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Towards a Socially Inclusive Circular Economy: Evidence From Social Enterprises in Low- and Middle-Income Countries

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ABSTRACT

Circular economy (CE) and social entrepreneurship (SE) are increasingly recognised as critical pathways for sustainable development, yet CE research often underplays social inclusion, particularly in low- and middle-income countries (LMICs). This paper examines how organisations engaged in circular practices achieve social inclusion in practice. Drawing on a qualitative multiple case study of waste management organisations in Lagos (Nigeria) and Bogotá and Cali (Colombia), we analyse how empowerment is embedded within circular activities. Our findings show that organisations integrate agency-building processes and opportunity structures into recycling, reducing and rethinking strategies, enabling marginalised actors to access services, gain recognition and participate in economic and civic life. We propose a socially inclusive circular economy (SICE) framework, which conceptualises social inclusion as an outcome of circular practices mediated by empowerment. The study contributes an empirically grounded understanding of how CE can support more inclusive and socially just sustainability transitions in LMIC contexts.

1 | Introduction

Circular economy (CE) and social entrepreneurship (SE) are increasingly recognised as important pathways for advancing sustainable development (Esteves et al. 2021; Ghosh et al. 2024). In low- and middle-income countries (LMICs), where poverty, informality and inequality remain pervasive and challenge holistic approaches to sustainability, enterprises adopting circular business models (CBMs) are emerging as key actors (Adelekan 2021; Ezeudu and Kennedy 2024). These organisations generate economic opportunities for low-income households by creating value from waste, while also integrating informal waste pickers into their operations (Holt and Littlewood 2017). Similarly, social enterprise business models (SEBMs) are gaining momentum in LMICs, characterised by a dual motivation to achieve social impact while ensuring economic profitability or at least financial

sustainability, a distinctive orientation in such contexts (Chliova and Ringov 2016). These parallel developments have stimulated growing scholarly interest in the intersections of CE and socially oriented organisations (Van Opstal et al. 2025), particularly in examining their potential to generate more holistic economic, social and environmental outcomes (Crespo-Rosas and Franco-García 2023; Hua 2024; Suchek et al. 2022).

For example, CE is often operationalised through strategies such as closing, slowing and regenerating resource loops (Bocken and Konietzko 2023). While these help address environmental and economic challenges, critics note their limited engagement with social dimensions (Hofmann 2019; Moreau et al. 2017). In many cases, the social value of CE is reduced to job creation, sidelining broader goals such as equity, empowerment and inclusion.

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This omission is particularly problematic because sustainability transitions in LMICs, where sustainability transitions are shaped by inequality, informality and power asymmetries that structure access to resources, recognition and participation (Dewick et al. 2022; Tebboth et al. 2025). Waste pickers, for example, are critical actors in recycling chains but remain undervalued, stigmatised and excluded from formal CE narratives. By overlooking these contributions, CE risks reproducing social inequities while advancing a narrow view of sustainability (Schroeder et al. 2019; Tebboth et al. 2025). Scholars increasingly argue that CE must engage with the lived realities of marginalised groups and align environmental practices with social justice (Dewick et al. 2022).

At the same time, research on socially oriented organisations enterprises (SEs) highlights their capacity to address exclusion by embedding economic, social and environmental objectives within their activities. These organisations mobilise resources under conditions of scarcity (Holt and Littlewood 2017), build community resilience (DiBella et al. 2023) and facilitate access to services, recognition and participation for marginalised groups (Esteves et al. 2021; Gold et al. 2020). Despite this relevance, their role in shaping socially inclusive CE (SICE) practices remains underexplored (Crespo-Rosas and Franco-García 2023; Suchek et al. 2022).

Together, these areas of literature reveal an important gap. While CE research has advanced strategies for material circularity, it provides limited insight into how social inclusion is achieved in practice. Emerging work on SICE has highlighted the need to address equity and participation but remains largely conceptual and offers limited empirical understanding of how organisations operationalise these goals (Hua 2024; Souza Piao et al. 2024). The limited empirical studies normally focused on the ecosystem level (Hormiga et al. 2011; Van Opstal et al. 2025) and are often based in the Global North, with a few recent exceptions of studies in LMIC (Adelekan 2021; Crespo-Rosas and Franco-García 2023; El Chaarani and Raimi 2021; Ojeda-Cortés and Camarena 2025; Souza Piao et al. 2024). At the same time, organisational and development literature identifies empowerment as a key mechanism through which individuals gain the capacity to participate meaningfully in social, economic and civic life (i.e., Crondahl and Eklund Karlsson 2015), yet this mechanism has not been systematically examined in relation to CE practices.

This gap is particularly significant in LMIC contexts, where circular activities are often embedded within informal systems and where inclusion cannot be assumed as an automatic outcome of environmental or economic interventions (Baffoe and Green 2026; Ojeda-Cortés and Camarena 2025). Addressing this requires moving beyond abstract principles to examine how organisations embed processes that enable marginalised actors to participate, benefit and be recognised within circular systems.

This paper contributes by examining how organisations engaged in CE practices foster social inclusion in LMICs. Drawing on a qualitative case study of two contexts, Lagos (Nigeria) and Bogotá and Cali (Colombia), we analyse how organisations are establishing CE principles to meet social inclusion objectives. In Lagos, we examine organisations that collaborate with waste

pickers and low-income households in recycling systems. In Colombia, we focus on waste picker associations that operate collectively and pursue both environmental services and social rights. These cases provided complementary insights into how socially inclusive circular practices can be achieved in practice across different contexts.

Our analysis demonstrates that circular practices generate more than material efficiency: When combined with empowerment processes, they create pathways for social inclusion, including improved access to services, recognition and participation. Building on these insights, we propose a SICE framework, which highlights how empowerment, through agency-building and the creation of opportunity structures, enables the translation of circular strategies into social inclusion outcomes. The framework also shows how these outcomes, in turn, reinforce and reshape organisational circular practices.

This study makes three contributions. First, it advances CE scholarship by positioning social inclusion as a central outcome of circular practices rather than a secondary effect. Second, it provides an empirically grounded explanation of how empowerment mechanisms are embedded within organisational circular activities in LMIC contexts. Third, it introduces the SICE framework as a practical tool for understanding and assessing how CE practices can contribute to more inclusive and socially just sustainability transitions. In doing so, we respond to calls for more socially responsible CE frameworks (Hua 2024; Merli et al. 2018) and contribute to ongoing debates on the social and solidarity CE (Suchek et al. 2022).

We ask two research questions: (a) How does the CE achieve social inclusion in practice? and (b) What are the mechanisms through which an organisation practising CE activities can achieve social inclusion?

The paper is structured as follows: Section 2 reviews the literature on CE, SICE and social inclusion. Section 3 outlines the methodology and case selection. Section 4 presents the findings from Colombia and Nigeria. Section 5 develops the SICE framework and discusses its implications. Section 6 concludes with a discussion of future research directions.

2 | Literature Review

2.1 | Circular Business Principles

Evidence increasingly highlights the central role of organisations in enabling circular transformation as a pathway towards achieving the Sustainable Development Goals (SDGs) (Bocken et al. 2025). Organisations typically engage with the CE through resource cycling principles to advance sustainability ambitions (Liu et al. 2025). Early CE scholarship focused on reduce, reuse and recycle, with recycling positioned as the least preferred option due to its continued dependence on material processing and energy inputs (Barnett et al. 2023). Potting et al. (2017) extended this framework to nine principles, introducing higher order strategies such as refusing, rethinking and repairing, alongside lower preference options such as repurpose (a form of upcycling), recycling and resource recovery. These principles

have shaped how organisations transition from linear to CBMs (Bocken et al. 2016; Triguero et al. 2022).

Within this literature, CBMs are defined as the rationale through which organisations create, deliver and capture value by closing, slowing, narrowing and regenerating resource loops (Bocken and Konietzko 2022). This framing is extended by Geissdoerfer et al. (2017) to include intensifying and dematerialising resource loops. Together, these strategies clarify how organisations operationalise circular principles in value creation while signalling different levels of circular ambition (Potting et al. 2017).

Narrowing loops focuses on doing more with less through reduced material input per product, generating efficiency gains that lower costs and resource extraction (Bocken et al. 2016; Potting et al. 2017; Ritala et al. 2023). Closing loops reflects recycling through end-of-life material processing for continued use. Slowing and intensifying loops emphasise extended use and higher utilisation, aligning with reuse and rethink principles such as shared consumption models including bike sharing (Gao and Li 2020). Dematerialisation prioritises service provision over ownership, reinforcing reduce principles by improving utilisation efficiency (Potting et al. 2017). Regeneration focuses on restoring natural systems and remains underexplored despite its potential (Konietzko et al. 2023).

These strategies are applied across organisational types including firms, social enterprises and NGOs (Forastero 2023; Pusz et al. 2024; Van Opstal et al. 2025), sectors ranging from fashion to renewable energy (Adelekan and Sharmina 2024; Colucci and Vecchi 2021; Kurniawan et al. 2022; Nyffenegger et al. 2026; Pascucci 2020) and contexts dominated by high-income economies with emerging evidence from LMICs (Born 2025; Ezeudu and Ezeudu 2019; Magalini et al. 2020; Pesce et al. 2020; Rodrigo-Illarri et al. 2021). As calls intensify for accelerated CE transitions and adoption of higher level principles (Barnett et al. 2023; Barrowclough and Birkbeck 2022), research is expanding, particularly through critical studies that challenge efficiency-focused framings and foreground fairness, inclusivity and social outcomes (Barford and Ahmad 2021; Liu 2024).

2.2 | Socially Inclusive Circular Economy

Critics argue that the CE is overly material focused and closely aligned with business-led growth pathways, often undermining broader sustainability goals and social inclusion (Clube and Tennant 2023; Moreau et al. 2017). In response, calls for more holistic and transformational approaches to a sustainable CE have intensified (Jaeger-Erben et al. 2021; Liu 2024). A growing body of research now examines what a more human centred CE entails and how CE transitions can contribute to social change beyond environmental outcomes alone (Clube and Tennant 2023; Gallardo-Vázquez et al. 2024).

At the individual level, studies focus on the CE consumer, examining consumption patterns, attitudes and behaviours to identify barriers to participation and more inclusive pathways

for sustainable consumption (Georgantzis Garcia et al. 2021; Hobson 2020). This work reframes the CE as a civic endeavour rather than solely a business or policy project, emphasising the role of public funding in supporting socially oriented circular activities such as repair cafés and circular spaces. It also foregrounds collective participation as central to the legitimacy and effectiveness of circular transitions (Hobson 2020).

At the organisational level, scholarship critiques CBMs for their limited engagement with social inclusion. Hofmann (2019) characterises CBMs as a green-coated approach that overlooks equitable profit distribution, asset ownership and power redistribution through open standards and knowledge sharing. More broadly, CBMs remain embedded in linear business logics that prioritise shareholder value through customer value propositions (Centobelli et al. 2020), reinforcing profit centred models that marginalise social and environmental objectives. Where social dimensions are addressed, they are often reduced to job creation, neglecting wider concerns such as human rights, equity and community well-being (Geissdoerfer et al. 2017; Murray et al. 2017). In response, emerging studies explore hybrid organisational forms within the social and solidarity economy as alternative pathways towards more inclusive circular practices (Monciardini et al. 2024). Related work examines the integration of CE and SE models (Hua 2024) through network empowerment (Pusz et al. 2024) or the triple layer business model canvas (Widya et al. 2024) alongside the development of frameworks to measure social sustainability within CE contexts (Pitkänen et al. 2023).

At the societal level, research highlights how the social and solidarity economy can contribute to a more circular society (Villalba-Eguiluz et al. 2023). These perspectives argue that CE policies and initiatives often fail to address justice and inequality due to their reliance on market-oriented actors and solutions, prompting calls to reframe the CE as a circular society that foregrounds social concerns more explicitly (Leipold et al. 2021). This reframing is particularly relevant in contexts characterised by inequality, poverty and large informal economies, where formally designed sustainability interventions frequently exclude marginalised actors (Dewick et al. 2022). As a result, there is growing recognition of the need to examine how emerging CE practices can better engage informal and marginalised groups who remain outside mainstream economic frameworks (Dewick et al. 2022). These dynamics resonate with broader insights from critical development and informality scholarship, which highlight how marginalised actors are often systematically excluded from formalised sustainability transitions (Avelino 2017).

Within these individual, organisational and societal level debates, social inclusion emerges as a core dimension of social sustainability. Evidence suggests that circular transformations are more likely to succeed as being inclusive when plural perspectives are recognised, inequitable structures are addressed to support fairer distributions of costs and benefits, potential perverse outcomes are anticipated and local people and institutions are empowered (Tebboth et al. 2025). Framing social inclusion in this way positions it as a necessary condition for engaging marginalised and routinely excluded groups in circular interventions. Despite growing evidence challenging dominant CE framings and calling for more holistic organisational

approaches, particularly in LMIC contexts such as South America (Fuss et al. 2021; Navarrete-Hernandez and Navarrete-Hernandez 2018; Ojeda-Cortés and Camarena 2025) and Africa (Adelekan 2021; Baffoe and Green 2026; Desmond and Asamba 2019), research still falls short of translating these insights into actionable guidance. As organisations face mounting pressure to deliver sustainability objectives, new frameworks seek to integrate CE with social and solidarity economy approaches to advance socially inclusive circularity (Hua 2024; Ojeda-Cortés and Camarena 2025). Yet practical guidance for organisations remains scarce, with limited studies offering clear frameworks or stepwise approaches to embed social inclusion within circular practices or to assess its impact on organisational circular outcomes.

2.3 | Achieving Social Inclusion in Organisations

Social inclusion is considered a multidimensional, multifaceted and holistic concept. Rather than reducing inclusion to only economic participation, social inclusion is considered the capacity to participate in various aspects of social, economic and civic life (Mansouri and Lobo 2016). This participation is not limited only to individual access but to how institutional structures either facilitate or obstruct meaningful participation (Allman 2013).

At an operational level, social inclusion refers to access to favourable opportunities in society, including employment, housing, education, social services and social protection, which enhance individuals' life chances and freedoms (Cheung 2013; Kelly 2011; Smyth 2008). Particularly for employment, Leach et al. (2010) study in Australia identified that employment alone does not guarantee inclusion, emphasising that social inclusion requires not simply participation in economic activity but participation in conditions that enable human flourishing and agency. Similarly, Davies (2005) found that a narrow focus on employment placement, while economically justified, may ignore the reality that individuals may require constant interventions addressing health, housing, education and relational dimensions of exclusion.

Beyond access, social inclusion can be associated with how individuals perceived their 'access to institutions and resources in the decision making environment' (Oxoby 2009, 1137). Particularly in developing countries, social exclusion extends beyond poverty alone to include deprivation of opportunities, dignity and participation in shared social benefits (Arocena and Sutz 2012), emphasising how important it is to address not only financial resources but the capacity to participate meaningfully in society.

To achieve social inclusion, there are different organisational mechanisms that can be used. For instance, Vidal (2005) examines work-integration social enterprises (WISE) in Spain, documenting how these organisations facilitate inclusion through combining productive activity with personalised support itineraries that integrate vocational training, practical work experience and social support services. Other mechanisms include the measurement of inclusion both with objective participation indicators (such as activity engagement) and subjective indicators (satisfaction and sense of belonging) (Martin and Cobigo 2011).

Braithwaite (2004) proposed that 'hope', considered as a realistic belief in one's agency and capacity to influence circumstances, constitutes a critical psychological foundation for sustained engagement in inclusion-oriented organisational efforts.

Significantly, across organisational and development literature, empowerment emerges consistently as the key mechanism linking structural opportunities to experienced inclusion. Empowerment can be understood as a dynamic, multidimensional process operating at individual (involving self-esteem and the overcoming of internal oppression) and collective levels (benefits gained through collaborative action across interpersonal to societal spheres) (Rowlands 1995). Kabeer (1999) elaborates that empowerment is the process through which individuals or communities acquire the capacity to make both basic and strategic choices. This process requires three interdependent components: resources (psychological, informational, organisational, material, social and human assets), agency (capacity to make purposive choices and pursue goals) and achievements (the actual outcomes and changes resulting from choice exercise). Similarly, Alsop et al. (2006) proposed that empowerment requires agency (self-efficacy, aspirations and autonomy) and opportunity structures (institutional supports, legal frameworks and access to services), but critically emphasising that neither agency nor favourable opportunity structures alone generate empowerment; both must interact. A person might have significant personal agency but still face institutional barriers that limit their ability to act. Conversely, institutional opportunities cannot lead to empowerment if individuals are unaware of them, lack confidence or do not have the resources to recognise and use those options.

Organisations foster empowerment through multiple mechanisms that address both agency development and the transformation of opportunity structures, resulting in social inclusion. Table 1 presents a description of mechanisms and strategies identified in previous studies, emphasising their outcomes and enabling conditions.

The evidence presented in Table 1 across multiple contexts demonstrates that social inclusion is fundamentally a relational process requiring simultaneous attention to structural barriers and individual agency. Organisations seeking to advance social inclusion must recognise that empowerment is not a commodity to be delivered but rather an outcome of deliberate institutional design that creates the conditions for individuals to recognise, develop and exercise their capabilities. The studies highlighted that social inclusion emerges when organisations move beyond deficit-focused interventions to strength-based approaches that honour existing knowledge, identity and community assets while simultaneously removing institutional barriers and creating meaningful opportunities for voice and influence.

Across the three areas of literature discussed above, a consistent gap becomes evident. Research on CE principles has clarified strategies for material circularity but provides limited guidance on how their social implications are realised in organisational practice, particularly in LMIC contexts. Work on SICE has highlighted the importance of addressing equity and participation yet remains largely conceptual and offers few empirically grounded accounts of how organisations

TABLE 1 | Organisational mechanisms for fostering empowerment for social inclusion.

Mechanism/ strategy	Description/organisational actions	Outcomes	Enabling conditions	Citations
Building agency through skill and capacity development	Vocational training, social–emotional learning and life skills development Practical skill development through successful task completion	Enhanced critical health literacy enabled participants to exercise greater control over lives and integration processes Strengthened Roma identity and sense of power through integration of learning	Integration across life domains (health, housing and education) Adaptation to cultural context and existing knowledge	Crondahl and Eklund Karlsson (2015)
Transforming opportunity structure through participation and voice	Organisations embed democratic governance Participants develop deliberative capacities	Better access to helping/coping networks Meaningful involvement in project decision-making identified as essential for empowerment	Appropriate scale of intervention Multiscaled interventions combining neighbourhood and wider scales	Smith et al. (2010); Crondahl and Eklund Karlsson (2015)
Facilitating access to resources and information	Remove information asymmetries and provide access to credit, technology, information and land Collective financial mobilisation	Need assisted with housing improvements Increased affordability of land access through resource leverage	Integration of multiple resource types (financial, informational and infrastructural) Sustained investment and partnerships with state institutions Adaptation to local constraints and capacities	Muller and Mitlin (2007)
Fostering recognition and dignity	Formally recognise worker dignity, provide safe conditions and challenge stigmatising narratives Formal employment with a regular salary	Enhanced psychological empowerment (higher resourcefulness) and well-being Increased kin-based networks	Adaptation to cultural and social context recognising existing assets and identity Sustained investment Participatory governance	Eggerman et al. (2023); Crondahl and Eklund Karlsson (2015)
Enabling political voice and democratic participation	Opportunities for participation in governance and collective decision-making	Political empowerment improved social inclusion and access to justice institutions Cooperative membership strengthened empowerment	Integration across personal, familial and political domains Adaptation to socio-cultural context Sustained engagement and trust-building with marginalised communities	Cherayi and Jose (2016); Ahnach et al. (2025)

operationalise inclusion within circular activities. Finally, organisational inclusion research shows that empowerment is a key mechanism linking organisational interventions to experienced inclusion but rarely examines how such mechanisms intersect with circular business practices. These gaps demonstrate the need to examine how organisations engaged in CE activities can embed empowerment processes that translate circular strategies into concrete social inclusion outcomes in practice.

3 | Methodology

We employed a multiple case study approach (Stake 2005), which focuses on understanding the dynamics present within singular or multiple bounded systems over time through in-depth data collection methods, including observations, interviews, audio-visual materials, documents and reports (Eisenhardt 1989). These methods culminate in either a case description or the identification of case-based themes. The case study approach is particularly suitable for examining the interaction between a phenomenon and its context (Dubois and Gadde 1999). While multiple case studies provide the opportunity to present diverse perspectives on an issue, each individual case must still represent a concentrated inquiry into its unique context (Stake 2005).

Case studies are often used for theory development (Eisenhardt 1989; Wilson and Vlosky 1997), particularly through comparison of two or more cases. To conduct a robust case study, Wilson and Vlosky (1997) and Creswell (2007) outline five key steps: defining the research problem, selecting cases, designing instruments and protocols for data collection, collecting the data and analysing the findings. For this study, our research problem is how CE achieves social inclusion in practice and the mechanisms by which organisations do so. To address this, we selected two cases that illustrate how this happens.

3.1 | Case Studies

According to Miles et al. (2014), multiple case studies require deliberate choices about case selection, particularly regarding relevance and comparability. We chose two countries and three major cities in them, both LMICs (Adelekan 2021; Granados et al. 2022). In Nigeria, we selected Lagos, one of its fastest growing cities, and in Colombia, we selected Bogotá and Cali, the capital and the third-largest city, respectively. Cities in Nigeria and Colombia were selected because both contexts share structural characteristics relevant to the study, including large informal waste sectors, persistent challenges in waste collection and growing policy interest in CE approaches (Adelekan 2021; Granados et al. 2022). In both countries, waste systems combine formal and informal actors and have long histories of waste recovery alongside the exclusion of marginalised groups (Nzeadibe and Ejike-Alieji 2020; Rosaldo 2016). These conditions create fertile ground for innovative organisational responses to integrate excluded actors into circular value chains. While these contexts are shaped by longstanding power asymmetries, institutional tensions

and market uncertainties, this study focuses specifically on how organisations operate within these conditions to embed empowerment and inclusion in circular practices. Therefore, the selected case study cities provide suitable contexts for examining how SICE practices are implemented and shaped in practice. In addition, the researchers' familiarity with the Nigerian and Colombian contexts facilitated access to relevant organisations and stakeholders.

Within these contexts, we focus on organisations operating under SE principles, this is 'organisations that trade for a social purpose' (Littlewood and Holt 2018, 54), as these actors are particularly relevant for examining how social inclusion can be embedded within CE practices. SEs are increasingly recognised as organisations pursuing social and environmental change through market-based approaches (Doherty et al. 2009; Social Enterprise UK 2023). Unlike traditional firms, they are explicitly mission driven and operate with a multi-bottom line, seeking to balance social, environmental and economic objectives (Battilana and Lee 2014; Doherty et al. 2014; Santos 2012). This hybrid orientation makes them especially suited to contexts characterised by resource constraints and social exclusion, where organisational models must simultaneously address economic viability and social impact.

3.1.1 | Social Enterprises in Nigeria

Lagos is the fastest growing city in Nigeria and one of the most rapidly expanding urban centres in Africa, both economically and in population. However, this rapid growth has led to severe environmental challenges, particularly in waste management. The city generates up to 12,000 t of waste daily, of which only about 40% is collected, with much of the uncollected waste ending up in the environment (Olukanni and Oresanya 2018). Formal waste recovery and recycling efforts have historically been weak, with waste collection primarily managed through a private sector participation (PSP) scheme that has been unstable due to shifting government policies (Aliu et al. 2014). For years, informal waste pickers have played a critical yet precarious role, salvaging valuable materials from dumpsites and selling them to earn a livelihood (Nzeadibe and Ejike-Alieji 2020). However, their activities raise environmental and social concerns, particularly regarding health risks from exposure to hazardous waste and repeated attempts to evict them from landfills, often using force (Ezeah et al. 2013). In response, government and private actors have promoted CE approaches to transform waste into economic value as part of their sustainable development agendas. There has also been growing interest in including informal waste pickers within the city's emerging CE framework, which has contributed to the rise of waste enterprises engaged in recycling and waste management (Olukoju 2018). These ventures integrate environmental activism with waste recovery efforts, refining informal waste collection models by working directly with households, processing collected materials and supplying them to manufacturers as feedstock (Holt and Littlewood 2017). Their approach not only enhances waste recovery from the environment but also creates economic opportunities for low-income households, women and informal waste pickers.

3.1.2 | Waste Picker Associations in Colombia

Bogotá, the capital of Colombia, and Cali, the country's third-largest city, are major urban centres facing persistent challenges in waste management, social inequality and informal employment. Rapid urbanisation and growing consumption have intensified waste generation, with municipal systems struggling to achieve effective collection and recycling rates (UNEP 2024). For decades, informal waste pickers, known locally as 'recicladores', have played a crucial yet marginalised role in managing recyclable waste, collecting materials from streets and dumpsites to earn a living (Calderón Márquez et al. 2021). Despite their essential environmental contribution, waste pickers have long worked under precarious conditions, lacking social protection, recognition and access to the formal waste economy (Parra 2020).

Over the past two decades, Colombia has become a global reference for the inclusion of waste pickers in formal waste management frameworks (Economist 2009). Cali's waste picker movement led a historic legal process that culminated in a 2009 Constitutional Court ruling recognising waste pickers as legitimate entrepreneurs and prohibiting their exclusion from public procurement contracts for recycling and composting services (Granados et al. 2022). This ruling prompted reforms nationwide, including in Bogotá, where municipal authorities were required to integrate waste picker organisations into public service schemes and compensate them for the environmental services they provided. Subsequent regulatory developments, including Decree 596 of 2016, further institutionalised this integration by establishing pathways for waste picker organisations to operate formally within the public recycling service (Gómez-Maldonado et al. 2023).

In both cities, waste picker associations have formalised their operations and adopted organisational models resembling social enterprises. Typically structured as cooperatives or associations, these organisations are led by waste pickers themselves and operate through democratic governance and collective decision-making (Parra 2020). They manage waste collection routes, sorting centres and commercial partnerships with private firms, selling recovered materials such as plastics, glass and paper back into the production flow. In Bogotá alone, thousands of waste pickers have been incorporated into the public recycling system through their organisations, which now receive remuneration for the environmental service they provide within municipal waste management schemes (Gómez-Maldonado et al. 2023; Parra 2020). Their activities directly support CE objectives while advancing social inclusion by providing income security, professional recognition and leadership opportunities for marginalised populations. Nevertheless, challenges persist, such as fluctuating market prices for recyclables, bureaucratic procurement systems and uneven municipal support, which continue to threaten their sustainability (Gómez-Maldonado et al. 2023). Yet, by aligning environmental recovery with empowerment and formal entrepreneurship, Colombia's waste picker associations demonstrate how CE initiatives can evolve into socially inclusive systems that recognise and reward the contributions of historically excluded workers, particularly when waste pickers themselves play an active role in shaping the policies that govern their work (Rosaldo 2024, 2025).

3.2 | Data Collection

We adopted a purposive sampling strategy, defined as the selection of cases that are particularly suitable for replicating or extending emergent theory (Eisenhardt 1989). Rather than fixing the number of cases in advance, sampling evolved iteratively during fieldwork. We began by identifying potential organisations through systematic online searches and direct outreach. Additional cases were subsequently identified through snowballing during participant interactions. Drawing on prior literature, we purposefully selected organisations across both country contexts using four criteria: organisational type, area of waste service provision, formal registration status and income source. In Colombia, we selected organisations operating in line with SE principles, such as democratic decision-making, collective ownership and reinvestment of surpluses for community/member benefit (Littlewood and Holt 2018), while in Lagos, we included organisations that explicitly self-identified as social enterprises (Rivera-Santos et al. 2014). Across both contexts, we focused on organisations engaged in waste collection and recycling as core components of their business models (Holt and Littlewood 2017). All selected cases were formally registered, operating within environments where informal waste collection remains prevalent (Dewick et al. 2022). Revenue models included the sale of recyclable materials in both Lagos and Colombia, with Colombian cases also generating income through membership fees.

Access was sought concurrently with case identification. Consent forms were emailed in advance, followed by introductory phone calls to present the study and establish initial rapport (Creswell 2007). Ethical procedures were guided by templates and protocols from the researchers' respective university ethics committees to ensure compliance with institutional research standards. Interviews were recorded using a secure electronic device, with participants informed in advance about the study's purpose, recording procedures and intended use of data. To minimise risk and ensure data quality, recording equipment was tested prior to each interview and a backup device was made available in case of technical failure. Using a qualitative methodology, we conducted 32 interviews at the SEs' workplaces, at places accessible for waste pickers (coffee shops and restaurants) or by phone between 2019 and 2021. This method facilitated a deep understanding of their operations while providing first-hand insights into participants' experiences (Creswell et al. 2003). The interviews conducted by phone were those done during COVID-19 pandemic (2020–2021) and researchers followed strict ethical considerations for phone interviews (Carr and Worth 2001; Gibson et al. 2017). To accommodate staff members who are more comfortable with local languages, some interviews were conducted in Pidgin English (Nigeria) and Spanish (Colombia), then transcribed and translated into English. Table 2 summarises the participants. Colours and shapes were used to pseudonymise organisations across both case studies; those in Nigeria are represented by colours, while those in Colombia are represented by shapes (Circle, Square and Ellipse in Cali and Triangle and Diamond in Bogotá).

Given the qualitative nature of this research and its engagement with marginalised communities, we also reflect on

TABLE 2 | Sample description.

Country	Case	Number of interviews/roles	Length of interview
Nigeria (19 interviews)	Blue (3 interviews)	Founder—1	3 h 35 min 58 s
		Manager—1	
		Bailer—1	
	Yellow (3 interviews)	Founder—1	4 h 47 min 38 s
		Operations manager and intern—1	
		Picker—1	
	Red (5 interviews)	Co-founder and CEO—1	4 h 23 min 31 s
		Co-founder and CTO—1	
		Collection driver—1	
		Research officer intern—1	
	Pink (4 interviews)	Social media officer intern—1	4 h 30 min 57 s
		CEO—1	
		Kiosk manager—2	
	Brown (4 interviews)	Hub manager—1	2 h 1 min 56 s
		CEO—1	
		Executive director—1	
		Operations manager—1	
Colombia (13 interviews)	Circle (4 interviews)	Project supervisor—1	3 h 20 min
		Associate and board member—2	
	Square (2 interviews)	Associate (waste picker)—2	1 h 55 min
		CEO—1	
	Ellipse (2 interviews)	Associate (waste picker)—1	2 h 9 min
		CEO—1	
	Triangle (3 interviews)	Associate (waste picker)—1	4 h 3 min
		Founder/CEO—1	
		Technical director—1	
	Diamond (2 interviews)	Associate (waste picker)—1	2 h 14 min
		Founder/CEO—1	

researcher positionality. Qualitative research recognises that researchers' social and professional backgrounds can shape access to participants, the interpretation of narratives and the coconstruction of knowledge in the research process (Berger 2015; England 1994). In this study, the two researchers are nationals of the countries under investigation (Colombia and Nigeria) and have prior familiarity with the respective waste management contexts and key actors involved. This positionality facilitated contextual understanding and rapport with participants, while reflexive discussions between the researchers during fieldwork and analysis were used to critically examine interpretations and reduce the risk of subjective bias (Cunliffe 2016).

3.3 | Data Analysis

We employed thematic analysis, a well-established qualitative method used to identify, analyse and interpret patterns of meaning ('themes') within data (Clarke and Braun 2017). Interviews were analysed through coding using NVivo software. This involves the grouping and labelling of data in free codes (Grbich 2013) and identifying categories and dimensions within each case to surface cross-case patterns and similarities (Eisenhardt 1989; Sundaramurthy et al. 2013). To generate the first-order codes, we examined both the underlying motivations behind the organisations' activities and the approaches they are taking to implement them. It resulted

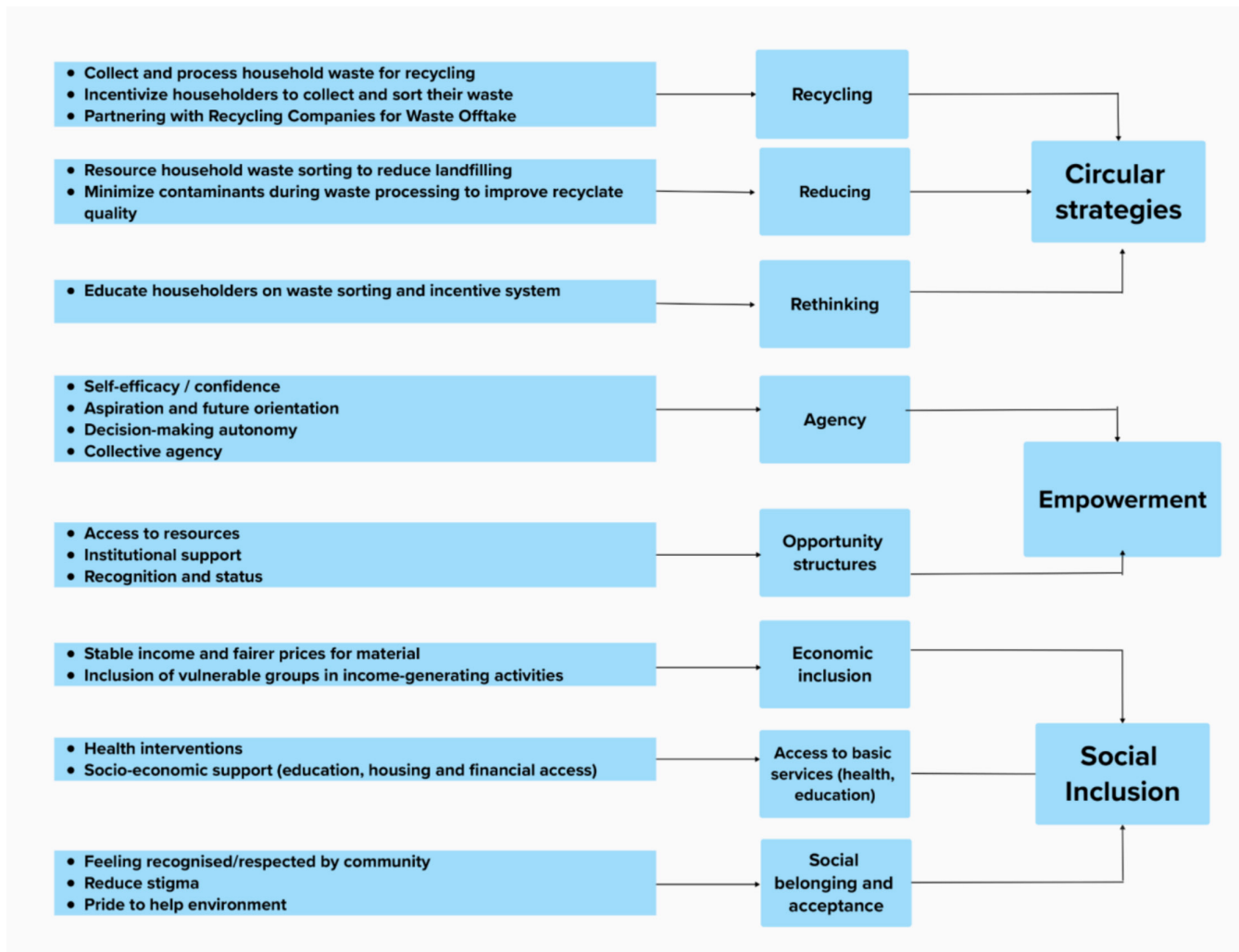


FIGURE 1 | Data structure showing the first-order, second-order and aggregate dimension codes.

in 20 first-order concepts, then grouped into eight second-order themes and three aggregated dimensions that capture why and how the organisations engage in their respective activities. We adopted an abductive approach to develop our themes, iterating between theory and empirical data to refine our interpretations (Dubois and Gadde 1999). This involved moving back and forth between the data and relevant literature on CE, social inclusive CE and social inclusion (Alsop et al. 2006; Bocken and Konietzko 2022) to organise and interpret emerging concepts.

The analysis proceeded in three stages. First, we generated first-order concepts through thematic interpretation of the empirical data. Second, these concepts were interpreted using insights from the literature to develop second-order themes. Finally, we iteratively compared data and theory to derive higher level aggregate dimensions, resulting in three overarching dimensions, as shown in the resulting coding structure (Figure 1). For instance, activities related to incentivising, collecting and processing waste for resale emerged as first-order concepts and were interpreted as part of broader recycling processes, a well-documented circular strategy in many LMIC contexts (Adelekan 2021; Potting et al. 2017). To improve the internal validity of the research, we triangulated our data during the

intracase and cross-case analysis (Eisenhardt 1989) by ensuring that empirical data obtained from different participants supported each dimension. We iterated between theory and data, continuously comparing across both country cases until we reached meaning saturation (Hennink et al. 2016). We identify the linkages among those key dimensions to develop an integrated framework, as suggested by Corley and Gioia (2011) and Gioia et al. (2012), to help explain how the interconnection between CE and SE can contribute to sustainability goals.

4 | Findings

Figure 1 comprises three aggregated theoretical dimensions: empowerment, circular strategies and social inclusion. Drawing on participant narratives, we understand **circular strategies** and **empowerment** as the *processes* through which SEs develop the capacity of waste pickers and low-income householders to exercise voice, make decisions and influence the structures that shape their lives, as well as efficiently manage their resources and support circularity. In turn, **social inclusion** is analysed as the *outcome* of these processes, manifesting in improved access to basic services, public recognition and participation in social, economic and

civic life. The following sections unpack each dimension through a set of second- and first-order codes that emerged during the analysis. Appendix A shows representative quotes that support the analysis for the three dimensions.

4.1 | Circular Strategies

Circular strategies aim to extend product lifespan, minimise waste and preserve materials in their highest value form for continued use in production and consumption. In our analysis, we find that participants adopt a mix of circular approaches. These include engaging in recycling by collecting, processing and selling discarded materials to recycling companies; reducing landfill waste through the organised collection of household waste; and ensuring careful handling to prevent contamination during processing. Additionally, they promote a shift in how products and materials are perceived and used within their communities, encouraging smarter consumption and waste reduction.

4.1.1 | Recycling

SEs engage in recycling through a value chain that includes collection, processing and resale of household waste. Collection often begins at the source, door-to-door retrieval of recyclables directly from households, capturing materials before they reach landfills. In Lagos, this door-to-door model is central. Organisations provide free, colour-coded waste bags to encourage household separation of recyclables. Recyclables are also sourced via household drop-offs and through community or corporate recycling schemes, such as a communal waste shed (Circle—Associate 2). The collected materials are then sorted, processed and sold, often in bulk, to make recycling financially viable. To increase household participation, some Lagos-based organisations offer incentives where residents earn points based on the quantity of recyclables they provide, which can later be redeemed for money or household items such as electronics, food or clothing: ‘... We would collect the recyclables and give them those incentives. We would take those materials to our hubs, sort and process them into bales, and then sell them ...’ (Pink—CEO).

This model enables the inclusion of low-income households, especially women and the elderly, turning waste into a source of income. The processed materials are sold to recycling companies and suppliers seeking a steady stream of clean inputs. Pre-sale activities, such as cleaning and baling, enhance the value of recyclables, making the organisations more attractive to buyers. In some cases, buyers are willing to pay in advance to help sustain collection operations: ‘... if you can give me money, when I bring this one, you can deduct, just help me keep this going ...’ (Blue—Founder).

4.1.2 | Reduce

Participants emphasised the importance of reducing the number of valuable materials that end up in landfills or as environmental litter by implementing a source-based collection approach.

Their goal is to reduce waste at its point of generation, primarily within households, by actively resourcing waste collection systems that intercept recyclables before they are lost to landfills or open environments, in response to inadequate government infrastructure. Many participants cited the absence of systems that enable household-level waste separation and the lack of functional landfills. As one participant in Colombia explained: ‘recognition of the work we do to fill that tricycle when we go from house to house and people give us their waste and clean the city, but besides cleaning it, we make sure that this material doesn’t go to the landfill’ (Circle—Associate and Board Member 2).

To encourage waste separation, some organisations provided colour-coded bags at no cost to households to encourage them to sort recyclables, while others collaborate with government actors who are ‘now looking at what can we do to reduce [waste] directly from the source ...’ (Brown—CEO and Executive Director).

They preserve the quality and value of recyclable materials by reducing contamination, such as food residues or adhesive labels, improving their resale potential. In Lagos, organisations reduce material rejection by training elderly women to remove glued labels (Pink—Hub Manager). Similar practices were observed in Colombia, where SEs take additional steps to reduce contaminants during sorting and processing (Square—CEO).

4.1.3 | Rethinking

Beyond reducing landfill dependency or collecting materials for recycling, all case organisations emphasised the importance of rethinking, encouraging individuals and communities to reconsider their relationship with materials, waste and environmental responsibility by transforming mindsets. A Colombian participant said: ‘... we do not just go and pick up the recycling ... but teach that person the meaning of removing their waste’. (Ellipse—Associate).

They promoted awareness through education, incentive systems and public clean-ups. One organisation helped individuals understand the importance of waste sorting, proper bagging and the broader environmental value of recycling. In Lagos, SEs offer rewards to encourage rethinking how waste materials are handled: ‘... so we say anybody that can bring us the most plastics will get a gift ...’ (Pink—CEO). The reward process includes educating households on how to accumulate value from their separated recyclables, what types of materials are accepted and how the incentive system works. In Lagos and Colombia, SEs organised active community clean-ups in urban and peri-urban areas, retrieving litter, sorting and bagging recyclables in public view. These activities often serve as live demonstrations, sometimes accompanied by loud music and performances, that draw in local residents and spark conversations around recycling and how waste can be a source of income. Such public engagements are often complemented by immediate incentives to further encourage participants to rethink the value of what they typically discard: ‘... so as they are bringing plastics they will be getting like umbrella, branded

items ... so that's already the incentive that we are creating in their head ...' (Pink—CEO).

These clean-up campaigns often spark a rethinking of communal space and environmental upkeep. Witnessing the transformation of a polluted area into a cleaner, more orderly space influences community members' desire to maintain the improvement. As one Colombian participant describes: '... they're pretty polluted ... we've cleaned it up and you've seen the change, and people have become aware ... that you've gotten into the rivers ... people who live near that place ... try to keep the place clean ...' (Circle—Associate 1).

4.2 | Empowerment

Empowerment refers to how SEs support waste pickers in making choices and acting on them, both individually and collectively. In the context of this study, empowerment emerged as a key mechanism through which the SEs in our study enable marginalised individuals to move from conditions of exclusion to greater autonomy, recognition and influence. We identified two interrelated but analytically distinct aspects of empowerment: agency (internal capacities) and opportunity structures (external resources and institutional support).

4.2.1 | Agency

SEs helped waste pickers strengthen their capacity to make choices and act upon them, particularly in building self-confidence and aspirations. As one participant reflected, 'it motivated me to organise myself as a waste picker' (Circle—Associate 1). For many, engagement with the SEs became a catalyst for developing future-oriented aspirations. A founder of an SE in Lagos, for example, described how their work aimed to empower younger generations through education and awareness: 'get them to be climate literate ... tell them their roles in sustainable development ...' (Yellow—Founder).

Participants also expressed a growing sense of autonomy and voice. A Colombian leader imagined a future where their association could expand, sharing 'be able to address many other services ... and obviously with the aim of improving the quality of life of both its associates and generating employment' (Ellipse—CEO). Others described greater voice in relation to the state and institutions: 'the waste picker already does not remain silent ... they are already asking the social part, the government, the policies' (Circle—Associate and Board Member 1). These examples reflect a growing capacity to question authority, demand rights and influence structures that affect their lives.

Collective agency was central. Participants described how associations helped them act together, share decisions and protect their collective interests. One SE leader explained: 'we all come together and organise ourselves ... what we have to do, we do, among all ... everyone participates' (Triangle—Founder and CEO). This demonstrates how associations helped them

act together, share decisions and protect their collective interests.

4.2.2 | Opportunity Structures

SEs created supportive institutional and contextual environments, where waste pickers could access resources. In Lagos, one organisation offers start-up capital to launch their own businesses (Pink—Hub Manager), and another facilitates savings (Blue—Founder). In Colombia, one SE offered training on recycling practices, engaging with the public and treating others with respect (Diamond—Founder/CEO). This initiative helps waste pickers feel more empowered by increasing their awareness of social engagement, leading to a shift from conflict or stigma to recognition and dignity. Another SE provided safe equipment both before and after the pandemic, along with education on the health risks associated with their work. Although implementing these changes was challenging, it resulted in greater awareness among waste pickers. As one waste picker shared: 'At first, it was hard because I knew that the long-sleeved uniform, the cap that itched my neck, and the boots were uncomfortable, but they raised awareness, and now we are doing it'. (Ellipse—Associate).

Institutional support for accessing services and gaining legal recognition was vital. The efforts of both SEs in Nigeria and Colombia focused on securing formal recognition for waste pickers' work. This recognition was vital for improving their conditions, allowing them to be legally protected and acknowledging them as service providers. During the pandemic, Colombian SE members were permitted by the police to collect waste because of their organisational affiliation (Ellipse—CEO).

Lastly, recognition and status were important, where simple interventions like ID cards improved legitimacy, reduced stigma and increased the feeling of being valued and seen as competent by others. As one leader of an SE shared: 'it is good to involve them and that they are visible, that they have their ID card that people start to look at them with another face, and ... that we leave the stigma that the recycler by trade is the street dweller ... but that he is trying to improve his quality of life and is doing it through recycling' (Square—Associate).

The SEs empower waste pickers by enhancing their working conditions. By providing ID cards and increasing their visibility in public life, the organisations help change perceptions of waste pickers. This shift allows them to engage more legitimately in society, reducing negative stereotypes and recognising their contributions to the economy and the environment.

4.3 | Social Inclusion

Social inclusion includes participation in social, economic, cultural and political life, as well as access to institutions, services and rights (Mosley and Dowler 2003; Silver 2010). In our cases, it refers to income security and formal economic participation, improved access to essential services and a sense of being valued and accepted by the broader community.

4.3.1 | Economic Inclusion

SEs enhance income security and overall financial well-being, providing greater stability and predictability, contrasting with the volatility of past earnings when working in informality. For example, SEs provided access to fairer prices for recyclable materials sold by waste pickers compared with what they would have received from informal intermediaries. As a Colombian SE explained, 'they [waste picker] go and see that here we pay them the kilo of cardboard at 300 pesos and elsewhere they pay it at 100, but if it is organised we can pay it better' (Diamond—Founder/CEO). Incentive schemes, such as bonus payments, benefited those who had historically struggled to sustain regular work, such as elderly waste pickers or those with health limitations (Triangle—Founder/CEO).

Economic inclusion was also about the intentional inclusion of vulnerable groups in income-generating activities. One SE focused its work on women waste pickers who were heads of household and sole income providers (90% of their waste pickers). As its founder shared, supporting these women was central to their mission, helping them earn a regular income while managing their family responsibilities (Pink—CEO). Others prioritised the elderly or disabled workers, designing activities that accommodated their needs while still enabling participation in the recycling economy.

4.3.2 | Access to Basic Services

SEs were given access to basic services to waste pickers that are often unavailable or inaccessible to marginalised populations. Two main areas of support emerged from our cases: health-focused services and broader socio-economic support in the areas of education, housing and financial access. They offered free healthcare with further support for medical emergencies (Pink—CEO), support to cover the cost of medicines not covered on the national health system (Triangle—Technical Director). Moreover, the SEs organised community health campaigns, offering access to vaccinations and distributing biosecurity kits, particularly relevant in the postpandemic context. One SE co-ordinated with local health agencies to offer a comprehensive campaign that included services for children, people with disabilities and elderly residents (Circle—Associate 1). These interventions demonstrate how SEs extend beyond their economic mission to act as health mediators and community health promoters, addressing both immediate risks and long-term exclusion from public health infrastructure. Some SEs also helped waste pickers access education, secure housing and obtain small-scale financial support. SEs in Lagos and Bogotá provided payment of children's school fees (Pink—CEO), provided loans or start-up capital (Pink—Hub Manager and Triangle—Technical Director) and facilitated housing subsidies either by linking them to government schemes or by providing intermediary support (Ellipse—CEO).

4.3.3 | Social Belonging and Acceptance

SEs played a critical role in fostering social belonging and public recognition for waste pickers, groups that have long

experienced exclusion, discrimination and invisibility. Through their structure, messaging and everyday practices, the SEs helped challenge dominant narratives about waste picking and created the conditions for greater dignity, pride and respect. Waste pickers working in the SEs described being seen and acknowledged in public spaces, expressing feeling recognised, respected by the community, happy, proud and validated, not only in how they were treated by the enterprise but in how they were perceived by the broader community. As one waste picker shared, 'I feel important and I stick my chest out wherever I am because I feel proud of being a waste picker. I take out my things, I go and pick them up and people just see me'. (Circle—Associate and Board Member 2). Through the provision of ID cards, uniforms and public-facing roles, waste pickers became more visible and more accepted as contributors to community well-being. Some shared experiences of being greeted by name, offered water or even blessed by neighbours, which indicated a growing sense of interpersonal respect and social recognition (Pink—Hub Manager).

This recognition helped to transform waste picking from an invisible activity into one recognised by others as legitimate and valuable. It reduces the stigma traditionally associated with waste picking, such as homelessness, criminality or dirtiness. It helped to alter even their perception of themselves as 'individuals working to recover the environment and support vulnerable families' (Pink—Hub Manager).

SEs also helped reframe waste picking as an environmentally significant activity. Several participants expressed pride in contributing to environmental change. One SE leader described the transformation in public perception, emphasising how the work was now seen as environmentally meaningful and socially dignified: 'we have collaborated in the recovery of the environment ... people who before looked at them as garbage diggers ... one day look at the difference ... what we do is to separate the waste' (Square—CEO). This pride was closely linked to CE activities of the SEs, which included educational efforts and helping build awareness around sustainability and positioned waste pickers as agents of positive transformation.

5 | Discussion

This study explores how CE can achieve social inclusion in practice and the mechanisms by which organisations practising CE activities can achieve CE research has largely prioritised environmental and economic efficiency while neglecting social dimensions, despite the critical role of informal labour, such as waste pickers in material recovery (Holt and Littlewood 2017; Monciardini et al. 2024; Schulz et al. 2019). Likewise, SEs who are key actors in creating social value and advancing circular practices are rarely recognised within CE debates despite their dual focus on sustainability and empowerment (Hua 2024; Indarti et al. 2024; Suchek et al. 2022). Our study sets out to address these overlooked contributions and address persistent barriers to inclusion (Hua 2024).

Our findings show that embedding empowering mechanisms, both agency-building activities and opportunity structures, into CE practices of organisations generates social inclusion

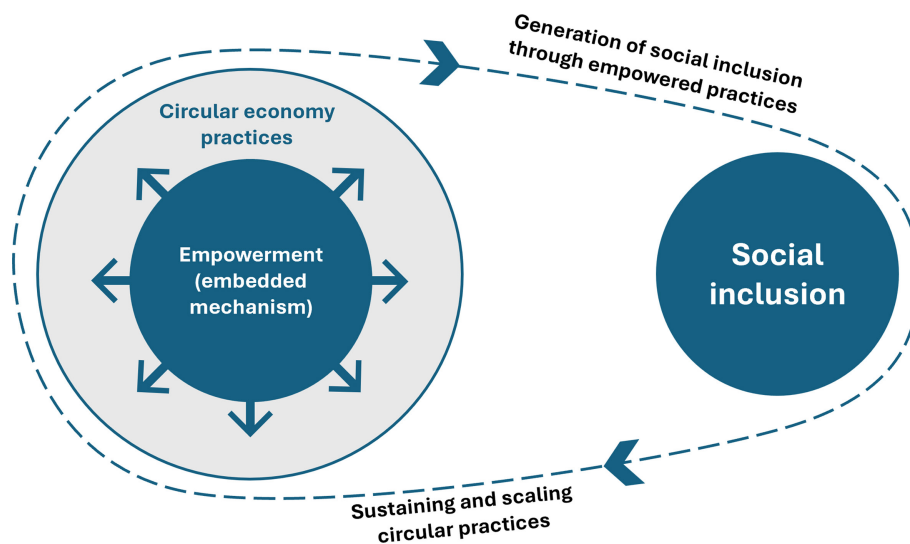


FIGURE 2 | Socially inclusive circular economy (SICE) framework.

of those affected and involved in the organisation. In turn, social inclusion feeds back the organisation to reshape and drive organisational CE practices, creating a recursive engine of inclusive circularity. SEs in our cases positioned empowerment and inclusion at the heart of recycling, reducing and rethinking strategies, providing critical insights into how circularity can operate in contexts of informality and exclusion, offering both theoretical and practical contributions to the development of a SICE framework.

Building on these insights, we propose the **SICE framework** (see Figure 2), which positions social inclusion as a primary outcome of CE strategies rather than a secondary or incidental effect. The framework highlights how SEs embed empowering mechanisms, including agency-building activities (fostering aspirations, autonomy and collective action) and opportunity structures (access to resources, formal recognition and institutional support), into CE practices. Our findings show that circular practices like recycling, reducing and rethinking contribute to the social inclusion of actors involved in the organisation, such as waste pickers, enabling them to recognise themselves as social, economic and environmental actors.

Building on calls to integrate social inclusion into CE (Crespo-Rosas and Franco-García 2023; Preston et al. 2018), the SICE framework conceptualises social inclusion across three inter-related dimensions: economic inclusion (via stable income and participation in income-generating activities), access to services (health, housing, education and finance) and social belonging (reduced stigma, recognition by communities and pride in contributing to environmental protection). These dimensions provide both a normative direction for CE strategies and a practical metric for evaluating their inclusivity.

Our findings further challenge narrow definitions of circularity that connect success with job creation or waste reduction. While important, such framings risk reproducing a linear economy logic focused on efficiency, without considering the lived realities of those most affected by environmental degradation. Instead, our cases illustrate that circularity must be understood

as a process that embeds empowerment mechanisms to achieve social inclusion, which can include outcomes such as well-being and self-determination, thereby allowing the organisations to sustain and scale their CE practices. Waste pickers in our study sought not only economic security but also recognition as environmental champions and rights-bearing citizens. SEs mediated this process by facilitating access to services, negotiating with institutions and embedding individuals into civic and cultural life. This highlights that social inclusion is not a one-off benefit but a multiphase process that requires collaboration with other actors, sustained innovation and a long-term commitment to structural change. For this reason, our SICE framework reflects the recurrent and cyclical relationship between the organisational CE practices that have empowering mechanisms embedded in them and the social inclusion that is an outcome not produced abstractly but through enactment.

Theoretically, we extend CE scholarship by showing how socially inclusive development can be operationalised in practice. Rather than viewing marginalised populations as passive beneficiaries, SEs recognised their existing capacities and reconfigured them into empowered participation within material value chains (Granados et al. 2022; Holt and Littlewood 2017). This reframes participation in the CE: Instead of simply incorporating the poor into execution roles, it positions them as knowledge holders and value creators, thereby advancing the goals of inclusive and sustainable development (Schroeder et al. 2019).

Finally, the SICE framework addresses a persistent theory–practice gap. While CE scholarship has sought definitional clarity (Kirchherr et al. 2017; Kirchherr et al. 2023), it risks losing sight of what matters most: delivering real social value. By demonstrating how SEs embed empowerment mechanisms into CE practices, our study contributes a contextually grounded definition of SICE for LMICs:

a system that embeds empowerment of social actors with material reduction, reuse, recycling, and recovery activities to achieve economic inclusion, social justice, and environmental sustainability.

This redefinition acknowledges that many so-called ‘circular practices’ already exist within informal economies, but require supportive institutional and organisational support structures to translate into genuine inclusion. In this sense, SEs emerge not as marginal actors but as central to enabling socially just CE transitions.

5.1 | Implications for Practice and Policy

The SICE framework has direct implications for both practitioners and policymakers seeking to promote more sustainable and equitable transitions.

For practice, our findings suggest that SEs engaging in CE practices must intentionally design for social inclusion, rather than treating it as a secondary effect of environmental or economic strategies. This requires embedding empowerment mechanisms into the everyday operations of recycling, reducing and rethinking. SE managers can use the framework as a diagnostic tool to assess whether their business models are enabling empowerment and providing the opportunity structures necessary for sustained social inclusion. In contexts where circular activities already exist within informal economies, the task is less about introducing ‘new’ practices and more about amplifying existing ones by providing resources, recognition and institutional linkages.

For policy, the SICE framework highlights the need for enabling environments that recognise and support the social contributions of SEs to the CE are key. Governments should integrate SEs more systematically into waste management policies, provide legal and financial support for grassroots associations and recognise waste pickers and similar actors as legitimate stakeholders within CE transitions, as in Colombia (Granados et al. 2022; Economist 2009). Policies that narrowly incentivise recycling rates or job creation risk overlooking the broader social benefits that inclusive circular strategies can deliver. By contrast, regulatory frameworks that prioritise empowerment, access to services and social belonging are more likely to achieve holistic sustainability outcomes.

More broadly, the SICE framework encourages policymakers to reconsider the dominant narrative of the CE. If circularity is framed solely in terms of resource efficiency, it risks reinforcing inequalities by excluding those already engaged in material recovery but without institutional support. As cities, especially in the LMIC, increasingly look to circular strategies, recognising the central role of social actors like waste pickers is vital for achieving sustainable and equitable futures. By adopting social inclusion as a core policy objective, governments and international organisations can align CE strategies with the SDGs, particularly those relating to poverty reduction, decent work and reduced inequalities.

6 | Conclusions of the Study

CE is a promising pathway for sustainable development, primarily because of its emphasis on resource efficiency and material circulation. Yet, despite its growing prominence, the CE is often

criticised for lacking a strong social dimension. Research on socially oriented organisations highlights their capacity to address exclusion by embedding economic, social and environmental objectives within their activities. Despite this, their role in shaping SICE practices remains underexplored (Crespo-Rosas and Franco-García 2023; Suchek et al. 2022). Responding to these gaps and to calls for greater integration of SE and CE strategies (El Chaarani and Raimi 2021; Monciardini et al. 2024; Suchek et al. 2022), we propose the SICE framework. Our framework demonstrates how circular strategies can advance social inclusion when underpinned by empowerment mechanisms such as agency-building activities and opportunity structures. It moves beyond abstract discussions to offer practical guidance for designing a CE that delivers social value.

We identify three key dimensions for evaluating social inclusion in CE business activities: social belonging, economic inclusion and access to basic services. In many LMICs, where circular practices may already exist informally as part of local livelihood strategies (Holt and Littlewood 2017), advancing CE means empowering and supporting these practices to achieve sustainability and inclusion. In sum, our study advances the theoretical and practical conversation on how a CE can be made socially inclusive by offering a framework grounded in empowerment and contextual realities. We encourage future research to build on this by exploring the operationalisation of the SICE framework across diverse sectors and geographies, particularly in underrepresented LMIC contexts.

6.1 | Limitations and Future Research Directions

This study has a few limitations. While we highlight positive practices of the SEs studied, we may underrepresent potential unintended consequences (Adelekan 2021; Bacq et al. 2025), such as disempowerment when community needs are misunderstood or when partnerships with formal institutions inadvertently exclude informal actors. Prior research has noted that such dynamics can marginalise waste pickers and erode local knowledge (Dewick et al. 2022; Granados et al. 2022; Tebboth et al. 2025).

Additionally, we acknowledge the limited generalisability of our findings, which is common in exploratory case study research (Creswell 2007). The purpose of this study was to examine social enterprises engaged in waste-related activities in Lagos, Bogotá and Cali, from which we derived insights into how empowerment processes are embedded within circular practices to facilitate the inclusion of marginalised groups. However, contexts in LMICs are often characterised by complex and layered institutional environments operating at community, regional and national levels. These environments can vary significantly across and within geographical settings, particularly in relation to governance structures, local leadership dynamics and ethnic or social relations (Rivera-Santos et al. 2014). As our analysis focuses on cases from one city in Nigeria and two cities in Colombia, the findings cannot demonstrate how similar or different CE approaches adopted by social enterprises may be in other regions within these countries or across other African and South American contexts. Consequently, the transferability of the strategies identified in this study to other settings

cannot be assumed without further empirical investigation. We recommend that future research adapt the SICE framework to local conditions and explore both its benefits and limitations, especially around inclusion and exclusion dynamics in circular transitions.

As indicated in the methodology section, both researchers are nationals of the countries studied and have prior familiarity with the local waste management systems and key actors involved. Therefore, we acknowledge the risk of researcher subjectivity, which is common in qualitative case study research (Mruck and Breuer 2003). While this contextual knowledge supported access and understanding, it may also have influenced aspects of the research design, case selection and interpretation of findings, for example, the decision to focus on emerging social enterprise organisations in Lagos instead of the informal waste pickers that have long been involved in waste recycling activities across the country. To mitigate this risk, several steps were taken. First, peer debriefing was conducted through regular discussions with project supervisors and colleagues to challenge assumptions and ensure interpretations remained grounded in the data. Second, participant validation was undertaken by sharing a draft report with participants and organising a live feedback session with stakeholders from the Lagos case studies, as well as consultations with participants from the Colombian cases. Finally, cross-case analysis was conducted, with the researchers meeting regularly to review and discuss emerging themes across cases and develop aggregate codes that captured such themes across both contexts. These steps helped ensure that interpretations of how social inclusion is achieved through circular practices grounded in empowerment were robust and empirically supported.

In relation to inclusion, prior research highlights that successful SEs often embed community participation from the earliest stages of planning to ensure that their initiatives are both relevant and empowering (Finlayson and Roy 2018). Building on this, future research could explore how SE-led CE practices impact a broader range of community members beyond householders and waste pickers, particularly examining the extent and quality of community involvement in the design and evolution of CE initiatives. Moreover, while co-created CBMs are important, achieving financial self-sufficiency and long-term impact also depends on participatory governance structures, accountability mechanisms, regular stakeholder engagement and strong local advocacy capacity (Moggi and Dameri 2021). Further studies are needed to understand how SEs build and sustain collaborations with public institutions, private actors and civil society organisations and how such networks support the scalability and resilience of SICE practices.

Lastly, a further limitation concerns the timing of data collection, which occurred before, during and shortly after the COVID-19 pandemic (2019–2021). While some participants mentioned operational challenges associated with pandemic-related restrictions and health requirements, these issues were not identified as directly shaping the CE practices or social inclusion outcomes examined in this study. As the research was not designed to investigate the impacts of the pandemic and data collection concluded in 2021, it is not possible to assess how COVID-19 may have influenced the longer term evolution

of these organisations' practices. Future research could explore how postpandemic conditions have affected the sustainability and inclusion dynamics of waste picker organisations.

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Appendix A

Dimension	Second order	First-order code	Examples of quotes
Circular strategies	Recycling	Collect and process household waste for recycling	‘This shut [communal waste shed] is this whole hectare, all around the block and part of the one in front because people from that side also bring garbage. This shut is where the most garbage is collected’. (Circle—Associate 2) ‘... We would collect the recyclables and give them those incentives. We would take those materials to our hubs, we would sort and then we would process them into bales and we sold them. So the model, that’s essentially how the model was formed and it’s been so ever since’. (Pink—CEO)
		Incentivise householders to collect and sort their waste	‘recognition of the work we do to fill that tricycle when we go from house to house and people give us their waste and clean the city, but besides cleaning it, we make sure that this material does not go to the landfill’. (Circle—Associate and Board Member 2) ‘... The processes is still the same. We gave subscribers incentives for them to give us their plastics. What we have realised from the foundation of the company is that we have made sure that we assigned the value to that plastic ... If we are giving you points, we have started giving you naira (Nigerian currency). So what they could redeem, say they had a thousand points, they could get maybe a handkerchief, a stove, or milo, or they can just choose to just take the money in cash ...’ (Pink—CEO)
		Partnering with recycling companies for waste offtake	‘... that was the reason why I met xxxx ... I said see, it requires working capital ... I had a lot of tons lying down there ... if you can give me money, when I bring this one, you can deduct, if you can give me money for me to keep this going ...’ (Blue—Founder)
	Reduce	Resource household waste sorting to reduce landfilling	‘recognition of the work we do to fill that tricycle when we go from house to house and people give us their waste and clean the city, but besides cleaning it, we make sure that this material does not go to the landfill’. (Circle—Associate and Board Member 2) ‘... they are trying to reduce the volume of waste ... because there is no more land for landfills so that’s why they are now looking ... what can we do to reduce direct from source’. (Brown—CEO and Executive Director)
		Minimise contaminants during waste processing to improve recylcate quality	‘... so once you have educated them on that, you tell them how to sort ... so sorting involves removing this cap and then the nylon ... obviously, for a week, they might not really get how to do it because after removing this label, especially coke and pepsi labels. So this seal here still stays on the bottle ... so you have to use knife to scrap it off to remove it ... so most of them will just leave it like that so you have to go back to them and tell them, this thing is important ... its important for you to remove it because whenever we crush, it reduces the quality of our material and that will reduce the price we sell it ... so after a week at most, they get it ...’ (Pink—Hub Manager) ‘there is also a lot of material that comes out for rejection, and a compaction is made for or cleaning of the material so that the material can also go up a little bit and improve the cost, some are commercialized, others we already have allied companies that transform it’. (Square—CEO)
	Rethinking	Educate householders on waste sorting and incentive system	‘we still lack and we still need a lot of awareness about the environment and this is something that I just do not do my work, but I make those people aware that they separate their waste, do not combine such a thing, that the recycling is clean, that is, it is not only my work in itself economical but also to make people aware that is what has made me my how to fall in love and continue my work and I have never been ashamed to do it or regret doing it’. (Ellipse—Associate) ‘... so we say anybody that can bring us the most plastics will get a gift ... so as they are bringing plastics they will be getting like umbrella, branded items ... so that’s already the incentive that we are creating in their head ... so we are now telling them like this is what we do ... just keep bringing us plastics ... that’s essentially how we approach it for communities’. (Pink—CEO) ‘thank god with CIRCLE, I have had the opportunity to be in others, in other processes so to speak, and ... we have worked in areas where they are ... quite an impact, yes, I mean they are pretty polluted and we have come in the group and we have cleaned it up and you have seen the change, and people have become aware of what you are ... you have seen it do to make one, that you have gotten into the rivers, the pipes, the ... rather, to the bush, to take out all this waste and already the people who live near that place already become aware and try to keep the place clean, then we are doing a good, one pal environment and pa ourselves’. (Circle—Associate 1)
Empowerment	Agency	Self-efficacy/confidence	‘with xxx I have had the opportunity to be in other processes, and it motivated me to organize myself as a recycler because it is ... it’s good for me, it’s like my company, it’s like the job I have’. (Circle—Associate 1) ‘... I wanted to do my own thing really ... It was in fact to be honest, it was grace working there, the salary was good ... you know ... I was in a senior level cadre ... because I was actually working as a production and recycling manager, yea so it was actually a good position but you know when you get to a phase whereby you are like it’s time to do your own thing ... I worked there for like 5 years or so ... so I already have the theory knowledge which was from my uni ... I had the practical knowledge which was from there so I was like look, put these knowledge together and then you know ... so you know those were my line of thinking at the time of starting ...’ (Red—Co-Founder and CEO)
		Aspiration and future orientation	‘... I believe that the only way to salvage a problem in the future is to step into that future ... and the only way to step into that future is to capture those who will be in the future ... so apart from all of these where we go to households, we do clean-ups ... we go to schools, we speak in schools ... so we have engagements, speaking engagements in different schools ... where we are talking to younger generation whose minds are even more malleable ... their hearts are more malleable ... so we speak to them ... get them to be climate literate ... to tell them their roles in sustainable development ... teach them about the SDGs that affects them ... how they can play a role ... let them know that we are depending on them ... the entire world is looking up to them for a change in future especially in behaviour ...’ (Yellow—Founder) ‘be able to address many other services ... and obviously with the aim of improving the quality of life of both its associates and generating employment’. (Ellipse—CEO)

Dimension	Second order	First-order code	Examples of quotes
		Decision-making autonomy	'the recycler already does not remain silent, the recycler is make account, nowadays those guys who keep supposedly all smelly, those many today are fine, they are already well, they are already asking the social part, the government, the policies, all that ... and the recycler starts to say no but look, this foundation, these people do this and this and this and this, and actually the organizations should be more committed to the social, to be more aware'. (Circle—Associate and Board Member 1) '... I am sure you know what happens there when it rains. So on that day, I was going to work and as I was about to cross the road. A fantastic car owner ... splashed dirty brown water all over me and of course drove away. To say that I was devastated was the least. It was a terrible personal experience that landed me into ... trouble at work. You know, long story short, I decided to want to get to the root of the matter ... you know the guy would not have splashed water on me if there was no pool on the floor ... right ... that's the first challenge. So why was there a pool on the floor, there was a pool on the floor because the drainage system does not work properly. Now, why do not they work properly? ... It's because they have been clogged with all sorts of materials that you and I call waste ... that you and I use and just throw out on the streets and expect it to go somewhere, to go away somehow ... so I then thought about that experience I had and that was where the whole spark started from ...' (Yellow—Founder)
		Collective agency	'we all come together and organize ourselves and have to move forward because if we did not, then we danger that all the recyclers will be left out ... what I value most is how united we are, right, what we all share, we all make decisions and practically what I tell you, what we have to do, what we do, we do, among all and then everyone participates'. (Triangle—Founder and CEO) '... yes I would pass it on to the group ... I would say oh there is somebody who wants to recycle ... okay is that what you mean ... do I select ... no no no I would put it out there on the group ... anybody that is interested will contact the person ... that's part of what we do for each other ... we collaborate ... we help each other ... so anybody who feels that they have capacity, and they are willing and they can go and pick up from their Takwa island ...' (Yellow—Founder)
	Opportunity structures	Access to resources	'... (we are) a recycling company, a waste management company that derives pleasure in making low income earner capture value from their waste ... so if you do not have money and you are looking for a way out, you can always join us at xxx ... so we help you to pay your children school fees ... we help people with startup capital to start businesses ... due to our incentive-based program ...' (Pink—Hub Manager) '... that was why you know the essence of this ... that's why I want to really impact life in this venture ... to impact life ... for the people that does not have opportunity to grow ... there is nobody to help them, through this means, at least they can be able to put some money together and achieve their aims ...' (Blue—Founder) 'they do meetings and they talk to us well how to work recycling, how to deal with people on the street, how to treat people on the street, because people on the street give us recycling and there they have people attend us very well and they understand if they understand me, then not be rude to people, treat them well as they treat us well, because, the truth because there are recyclers who are also very rude very abusive' (Diamond—Founder/CEO) 'those who are already organized I see them more than they are because they are very well organized, they are judicious with their uniform, which at first was hard because I know that not the long-sleeved uniform, not that cap that your neck itches, that those boots, that is, they have raised awareness and are doing it, their gloves their face masks before all this bullshit about this pandemic began, their face masks were used normally'. (Ellipse—Associate)
		Recognition and status	'Then they began to go out with their selective routes, obviously at the time the national police authority began to place problem which is that you cannot be until a certain time outside that this, then it fell to us as an organization to start doing a treatment with the police to tell you that we were within the decisions, that outside of that is a vulnerable population that has no other means to be able to subsist, then they began to be able to let us do all the selective route to all the recyclers'. (Ellipse—CEO) 'it is good to involve them and that they are visible, that they have their ID card that people start to look at them with another face no, and that we leave the stigma that the recycler by trade is the street dweller and the one who is going to steal them and the one who is going to take away from us, but that he is trying to improve his quality of life and is doing it through recycling'. (Square—Associate) '... so that was one of the things that just keep pushing me that there has to be a better way to provide, make money rather than staying in the dumpsite, whereby you are exposed to many health issues, diseases, toxins ... so it's also like concerns for like the humans that are doing this job ... a lot of people (say) ... it's a dirty job, but I'm doing it! So what's the "dirty" about it? Just get yourself prepared, wear your gloves, wear your boots ... it's work ... it's doable ... so yea those are the little things that just got me interested and just kept pushing ...' (Red—Co-founder and CEO)
		Institutional support	'First because as a recycler by trade you have to be organized yes, because there are better conditions for the recycler by trade who is linked to some organization, because I have also seen the work and the strengthening that the organization has had to improve the life of the recycler, so that's why'. (Square—Associate) '... we are trying now to more of like formalised the informal sector by actually using programs like the wastepickers initiatives to support them to have accounts, where we can monitor their inflows ... tell them how much materials they are recycling ... how they can improve and all ...' (Brown CEO and Executive Director)

Dimension	Second order	First-order code	Examples of quotes
Social inclusion	Economic inclusion	Stable income and fairer prices for material	'what I valued the most, I told him that it was to be able to join the recyclers by trade who have no idea to an organization that gives them benefits and that they can and see the benefit because it is one thing to talk to them and another thing is that they go and see that here we pay them the kilo of cardboard at 300 pesos and elsewhere they pay it at 100, but if it is organized we can pay it better, then I love that, I love being able to be part of that process'. (Diamond—Founder/CEO) '... I think one thing that give me joy ... there are so many things ... one thing I say that is one joy of xxx (organization's name) is that, at least we have been able to provide stable employment ... so my driver started, we have had a lot of driver come in and out and this driver came in and has stayed with us for like a year now ... and he has earned, we have been able to pay him 540,000 Naira per annum ... I mean for me it's a plus ... that somebody earns money that sustains himself, his family ...' (Red—Co-Founder and CTO)
		Inclusion of vulnerable groups in income-generating activities	'we help you in everything, that is to say they have on our part they receive what is their rate as such and they also have their bonuses and everything that, what we also manage on the outside, right? ... we also with that we also support all our colleagues and most of all we take into account the elderly, they are the ones who collaborate the most'. (Triangle—Founder/CEO) '... the advantages that we see are we are able to empower the households which need it ... just as much as the wastepickers do. 0.90% of our subscribers are women that are sole providers in their households ... so they are making 20–30,000 a month from collecting plastic bottles and they are supporting their family that way ... so to me that is important ... even more so than just a wastepicker ... but these are also people that are maybe the least privileged in the society they are women, the most vulnerable ... they women ... that are like nobody would, it would be difficult to find a job ... nobody will give them a job ... so we wanna help the old the poor the weak ... that's how we are trying to develop ...' (Pink—CEO)
	Access to basic services	Health interventions	'... yea they work for us ... they are wecyclers staff ... they are not temporary staff ... they work for us, we give them healthcare ... so we actually have partnerships with erm ... healthcare called roden healthcare ... so they came to us and said hey we like what you are doing we are willing to provide free healthcare to all of your at risks staff ... so we took the offer so now they have the ability to go to certain hospitals to take care of some basic care so we provide that for the staff and then obviously, depending on the situation if they have a medical emergency, we would cover the cost of their medical emergency ... almost a form of self insurance thing that we do ...' (Pink CEO) 'they do activities, they have a good administrative component, because they are always as aware, they warn us, that educational campaigns, that ... at least today we had the opportunity to participate in a health campaign, eh there were activities for the family, for children, for disabled people, there were vaccines, they gave us a biosecurity kit ...' (Triangle—Technical Director)
		Socio-economic support (education, housing and financial access)	'so if you do not have money and you are looking for a way out, you can always join us at xxx ... so we help you to pay your children school fees'. (Pink—Hub Manager) 'happy is the day to day, because day by day more and more recyclers are registered, we can know their lifestyle, their strengths, their weaknesses, we can see that although there are people who need there are other people who need more than others, then we have always tried within the organization to be able to make arrangements, to be able to help at least in the housing subsidies ... we have always driven them that this is not mine or a board of directors, a president or a legal representative but that this is of all, this that we build is of all'. (Ellipse—CEO) 'responsible for having resources to be able to collaborate with them with endowments, activities, benefits ... loans and everything else'. (Triangle—Technical Director)
	Social belonging and acceptance	Feeling recognised/respected by community	'I have a place where I store my things and when I have the amount I bring it back. I act as if it were my safe, I feel important and I stick my chest out wherever I am because I feel proud of being a recycler. I take out my things, I go and pick them up and people just see me'. (Circle—Associate and Board Member 2)
		Reduce stigma	'so it's like a way of helping people ... so when people come they pray ... haa ilese eyin a da gba si oo (your company will grow more) ... so we get recognised for doing it ... so contrary to people's first opinion ... that they would say you are packing trash ... or something, you will get loved by people ... so when you walk on the street, they will be like ... aunty XXX (name of staff) ... they will stand and gist with you ... they would even offer to give you water ...' (Pink—Hub Manager)
		Pride to help environment	'The moment that fills me ... let us say it like joy, it is to know that we have collaborated in the recovery of the environment and in the help of those vulnerable families, that recycler who have not seen him as a dignified person, I liked that already the municipality of Restrepo, and the people, the users ... has sought the purpose of recovering the environment and in the same way generate employment, in the same way dignify also the work of those people who before looked at them as garbage dumps, garbage diggers, who really one day look at the difference that what we do in reality, it is to separate the waste'. (Square—CEO)