

# JUST2CE

A Just Transition to Circular Economy



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# CHAPTER 17

## Global Environmental Justice and Circular Economy

## Chapter 17. Global Environmental Justice and Circular Economy

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### Abstract

This chapter explores the intersections between the circular economy (CE) and global environmental justice (EJ), examining both conceptual and empirical levels.

The chapter begins by acknowledging the contribution of EJ research in highlighting the unequal distribution of environmental costs caused by industrial social metabolism. It argues that for the CE to promote global EJ, a degrowth approach is necessary. Current research reveals that prevailing CE policies and practices generate social and territorial impacts similar to those of a linear economy.

Furthermore, empirical evidence demonstrates that different social actors perceive the CE differently, depending on whether it is mobilized by EJ organizations or by state and corporate actors. The chapter delves into a case study analysis of waste-pickers in Rio de Janeiro (Brazil) as a significant group involved in repair-reuse-recycle activities, particularly in the GS, providing crucial yet undervalued services to the CE.

In conclusion, the chapter proposes key recommendations for a just CE: 1) recognizing workers, both paid and unpaid, as primary stakeholders in the transition; 2) addressing cost-shifting issues and ensuring equitable distribution of costs during the transition; and 3) promoting inclusive decision-making processes that involve marginalized groups and give their perspectives equal consideration.

**Keywords:** Global Environmental Justice; Social Metabolism; Ecological Distribution Conflicts; Ecological Debt; Working Class Environmentalism

The problem addressed by this contribution is the potential for the circular economy (CE) to perpetuate global environmental injustice (EJ) due to its current formulations, which generate unequal social and territorial impacts. This study highlights the need to consider environmental justice and address historical inequalities in CE policies and practices.

## 17.1 Introduction

The JUST2CE consortium focuses on the idea that transitioning to a circular economy (CE) should prioritize justice in all aspects. The main objective is to explore how the CE model can be a sustainable and socially just alternative to the traditional linear economy. Achieving this goal involves examining the research on Environmental Justice (EJ) and identifying its connections with CE research.

While there is a larger body of literature on CE compared to EJ (around 18,000 entries versus 8,000 entries in Scopus<sup>30</sup>), EJ research actually predates CE research by about 15 years. The interdisciplinary field of EJ emerged in the United States in the mid-1980s, around the same time as the field of Ecological Economics. Scholars in both EJ and Ecological Economics have developed alternative theories that address the unequal and unsustainable impacts of material and energy flows associated with GDP growth on vulnerable communities and ecosystems (Martinez-Alier, 1987; Bullard, 1990).

It's worth noting that Kenneth Boulding (1966), one of the pioneers of Ecological Economics, wrote a paper titled "The Economics of the Coming Spaceship Earth." This paper influenced scholars D.W. Pearce and K.R. Turner, who were the first to use the term "circular economy" in their handbook of environmental economics (Pearce & Turner, 1990). Boulding criticized the linear "cowboy economy" and laid the foundation for research on the material balance of the economy (D'Alisa, 2019). Ecological economists have since demonstrated that viewing the economy as a linear system of endless expansion disregards the environmental limits and boundaries required for sustainable resource extraction and waste management (Daly, 1997). Concurrently, experts in Environmental Engineering, Innovation, and Technology Studies, specifically in the fields of industrial ecology and eco-design, have focused on practical research to enhance material efficiency and extend product lifespan. These efforts aim to address the ongoing demand for new resources and the urgent need to reduce the exponential growth of industrial waste (Ghisellini et al., 2016).

Since the early 2000s, a new approach to EJ has emerged, known as the Ecological Distribution Conflict framework. This framework, influenced by ecological economics, examines the unequal distribution of costs and benefits associated with the linear growth of the economy (Martinez-Alier, 2002). It specifically highlights the need to address environmental distributive injustice that is inherently linked to the "take-make-waste society" model. Notably, landmark literature focusing on waste conflicts and toxic disposal in impoverished, vulnerable, and racialized areas worldwide have played a crucial role in developing an EJ framework (Pellow, 2002; Pellow, 2007; D'Alisa & Armiero, 2012).

Both CE and EJ scholarship share two primary concerns: transitioning from a linear economic path to a circular one and addressing the escalating issue of industrial waste generation. However, the CE perspective often overlooks the unequal distribution of costs and benefits associated with the linear economy and potential transitions to a circular economy. For example, it fails to thoroughly consider how transforming the waste sector will impact different actors involved in formal and informal waste management globally. This partial neglect helps explain why CE and EJ scholars have not extensively incorporated each other's research findings, despite having

ample opportunities for collaboration. Bridging this knowledge gap necessitates a comprehensive exploration of EJ theories developed over the past three decades and identifying the most relevant conceptual tools for CE research and policy.

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<sup>30</sup> Retrieved in September 2022

## 17.2 Global Environmental Justice: a conceptual toolbox

The EJ scholarship originates in the second half of the 1960s in the anti-toxic struggles of Black, Latino, and Native American communities in the U.S.A. (Bullard, 1993; LaDuke, 1999). The concept of EJ embodied community-led expertise that demonstrated the correlation between sites of pollution disposal and exposure, racial discrimination, and poverty. Statistical evidence of the existence of "environmental racism" was thus established via social science research (Bryant & Mohai, 1992), giving rise to a new body of scholarship, which has produced detailed analyses of the unequal distribution of social and environmental costs between different social groups.

This section introduces a conceptual toolbox with four key concepts related to framing the CE within the context of EJ: 1) social metabolism; 2) ecological distribution conflicts; 3) climate and ecological debt, and 4) working-class environmentalism.

The concepts covered are as follows:

1. **Social Metabolism:** Refers to the material and energy flows necessary for the functioning of societies. It highlights the connection between economic growth, industrial social metabolism, and the unequal distribution of environmental costs across social groups and regions. According to Martinez Alier (2012), addressing inequalities related to environmental justice requires an alliance between the concept of "degrowth" in wealthier nations and the "environmentalism of the poor" from regions in the GS.
2. **Ecological Distribution Conflicts (EDCs):** EDCs arise from the unequal distribution of benefits and costs related to the use of the biophysical environment. The Environmental Justice Atlas (EJAtlas) is an essential inventory of these conflicts, involving indigenous communities, rural populations, and marginalized workers (Temper et al., 2015). EDCs demonstrate that the current formulations of the CE can perpetuate global environmental injustices.
3. **Ecological and Climate Debt:** Signifies the unequal distribution of costs and benefits resulting from the increase in social metabolism between the GN and South (Martinez-Alier, 2020). It stems from historical and present resource plundering, waste disposal, and ecological damage caused by colonizing countries (Pigrau et al., 2014). Reparations for ecological and climate debt are demanded, highlighting the need to reformulate the CE as a response to ecological unsustainability and as a means of debt repayment.
4. **Working-Class Environmentalism:** From an EJ perspective, the working class can be defined as "those who make a living out of physical work performed in agriculture, industry or service, typically occupying the bottoms of the labour hierarchy, i.e. the lowest paying, highest risk jobs" (Barca 2012:2). Explores the environmental agency of workers engaged in struggles to defend both the environment and their labor conditions. It emphasizes the environmental injustices faced by working-class communities and recognizes the diverse actors involved in GEJ movements, including women, racialized individuals, and those in unwaged or informal labor.

These concepts provide a foundation for understanding the intersections between CE and EJ in a global context, and highlight the need to address social and environmental inequalities in the pursuit of a just transition to a circular economy.

## 17.3 Methodology

This study was conducted in three phases: a bibliometric analysis and literature review, an analysis of empirical data from the EJ Atlas, and complemented with a case study analysis.

For the bibliometric analysis, we searched the Scopus database, which contains a large collection of research papers. We looked for documents that discussed both the CE and EJ in their titles, abstracts, or keywords. After filtering out the results, we identified a set of 11 relevant documents. Using bibliometric software (VosViewer), we analyzed the connections between different items mentioned in these papers, such as keywords and concepts. This helped us identify clusters of related topics within the literature, and understand the distribution of topics and research trends within the fields of CE and EJ. By examining how often certain keywords appear together in different papers, we gain insights into the relationships and structures within these research areas.

We conducted a co-occurrence analysis to examine the relationships between concepts based on bibliographic data such as journals and scientific areas. We assigned different colors to clusters of keywords, and the size of the circles represented their frequency in the dataset. The strength of the links between keywords indicated how often they appeared together in the same papers (**Figure 17.1**).

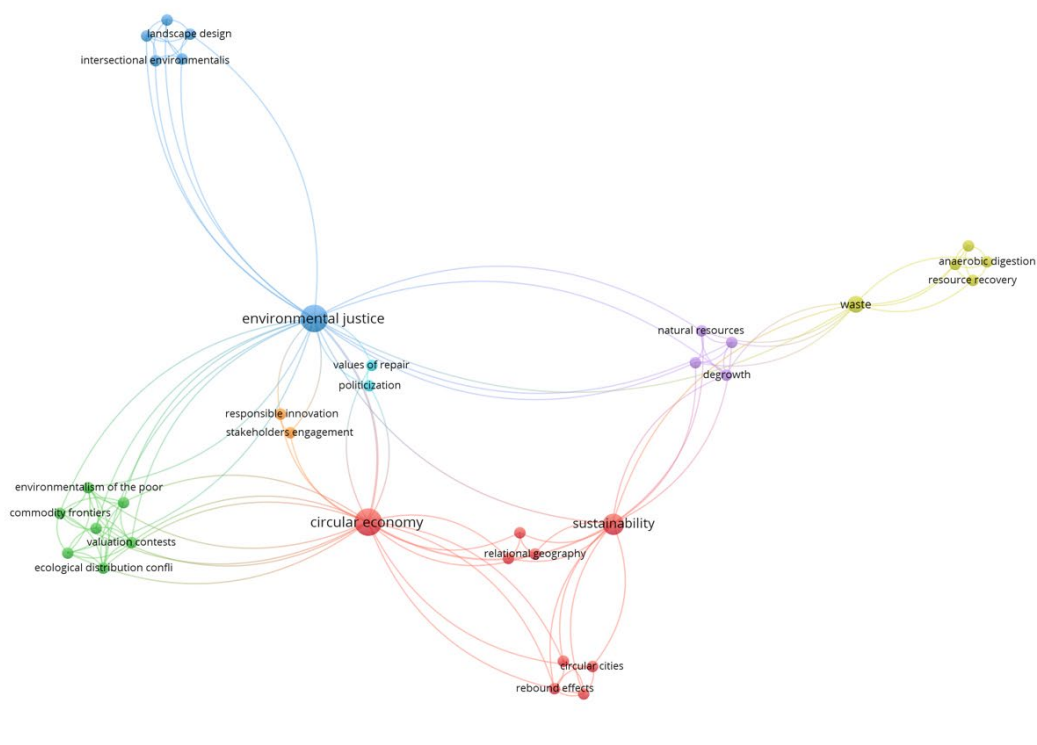


Figure 17.1 Bibliometric network based on keywords

After the bibliometric analysis, we proceeded to conduct a critical review of the selected papers (**Table 17.1**). We qualitatively and analytically grouped them based on concepts such as social metabolism, environmental conflicts, ecological/climate debt, and working-class environmentalism. This allowed us to explore the intersection of labor, gender, and just transition, which has been largely overlooked.

Table 17.1 Selected papers from Scopus database

#	Title	Authors	Year	Source
1	<a href="#">"Nobody" matters in circular landscapes</a>	(Wuyts & Marin, 2022)	2022	Local Environment
2	<a href="#">Scientists' warning against the society of waste</a>	(Marín-Beltrán et al., 2022)	2022	Science of the Total Environment
3	<a href="#">Mapping ecological distribution conflicts: The EJAtlas</a>	(Martinez-Alier, 2021)	2021	Extractive Industries and Society
4	<a href="#">Future-proofing capitalism: The paradox of the circular economy for plastics</a>	(Mah, 2021)	2021	Global Environmental Politics
5	<a href="#">Clarifying rebound effects of the circular economy in the context of sustainable cities</a>	(Chen, 2021)	2021	Sustainable Cities and Society
6	<a href="#">Repair for a broken economy: Lessons for circular economy from an international interview study of repairers</a>	(Niskanen et al., 2021)	2021	Sustainability (Switzerland)
7	<a href="#">Politicising Circular Economy: what can we learn from Responsible Innovation?</a>	(Pansera et al., 2021)	2021	Journal of Responsible Innovation
8	<a href="#">The trilemma of waste-to-energy: A multi-purpose solution</a>	(Malinauskaite & Jouhara, 2019)	2019	Energy Policy
9	<a href="#">Conceptualizing waste as a resource: Urban biosolids processing in the rural landscape</a>	(Mason-Renton & Luginaah, 2018)	2018	Canadian Geographer
10	<a href="#">Interrogating the circular economy: the moral economy of resource recovery in the EU</a>	(Gregson et al., 2015)	2015	Economy and Society
11	<a href="#">Waste Picking as Social Provisioning</a>	(Velasco et al., 2021)	2021	Academy of Management 81st

	<a href="#">Constructing a Socially Regenerative Circular Economy</a>		Annual Meeting (26 July 2021): 1-6.
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In addition to the bibliometric analysis, we also explored empirical data using the Environmental Justice Atlas database (<https://ejatlas.org/>). This database is the result of collaboration among scientists, citizens, and activists and documents cases of environmental conflicts. These conflicts are categorized based on the type of activity involved, such as nuclear, mineral extraction, waste management, and more. The EJ Atlas allows filtering and browsing the cases based on various criteria, providing valuable insights into the dynamics of environmental justice.

## 17.4 Results

Out of the 3740 cases in the EJ Atlas, only 13 mentioned the Circular Economy in their descriptions or as an alternative solution<sup>31</sup>. By analyzing these case studies, we aimed to understand how the concept of CE is integrated into public policies, business criteria, or proposals from environmental justice organizations and affected communities.

We present the main features of the selected cases according to three criteria: 1) if CE is being mentioned as part of a policy goal proposed by public authorities; 2) if it's presented as a business solution, or 3) if it is emerging as an alternative proposed by the communities/EJOs.

We are aware that this result is not a representative sample, for example, the overrepresentation of China cannot be used as a conclusion for how CE practices are more relevant there. Nevertheless, this sample is a useful entry point into the different ways in which CE intersects with EJ mobilizations.

These cases are distributed across different regions: seven in Asia (China), two in Africa (Tunisia and Mozambique), one in Europe (Poland), two in North America (Canada), and one in South America (Argentina).

Out of the thirteen cases, eight are classified as waste management conflicts, two as mining conflicts, and three as fossil fuel extraction conflicts. However, upon examining the specific conflict types, it becomes apparent that all of them have a direct relation to waste. Mining conflicts involve landfills, toxic waste treatment, and uncontrolled dumpsites, while fossil fuel conflicts are associated with emissions.

The analyzed conflicts range from 2009 to 2020, with only four of the thirteen cases having been updated within the 2022. It is noted that time is an important factor in analyzing the EJAtlas, as temporary wins can sometimes result in permanent losses. Projects may eventually be approved if protests subside or new legislation is ratified, even after years of opposition from Environmental Justice Organizations (EJOs).

It's important to note that the EJ Atlas is a complementary knowledge tool that enriches our understanding of the justice dimension in the CE. While the EJ Atlas may have representation biases and not capture all relevant cases, we acknowledge these limitations and provide in the next section a discussion of a case study that is not referenced in that database but also highlights the global environmental justice challenges associated with the transition to a CE.

## The case of waste-pickers in Rio de Janeiro – Brazil

The study of waste-pickers<sup>32</sup> in the GS can bring important insights to the discussion about how circular activities already in place are not recognized as such, and how they can be jeopardised by the implementation of CE policies. Waste-pickers are important enablers of sorting, repairing and recycling activities, not to mention the environmental services conveyed by them. In Brazil they represent 1 million workers (MNCR, 2022); in India, this activity represents 1% of the informal sector, which means around 2 million workers; in Ghana, waste-picking is one of the top 5 occupations in the informal sector. Generally speaking, waste-pickers form a numerous workforce in countries where the large majority of workers are informally or self-employed (WIEGO, 2020). In this section, we draw from previous research (Meira, 2017) to offer an overview of a CE-related environmental conflict involving informal waste-pickers in Brazil.

In the background of this case is the landslide in a waste dumpsite inside Morro dos Prazeres, a favela in the center region of Rio de Janeiro, Brazil, that killed almost 50 people in 2010 (IAI, 2010; Meira, 2017). This tragic incident was followed by a series of protests drawing attention to the severe risk the location was under, and the potential equivalent episodes that could happen due to the same reasons – the accumulation of huge quantities of solid waste in a number of areas within the favela. In that same year (2010), the Brazilian National Policy on Waste was published and included important changes in the legislation, among which: the formal recognition of waste-pickers as workers; the obligation to include those workers in the municipal waste management plans; and the obligation to shut down all the illegal dumpsites in Brazil. The new regulatory framework introduced the principle of shared responsibility for the life cycle of products, a CE-like policy, and highlighted the need to include waste pickers as “agents of change”. Their service and “economic emancipation” should have been considered as a priority in the municipal waste management plans.

The National Movement of Waste-Pickers, founded in 2001, offered fundamental support to the workers impacted by the national policy. In fact, the actions undertaken by the government in implementing the new policy left many waste-pickers behind, either by restraining access to the dumpsites (and therefore the recyclables), or by imposing the high costs of formalisation upon the workers themselves (e.g. health insurance and insalubrity costs), resulting in an insufficient inclusion of these workers in the municipal waste management plans.

In Rio de Janeiro, ¼ of the total population lives in favelas, home of most waste-pickers. In addition to the high population density, dwellers are subject to eviction threats, and to the drug traffickers and paramilitary factions that control the supply of basic services (e.g. electricity and gas). After the 2010 landslide, a women-led movement in the Morro dos Prazeres community founded an organisation called “Reciclação”, which resorted to collective action to encourage the participation of residents in the waste sorting and environmental preservation of the favela. The financial support came from both the state and the private sector, the organisation achieved much

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<sup>32</sup> For the purpose of this chapter we use “waste pickers” as general term to represent the workers in the waste sector as defined by the International Alliance of Waste Pickers: “a) individuals involved in the collection, segregation, sorting, and sale of recyclables in an informal or semi-formal capacity as own-account workers; b) itinerant waste pickers, informal/semi-formal waste collectors engaged in transporting, sorting, and selling recyclables, informal workers engaged in transporting or sorting within the informal or semi-formal sorting/recovery/recycling sector, or any of the above who are integrated into municipal waste management systems and continue to sort and sell recyclables; c) Former recyclers who occupy new roles in their recycling organisations in environmental promotion, caregiving, health programs, gender programs, etc.” (p.1, Globalrec, 2022).



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higher rates of separation of recyclable materials than the rest of the city (71% against 3%) (Meira & Muradian, 2016).

The uneven distribution of the costs and benefits of public services allows us to characterise favelas as "sacrifice zones" (Bullard, 1994). As the workforce with the lowest income is concentrated in these territories, the environmental loads tend to be concentrated there (Cunha et al., 2015); in some cases, such as that of the Morro dos Prazeres, this spatial injustice causes the emergence of "working-class environmentalism". In this case, a women-led, bottom-up model of CE involving waste pickers and local cooperatives was developed - even though it has not been officially recognized as CE.

## 17.5 Discussion

The literature on the intersection of CE and EJ has focused on several key topics, including cities, rebound effect, commodity frontiers, territorial approaches, recycling and waste, degrowth, politicization, and responsible innovation. However, rather than indicating a common approach, these themes reflect the fragmented and dispersed nature of the literature. The articles cover a wide range of topics and utilize different case studies, often at incompatible geographical scales (local, national, and global). Furthermore, they are published in diverse scientific journals, drawing on heterogeneous pieces of literature.

Geographically, the fragmentation of the EJ/CE debate is evident. Some papers adopt a global scale and examine various objects such as waste increase, environmental conflicts, plastic recycling, and machine repair work. Other papers focus on specific regions or local scales within countries, while some articles have a theoretical or conceptual dimension without specific geographical references. Due to the wide scattering of these texts, it becomes challenging to compare them as they differ significantly in terms of geographical basis and topic.

In terms of journals and literature mobilization, there is also a significant fragmentation. The papers can be classified into three main fields: social sciences, management and innovation, and sustainability and environmental science. Each field has its own methodological requirements and approaches to the transition. While some articles within each field share common references, others have no overlap with any other article. The literature fragmentation is apparent in the diversity of journals and approaches utilized.

Despite the dispersion of references, there are some common points that can be analyzed comprehensively. The encounter between CE and EJ emerged relatively recently, with articles focusing on topics such as global social metabolism, consumption patterns, waste, and the inclusion of informal CE actors. The unequal impacts of CE policy implementation strategies and the expansion of waste disposal frontiers are also recurring themes across the papers.

It is worth noting that the main topics addressed in this literature directly align with the conceptual toolbox presented in the first section, including global social metabolism, inclusion/invisibilization processes, unequal impacts of CE policies, and EDCs.

The selected articles in this section provide a critical analysis of the intersection between EJ and CE. They highlight the absence of justice concerns in the CE literature and explore how concepts such as social metabolism, ecological debt, ecological conflicts, and working-class environmentalism could be integrated into CE debates.

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One perspective presented by Martinez-Alier (2021) argues that achieving a fully circular economy is impossible due to the reliance on economic growth, which leads to increased extraction, pollution, and waste. Only a circular economy based on degrowth can be socially and environmentally just. This challenges the techno-optimistic view of CE and emphasizes the need to address environmental justice concerns.

The literature review also addressed questions about the role of technology in addressing the ecological crisis. While some articles suggest that new technologies like waste-to-energy can contribute to the circular economy, concerns are raised about the potential negative impacts. For example, the use of patented technology like the Home Energy Recovery Unit may exacerbate social inequalities and lead to rebound effects where increased individual waste processing may result in more overall waste.

The concept of justice is explored in the context of CE, with some articles highlighting the importance of recognition, distributive justice, procedural justice, and restorative justice. In particular, Wuyts and Marin (2022) discuss how the CE can perpetuate social inequalities if it fails to recognize the diverse social identities of stakeholders and value certain activities practiced by marginalized groups.

The review also addresses the need to recognize and analyze social and environmental conflicts in the context of CE. This dimension is often overlooked in the literature, but understanding conflicts over resource access, use, and distribution is crucial for achieving environmental justice.

Lastly, the perspective of working-class environmentalism is discussed, emphasizing the importance of repair and challenging the dominant focus on recycling in the CE discourse. The political and social dimensions of repair are highlighted, and the need to consider existing autonomous circular practices that are not profit-oriented.

Overall, this critical review of the literature on CE/EJ intersections highlights the need to incorporate justice concerns, address social and environmental conflicts, and recognize the diversity of stakeholders and practices in the pursuit of a more sustainable and just circular economy.

The EJ cases found in EJ Atlas showed that in terms of CE as a policy goal, China stands out as a country that has implemented CE models to address issues like waste management, resource efficiency, and low-carbon cities. However, conflicts have arisen due to conflicts with local communities, as seen in cases such as the Guiyu National Circular Economy Industrial Park and the Asuwei waste incinerator. These conflicts highlight the importance of considering EJ in CE policy implementation.

There are also cases where CE is presented as a business solution. In Tunisia, a public-private partnership was established to integrate the informal waste sector into municipal solid waste management, with the goal of realizing a circular economy. In China, the Chenjiachong landfill site and the proposed waste-to-energy plant project aim to address waste management issues through a circular economy approach. However, these projects are still under negotiation and face opposition from local communities. It is important to notice that the CE models found in the Atlas, that address CE both as business solution and as policy goal, are based on technocratic approaches and their main goal is resource efficiency.

EJOs have also made claims related to CE. In Canada, EJOs mobilized against mining projects in Quebec, proposing CE as a solution to limit the impacts of the transport electrification process. The cases of Nouveau Monde's Matawinie graphite mine and Sayona Mining's Authier Lithium Project demonstrate how EJOs advocate for social acceptability and the reduction of environmental impacts through CE approaches.

Furthermore, EJOs in Mozambique and Argentina have used CE to highlight the importance of integrating informal waste workers into the formal waste management system and recognizing their contributions to CE. The cases of

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the Hulene Dump Site protests in Mozambique and the ban on animal-drawn carts in Berazategui, Argentina, shed light on the struggles faced by waste pickers and their demand for social inclusion and recognition.

The case study of waste-pickers in Rio de Janeiro, Brazil, underscores the critical role these workers play in the context of CE policies and are not recognized as such. The landslide tragedy exposed the complex dynamics of inclusion and exclusion of non-value-based circular practices, and spatial injustices in working-class environmentalism.

Overall, these cases illustrate the complex intersections between CE and EJ, highlighting the need for inclusive and equitable approaches to CE implementation that consider local contexts and address EJ concerns.

## 17.6 Conclusions

The current formulations of the CE have two major shortcomings:

1. The transition to CE can result in unequal distribution of benefits and costs, impacting different groups due to existing power asymmetries and historical injustices. Without addressing these inequalities, new conflicts may arise. CE policies must consider social dimensions and historical injustice to achieve a just transition.
2. Many circular activities, such as informal repair, waste picking, and unpaid reproductive work, are not recognized as part of the CE. These activities contribute to waste reduction and circularity but are excluded from CE design and policies. This exclusion perpetuates colonialism of knowledge and disregards sustainable practices that have never been described in circular terms.

In summary, mainstream CE models focus on resource efficiency and technocratic projects, while non-value-based circular practices remain unnoticed. This includes subsistence-oriented practices, unpaid labor, and marginalized workforces. To achieve a just transition to the circular economy, it is crucial to recognize and include these overlooked aspects.

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