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# Grassroots Social Innovation of Waste Pickers as Critique of the Existing Social Order

*Jutta Gutberlet and Isabella de Carvalho Vallin*

## Introduction

The intensification of industrial activity over time, which is driven by economic and technological unsustainability, had led to the global environmental crisis of climate change. Projections have indicated that extreme climatic phenomena, such as heat waves, severe droughts and floods, water scarcity, and the spread of disease, will be even more widespread, intense, and accelerated than previously predicted (IPCC 2022). The human intervention that is leading to climate change is directly linked to the existing social order, a construct permeating the fundamental structures of human society, characterized by complex networks of interdependence in relationships among individuals and groups, mediated by institutional systems and cultural norms (North, Wallis, and Weingast 2009).

Capitalism is an institutionalized social order that dominates most of the world. It is not merely an economic system but also a social arrangement that perpetuates and reproduces systemic inequalities and is inextricably linked to forms of oppression and exploitation, undermining the public sphere. Capitalist relations of production exacerbate disparities in income and access to resources and opportunities, contributing to the systematic marginalization of certain social groups. The logic of capitalist accumulation leads to the rampant exploitation of natural resources and to environmental degradation (Fraser and Jaeggi 2018).

It is important, in questioning this scenario, to focus on a just transition. In general, just transition is a set of policies ensuring a decarbonized economy with low greenhouse gas emissions, decent working and living

conditions, respect for human rights, and equal opportunities, provided in a fair manner (Rendon 2020). The transition must be fair and equitable, with due consideration for race, ethnicity, class, and gender, especially in the Global South (McCauley and Heffron 2018). The concept of a just transition is multifaceted, and it can be employed as a governance approach focusing on labor, justice, and sustainability (Wang and Lo 2021).

Employing a justice lens and recognizing procedural and distributive implications helps address social inequalities among urban residents. In the context of a just transition, it is important to note that the concept climate justice (CJ) is based on activism and socioenvironmental movements and linked to human rights, ethics, moral responsibility, and co-constructed collective action (Sultana 2022). Power relations are at the epicentre of the CJ perspective, as it considers the intrinsic intersection between social, political, and economic structures, taking into account underlying structural inequalities, disparities in vulnerability, and capacity to respond to climate change, such as in terms of the power asymmetries influencing the formulation and implementation of climate policies that perpetuate systemic inequalities (Sultana 2022). Grassroots social innovation is an important form seeking to break with the existing social order and proposing alternatives for a more just, inclusive, and equitable society. The grassroots approaches can be developed with respect to many different practices, from addressing housing, food, health, access to employment, and other inequalities to reducing poverty and improving community engagement (d’Cruz and Satterthwaite 2006; Ardakani 2007).

In the climate justice literature, grassroots social innovations are considered initiatives emerging from specific, urgent contexts and everyday routines (Smith, Fressoli, Abrol, Arond, and Ely 2017). Between scientific and technological knowledge, these initiatives incorporate traditional and popular knowledge and adopt resourceful practices to address local needs and problems. Many studies classify grassroots innovations as informal sector innovations (Cozzens and Sutz 2014; Sheikh 2018). Such innovations are the result of either a social movement (formed by organized individuals, groups, or nongovernmental organizations (NGOs) (Seyfang and Smith 2007) or of ordinary people who act outside of formal institutions to create innovative activities (individually or as groups) (Gupta 2013). Whatever the case, these initiatives seek to overcome poverty, injustices, and exclusion. While informality is not synonymous with poverty and inequality, poverty is in fact widespread in the informal sector, as well as in many formal sectors (e.g., small-scale farmer organizations or recycling cooperatives) and

a condition shaping many innovations from the grassroots (Cozzens and Sutz 2014).

Some initiatives contribute to setting trends and novel approaches to sustainable development, such as in the *appropriate technology movement* between the 1970s and 1980s, the *HoneyBee Network* in India, which started in 2005, and the *social technology network* in Brazil, from 2005 to 2011, with the purpose of promoting and adapting social technologies for sustainable development. These networks and social movements contribute to building greater awareness for the need to address systemic unsustainability and injustice, allowing some of the innovation to become scaled up and to contribute to the development of more appropriate practices (Seyfang and Smith 2007). To understand the process and results involved in such innovation, Cozzens and Sutz (2014) suggest focusing on developing an understanding of the actors, the roles they play, and the aims that they pursue to solve specific problems and to critique the existing social order, indicating that different forms and arrangements are possible. In this chapter, we will specifically discuss grassroots initiatives that are related to waste management and waste governance.

Worldwide, waste generation is growing at an unprecedented rate, and with it come complex environmental and social challenges and threads (Kaza, Yao, Bhada-Tata, and Van Woerden 2018). Grassroots initiatives are involved in waste management in many ways in cities of the Global South, from collecting waste for its final disposal to collecting recyclables and reusables for classifying and forwarding to the recycling industry or finding alternative uses and forms that can add value to these materials. Often, elaborate and thoughtful innovations are required to allow this work to proceed.

Particularly in countries of the Global South, organized and autonomous waste pickers are a major actor in waste management and constitute a main motive force to feed the recycling chain, adding new value to discarded materials (Kaza et al. 2018). These workers collect, classify, and sell a range of recyclable materials, salvaged from the endless, everyday garbage flow (Gutberlet, Carengo, Kain, and Azevedo 2017a). They organize in different forms, including cooperatives, associations, networks, unions, federations, and other small groups or community-based organizations (Gutberlet 2015; Kain et al. 2022).

The literature recognizes several different frontiers where the visibility of the efforts waste pickers make can be increased. The environmental and climate contributions made by their work have been recognized in the

academic literature for several years (Dias 2016; Amorim de Oliveira 2021). The work of waste pickers reduces greenhouse gas emissions and saves energy while feeding the circular economy (Achtell 2013; King and Gutberlet 2013; Mesquita, Gutberlet, de Araujo, Cruvinel, and Duarte 2023). In addition, increased mobilization and networking have entered the leaders of waste pickers into the arena of current debates on climate justice and just urban transition. Their perspectives do not focus entirely but also encompass sustainable socioecological reproduction from within their vulnerable conditions of existence and reproduction (Akbulut et al. 2019; Rendon 2020).

The waste pickers' grassroots social innovations often go unrecognized as such by other actors in this field, who may consider waste pickers to be merely labour, not developers of technologies or innovators. Their experiments include technological, organizational, structural, and political changes made by the group, which resulted in different accomplishments. These include facilitating the work, increasing their income, reducing their occupational risk, improving the organization and management of the group, enhancing human relations, reducing intraorganizational conflicts, and questioning the bottlenecks and impacts that occur in production and consumption (Carenzo 2020). Here, we concentrate on grassroots initiatives that impact waste management and waste governance as examples of social innovation critiquing the social order. We analyse whether waste picker initiatives question the existing social and political order by proposing new perspectives and alternatives for dealing with climate change, environmental degradation, and global deficits in human well-being. We present examples from around the world, but we focus specifically on the experience of the Brazilian *catadores*.

In the following section 'Situating Waste Pickers', we review the organization of waste pickers and their innovative capacity in the waste sector, presenting practical examples of their work, highlighting the genuine improvements that are achieved through their transformation of their tools, spaces, and social relations. In the section 'Grassroots Waste Picker Movements', we present a discussion of the role that *catadores* play in the context of climate justice and alternative economic paradigms. Then we discuss overlaps between spaces and initiatives in which *catadores* innovate and challenge the social and political order and their prevailing interpretations. Our final section brings together the power of the arguments that *catadores* present in Brazil, demanding a social and political transformation of society, acting on the present climate and environmental crisis while also tackling poverty eradication.

## Social Grassroots Actors and Their Innovations

### Situating Waste Pickers

The work of waste pickers is a significant social contribution, reducing cities' carbon footprint (Kain et al. 2022; Wilson et al. 2008), recovering resources for recycling, improving the local environment, and creating jobs and income among the poor (Mitlin 2008). The actions of informal and organized waste pickers, youth groups, and others are co-producing basic waste collection and recycling services (Bovaird 2007).

In spite of their numerous contributions, waste pickers are among the most widely excluded, impoverished, and disempowered segments of any society. They are exposed to toxic materials (Zolnikov, Furio, Cruvinel, and Richards 2021), suffer from prejudice and stigmatization (Coletto and Carbonai 2023), are persecuted by police because waste picking is often illegal (Rosaldo 2022), experience difficulties in creating formal associations, lack access to official microfinance and funding opportunities (Gómez-Maldonado et al. 2023), are susceptible to price market oscillation and unfair competition, and are subject to exploitative relations with waste intermediaries (O'Hare 2020).

Their work exposes waste pickers to extreme weather, including heat, cold, rain, and wind. They are thus exposed to heatstroke, dehydration, headaches, fatigue, and heat rashes (Michael, Deshpande, and Ziervogel 2019). Dias et al. (2024) interviewed 93 *catadores* in Brazil. They found that 91 per cent reported experiencing at least one event related to climate change in 2022: 85 per cent experienced abnormal heat or heat waves, and 39 per cent were exposed to flooding, which often spread disease (e.g., leptospirosis), as consequence of the water contaminated by the urine of infected rodents. Heavy rain can damage storage facilities, soaking materials, resulting in significant work and income loss. Climate change's impacts worsen the health and livelihood of *catadores*, who already face financial and social challenges.

An important factor for understanding waste pickers is social inequality. Societies in the Global South are marked by historical processes of colonization. In the case of Latin America, slavery, exploitation, and oppression had consequences for social relations and for study and work opportunities for those of African descendant and for indigenous people, leading them to marginalization. This is evident in the case of Brazil, where most *catadores* are of African descendant (IPEA (Instituto de Pesquisa Econômica Aplicada) 2013). This shows that the work of waste picking is rooted in a structural social condition marked by inequality and reinforced by capitalism.

*Catadores* are not homogenous: they may be homeless, living in precarious conditions, unemployed, temporarily engaging in this work, or long-term *catadores*. These characteristics entail variations in their vulnerability and their access to resources and work tools, including bags and vehicles, such as carts, cars, vans, or small trucks for the collection. Similarly, there are cooperatives that have precarious infrastructure or no equipment at all, and there are others that have presses, scales, conveyor belts, trucks, and support provided through various partnerships with private sector organizations, NGOs, or the government (see Figures 8.1 and Figure 8.2).

## Grassroots Waste Picker Movements

Waste pickers' social movements have been established at different levels and in different regions over the past two decades. Examples of such movements are the following. International Alliance for waste pickers is a global platform. The Latin American Recyclers' Network (Red Latinoamericana de Recicladores) brings together different national movements and inter-regional representations for *catadores*. The Federation of Recicladores in Argentina (Federación Argentina de Cartoneros, Carreros y Recicladores) was created in 2011 and now forms part of the Confederation of Workers of the Popular Economy (Confederación de Trabajadores de la Economía Popular). There are also networks specific to certain cities that represent them as a whole, such as the Excluded Workers Movement in Buenos Aires. In Brazil, *catadores* are organized at the national level by the National *Catadores* Movement (MNCR), and there are many regional networks throughout Brazil conducting collective operations, including commercialization and negotiations among organizations of *catadores* (e.g., Rede Catasampa and Rede Verde Sustentável in the metropolitan region of São Paulo, Brazil) (MNCR Movimento Nacional dos Catadores de Materiais Recicláveis n.d.). Across Brazil, many *catadores* have been organized in cooperatives and associations. These grassroots initiatives and networks have developed into new social movements of the urban poor that, whether intentionally or not, are challenging the nature of the state, local government, and civil society (Brunhara et al. 2023). Using quantitative and qualitative indicators, it has been possible to highlight the pressures, states, potential impacts, and responses of these cooperatives to identify aspects that require improvement to increase their overall political impact (see da Silva Guabiroba et al. 2023).

The influence that social movements can have on public policy has been studied widely (de Sousa Teodósio et al. 2013; Abers, Silva, and



**Figures 8.1** Panel A and B Examples of the work of *catadores* at a cooperative in Brazil, Avemare, Santana de Parnaiba (photograph by the authors)



**Figures 8.2** Workspace and tools of an autonomous *catador* in São Paulo, Brazil (photograph by the authors)

Tatagiba 2018; Mitlin 2018; Carlos 2020) and it has been shown how their actions bring demand from social groups such as the Brazilian *catadores* organization MNCR to develop decision-making arenas and sometimes to make important contributions to public policies, bringing new perspectives to the problems at hand. MNCR has been instrumental in the drafting of federal policies such as the federal waste management legislation, which forms an important example of how these change-oriented actions can be brought about by grassroots movements. The representatives of MNCR participate in public hearings, council meetings, and other political spaces (such as, e.g., the annual *Expocatadores* event, where *catadores* meet representatives of governments and industry to discuss their contributions to selective waste collection and separation) to voice their demands. Since 2010, supported by targeted government policies (the so-called *Pro-Catador* funding programme), *catadores* have engaged in reverse logistics and sectoral agreements, such as one concluded with Associação Brasileira da Indústria de Higiene Pessoal e Cosméticos (ABIHPEC), explicitly designed as partnership programmes between industry and waste picker cooperatives (Brandão 2019).

Unlike the standardized knowledge that is generated by donors and international organizations through best practices, which is easy to package and sell but difficult to replicate successfully in other contexts (Gutberlet et al. 2017b), these bottom-up, often South-to-South oriented networks bring locally developed, innovative, and flexible solutions, posing challenges to existing power structures and systems. While economic and security needs generally come first, after social and environmental rationales (such as the contribution that waste pickers make to a cleaner and healthier environment, the improvement of services in deprived neighbourhoods, which makes cities more inclusive, and the role they play as environmental stewards and agents of change) are often developed in parallel and are intertwined with basic material rationales (Gutberlet et al. 2021). This is an outcome of the organized *catadores* pressuring governments and society during the COVID-19 pandemic to be recognized as essential public service providers (Azevedo, Gutberlet, de Araujo, and Harada 2022).

Similarly, changes in legal frameworks resulting from the advocacy of *catadores* in Brazil and Argentina has opened windows of economic opportunity for these organizations. Among these are new environmental regulations in the Buenos Aires metropolitan region, whereby large waste producers are required to take responsibility for their waste, and waste picker cooperatives are encouraged to collaborate with waste producers to process waste and reduce the final amount that is disposed (Carenzo 2020).

Since 2010, the Brazilian national waste management legislation has held open the possibility for organized *catadores* to become official service providers and be remunerated for their selective waste collection; however, very few municipalities actively remunerate *catadores* for this public service because there is insufficient formal enforcement of the policy, and thus, *catadores* often remain at the margins. In the absence of any official enforcement measures to guarantee the application of this legislation, whether *catadores* are included from local waste management is dependent on the existence or absence of local political will.

Reverse logistics programmes are company initiatives taken in response to the recent requirements entailing the liability of producers of waste-generating goods, including hazardous waste and mass-consumer goods (Brandão 2019). Reverse logistics forces companies to demonstrate the destination of their waste, with the result of a push to increase recycling rates. This has created opportunities for *catadores* cooperatives in Brazil, such as in 2010 the 'Dê a Mão para o Futuro' programme of ABIHPEC and Recycle for Brazil (Reciclar pelo Brasil), financed by large manufacturers in the

food and beverage industry. However, these examples, as well as others from Argentina, show that such programmes incentivize competition with other players in the recycling market.

Finally, macro-scale global discourses, such as the solidarity economy movement, materializing through policies and crystallizing public administration structures, such as in the case of the creation of the Solidarity Economy Secretariat in Brazil and the Brazilian Forum of Solidarity Economy, resulted in funding being made available to strengthen these organizations (Talga and Lopes 2023). In 2007, the federal government established the CATAFORTE I programme, allocating it a four-year budget of approximately R\$60 million (US\$22.6 million) to support organized *catadores*, followed by a second CATAFORTE programme launched in 2010 and a third programme in 2014 (Rutkowski and Rutkowski 2015).

## Grassroots Initiatives Tackling Social and Environmental Contributions

Organized waste pickers often rely on financial and technical support provided by NGOs, universities, and local governments for space, equipment, training, and publicity. However, changes in government, budget cuts, or project completion can lead to discontinuity. For informal waste pickers, it is particularly important for them to have official and controlled waste transfer points in which the waste that they collect from households is stored until the municipality removes it to landfills or recycling centres (Gutberlet et al. 2017b).

While there are some examples in Brazil of organized *catadores* being hired to carry out the collection and sorting of recyclables and provide environmental education, the numbers of such tasks are low, and the contracts generally have low value. In general, local governments do not recognize the social benefits of generating employment and income for marginalized populations to alleviate poverty, in particular with respect to black women, young people, and the elderly to create a more inclusive waste management (Velis 2017). Because there is no enforcement of inclusive waste management, few municipalities are committed to it. Generally, therefore, projects and initiatives to strengthen the activities of *catadores* are set up by the organizations of *catadores* themselves or by NGOs that recognize the importance of this group of workers. Table 8.1 shows examples of certain initiatives developed in Brazil.

The National Association of *Catadores* has a long history of conducting projects to benefit *catadores* associations and cooperatives, whether by means of projects funded by public calls or through reverse logistics agreements concluded with the private sector. In recent years the organization has been developing projects that also benefit self-employed *catadores*. The Citizenship Hub initiative is seeking to provide social and political assistance, and it will also offer leisure and cultural activities, particularly to strengthen autonomous workers. It is important to expand the collaboration between organized and self-employed *catadores*, as the former often have difficulty obtaining recyclable materials, and the latter have difficulty obtaining a fair price. One example of such a collaboration can be seen in the Cooperative of Independent Collectors of Paper, Scraps, and Reusable Materials, which purchases recyclable materials from around 20 independent workers and offers fair prices (see Table 8.1).

Pimp my Carroça, a nonprofit NGO, runs several projects to support *catadores*, ranging from improving the infrastructure of cooperatives with the Pimp my Cooperativa project to the circuit for self-employed *catadores* (Pimp my Carroça n. d.). The circuit values *catadores*' work by improving their carts, and it also values them, offering them medical care and personal assistance. It also makes it easier to connect buyers to *catadores*, increasing *catadores*' income and providing payment for the services provided, as users of the Cataki app pay a fee for the service. Finally, the initiative has developed prototypes to make the carts more ergonomic and efficient, contributing to *catadores*' physical health and reducing environmental impact by using electricity instead of fossil fuels (Table 8.1).

## Grassroots Initiatives as a Critique of the Social Order

### Waste Pickers' Struggle for Climate Justice

Climate justice entails acknowledgment that climate change can have different social, economic, environmental, and public health impacts on underprivileged populations. It begins with the recognition that certain groups and individuals are differently affected by climate change. Thus, there could be significant differences between rich and poor, women and men, and older and younger in terms of the consequences for their lives. The UN Secretary-General António Guterres emphasized this, saying, 'as is always the case, the poor and vulnerable are the first to suffer and the worst hit'

**Table 8.1** Examples of grassroots initiatives for waste pickers in Brazil

Organization	Description of actions
National Association of <i>Catadores</i> (Associação Nacional de <i>Catadores</i> e <i>Catadoras</i> de Materiais Recicláveis—ANCAT)	<p>ANCAT is a nonprofit association formed by and for <i>catadores</i>, linked to the National Movement of <i>Catadores</i>, focusing on issues such as packaging recovery, reverse logistics, and technology, as well as on generating and organizing data on the sector:</p> <ul style="list-style-type: none"> <li>• <a href="#">Recycle for Brazil</a></li> </ul> <p>The program aims to regularize, improve, and professionalize the work of recycling cooperatives and associations. With cooperatives from 269 cities participating, it is considered the largest inclusive recycling program in the country.</p> <ul style="list-style-type: none"> <li>• <a href="#">Citizenship hub (Hub da cidadania)</a></li> </ul> <p>A partnership between ANCAT and the private sector (Heineken Institute) in 2023, this project seeks to identify needs, and offers individualized care, relying on a multidisciplinary team (psychologists, social workers, lawyers, and others).</p> <ul style="list-style-type: none"> <li>• <a href="#">Brazilian Recycling Atlas</a></li> </ul> <p>This document provides a secure and traceable database with information portraying the entire recycling chain across different types of materials (ANCAT s.d.).</p>
Pimp My Carroça	<ul style="list-style-type: none"> <li>• <a href="#">Pimp my Carroça Circuit</a></li> </ul> <p>This NGO creates public events and provides interventions and repair for carts used to collect recyclables, as well as paintings by renowned graffiti artists in parallel with a wide range of social services (Pimp my Carroça s.d.).</p> <ul style="list-style-type: none"> <li>• <a href="#">Cataki app</a></li> </ul> <p>A nonprofit collaborative platform aiming to connect citizens and companies that seek to properly dispose of their recyclable materials to independent <i>catadores</i>.</p> <ul style="list-style-type: none"> <li>• <a href="#">Carts of the future</a></li> </ul> <p>In 2021, the first electric cart model was launched in the city of São Paulo.</p>

Source: Authors' data.

(United Nations Secretary-General 2019). Furthermore, the impacts of climate change are exacerbating already existing inequitable social conditions. Thus, low-income communities, people of colour, indigenous people, people with disabilities, older or very young people, and women in general are more at risk and will suffer more. Living in underserved neighbourhoods with precarious infrastructure makes people more vulnerable and more prone to risks. In many cities in the Global South, this encompasses most of the population. Hence, climate change can be seen as a problem of justice. Critical reflections and different framings have emerged in the literature on climate justice, for example, questioning how the benefits and burdens of mitigation and adaptation to climate change should be distributed and split within cities and among cities, considering huge discrepancies in resources, socioeconomic capacity, and political voice (Chu and Michael 2018).

Climatic factors directly affect the livelihoods and living conditions of waste pickers and exacerbate their vulnerabilities. The root causes of such vulnerability are linked to socioeconomic conditions and the exercise and distribution of power across society (Blaikie, Cannon, Davis, and Wisner 2014). Waste pickers are exposed to social stigma, exploitive work relations, and dependency, and they experience social and economic exclusion on a daily basis. The nature of their work exposes them to extreme climate episodes (heat, cold, rain, and wind), and they are more likely to suffer from heatstroke, dehydration, headaches, fatigue, or heat rashes (Michael, Deshpande and Ziervogel 2019). After heavy rains and flooding, waste pickers are directly exposed to contaminated water, which can transmit diseases such as leptospirosis, disseminated by the urine of infected rodents. Heavy rainfall can also damage their storage facilities, drenching their materials and leading to significant income losses. As a result of climate change impacts and injustice, the livelihoods of population of waste pickers, already a financially and socially distressed one, becomes further affected.

## Waste Pickers in a Just Urban Transition

A just transition must be fair and equitable, accounting for race, ethnicity, class, and gender, especially for the Global South (McCauley and Heffron 2018). However, it can be difficult to build a just transition due to the historical colonial relations established among the countries of the Global North and Global South. Transition is inevitable, but it also is a conscious process, meaning that it may not be just, and may rather reinforce capitalism, intensifying social inequalities and maintain the colonial transition model

(Svampa 2023). It is therefore crucial for any agents of a just transition to reflect on the development model and the type of society desired and to promote change in our current consumption and production model (Svampa 2023).

Justice at urban scales requires a recognition of existing forms of inequality, rights, and responsibilities and an understanding of how climate change interventions can exacerbate or redress underlying structural issues (Ziervogel et al. 2017). Thus, a just urban transition seeks to constitute just cities, which do not have any disproportionate burden falling on vulnerable groups, whether it be risks, dangers, harms, or benefits to a particular group. The urban dynamics involve multiple actors and powers, with political, institutional, social, and economic forces and counterforces (Hughes and Hoffmann 2020). Thus, just urban transition is not only concerned with redressing past injustices but also with addressing structural inequalities as cities seek a low-carbon future (Hughes and Hoffmann 2020). Waste is a major urban problem globally. This is why recycling has gained prominence in society seeking a just transition, as it supports the reduction of exploitation of natural resources, reduces environmental pollution, extends the useful life of products, and generates work and income. In the Global South, especially in Latin America and Africa, recycling only becomes possible as a result of the work of waste pickers. As noted, however, most waste pickers do not enjoy fair working and living conditions.

Waste picker leaders are initiating and sustaining discussion of the sector with respect to a just transition. An example of this is the participation of waste pickers in debates surrounding the Global Treaty against plastic pollution. This treaty is intended to significantly reduce the pollution caused by disposable and unnecessary plastic items and is the first attempt to address plastic pollution from extraction to disposal in a legally binding way. Waste pickers recognize that their work contributes to reductions in plastic pollution and carbon emissions, and they are not opposed to technological advances in waste management or to banning of plastic materials, but they call for this process to be done with workers in mind while updating forms of work for better livelihood opportunities (Arora 2022).

Transformative solutions to climate change cannot be achieved if the understanding of the problem is not transformed as well (Jasanoff 2018). For this reason, considering strategies combining environmental solutions with adequate labour supply is an important turning point (McCauley and Heffron 2018). Waste pickers recognize their vulnerability to climate change, and they are calling for a just transition to take place for workers throughout the plastic chain. This transition requires social innovation geared towards

waste pickers. Some waste pickers have already developed and implemented significant social innovations, which must be recognized (Zapata Campos et al. 2023). Taking the context of vulnerability in which most waste pickers live into account, better working conditions can also mean better living conditions. Vallin and Gonçalves-Dias (2019) showed that some women *catadores* in Brazil may prefer this work to domestic work, given the exploitative relationship that is often part of the daily life of domestic workers. Other women *catadores* may prefer to work in a cooperative instead of taking a better-paid, registered job that requires a long commute due to the proximity and thus better quality of life that a cooperative can offer (Vallin and Gonçalves-Dias 2019). However, we should not romanticize the work of waste picking, while not ignoring the fact that waste picking can represent economic opportunity for some.

Figure 8.3 shows waste pickers in their unacknowledged role as social innovators fighting injustice. Capitalist and neoliberal social structures force people into vulnerable situations and make them accept work as waste pickers. Waste pickers often belong to marginalized and vulnerable social groups based on race, gender, class, age, migration, and other factors. While working, they are exposed to many dangers and risks. However, collecting recyclables is an opportunity for workers who can discover the socioenvironmental contribution that their work makes to society. Even where they do not obtain fair financial returns, their self-perception through the contributions made by their work encourages resilience. In this sense, they challenge the system to remain in it. From this interpretation, we can see the struggle that waste pickers undergo in search of better working and living conditions. Their goals are manifold, and they vary from fighting waste incineration to struggling to get paid for the environmental and cleaning services they provide. Regardless of their particular orientation, the mobilization of waste pickers contributes to the struggle for environmental justice and climate justice and for the construction of a just urban transition, whether by recovering materials and channelling these resources into recycling and the circular economy or by creating low-barrier job opportunities to help create cleaner cities (Gutberlet et al. 2020, Gutberlet 2023). They perform environmental education, contributing to raising awareness concerning the impacts of our excessively wasteful society (e.g., many *catadores* visit schools and community centers to speak about waste management). They question the need for materials that are not recyclable or that do not yet have a market, providing potentially valuable insight to product and material design, developing a transition toward less waste. Most *catadores* see plastics as yet another material to be recovered and placed on the market and do not

necessarily support a complete shift away from plastics towards less problematic and more recyclable materials. While the *catadores* movement is involved in plastic treaty discussions, leaders' voices are often not radical enough in their demand for a paradigm shift away from petroleum-based materials.

Innovations in the field of solid waste management are continually being discussed, and innovations in relation to the circular economy are gaining prominence. The mainstream definition of the circular economy mentions three major outcomes: reduction in the use of virgin raw materials, reuse of already processed materials, and recycling of materials considered waste (Kirchherr, Reike, and Hekkert 2017). While it is argued that it will have great benefits, the circular economy is technocentric, led by companies and policies that prioritize economic growth rather than addressing wider social and environmental issues (Corvellec, Stowell, and Johansson 2022). Furthermore, the circular economy generally does not focus on the social facets involved in recycling, and the concept overlooks waste pickers and waste workers as key protagonists (Burneo, Cansino, and Yñiguez 2020). The next figure presents the many vulnerabilities waste pickers suffer from and the opportunities they identify and engage with representing a spiral towards a just urban transition (see Figure 8.3).

Grassroots initiatives accumulate innovative knowledge on waste collection and handling by waste pickers, as they live with materials daily. They therefore have the potential to contribute to the creation of a circular economy, as they recognize the difficulties involved in recycling different types of materials that often become waste. Waste pickers are thus key to developing strategies aimed at minimizing resource losses and optimizing circularity and recycling. They critique the present waste management system and the circular economy, as they are not recognized as main actors. They are also vocal in criticizing the implementation of waste incineration in many countries. In Brazil, for example, a national movement of *catadores* has halted the implementation of the waste to energy industry in several municipalities. Participatory structures, such as seminars, conferences, and meetings organized by the national movement of *catadores* or by their allies have strengthened their movement and struggle, producing victories as well as backlash. Continuous engagement and dialogue have been instrumental for moving the agenda forward.

Nevertheless, local governments and industries rarely engage in dialogue with waste pickers or recognize their knowledge in developing their programmes. This lack of communication and partnership has created an impasse, as waste pickers require resources to maintain and optimize their



Figures 8.3 Waste pickers grassroots social innovations to a just urban transition

activities, and without adequate support, there are limits to what they can achieve.

The social and solidarity economy (SSE) seeks to promote change in social and economic systems based on human rights, democracy, solidarity, inclusion, diversity, and self-management. It is concerned with livelihoods, working conditions, and forms of noncapitalist and hierarchical organization (Singer 2006; Castelao Caruana and Srniec 2013; Laville 2015). The social and

solidarity economy supports the development of public policy that would encourage grassroots and community-based initiatives. Solidarity economic enterprises (SEE) are collectively and democratically managed, including recovery companies, associations, cooperatives, and networks. In Brazil, the social and solidarity economy encourages social innovation, such as solidarity selective waste collection, a project to strengthen the participation of *catadores* in selective waste collection. Brazil's federal solidarity selective collection project requires public institutions to separate their recyclable waste and send it to recycling cooperatives. In spite of the encouragement given to social issues, the SEE perspective is not widely enough applied. The *catadores* movement has learned from such alternative economies that question the existing order of capitalism and envision alternative developments. The social and solidarity economy is tolerated by the government and the business sector in Brazil, and it operates as a niche within the capitalist system, but it has serious limitations. While ideas of equality, justice, and sustainability permeate the discourse of *catadores*, the change desired is limited, given that the capitalist system offers them short-term benefits, silencing their critique and preventing more widespread radical actions. The absence of a solidarity economy in political proposals and the initiatives of large companies precisely demonstrate the difficulties that exist in aligning other forms of operation that could contest capitalist logic. In this sense, taking on social innovation proposals based on the social and solidarity economy could be important for strengthening a just urban transition, but it needs to occupy wider spaces.

Globally, *catadores* and waste pickers, along with other grassroots social movements that are pursuing another logic of development (leading from social and environmental values to demanding a sustainable and just transition), are facing limitations, particularly resource limitations. However, their examples, driven by a vision of a better world and implemented in everyday practice, transmit hope to alter the current social and environmental order. These cases illustrate the crucial roles that *catadores* can play. In their innovative practices, they challenge the injustices of the current social and environmental order, both in waste management and in citizenship and environmental issues, developing a new critical epistemology of waste.

## Final Considerations

Many challenges continue to face waste pickers and community-based social initiatives and must be granted greater empowerment if climate justice and

a just transition are to be achieved. The revolutionary aspect of the work of waste pickers in particular is tied to the fact that innovations in social development target those in society who have been historically marginalized, stigmatized, and without a place at the negotiating table or in decision making. Resisting and overcoming obstacles and questioning power dynamics and manoeuvring past all sorts of imbalances are part of the everyday praxis of waste pickers in their daily struggle and in their innovation.

In the current environmental crisis, waste pickers have always been on the margin, exposed to environmental injustices. Over the years, through their power of agency, waste pickers have organized themselves on the international, national, and local fronts, becoming protagonists in environmental discussion involving waste and recycling.

Waste pickers' and their allies' practical actions, described above, are crucial for advancing waste pickers as socioenvironmental service providers, allowing for climate change mitigation and improved environmental quality. By means of these and other innovations, they contribute to finding solutions that can help increase material separation at the source, improve rates of recycling, and developing creative ways to add value to materials previously discarded as waste. They also engage in many ways with environmental education, helping raise awareness concerning the connections between consumption and waste. Their participation in the elaboration of the global plastic treaty, for example, has been a significant technical and practical contribution. It is a necessity to include these protagonists in debates regarding climate justice.

These social movements and networks are constantly struggling to increase their recognition and inclusion. Their marginal voices and their initiatives need to be seen and heard to enable their contributions to be noticed and their vulnerabilities addressed.

Finally, waste picker leaders are seeking recognition to enable a more radical climate justice in cities, recognizing the roles they play in diminishing greenhouse gas emissions and reducing the city's footprint. The effective critical practice of waste pickers addresses several of the United Nations Sustainable Development Goals. They contribute to recovering citizenship, and they perform urban environmental services that contribute to climate change mitigation. Their leaders understand the root causes of their inequality and their struggle for these to be addressed in public policy, with outcomes that can improve social, environmental, and climate justice. They challenge authorities to address the sharing and distribution of the benefits and disadvantages of adaptation actions across the city in a fair way, recognizing that communities experience varying levels of adaptive capacity,

socioeconomic status, and political voice. Waste picker leaders are contributing to the dialogue needed for policy innovation, technology improvement, and widespread social innovation.

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