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PICKING AS SOCIAL PROVISIONING: THE CASE FOR A FAIR TRANSITION TO A CIRCULAR ECONOMY

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Waste picking as social provisioning: The case for a fair transition to a circular economy

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ABSTRACT

Implementing a circular economy in Latin America can be the opportunity to include waste pickers and other informal workers in a regenerative economic model. This study performed in-depth interviews with female waste picker leaders from Ecuador and Colombia. The results suggest that the modifying effect of becoming part of an association, rooted in social provisioning communities, enables exchange of materials and training while also creating social safety nets for circular economy activities to function in informal contexts. A set of 9Rs for a fair transition to a circular economy are proposed to guide policy and practice based on demands for dignity, care-work counting, and environmental justice fostering what has worked and correcting the oppression that has accompanied the linear economy.

1. Introduction

The circular economy (CE) intends to maintain the value of materials in closed-loop systems to replace the current linear economy of take-make-dispose (Ghisellini et al., 2016; Murray et al., 2017). However, the social implications of the CE have been limitedly explored (Kirchherr et al., 2017; Mies and Gold, 2021; Padilla-Rivera et al., 2020). Actors that have been affected by the detrimental effects of the linear economy sometimes have unknowingly practiced CE principles out of need; this is the case with waste pickers. In Latin America and the Caribbean, over 4 million people depend on the informal recycling economy for sustenance (EIU, 2016). The contribution of informal recyclers in waste management towards the sustainable development goals and the CE has been acknowledged previously (Gutberlet et al., 2017; Rodić and Wilson, 2017; Schroeder et al., 2019; Valencia, 2019; Velis, 2017; Wilson et al., 2006). The contribution by waste pickers is higher for their recovery of material for reuse, such as textiles, rather than only recovering material valued in the market such as cardboard or plastics (Vergara et al., 2016). This is a benefit for the planet as recyclers embody the role of reclaimers, and their contribution has higher relevance for the value of use of these materials rather than their value of exchange (Samson, 2015). Emphasizing the role of extending the lifespan of materials through care and ensuring that the transition to a CE include these actors is essential to guarantee dignity and justice for those that have been affected by the linear economy.

An exploration of care ethics for the CE has been previously presented in the literature in an industrialized context (Pla-Julián and Guevara, 2019). Nonetheless, considering the existing globalized economy and the waste trade worldwide (Cotta and De, 2020), exploring this topic in industrializing nations such as Ecuador and Colombia, is relevant for those countries but also for nations with similar informal waste management contexts in Asia, such as India (Chaturvedi and Gidwani, 2010) and Africa, in Cameroon (Sotamenou et al., 2019), as examples. It is also noteworthy for the existing but mostly unrecognized informal recycling and reuse operations surrounding the European Union and other industrialized nations (Scheinberg et al., 2016).

Power (2004) introduced the term provisioning, defined as 'the work of securing resources and providing the necessities of life to those for whom one has relationships of responsibility' as a useful category for feminist economics. Built upon this argument, only when the boundaries of time expended and the responsibility set upon women is recognized, new forms of provisioning can be envisioned (Neysmith and Reitsma-Street, 2005; Segato, 2019). The labour of waste picking is an extension of care work for the planet. Furthermore, associations play a critical role in enabling the material or resource-based provisioning and the social and justice-based provisioning in the context of urban and periurban waste pickers.

This study entails an empirical exploration of how applying the

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framing concept of provisioning to analysing systems of CE can help reveal how CE models can be not merely about materials recovery but also socially restorative and regenerative. The restorative portion intends to account for the linear economy's historical and geospatial faults, providing integral reparation. The regenerative portion aims to recognize and redistribute care for people and planet by developing dignifying conditions in circular labour. The focus of this analysis is to rationalize the need for a CE that addresses dignity, care work and environmental justice with the example of waste picking. Section 2 explores the theoretical framework to propose 9Rs for a fair transition. Section 3 develops the qualitative methodology used for this assessment. Section 4 describes the empirics to support the 9Rs presented alongside the mechanisms of sensemaking and provisioning that generate the basis to explain how waste picking and its relation to the CE promote a fair transition. Section 5 discusses the relevance for policy and practice.

2. Framework for the 9Rs of a fair transition

The 9Rs proposed are a combination of 3Rs of dignity demanded by recyclers, 3Rs of care work and 3Rs of environmental justice as described below.

2.1. The 3Rs of dignity

Recyclers have organized in several cities around the world to demand access to waste for their sustenance. The demands include transitioning from the 3Rs of reduce, reuse, recycle to additional 3Rs identified by the Waste Pickers Association in 2008: 1) Recognition of the work performed by recyclers, 2) Redistribution of the burden by differentiated collection while guaranteeing access to waste and 3) Remuneration for their services (EIU, 2016). Contextualizing the 3Rs proposed by waste pickers in research and practice to be included in the framework is a form of revindication for the linear model that has previously ignored these actors.

2.2. The 3Rs of care-work

Most recyclers are women (Dias and Ogando, 2015). The numbers vary widely, with data from Ecuador at 60% being women (RENAREC, 2018), reaching 75% in Quito. There are fewer female recyclers in Colombia, with 31.1% being women in Bogotá (UAESP, 2014). Regardless, women tend to earn less in the labour of recycling and have had fewer opportunities to lead recycler organizations (Dias and Ogando, 2015; Fernandez and Dias, 2012). In many industrializing countries, the inclusion of women in the workforce has not reached the welfare benefits expected, such as social security (Razavi, 2007). Though it has increased women's income and ability to sustain their household, informal work's exploitative nature requires policy changes that can support the added benefits of their service to society. This antecedent also implies moving beyond the success in improving women's involvement in basic capacities such as sustenance and participation, to enhanced capabilities, such as agency and social change (UNDP, 2019).

From a feminist economics perspective, women's care-work has been grossly neglected and taken for granted as part of the reproductive system that sustains production (Elson, 1998). Care economics, a development from third-wave feminism, revendicates the 'other economy' from a perspective of social reproduction (Donath, 2000; Marçal, 2017). The added burden to participate in the productive economy to generate an income combined with reproduction and caring for the household has been deemed the triple burden on women (Breilh, 1991; Lyon et al., 2017). The activities of care-work include caring for children, the elderly, the sick as well as cooking and cleaning the household, among others. As an extension of the household, the administration of our common household, nature, also requires care and should be considered from a normative perspective (Waddock, 2011). Elson (2017) has previously argued that there are three elements to account for the care economy in overall economics: 1) recognize this work by creating metrics that report this service to society, 2) reduce the burden on women through systemic change in labour policies and government infrastructure 3) redistribute care work through solidarity among women and men. We argue this is also reflected in the care-work for the planet that waste pickers perform.

2.3. The 3Rs from environmental justice

Recyclers have experienced marginalization from a societal and territorial perspective due to the location of dumpsites and the externalities associated with them (Wenzel, 2018). Many communities form around dumpsites and start organizing; some to demand relocation, but others to sustain themselves based on their use of the materials obtained from those dumpsites. These communities establish organizations consistent with Ostrom's principles of commons where boundaries are identified, and self-regulation is in place (Ostrom, 1990; Zapata and Zapata Campos, 2015). Nonetheless, as the driver of environmental protection for waste management gave way to the development of landfills in the 1970s in the U.S. and Europe (Wilson, 2007) and has been instilled as a development agenda in the rest of the world, many recyclers were and continue to be displaced (Scheinberg et al., 2016). This has been justified, partly as heavy machinery in the landfill generates an occupational hazard and the known hygienic concerns around open dumpsite recovery of materials, and partly, due to the privatization of landfills as companies would get paid per ton buried, disincentivizing recycling and driving further ostracism towards waste pickers.

In a quest for environmental justice for both nature and waste pickers, Rawlsian justice theory serves as a model that defines that justice must be distributive and benefit the least advantaged (Rawls, 1999). This recognition is consistent with the ruling from the Colombian supreme court for all municipalities to apply affirmative action for informal recyclers to be included in the waste management systems of cities (Parra, 2015). Even though this action was signed into law in 2003, there have been continued pleas and legal battles to obtain recognition and remuneration. Recyclers began receiving payment per ton of material recovered in 2016 based on the cost of collection and burial of waste saved by the municipalities in Colombia due to waste pickers' work. The law for an inclusive circular economy was signed in Ecuador in 2021 prioritizing the services from waste pickers and promoting training, certification, and the development of a social security system (Ecuador, 2021).

From a capabilities approach, justice demands, beyond redistribution, a recognition of the damages performed by and towards individuals' ability to flourish in society (Nussbaum, 2003). Most recyclers have turned to this labour due to their poverty conditions to make ends meet (Holt and Littlewood, 2017). As a result, many waste pickers are vulnerable and have faced multiple forms of violence in their quest for social justice (Chaturvedi and Gidwani, 2010; Parizeau, 2015; Solíz, 2014). Therefore, it is relevant to add Fraser's argument to integrate political representation to the Rawlsian conception of justice from a feminist perspective (Fraser, 2013). The environmental justice 3Rs then become recognition, redistribution, and representation.

Table 1 summarizes the triad of 3Rs that serves as a framework for the 9Rs for a fair transition to a socially restorative and regenerative CE.

3. Research design and methods

The interviews were conducted with ten women recycler leaders in their respective cities in Colombia (Bogotá) and Ecuador (Quito, Portoviejo, Cuenca, Coca, and Lago Agrio). These interviews are a subsection of 42 recyclers interviewed for the book 'Recycling without recyclers is trash: The return of the witches'[1]. The initial participants

[1] Soliz et al. (2019). https://www.no-burn.org/libro-reciclaje-sin-reciclado ras-es-basura-el-retorno-de-las-brujas/.

Table 1
The 9Rs of a fair transition. A previous version of this table was presented in (Valencia et al., 2019).

Recycler's dignity (EIU, 2016)	Care economics (Elson, 2017)	Environmental Justice (Rawls, 1999; Nussbaum, 2003; Fraser, 2013)
Recognition of the work of recyclers	Recognition of the work of care providers	Recognition of the social and environmental damage of waste generation and disposal
Redistribution in the labour of recycling. Guarantee of access to waste and material conditions	Reduction of caring burden	Redistribution of the detrimental effects of waste generation, restorative action.
Remuneration of the work considering social and environmental justice, accounting for externalities and the historical burden	Redistribution of care work	Representation in political and organizational settings

cities, and country in relation to government, citizens, and industry using the same primary data. Interviews were conducted in person in Spanish and lasted between 30 min and 4 h between November 2018 and July 2019. Based on the open conversations recorded and transcribed, this study entails a phenomenological analysis (Cresswell, 2013) of women's sensemaking of becoming recyclers and recycling leaders. Sensemaking is understood in this context as a process to find meaning in identity and further as a leadership tool for action taken by waste pickers to dignify their working conditions as recyclers, women, and the combination thereof (Ancona, 2012; Weick et al., 2005).

NVivo® 12.1 was utilized for the coding process. Codes were created both inductively and deductively (Fereday and Muir-Cochrane, 2006), and memoing was extensively used to interpret the interviews (Maxwell, 2013). Deductive coding was performed based on the 9Rs presented in Table 1. For the inductive process, the initial open coding entailed identifying themes within the text to continue with axial coding to evaluate the relationship among all themes. The transcripts were kept in Spanish, but the codes were created in English; only the selected quotes for this publication were translated from Spanish to English. The

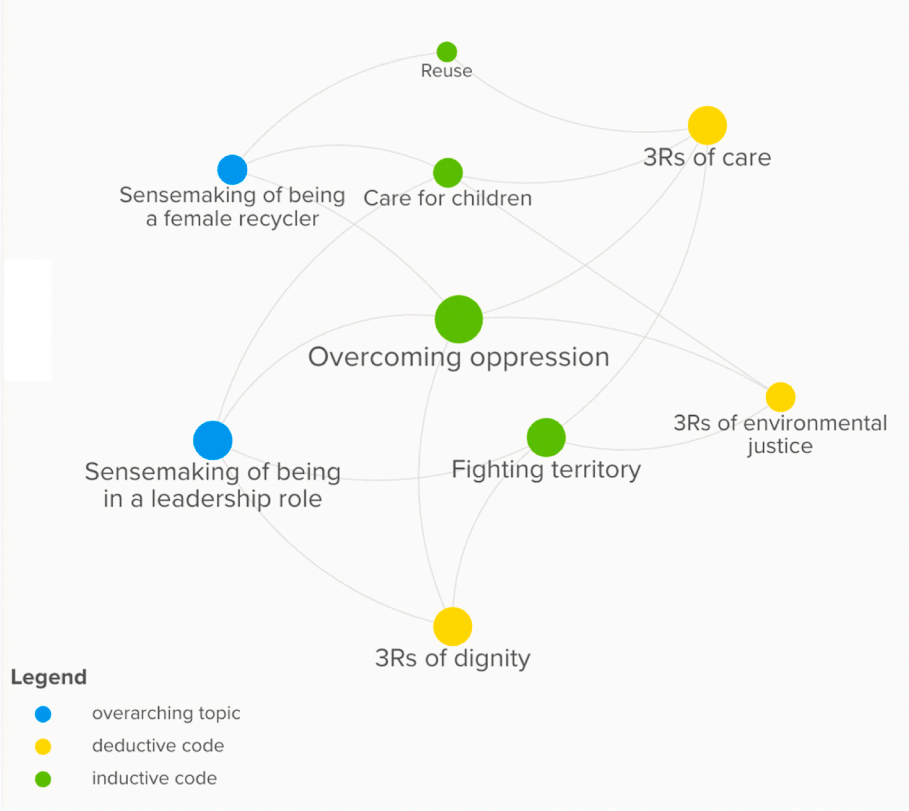

Fig. 1. Themes from coding process. Size of codes indicative of number of connections. Connections show that these variables were found together in the interviews. The interactive version of this graphic with relevant quotes is available here.[2]

were selected via snowball sampling (Goodman, 1961) and the methodology can be reviewed in chapter 1 of the book. In this analysis, only those that held leadership positions at the time of interview were included. The book is publicly available, including the names and photographs of the recyclers who agreed to have their information published, therefore, their names have been maintained in this publication to highlight this narrative's co-creation.

In this follow-up, a substantive post-structural critical lens is taken (Agger, 1991) to assess recyclers' embeddedness in their associations, numbers in parenthesis represent the number of mentions in the interviews; when using the denominator 10, it represents how many recyclers referred to this topic; other denominators refer to the theme's total mentions. Despite using sentences as the coding units, many phrases were presented in paragraph form in the results to encompass the full ideas. The online tool kumu.io was used for creating interactive maps to showcase the relationship of codes and relevant quotes.

4. Results

The themes of the coding process are summarized in Fig. 1. The sensemaking of recycling comprises the reuse of material, care for

[2] https://kumu.io/melvalvel/codingwp#themeswp.

Table 2
Implementation of policy demands per city.

Demands		Bogotá	Quito	Cuenca	Lago Agrio	Coca	Portoviejo
Recognition		Through national regulation and abiding municipalities[a]					
Redistribution	Guaranteed access to waste	Constitutionally recognized	Recognized legally	Recognized legally	Program with stamps for stores to receive their permit, only if they give their recycling to the recycler.	Through direct contract	None
	Source separation	Recognized legally	Pilot program	Recognized legally		Some private entities	Pilot program
	Storage facilities	Some privately owned	Privately owned	Provided by local government	Provided by local government	Funded via local government payment	None
Remuneration		Payment for service per ton	None	None	None	Direct Contract	None

[a] In Ecuador, the Regulation for Environmental Organic Code (2019), Article 593 explicitly calls for the prioritization of recyclers for collecting and separating recyclablefbbbble material. In Colombia, since 2003, the protection action T-724 judicially demanded that municipalities take affirmative action to include recyclers in their waste management model.

children and the territorial and multigenerational inheritance of waste picking. For the sensemaking of their motivation to lead their organizations, the examples comprise the care for children, fighting territory, overcoming oppression, and demanding dignity through their associations. These same variables represent environmental justice, adding intergenerational justice due to the language used around caring for children and their future. Combining these codes enables the argumentation for a fair transition from a lens of provisioning.

4.1. Sensemaking of being a female recycler

Waste pickers explain they became recyclers because of one or more of the following: caring for their children (9/10), being born into it (4/10), and making ends meet to obtain sustenance (10/10). Most female recyclers see their role as mothers as the main reason to start or continue waste picking to satisfy the basic needs of their children and family (10/10). Most recyclers mention their reuse of materials found in the garbage at home (6/10). These materials entail wood, food, clothing, furniture, toys, among others.

Many recyclers describe the opportunity to care for their children while recycling as a significant driver to pursue recycling (4/10). They carry their children, the recyclable material, and food for their animals while waste picking. For those working in curbside collection, they take their children with them for fear of something happening at home. This image represents the multiple burdens of women aiming to care while looking for material sustenance. As a result, women recyclers come together in 'provisioning communities' (Neysmith and Reitsma-Street, 2005), which resemble the feudalist organization in which women collaborated in household chores and child-rearing (Federici, 2010). In all cities, recyclers mention the caring for other recyclers' children as a necessity. In Bogotá, they created their own day-care, occupying land to do so and later, developing it into a school with local officials' support.

Some recyclers already have experience caring for other children and doing household chores as a common theme. Prior to being recyclers, many were housemaids while still being children (4/10) or during early adulthood (1/10). *Empatronamiento*[3] stories result from care-work deflected from wealthier families at no cost, a type of exploitation that results from the marginalized conditions in which many children are still growing up.[4]

Some of them experienced physical violence and rape during their time in these households (2/10). They managed to escape and turn to recycling for their livelihoods. This example of exploitation also calls for redistribution of care-work not only from a gendered perspective (from women to men) but also from a socioeconomic one (from poorest to richest). Given the recurrent theme of exploitation and violence also as they transitioned into waste picking, Iris Young's framework to evaluate the different types of oppression as operational categories was utilized (Young, 2009); the categories are marginalization (86), exploitation (25), cultural imperialism (7), powerlessness (25) and violence (80). Detailed definitions of the faces of oppression are listed in Supplementary Material.

Many recyclers, having loose contracts or agreements to collect material, have been displaced or left behind, powerless. Moreover, because of governments or industries trying to impose waste management models from other countries that would disregard recyclers, cultural imperialism becomes evident, not only from the endpoint, pushing for landfills but also in the process as new policies are designed importing models that do not recognize the role of waste pickers in the local context.

4.2. Sensemaking of being in a leadership role: social provisioning communities

Multigenerational recycling is present in many cases, and most result from internal or foreign migration (6/10). Dumpsites are already in the peripheral areas where people settle or begin forming, either due to illegal dumping or established sites for dumpsites, before creating landfills. For most recyclers who have worked in dumpsites, there is a significantly larger number of mentions about territory (71/82) compared to those who started directly in curbside collection. Territorial agreements spotlight the socio-spatial relations of recyclers, defining who belongs. The territorial dispute for the right to recycle comes from the omnipresence of waste in territories neglected in cities. The combination of being migrants and retaining this right to recycle fostered the creation of organizations that functioned as periurban commons.

Waste picking associations resulted from the impending closure of dumpsites. All were threatened, particularly by the government and sometimes private companies, as more landfills became privatized. Despite the drawbacks for recyclers when they were displaced from the dumpsite, associations have mostly been strengthened by this process, pushing for some type of formalization that brings recognition. For many waste pickers, this is the turning point when leaders had to emerge from waste picking groups. It was only through sustained organizing that remuneration for the recyclers by Colombian municipalities became a reality.

> "I remember when the first money transfer was sent, people got a message telling them they had a deposit, and people were surprised … That was like breaking a wall because recyclers thought that because they were looking through the trash, they did not deserve

[3] *Empatronamiento* was the term utilized by waste pickers abducted and sold or gifted to wealthier families to conduct unpaid or underpaid domestic work, many times as children.

[4] Children servitude continues to be a significant concern in the developing world, with approximately 17.1 million children in positions of unpaid domestic work, of which 62.7% are girls (ILO, 2013).

people to recognize that they were doing a good service. Many went to eat ice cream with their children in the park that day; they did things that were previously denied to them."

Nohra Padilla, Bogotá

In different cities, the achievements regarding the 3Rs of dignity have varied widely. Table 2 summarizes them by city based on the interviews with recyclers and triangulated with each city's policies.

The role of associations has extended beyond these demands. In Colombia and Ecuador, from all cities and leaders (10/10), there is evidence of the role of forming these bonds among women through larger networks of recyclers, a sorority that not only worked towards external recognition but first helped in awakening the sense of dignity of each recycler to empower each one to become a leader.

Moreover, these support groups train themselves to avoid violence at home, within the organization, and from others that would deem their work dirty. To overcome this discrimination, recycler leaders build self-esteem and identity, create social buffers, confront the public and create defence mechanisms, practices that have also been identified in other occupations deemed as dirty (Ashforth et al., 2007; Ashforth and Kreiner, 1999).

"When I met other recyclers, they were like me, their husbands physically abused them, and they were abused even by citizens because they called them dirty. What I learned; I was able to teach my fellow waste pickers … Today I am proud to say that I am a waste picker, to support other recyclers, to see that we make a change towards improving the life of the people who need it most."

Elvia Pizuña, Quito

This identity and social safeguards within recyclers organizations are not used to insulate themselves, but rather to create a united front that allows them to gain recognition and material protections. Identifying who to trust while avoiding exploitation has been a key objective in organizing. The exploitation of recyclers takes several forms, the most mentioned are intermediaries' overpricing and governments' publicity campaigns.

"That's how we all were because when we saw people coming from television, we ran into hiding because we didn't want to give them an interview, to be seen, and worse to have our pictures taken. When we started our field visits, the recyclers would say, "Why do they come if they always deceive us. You come as the municipality that deceives us," … nobody believed in the process."

Laura Guangoluisa, Quito

As a result, there have been many situations in which recyclers have felt continuously powerless when facing government officials, mainly due to unfulfilled promises. On multiple occasions, NGOs' involvement solidifies the credibility of associations that have had negative experiences before. The association's training and the intervention from NGOs were cited as critical in getting processes started (10/10) and allowing recycling leaders to recognize their dignity to be able to demand recognition for and from others. Some recycler leaders expand their societal involvement. For example, when recyclers can get more income for their associations, they involve more people, particularly homeless populations, rather than keeping it among the few; this happens consistently in Coca and Bogotá. This inclusion is vital in a social provisioning community and interestingly coincides with the only two cities analysed where remuneration for the service is guaranteed (See Table 2). The interviewees discussed the programs they have created such as day-care centres and sorting stations where the elderly can continue earning an income as an emerging benefit of becoming associations to devise a social safety net that the state hasn't provided.

4.3. A social vision for the CE

Recyclers have also been demanding redistribution of their load to be able to perform adequate collection, including preferential access to waste through source separation by citizens, storage capacity and transportation. Waste pickers, in collaboration with multiple social and governmental actors, have created campaigns and educational programs to teach source separation, but this has had limited success, continuing to make their work very labour intensive.

The demand for access to waste also foresees the implementation of extended producer responsibility (EPR), a useful tool in the CE to make producers responsible for their products throughout their lifecycle and disposal (OECD, 2016). Many companies are designing closed loop systems without considering the benefits that working with waste pickers could bring, particularly the large coverage at a low cost with lower greenhouse gas emissions. Given the possible exclusion of recyclers, they have demanded guaranteed access to the waste discarded with a first-come, first-served system for curbside collection. Nonetheless, most of waste pickers recognize that recycling has a limited effect in avoiding waste disposal and even though it is not clear how it will affect their income, they are calling directly for EPR.

"Waste is from the generator until it is on the curbside, if you put it outside it belongs to the first one that passes by. It can't be a public resource because then the state can claim it as its own, and that's why we had a huge discussion and we got it declared that when it gets out of the house it belongs to the first one who picks it up."

Norah Padilla, Bogotá

Recycling and reuse of waste constitute a portion of the material provisioning that waste pickers perform. Nonetheless, when not remunerated, it is another type of exploitation: care-work for the planet that is not recognized and conceals the damages of consumerism. Reintroducing materials that have already been deemed waste into production has a market value but also a service value. In Ecuador, the collection and burial of waste reach $60 per ton (INEC, 2020), costs that are saved when waste pickers divert material for recycling or reuse. This value still doesn't consider the social costs due to NIMBY[5], the economic costs saved from installing a new landfill, and the environmental burden that falls on recyclers.

Even though only a few recyclers (3/10) emphasize their contribution to the environment, all identify caring for members of their associations and society as their role. They are aware that their work is aiming for long-term impacts that will require long-term efforts, both internally from recyclers' dignity, and externally with the government and society at large. Finally, almost predicting the conditions that would lead to COVID19, they can see the intergenerational justice that their work entails and the critical socio-ecological implications of implementing a CE.

"The environment keeps getting worse, and we're just thinking about money, but we don't start thinking that someday when the environment is worse, we're going to have to go around with a mask and that's why we have to think about the future of our grandchildren."

Asunciona Torres, Cuenca

5. Discussion

The results in this analysis are consistent with previous research where women who begin recycling do so as a form of making ends meet, to escape extreme poverty conditions and to be able to provide for their children. In this study, most recyclers began reclaiming material for their use, from wood to toys and only later in life began collecting material to sell. The process of becoming recycling leaders shows remarkable advancement in enhanced capabilities, demanding social change. The modifying effect of becoming part of an association is rooted in the

[5] Not In My Backyard. Popular term denoting the resistance by neighbors to installations such as wind turbines and landfills in their neighborhoods.

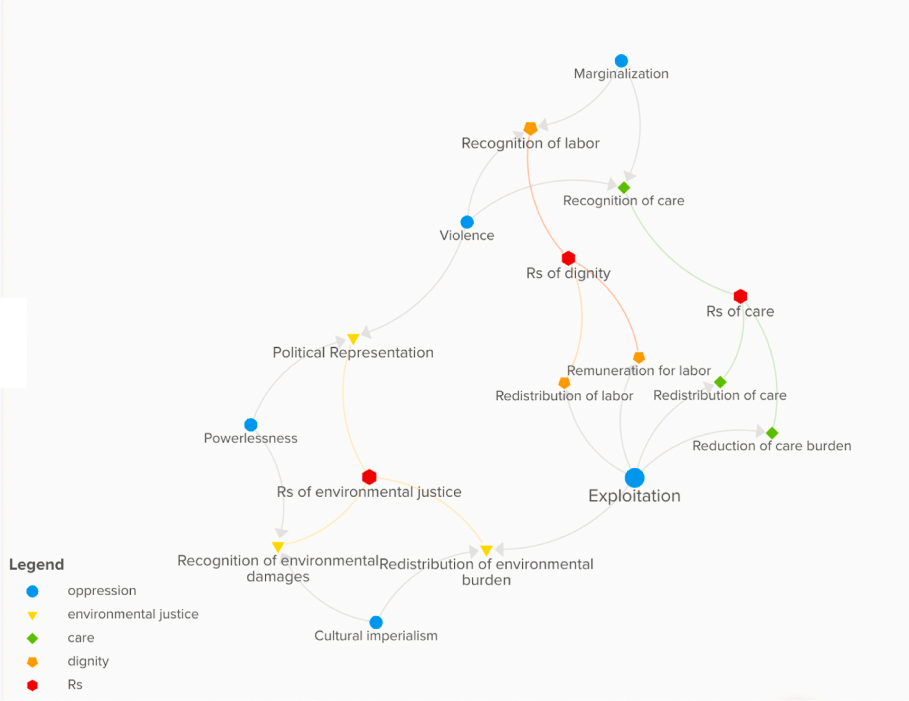

Fig. 2. From oppression to the 9Rs. Undirected color-coded connections show to which R the variable is related to. Directed grey arrows show the transformation of the oppression variable to the relevant Rs. Interactive version of this map is available here.[6] (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

social provisioning communities formed to provide materials and strengthen social relations, but mostly, to exchange training. This training is not necessarily technical, but rather one that helps them reinforce their identity to empower them to escape the stigma associated with waste picking and all forms of oppression to demand the 3Rs of dignity.

The role of extensive networks of recyclers has been crucial in obtaining recognition and sometimes remuneration from governments alongside guarantees of access to waste. Nonetheless, the process initiates with leadership training and a sense of self-worth that has been dampened by continuous events of violence and marginalization. The testimonies portray how provisioning generated through organizations' formation led by women provides the opportunity to escape oppression into the new 9Rs. The interviews showed clear mechanisms to switch from: 1) marginalization to recognition for the labour of recycling and care; 2) exploitation to redistribution and remuneration for recycling and redistribution and reduction of the caring burden; 3) cultural imperialism to recognition and redistribution of the social and environmental damages generated by dumpsites; 4) powerlessness to the recognition of the social and environmental damages and political representation; and, 5) violence to the recognition of the labours of recycling, care and representation that recyclers had been previously denied. Mapping these variables in Fig. 2 also showed that the oppressive forces related to environmental justice were more closely related to powerlessness and cultural imperialism, care to exploitation, and dignity to marginalization and violence.

These insights are consistent with previous proposals for the combination of ecological economics and solidarity economy in setting a theoretical basis for a CE (Gutberlet et al., 2017). The lens of care puts forward an opportunity to correct the environmental and social injustices endured by recyclers due to the impacts of the linear economy in the location of dumpsites and the consequent marginalizing conditions they have faced. Recyclers' associations have taken the role of provisioners for the lack of social safety nets available to them, including building the neighbourhoods' infrastructure, the schools for their children, and protection for the elderly when they can no longer work, all led by women.

The community of women waste picker leaders takes a vital role in securing the implementation of recyclers' demands, they do this for all, not just women. This finding resembles previous conclusions from Segato (2014) where women taking leadership roles promote progressive policy for all, not just their gender. Nonetheless, despite all these efforts, recyclers' work has been to transition into source separation that focuses mostly on the exchange value of materials, neglecting the initial reuse value. Waste picker associations recognize this limitation and have joined zero-waste and CE movements at the national level in Colombia and Ecuador. Adopting a CE also guarantees a reduction of the burden of the social and environmental impacts for themselves and their children, as they mention. This is a clear form of social provisioning where recyclers could argue they would be jobless without waste but acknowledge the greater good of a zero-waste society.

However, they continue to ensure they have access to the waste that is still generated. As EPR systems are currently being devised, companies are looking at reverse logistics models to recover their materials. As described in the interviews, waste pickers demand that any waste generated and put on the curbside, though the responsibility of municipalities, is not their property, so anyone passing by should be able to take it. This recognizes the discarded material as a common good, while also acknowledging that in the CE there is greater value in reuse than recycling while benefitting those who use the material when collecting it. Through this system, the value-added of the inclusion of recyclers in the value chain, a recognized driver in waste management systems (Rodić and Wilson, 2017), occurs through the embedded value of their labour in collection and care for the environment. Uruguay (Artieda et al., 2018) and Chile (MMA, 2015) have designed EPR systems where recyclers are included and serve as examples. Nonetheless, the value of the social provisioning communities remains invisible while it

[6] https://kumu.io/melvalvel/optosce#oppression-to-9rs.

constitutes a societal benefit that should be accounted for and redistributed through access to social safety net programs, constituting the restorative portion of a CE.

Despite the argument that unpaid work represents the most essential contribution to what matters, many perform it out of not having other options (Jackson, 2009; Nierling, 2012). The recognition and remuneration of this work is not only an economic matter but also a form of integral reparation from an environmental justice perspective, a concept recognized in both Colombian and Ecuadorian regulation under human rights law (Beristain, 2010; OHCHR, 2005).The 9Rs proposed can constitute the integral reparation for the detrimental effects of the linear economy. They can lead to realizing a socially regenerative and restorative CE that incorporates community-based organizing from a care perspective. Moreover, they can promote care in a political context (Tronto, 2018) in which care for the environment combines care for communities, work that has been mainly performed by females getting organized. The model presented can be beneficial not only for recyclers but also for all other jobs that combine a CE with care-work. This change in the job market can also promote a regenerative opportunity for other undervalued jobs. Examples of these are artisanal ecodesign and repair within the CE's loops, such as the work of electromechanics, cobblers and seamstresses. The guiding questions and examples in Table 3 show how the 9Rs of a fair transition can be applied.

More research is needed to understand the implications of the application of this framework since it is developed from a bottom-up approach where associations pushed and achieved the processes that fit them best. Applying the framework as a process design or top-down policy will face different challenges that should be studied. The role of platforms for partnerships such as the new CE Coalition for Latin America and the Caribbean will be crucial in raising awareness of the need for a fair transition that takes both a material evaluation of circularity in the region but also a social assessment.

The examples provided are also limited and should be further investigated. Nonetheless, operationalizing these 9Rs can be a guide to right the historical wrongs of the linear economy that disregarded the social provisioning role of care-work in organizations and the environmental injustices perceived by vulnerable communities. Strengthening existing bottom-up efforts from organized communities affected by the linear economy that are applying CE principles will help to avoid another imposition of economic and environmental models that jeopardize the social benefits achieved by the existing social provisioning efforts.

Table 3
Guiding questions and practices to apply the 9Rs of a fair transition with a CE.

Rs	Guiding questions	Examples
Recognition for labour	• Has anyone been doing this CE work before (applying ecodesign principles, repairing, waste picking, others)? • How can the policy we design amplify their work? • How can producers partner with (many times neglected) actors applying CE principles in their value chain?	Identify actors and stakeholders along life cycle of the product or service. Generate agreements such as payment for collection of the material recovered or incentives for waste avoided in design.
Redistribution of labour	• Who are the actors alongside the life cycle of this product or service? • Are the main beneficiaries of its profit and use, also the main responsible for their management and disposal? • How can these actors more actively engage in their responsibility?	Implement and reinforce extended producer responsibility (EPR), returnable systems by companies and source separation from households.
Remuneration for labour	• Besides the material value of the recovery of the material, what is the economic value for the externalities avoided by applying the resource based Rs (repairing, reusing, recycling, etc)? • How can this economic value reach those who are performing this labour?	Cities paying waste pickers for collection services. Companies recruiting repairers in cities and paying for services when they fix their products. Cities or organizations rewarding zero waste practices such as tax reductions.
Recognition of the social and environmental damages	• Did the linear version of this product or service provision create social or environmental damages such as sending to landfill, generating emissions localized to a community?	Use environmental impact assessment tools alongside social life cycle analysis with comparative strategies. Create inclusive plans for dumpsite closure that include waste pickers in new waste management systems.
Redistribution of environmental impact	• Has the detrimental impact of production, use or disposal of this product or service affected an area or community disproportionately? • How can this impact be reduced via ecodesign or by applying any of the resource based Rs?	Reduce the need for landfills that bring localized impacts in favour of repairing, EPR, creating or promoting second-hand markets.
Political representation	• Are the voices of the actors that have been applying CE principles being heard to create relevant policy? • How can those voices be found if no association is in place?	Destine resources for guilds and associations to be formed or strengthened in cities, particularly for waste pickers and repairers.
Recognition for care	• Has the work associated with the production and care during use or disposal of this product been gendered or marginalized in any way?	Identify relevant actors, measure their impact in provision of environmental, economic, and social services

(*continued on next page*)

6. Conclusion

In the quest to transform the modes of production and consumption from linear to circular, there is a need to correct the unequal distribution of the labour, care, and environmental burden the linear model has had on marginalized communities. Using the example of waste picking in 2 countries in Latin America, this study explored how social provisioning communities with female waste picking leaders transformed oppression into activism for dignifying conditions for labour that also call for counting care-work and environmental justice. The study proposes 9Rs for a fair transition to a CE. These 9Rs can comprise an integral reparation method for those who have been doing care-work in the context of a CE under informal, unpaid, or underpaid conditions, including waste pickers, repairers, and artisans. Guiding questions and examples are proposed to extrapolate the experience from female waste picker leaders to other types of work related to the CE and conduct further research.

CRediT authorship contribution statement

Melanie Valencia: Conceptualization, Methodology, Validation, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization. **María Fernanda Solíz:** Conceptualization, Methodology, Validation, Investigation, Resources, Data

Table 3 (*continued*)

Rs	Guiding questions	Examples
Reduction of care burden	• How is the product or service designed to ease the burden of management it requires along its lifecycle, avoiding final disposal of the material or its parts?	Guarantee a returnable system that is functional, accessible, and effective for all. Ensure availability of spare parts in local market when allowing imports to avoid early disposal.
Redistribution of care burden	• What are the conditions that support the balance of caring for planet, people, and the economy of circular work, particularly for vulnerable populations?	Design social security services schemes for previously informal workers. Create affordable day-care services, schedule flexibility.

curation. **Milena Yépez:** Conceptualization, Methodology, Validation, Investigation, Resources, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix ASupplementary data

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