2023.103990.

Yeboah, S. D., J. G. Gatsi, M. O. Appiah, and M. P. Fumey. 2024. "Examining the Drivers of Inclusive Growth: A Study of Economic Performance, Environmental Sustainability, and Life Expectancy in BRICS Economies." *Research in Globalization* 9: 100267. https://doi.org/10.1016/j.resglo.2024.100267.

Zhang, Q., B. L. Oo, and B. T. H. Lim. 2024. "Modeling Influence Mechanism of Factors on Corporate Social Responsibility Implementation: Evidence From Chinese Construction Firms." *Engineering Construction and Architectural Management* 31, no. 1: 324–362. https://doi.org/10.1108/ECAM-07-2021-0603.

Zhu, Q., J. Sarkis, and Y. Geng. 2005. "Green Supply Chain Management in China: Pressures, Practices and Performance." *International Journal of Operations & Production Management* 25, no. 5: 449–468. https://doi.org/10.1108/01443570510593148.

Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Table S1:** Main priorities reported by interviewees (each letter represents one sector. A: Academia, B: Business, C: Consumers, N: Non-governmental Organizations, P: Policymakers).