

Exploring Inclusive Reuse in Ecuador

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Waste picker in her stall with reused items. Photo credit: Matteo Saltalippi

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SUMMARY

This study examines inclusive reuse as a socio-technical and ecological strategy within Ecuador's circular economy (CE), drawing on empirical evidence from waste-picker-facilitated reuse systems in Quito, Cuenca, and Machala, as well as reuse business models with inclusive components. Ecuador's legal framework, anchored in the Rights of Nature and the Organic Law of Inclusive Circular Economy, provides a progressive basis for circularity. However, policy implementation remains predominantly technocentric and recycling-oriented, with reuse rarely translated into operational targets, indicators, or fiscal instruments. In the three cities, waste pickers perform complex reuse functions that extend product lifespans, reduce demand for virgin materials, particularly plastics embedded in packaging, textiles, and electronic equipment, and prevent waste and microplastics from entering landfills and aquatic systems. Reuse particularly displaces demand for new plastic packaging through refillable containers, gallons, and sacks traded with small producers and local markets. This study explores the vital role of waste pickers in reuse and the need to include them in a more systemic way to make reuse more effective and scalable, while also providing livelihoods for those who have been contributing to it for generations.

Although recycling dominates income by weight, reuse generates 1.5 to 10 times the revenue per unit and yields 5.3% greater income per ton. For individual waste pickers in the second-hand clothing market, reuse can generate up to a third of their income. The cases highlight that inclusive reuse is enabled with access to infrastructure, storage, repair capacity, and trusted buyer networks, while constrained by a misunderstanding of its technical definition, weak policy recognition, lack of data systems, informal pricing, and exclusion from fiscal incentives and extended producer responsibility schemes. The findings demonstrate that inclusive reuse simultaneously strengthens waste picker livelihoods, reduces plastic waste and pollution, and extends material lifecycles with minimal energy input. The study concludes that embedding reuse targets, integrating refill and reuse into EPR frameworks, expanding municipal commodatum infrastructure, and formalizing second-hand and repair markets are essential to positioning inclusive reuse in Ecuador and beyond.

1. Background

1.1. Inclusive Circular Economy and Reuse

The circular economy (CE) is a system where materials never become waste and nature is regenerated (EMF, 2024). It is an umbrella term that refers to a multi-level resource use system that stipulates the complete closure of all resource loops (Blomsma & Brennan, 2017; Figge et al., 2023). A clear hierarchy for the CE includes rethinking product design and business models to reduce material extraction, as well as to invest in reuse, repair, remanufacturing and refurbishing all above recycling (Kirchherr et al., 2017; Valencia, Bocken, et al., 2023). Depending on the discourse adoption of the CE by the organization drafting a policy or implementing a strategy, it can be technocentric on one extreme (optimistic in its use of technology and segmented in how it involves and responds to society's challenges) or transformational (skeptical of the role of technology in addressing systemic issues and holistic in how it engages with society at multiple levels) (Calisto Friant et al., 2020). An inclusive circular economy derives from the call for a just transition to a CE¹, particularly in the Global South where waste pickers are central to closing resource loops despite their labor being unrecognized, unpaid and in some contexts, still illegal or lacking policy that supports their work effectively (Schröder, 2020; Valencia, 2019). An inclusive CE more adequately fits a transformational discourse for the CE since it questions the production and consumption model with a lens on social and environmental justice.

Reuse constitutes the use of products or components more than once for the same or other purposes without reprocessing² (ISO 20887, 2020). Within the reuse taxonomy developed by GAIA and Break Free From Plastic (2025, unpublished), there are 3 main categories: reuse systems, reuse practices and Alternate use. **Reuse systems** encompass formal systems that enable products or packaging to circulate multiple times in their original form and function. They have established arrangements (organizational, technical, financial and social) which ensure the possibility of reuse and require investment and infrastructure. Its subcategories include closed return systems (either exclusive to a single company or shared among several producers), open return systems where packaging circulates across multiple actors, pre-filled return systems, onsite and takeaway returnables, refill-at-home models, returnable secondary packaging for deliveries, and product rental systems, which maintain ownership with the provider. Ownership transfer reuse systems also fall within this category such as second-hand markets, though this can be highly informal. In contrast, **reuse practices** refer to individual or community-led actions that sustain product life without relying on formal systems. These include bringing one's own bags or containers (BYOB/BYOC), using consumer-owned refills in community stores, maintaining and repairing household items and sharing goods within communities. These are activities that demonstrate reuse even in the absence of policy or infrastructure support. **Alternate use** involves adapting a product or component for a different purpose from its original design, often through minimal alteration of its form or function. Examples include turning campaign posters into bags and transforming cookie tins or ice cream containers for storage or old packaging to distribute artisanal products; initiatives that embody innovation and cultural creativity within the reuse economy. It is worth noting that some alternative uses can be detrimental to health, particularly when single-use packaging is used for refill. Therefore, it is important to guarantee that alternate uses do not pose safety concerns such as exposure to toxic chemicals (e.g. reusing an oil container to refill with water) (GAIA & BFFP, 2025).

In this case study, the focus is on reuse facilitated by waste pickers. These include reuse closed systems such as returning refillable bottles to bottling companies, and transfer of ownership reuse systems such as second-hand clothing markets. It also includes reuse practices in which artisans and entrepreneurs use otherwise discarded packaging in their current form such as buckets, wooden and cardboard boxes, and alternate use of much of this

¹ Just transition: Ending pollution from waste management in a way that is as fair and inclusive as possible to everyone concerned, by ensuring effective social dialogue among all groups impacted by the plastics crisis and creating decent work opportunities while leaving no one behind, in accordance with human rights standards and the [ILO guidelines for a just transition](#). (definition edited from International Alliance of Waste Pickers response to the third Non Paper for the Global Plastic Treaty Negotiations)

² Reprocessing refers to the processing of a used product or waste to produce new materials or products, typically altering the form or structure as well as function of the product. Reprocessing does not include preparation for reuse or reuse enablers including cleaning and sterilizing, checking, minor repair, as long as the item is not materially transformed. (GAIA and BFFP, 2025).

packaging for refilling with different products, a highly informal practice. See Figure 1 for a visual on the reuse taxonomy and how it fits into the circular economy hierarchy, where the circles emulate the CE butterfly from Ellen MacArthur Foundation (EMF, 2013) showcasing the amount of energy and resources it would take to close the cycle.

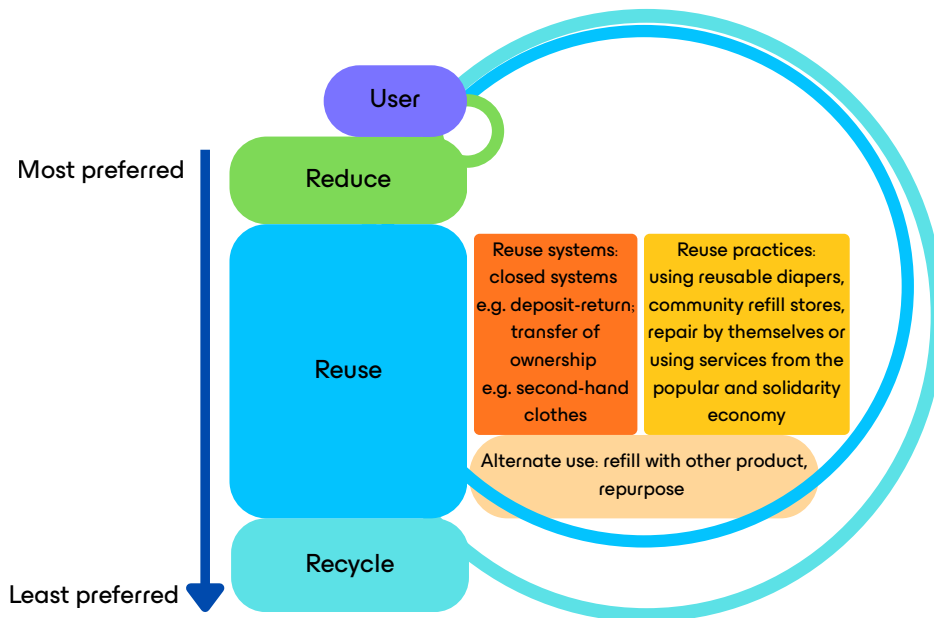


Figure 1: Reuse taxonomy as it fits into the circular economy hierarchy and cycles. Edited from (EMF, 2013; GAIA & BFFP, 2025)

1.2. Reuse to curb plastic pollution

Plastics have become ubiquitous in the environment, being the main culprit for transgressing the novel entities³ planetary boundary and exacerbating all other planetary boundaries as well, including climate change and biodiversity loss, particularly as macro and microplastics continue to pollute water streams worldwide (Villarrubia-Gómez et al., 2024). Reuse models have been studied for reducing packaging (EMF, 2020) as packaging represents over 30% of all plastic demand and 40% of plastic waste (OECD, 2022). Therefore, discussing not only how plastic packaging can be recovered for reuse but also exploring alternative materials that are better fit for purpose withstanding multiple wash cycles without further liberating microplastics, such as is the case with glass, is relevant to curb plastic pollution.

Furthermore, plastic is also present in other consumer goods highly relevant for reuse. For example, in clothing, synthetic fibers, mainly fossil-based, have outpaced natural ones, currently representing 65-70% of all textiles for fabrics (UNCTAD, 2025), which additionally liberate microplastics during washing throughout their use phase (Cai et al., 2020). Plastic also has increasingly replaced metals as the structure in electric and electronic equipment, many including flame retardants that reduce their recyclability and further contaminate final disposal sites (Delva et al., 2018; Frisk et al., 2014). Therefore, extending the lifespan of these consumer products is also increasingly important to reduce demand for virgin plastics, ideally with ecodesign or design for circularity happening upstream in the process (den Hollander et al., 2017) to counter still insufficient efforts against planned obsolescence (Malinauskaite & Erdem, 2021). Even when plastic is not necessarily present in the product, improved collection and sorting for reuse enables the recovery of plastic for recycling or reuse from mixed waste (UN Habitat & NIVA, 2020).

³ The novel entities planetary boundary refers to new synthetic chemicals that have been introduced into the environment including microplastics but also endocrine disruptors and other pollutants. (Richardson et al., 2023)

1.3. Waste pickers, reuse and activities beyond recycling

Reuse as a strategy performed by waste pickers is not as widely documented as recycling but there are records of reuse from various geographies (Dias, 2016; Gutberlet, 2016; UNEP & ISWA, 2024). In fact, the beginning of waste pickers' work in many Ecuadorian cities was initially focused on recovering material for their own reuse such as clothing or toys or for its use-value such as food for their animals and wood for heating (Valencia, Solíz, et al., 2023). Furthermore, their role in reuse of clothing via direct use or second-hand markets has an even larger contribution to reducing greenhouse gas (GHG) emissions than recycling inorganic materials (Vergara et al., 2016). Nevertheless, this is seldom considered in policy development.

In many Spanish-speaking countries, including Ecuador, waste pickers are referred to as 'recicladores de base', best translated as 'grassroots recyclers'. Much of the policy being developed refers to inclusive recycling rather than acknowledging their role in recovery for multiple purposes such as reuse or composting. The term 'recuperador' (recoverer) used in Uruguay, or the recategorization of waste pickers as 'reclaimers' in South Africa (Samson, 2015) more adequately reflect their roles but it is not evident whether that also translates into better policy in those contexts. Waste pickers demand that their access to waste is secured (avoiding privatization) and better working conditions that include transport, storage and payment for collection services. Only a few cases have achieved the latter, with Colombia as the frontrunner in payment for services (Parra, 2020). Nevertheless, their payment per ton diverted from landfills only recognizes the materials that are inserted into the recycling market whereas reused materials in second-hand markets are not monitored nor paid for (Communication with Nohra Padilla- Bogota's Waste Pickers' Association, 2025).



Figure 2: Waste picker collecting used shoes. Photo credit: Melanie Valencia

2. Ecuadorian public policy environment

Since its establishment in 1830, Ecuador has had 20 constitutions written, of which the latest has been in force since 2008. The current constitution is the main body of law that determines the legality of other organic laws instituted in the country and it was the first constitution of the world to recognize nature as a subject of rights in article 71.

“Nature or Pachamama, where life is reproduced and exists, has the right to exist, persist, maintain and regenerate its vital cycles, structure, functions and its processes in evolution.”

This article and subsequent regulation has allowed civil society and other entities to demand rights for multiple polluted rivers in the country in the quest for their integral remediation. The mention of the regeneration of vital cycles alludes to a closure of loops, as the CE requires, and opens a legal avenue to promote a CE as a national economic model. This article has been included in the legal basis for subsequent laws but not all have specifically mentioned the social aspects of the CE, particularly the recognition and role of waste pickers in realizing these rights. A recent assessment of Ecuadorian regulation related to circular economy and plastics categorizes the discourse managed as optimistic and still technocentric (Ochoa-Herrera et al., 2025). The following regulations are the most prominent governing CE and waste pickers’ work in Ecuador:

Redeemable Tax on Non-Refillable Plastic Bottles (IRBP) (2011): This instrument is included in this analysis because even though it is focused on recycling, it introduces the only public deposit-refund mechanism in Ecuador which could be applicable for refillable and other extended producer responsibility (EPR) programs. The IRBP was introduced in Ecuador through the Environmental Promotion and State Revenue Optimization Law; it came into effect in January 2012, imposing a USD 0.02 charge per PET bottle placed on the market. This value is later redeemed by recycling companies who can prove the material will be used for recycling locally or for export on a kilogram basis. Between 2012 and 2019, the IRBP scheme collected approximately USD 203.5 million, while reimbursements under the system amounted to USD 231.4 million—a fiscal imbalance in some years. Over time, the system achieved a collection rate above 100 % for PET bottles since there is an oversupply of plastic bottles attributed to illegal entry over the border (Viteri, 2022). The IRBP thus succeeded in mobilizing large volumes of PET bottles back into recycling channels but not necessarily from the right sources. This situation has forced the fiscal authorities to look for alternatives to decrease payments. As a strategy the number of bottles recognized per kilogram of PET has been gradually reduced from 44 in 2013 to 15 in 2019, as payments are per bottle but only reported in weight (Viteri, 2022)⁴.

In 2021, the Constitutional Court declared the law under which IRBP operated unconstitutional. In September 2023, the Ecuadorian government renewed the IRBP through a Decree-Law 877 (Economic Emergency Law Decree) in order to reinstate the mechanism. Subsequently, Executive Decree No. 929, published on November 29, 2023, established new reporting, payment, and eligibility procedures for recycler-transforming industries under the renewed IRBP regime.

Even though the IRBP was intended to reward those collecting PET bottles through a refund mechanism, none of the seven recognized entities eligible for refund under the renewed regime have been waste picker organizations. The system remains dominated by large recycling companies and intermediaries with higher administrative capacity. During the months when there was uncertainty about the renewal of the tax incentive between 2022 and 2023, PET prices dropped by 40%, forcing waste pickers to actively promote its renewal. Waste pickers continue participating informally, but are not structurally integrated into the refund framework, limiting IRBP’s effectiveness as an inclusive instrument in practice.

In interviews with the National Network of Waste Pickers in Ecuador (RENAREC) conducted on September 24, 2025, waste pickers argued that despite providing multiple suggestions for the tax as it was reinstated, the only

⁴ This is contradictory to common practice as grammage for each bottle continues to decline with improving design which would increase the number of bottles per kg (Viteri, 2022)

contribution that was added was the task for the Environmental Authority to provide an Inclusive Recycling Plan in the three months following the expedition of the decree. This plan exists as a draft but has yet to be published⁵.

Organic Environmental Code (COA) (2017) and its regulation (2018): This instrument was the first to recognize waste pickers and inclusive recycling in the country. It assigned the competency of managing the relationship with waste pickers to the municipal governments to improve working conditions. It also promoted the formation of waste picker associations for the promotion of the social and solidarity economy.

Organic Law of Rationing, Reusing and Reducing Single Use Plastics (SUPs) (2020) and its regulation (2021): This regulation failed to mention waste pickers' role in reducing SUPs. It did establish gradual bans on SUPs and installed recycled content targets for plastic bags and polystyrene containers, among others. Government figures show substantial tonnages produced with recycled material between 2022 and 2024 across key categories including plastic bags: 18.8 million kg in 2022; 21.1 million kg in 2024; cups/tubs/cutlery rising sharply in 2023 then moderating in 2024; polystyrene containers are also increasing (MPCEIP, 2025). Based on an interview with the Ministry of Production, Commerce, Investment and Fisheries (MPCEIP) officials on September 22, 2024, these indicate supply-chain adaptation to content targets by all the 105 manufacturers and distributors that are directly overseen. However, the market is much larger and despite multiple sanctions already placed on non-compliant companies, the Environmental Authority still lacks capacity to perform sufficient inspections.

Even though deposit-return schemes are encouraged in the regulation as well as other reuse business models, no targets were established. Furthermore, it was identified during interviews with multiple government actors that recycling activities are wrongly categorized as reuse due to misunderstanding of the term. Therefore, the focus and investment in increasing recycled content has undermined reuse efforts and the SUPs market is still on the rise. It is important to consider that depending on the purity of the manufacturing process, the recycled content containers may also have more additives, which in turn reduces recyclability, a phenomenon directly affecting waste pickers since they collect it but fail to receive an equivalent income for the same amount of material due to arguments that the material has lower quality.

Organic Law of Inclusive Circular Economy (LOECI) (2021) and its regulation (2023): This law places waste pickers at the center of Ecuador's transition toward circularity. It defines them explicitly as individuals who recover materials for their livelihood, with or without formal recognition, and establishes their role as indispensable actors in the circular economy. The law mandates their inclusion in municipal waste management systems, recognition of their contribution to material recovery, and incorporation into extended EPR schemes.

Beyond recognition, this law obliges national and local authorities to ensure that waste pickers have access to recyclable waste, infrastructure, and fair working conditions, and to promote their organization within cooperatives or associations. Some of the main advancements of this law include:

- (a) Mandated census of waste pickers executed in 2022 that registered 10,053 waste pickers. This census has not been updated and effectively functioned as a voluntary registry which had half of the estimated waste pickers that RENAREC published in 2015.
- (b) Certificate of work skills granted to over 700 waste pickers by the National Service of Professional Competencies (SECAP); the initial target was at 1500.
- (c) Mandated creation of a category for waste pickers to contribute to the National Social Security System (IESS), within six months of its approval. Unfortunately, IESS has determined in unpublished documents that waste pickers are a high risk population and creating a separate scheme would make it more expensive for them than the voluntary fees already established that anyone can access at USD 80 per month. The census had previously identified that less than 4% of waste pickers contribute to IESS.
- (d) Demands for municipal governments to create a plan to collaborate with waste pickers within three months of bylaws issuance. Out of 221 municipalities, 204 have ordinances for waste collection (INEC, 2023) and only 31 have updated them after the expedition of LOECI (AME, 2025). Only 10 have made them explicitly inclusive, six have mentions of inclusion or are working with RENAREC to establish agreements and two

⁵ The project GRECI (Gestión de residuos sólidos y economía circular inclusiva) which stands for integrated solid waste management and inclusive circular economy, in charge of providing the technical and policy assistance to develop these projects was changed for Gestión integral de residuos sólidos y economía circular (GIREC) This change came as the Ministry of Environment was absorbed by the Ministry of Energy and Mining as of October 2025 and several changes are still in the midst of implementation.

continue to have restricting ordinances⁶. One of these is the special case of Portoviejo that established the ordinance during COVID but allows waste pickers into the dumpsite and holds one of the two inclusive recycling roundtables in the country⁷. The National System for the Inclusive Circular Economy that was assigned the overseeing duties has not been established as of the writing of this case study, therefore, there have been no consequences for non-compliance. See Figure 3 for a geographic overview. It is worth noting that none of these ordinances recognize or mention the work done by waste pickers to scale reuse efforts.



Figure 3. Municipal ordinances for inclusive recycling. See interactive link [here](#).

Guidance documents have also been deployed in the country, including the White Paper for Circular Economy (MPCEIP et al., 2021) and the National Strategy for Inclusive Circular Economy (MPCEIP & MAATE, 2024), among others, which do include reuse in their recommendations. Nevertheless, these documents are non-binding and do not discuss the role of waste pickers in reuse at length with operational indicators. Ecuador was the first regional

⁶ Based on virtual access to the ordinances which not all municipalities publish online and validation with RENAREC.

⁷ Inclusive recycling roundtables are multistakeholder spaces to discuss and co-design waste picker collection and sorting activities as it pertains to municipality operations. Link to Portoviejo’s inclusive recycling roundtable <https://www.uasb.edu.ec/portoviejo-avanza-hacia-el-modelo-basura-cero/>

country to institute a national roadmap out of the [Global Plastic Action Partnership](#)⁸. According to the roadmap, Ecuador's transition to circularity regarding plastic from 8% to 42% in 2040, would require that at least 129 kilotons of materials are reused (GPAP, 2023). In this scenario multiple strategies for reuse will have to be designed and implemented, many of which should involve waste pickers. In the context of the [Global Plastics Treaty](#)⁹, expected to be finalized in 2026, these instruments will become useful to fulfill the binding obligations that will come with it, particularly if high ambitions for a just transition are instituted in the agreement.

3. Waste picker facilitated reuse operations

For this analysis three different case studies were investigated in Ecuador: Quito as the capital, Cuenca as the fourth largest city and home of one of the inclusive recycling roundtables and Machala to represent a coastal city that includes a bartering system. Methodology and data collection details used for all case studies are included in Annex 1.

3.1. Case study Quito

In Quito, Ecuador's capital, waste pickers play a vital role in material recovery. The research shows that alongside the materials collected for recycling, a wide range of materials and objects are collected for reuse. While recycling has gained formal recognition and is partially supported by the city, reuse remains largely informal and underdocumented. This case study explores how four associations of waste pickers (all part of the RENAREC national network) engage in reuse practices as part of their daily work in different parts of the city.

3.1.1 Association Eugenio Espejo Colinas del Norte

Located in the north of the city, members of this association usually source material while doing their waste collection rounds in their assigned collection areas, and by buying some objects offered by residents who want to discard them. Objects which can be reused are separated from the material sold for recycling at the sorting facilities, where these are further classified by materials and destination of use. They focus on:

- **Plastic containers:** Yogurt, disinfectant, shampoo, detergent and other bottles are sorted, washed and sold to small producers who refill them.
- **Glass jars and aluminium canisters (from preserved foods such as powdered milk):** Mainly bought by small producers to refill, for households to store food or for crafts.
- **Cardboard and egg cartons:** Sold to farmers who sell fruits and vegetables in the market and schools for packaging and manual crafts activities.
- **Household items and appliances:** Notebooks with some blank pages, hard plastics, trays, small glasses, and utensils are casually collected and mainly reused by association members and their families. Kitchen appliances and electronics are resold, repaired for use if broken, dismantled for parts or sold as scrap.
- **Tires:** Around 50 resold annually to a buyer who retreads them for resale.

Colinas del Norte engages directly with nearby communities, artisans and small producers, helping to extend the life of many common household materials and appliances.

⁸ The Global Plastic Action Partnership (GPAP) is the World Economic Forum's multi-stakeholder platform that unites governments, businesses, and civil society to tackle plastic pollution and build a sustainable, inclusive world. <https://www.globalplasticaction.org/home>

⁹ The Global Plastics Treaty is a legally binding international agreement being negotiated by United Nations member countries to end plastic pollution across its entire lifecycle <https://www.unep.org/inc-plastic-pollution>

0 3.1.2 ASOSERECIMANU

Working mainly in center-southern Quito, ASOSERECIMANU focuses on recovering:

- **Mixed goods, kitchen utensils and toys:** Collected during weekly rounds and sold in bulk once they have accumulated around 1 ton, every 3 to 4 months.
- **Used clothing:** Collected and sorted for reuse within families or sold in local markets. They are able to collect about 200 kg of used clothing per month, but only half of this amount is suitable for resale depending on the conditions of the item. Clothes of poor quality, ripped, or too dirty to be reused or resold are thrown away.

They usually work with one buyer who resells the goods at second-hand markets. Like other groups, these waste pickers do not keep official records of the materials sold for reuse. However, based on anecdotal data, it is estimated that a sack of good-quality garments weighing 100–120 kg is sold for USD 40–50. Clothing resale prices are low but offer essential support to the association's members.

0 3.1.3 Association of Wholesale Environmental Managers Ñuca Kawsay

Based at the Wholesale Market (Mercado Mayorista) in Quito, which accommodates 1,385 registered vendors, organized into categories such as groceries, fruits, vegetables, meat products, and complementary goods, the materials recovered and reused by the association originate primarily from the market itself. They recover:

- **Woven polypropylene sacks and cardboard boxes:** Sold to other vendors or reused for transporting fruits, vegetables, seeds, and other food products.
- **Plastic containers:** High density polyethylene (HDPE) bottles and gallon-sized containers are sold to intermediaries or small-scale producers and reused for chemicals such as chlorine or related substances.
- **Food rescue¹⁰:** Used as animal feed or, if still edible, for household consumption.

About 25% of all materials recovered by the association is ultimately reused, either through commercialization or for personal and domestic use.

0 3.1.4 Association of wholesale environmental managers ASOQUITUMBE

Members of this association are part of the ECOCEGAM (Environmental Education and Management Centers) Quitumbe in South Quito. ASOQUITUMBE has a new sorting station equipped with a cardboard compactor and is the association that recovers the most in terms of reusable materials. They have existed for more than 15 years but only in June 2025 did they begin operations at the ECOCEGAM. The agreement to use the facilities and infrastructure development by the city of Quito, as a precursor for commodatum¹¹ contracts supported via COA and LOECI, have unlocked storage capacity which enables them to manage an interesting inventory to sell to a more diverse set of clients ranging from community members to small and medium-sized enterprises. Thanks to agreements with residential buildings, enclosed blocks and packaging companies, they handle high volumes and a wide variety of items. Their main reuse items include:

¹⁰ Generally, for household organic waste to be transformed into food for animals, it would have to go through a preparation (cooking, autoclaving) to remove pathogens (Salemdeeb et al., 2017). This transformation would be considered reprocessing and therefore recycling instead of reuse. However, since this food is directly obtained at the market and has not been discarded or reprocessed for consumption, it is highlighted here as a form of reuse.

¹¹ According to Article 2077 of the Civil Code of Ecuador a commodatum or loan for use is a contract by which one of the parties delivers to the other, free of charge, a specific object or property, movable or immovable, so that the recipient may make use of it, on condition of restoring it after the use has terminated. In this case and with many other cases in the Latin American region, municipalities lend property to waste picker associations to operate collecting, sorting and cleaning facilities for recyclable materials.

- **Clothing:** About 3 tons/year are collected, from the streets or through donation, sorted for resale, used for personal use (helping to reduce household expenses) or repurposed for cleaning purposes.
- **Toys and stuffed animals:** Washed, restuffed, and resold after being recovered from the waste stream.
- **Plastic and reusable containers (sacks, buckets, and cardboard boxes):**
 - Around 1,000–1,500 sacks and 200–300 cartons recovered every two months.
 - Sold to packaging companies
 - Plastic crates exchanged with the Food Bank when receiving donations for the association.
 - Plastic bottles (e.g., detergent, bleach) resold for USD 0.05–0.10 each to small producers and local residents for household use.
- **Books and notebooks:** Notebooks with blank pages are reused by waste pickers' children as school supplies or for book-keeping at the association; books are cut up to collect images for collages, reducing school costs for waste pickers and their families.
- **Furniture, small appliances and electronics:** Reused if functional or sold; large appliances and furniture are mostly donated within the community or repaired for reuse.
- **Fuel tanks:** Collected about 20 per month, bought at USD 5 and resold for USD 8–10.
- **Tires and bicycles:** Sold based on condition for USD 10–20 each.



Figure 4. Buckets, sacks and plastic jugs stored in ASOQUITUMBE.
Photo credit: Melanie Valencia

ASOQUITUMBE benefits from a well-equipped sorting station and better material access, but like other groups, still relies on informal markets and lacks structured reuse channels. Despite the limitations they face, data collection suggests reuse generates higher margins in comparison to recycling with cost sensitive multipliers leading to 1.5 to 10 times the revenue of what they would have received for the same amount of material sold for recycling. See table 1.

Material	Multiplier of revenue for reuse over recycling
Plastic buckets	2.1
Cardboard boxes	10.4
Industrial PET	3.3
Steel Tanks	5.7
Electrical appliance	3.8
Clothing	Total sale value (no recycling market)
Wooden boxes for food transport	Total sale value (no recycling market)

Table 1. Reuse revenue multiplier in comparison to selling for recycling by material.

Compared to the total weight of materials sold monthly for recycling, reuse corresponds to only 1.2 tons, generating USD 426 in income, whereas 16.8 tons are sold for recycling, generating USD 5670. Based on the short-term data collection, even though recycling corresponds to the bulk of income and materials sold, reuse overall generates 5.3% more revenue per ton. It is worth noting that all of the earnings from reused materials collectively sold by the association are considered extra income and are used for Christmas bonuses in the form of bulk food provisions such as rice and grains. Other materials sold for reuse individually such as clothing are for personal income and are generally not included in the profit sharing for the association, see Table 2.

EJ is a waste picker and a member of ASOQUITUMBE who, every Thursday, goes on a collection round in nearby condominium complexes. Through an established network, he is able to recover a variety of materials, obtained through donations, household disposals, or low-cost purchases.

"The ladies call me to their houses, [...] and will let me know, 'Look, here I have this,' and then she either sells it to me, or gifts it"

These include both functional and broken items such as blenders, microwaves, refrigerators, sinks, lamps, tires, clothing, shoes, tricycles, and luggage. In the past, EJ occasionally sourced clothing from airport second-hand bulk shipments, known as "pacas," but this has become too expensive in recent times. Recovered appliances are repaired and then sold either in local markets or directly to households. Tires are sold for reuse, while shoes in good condition are sold at approximately USD 2 per pair. Clothing is carefully sorted, with high-quality pieces resold locally.

All the material EJ is able to recover is stored at his house where his two main buyers, two ladies who resell at the second-hand markets in the vicinity and live in his same neighborhood, come and buy the materials in bulk relying on a decade-long trusted relation.

Table 2. Example of waste picker operations in Quito

As a last highlight of the Quito case, it is worth noting that waste pickers recognize the limitations of being deemed grassroots 'recyclers'. Therefore, two of the associations already included in their names the term environmental managers instead of recyclers to capture their expanded role beyond recovering material for recycling.

Lessons learned

- In recycling, direct agreements with companies enable waste pickers to secure higher earnings by capturing a greater share of the value chain, bypassing intermediaries. However, such practices are not commonly applied to materials and objects destined for reuse. Only a small proportion of these items are sold directly to end users, while the majority continue to pass through intermediaries.
- The absence of standardized pricing mechanisms and reliable data on the sale of reusable materials highlights the informality of this sector. Prices are highly variable and are often determined through ad hoc negotiations at the point of sale.
- Electrical and electronic equipment are often repaired; however, such appliances are not guaranteed to meet health and safety standards. In this regard, it would be valuable to establish workshops or training programs focused on the repair of Waste Electrical and Electronic Equipment (WEEE).

Conclusion

This case illustrates how waste picker associations, despite operating under informal and resource-constrained conditions, have built resilient local systems for reuse that generate higher economic value and social benefits than recycling alone. The experience of ASOQUITUMBE and other associations demonstrates that access to municipal infrastructure, trusted buyer networks, and collaborative organization can transform reuse from a survival activity into a structured pathway for inclusive circularity. Table 3 summarizes the materials collected, buyers, main destinations and quantities and prices of reuse operations by each association in Quito.

Association	Number of members	Materials Collected	Buyers / Users	Main Uses / Destinations	Quantities & Prices
Colinas del Norte	11	Glass jars, aluminium cans, beer bottles, cartons, plastic containers, appliances, tires, notebooks, household items.	Artisans, small producers, schools, community members.	Crafts, refilling products, resale, school activities, household use.	Plastic containers: approximately 80 kg/month; Tires: app. 50/year. Prices vary by item
ASOSERECIMANU	10	Used clothing, appliances, toys	Bulk resellers	Resale in markets, low-value clothing for personal use	Sorted: 100–120 kg/month (\$40–50); Mixed items: app. 1 ton every 3–4 months; Resale: 5 pieces/\$1
Ñuca Kawsay	32	Sacks, cardboard boxes plastic HDPE liquid detergent bottles, organic waste	Associations, local farmers, intermediaries	Sacks & boxes: resale/reuse; HDPE bottles: refilled; Organic waste: family consumption/animal feed	Small cardboard boxes: \$0.10 each; app. 25% of collected materials reused
ASOQUITUMBE	25	Notebooks, books, furniture, appliances, household devices, reusable containers, plastic flacons, fuel tanks, clothing, stuffed animals, bicycles, tires	Community members, resellers, small producers, Food Bank, second-hand vendors, companies	School supplies, appliance resale/repair, household use, resale, cleaning, refill containers, toy refurbishment, vehicle use	Clothing: app. 3 tons/year (100 kg/sack, \$20–25) Plastic flacons: \$0.05–0.10; Fuel tanks: 20/month (\$5 each, resold \$8–10); Sacks: 1,000–1,500/2 months; Cartons: 200–300/2 months; Bicycles/tires: \$10–20 each

Table 3. Summary of waste picker reuse operations in Quito

3.2. Case study Cuenca

This case study explores the ways in which three associations of waste pickers (all part of the RENAREC national network) engage in reuse practices as part of their daily work, in different parts of the city. Unlike Quito, the more individual nature of the operation means there is more anecdotal data, although quantitative data was also gathered in one case. While recycling has gained formal recognition and receives partial support from the city, reuse remains largely informal. A case in point is EMAC, the local municipal waste management corporation. They established the 'Fondo de Reciclaje Inclusivo - FRI' (Inclusive Recycling Fund), an economic support mechanism for waste pickers based on the amount of waste they recycle and does not end up in the municipal landfill, thereby extending the landfill's lifespan. The FRI fund does not take into consideration the amount of material the waste pickers direct towards reuse. Therefore, quantifying the volume of reusable materials collected by waste pickers could provide valuable data to justify increasing the funds allocated to them in Cuenca.

3.2.1 Asociación de recicladores de Pichacay (El Valle)

All sixteen members of the association actively engage in reuse activities, with the recovered objects intended for both personal consumption and commercial exchange. Members clean and disinfect all collected clothing and keep stationery and various other items for their own use. On occasion, they repair and resell bicycles, household appliances and furniture. The two selected cases illustrate both common and specific practices of reuse activities and related trade.

The first one, with SM and MR, corresponds to an elderly couple of waste pickers who collect recyclable waste in a neighborhood in the southern part of Cuenca, assigned to them by the municipality. As part of their weekly shifts, they gather used clothing, small electrical appliances, and other discarded household items left by residents alongside their waste and recycling bags.

Once or twice a month, they sell the goods they have collected and stored in their home to one intermediary. Clothing is sold every one to three months, once they have gathered sufficient stock. SM and MR established contact with the intermediary independently. In 2020, during their first visit to the local market, they met an intermediary seller interested in purchasing their goods. Since then, she has become their regular buyer. Initially, she paid approximately USD 20 to fill a small pickup truck with bags of clothes, but over time the price increased to USD 40–50, as SM and MR improved their sorting and cleaning processes, and the intermediary became less selective with the items. The intermediary then resells these items at the same market.

Another member of the association, LF, operates on a larger scale compared to most of his peers. He stores both reusable and recyclable materials, often to the point of being overwhelmed by the volume. LF expressed frustration that the group is not better organized as an association, noting that if they worked more effectively together, they could increase their income and improve both the quality and quantity of the reusable and recyclable material they sell. LF mentioned that he would like to have someone dedicated solely to sorting materials, as the volume he handles is too large for him to manage alone.

Because LF is well-known in his area, private individuals, residents, and local shop owners contact him directly. He both purchases from them and collects materials from the street. On his plot of land, he has a dedicated section for reusable goods, which he stores separately from recyclables. Neighbors often visit to request or purchase these items; however, he does not keep records of these sales or transactions. He has a passion for recovering, repairing and selling musical equipment like loudspeakers. He also collects, filters and resells burnt oil.

3.2.2 Asociación Ricaurte

At the time of the data gathering, this association was in the process of being formalized. In fact, up until the previous month it was part of Asociación de recicladores de Cristo Rey, another local association that is part of RENAREC.

MG is a 65-year-old waste picker who primarily collects and sells used clothing, shoes, toys, small household items, and accessories such as costume jewelry and watches. She works with her husband, each collecting and separating

materials during their waste collection rounds and recovering items in usable condition in the town of Ricaurte, north of Cuenca. Clothing that is too deteriorated is discarded, while garments in good condition are washed, dried, folded, and prepared for resale.

In the past, the couple did not have a formal selling space, which caused stock to accumulate at home. However, for the past three years, MG has been selling goods two to three times per week at a flea market located near the Feria Libre Market, one of the largest in Cuenca.

They collect a wide range of items, with used clothing being the most valuable. Men's trousers and women's shoes are typically priced between USD 3–4 per item, depending on quality and condition, with prices negotiated directly with customers. The quantity of objects collected varies each week. During a week of data collection, the recovered items were expected to yield approximately USD 60 in sales: watches were sold for USD 3 each, a bag of assorted items for USD 40, and a baby cot for USD 20.

Part of the stock is sold to bulk buyers and other merchants who have stalls in the same market. Sales are informal and variable, with income depending on weekly turnout. The current market is slow, and she often earns barely enough to cover daily food expenses and stall fees. Earnings are shared between MG and her husband to cover basic household expenses such as food and utilities. MG also shares her stall with two other waste pickers: AL, who helped her become a waste picker 15 years ago, and AL's daughter. She rents the stall in her own name but allows them to use it on Sundays to sell their goods. This rotational arrangement helps each seller save on costs and maintain regular access to the market.

● 3.2.3 Asociación de recicladores de Feria Libre

This association has 30 members who work independently. As with many other waste pickers, for some members of this association, reuse was the first form of waste recovery they engaged in before recycling became formalized, and their work gained official recognition. The materials currently reused include clothing, shoes, decorative glass bottles, household appliances, and books—particularly older ones. Occasionally, partially used school supplies such as pens, pencils, crayons, and modeling clay are also collected and resold. It was not possible to engage with all the members of the association, and therefore, unlike in previous cases, it has not been possible to assess whether or not all members engage in reuse. Among those who do, some sell reusable materials in second-hand markets, while others do not sell directly, and either supply their materials to other members who do or sell them to intermediaries. The following section focuses on the former case: two cases of waste pickers who sell items in and around the Feria Libre market.

MJ, a woman over 55 years of age, conducts her sales at the rear entrance of the market, as she does not have access to a formal stall. She sells without authorization together with other vendors, with the risk of being fined and forced to leave by the police. Previously, MJ was part of an association that sold second-hand clothes in a market located farther from Feria Libre. However, that market had lower attendance and higher costs, which made it less profitable. She personally collects clothing and purchases items from other waste pickers. The garments she collects are primarily intended for her household use, while surplus items are sold informally on the street once or twice per week. Her clients include both individual customers and bulk buyers, which are merchants who arrive early in the morning to acquire second-hand goods in quantity to resell at other markets, including those located in coastal towns. Prices vary according to item type and condition: garments are commonly sold individually or in small bundles, such as three pieces for USD 5, while higher-quality items may be sold directly to customers for as much as USD 50–60 per piece.

MA is over 65 and part of a large family where five other members are involved in this work. She rents two stalls for USD 240 a month in a small second-hand market located opposite the main entrance of the Feria Libre. She started selling at the market seven years ago, and is a well-known presence, clients look for her, and over the years she has learnt the best ways to negotiate with clients to sell at the highest price. She primarily sells directly to customers, and about once a week she also trades with intermediaries who purchase large quantities of second-hand clothing to resell in other parts of Ecuador.

Each week, she collects approximately 100 to 150 kg of clothing, selling about half at the market. Unsold garments are kept for two to three weeks; if they remain unsold, she donates them to locals in need and the remainder are

thrown away. In addition to clothing, she also trades in electronic goods, handling around 50 kg per week. Roughly half of these items are sold at the market, while the remainder is stored and/or displayed for up to two weeks. She sources materials from various channels, buying from her daughter (also part of the association), her daughter-in-law, and other waste pickers. The overall dynamics of her trade are shaped by the availability of materials collected from the streets. The turnover of the objects on sale is irregular, fluctuating between two weeks and a month, depending on the flow of goods and customer demand. If not sold after this time, items that retain value are recycled, while those that do not are ultimately discarded as waste.

Quantitative data was collected over a one-month period of sales at this waste picker’s market stall. All materials and objects sold were weighed, and their prices recorded. Data collection took place over one week in July, two weeks in September, and one week in October 2025. The data provide insight into the quantity of materials diverted from waste streams, and the corresponding earnings. The quantitative findings show that, on average, 236 kilograms of materials were sold per week, with clothing and textiles representing the largest share, with 185 kilograms or 78% (see table 4 below). The net revenue from these second-hand sales generates USD 121 per month for MA which complements her income from recycling around USD 240 per month for 1 to 1.5 tons of materials being sold monthly. This means that reuse is generating a third of her income.

A simple projection shows that one waste picker can potentially recover 2.8 tons (236.3 kg x 12 months) of waste destined to reuse per year. This simple annualization does not consider seasonal peaks and troughs in sales, liquidity, availability to buy the material and market changes, including competitor actions which can significantly influence sales.

WEEK	EXPENSES (USD \$)	gross income (USD \$)	Electrical and Electronic Equipment (kg)	METALS (kg)	PLASTIC OBJECTS AND RECIPIENTS (kg)	CLOTHES AND TEXTIL (kg)	GLASS (kg)	OTHER (kg)	ALL MATERIALS/ OBJECTS (kg)
1	198	245	1.82	1.51	3.13	61.59	2.50	4.50	75.03
2	170	201	7.82	1.46	2.01	53.29	1.97	6.17	72.71
3	135	168	0.33	0.64	2.40	29.52	1.17	3.12	37.16
4	120	130	0.00	0.68	2.86	40.84	0.98	6.03	51.38
TOTAL	623	744	9.96	4.28	10.39	185.23	6.61	19.81	236.28
								AVERAGE	59.07

Table 4. Summary of materials collected for reuse, expenses and income during four weeks by one waste picker in Cuenca

Lessons learned

- Using stands at informal markets to sell reused materials exposes waste pickers to regulatory pressures, such as displacement by the police, and often leads to financial strain, as some resort to renting individual stalls at higher costs to avoid fines.
- Profits are often minimal due to low sale prices and increasing competition
- There is high motivation to repair and mend reusable objects to be sold for extra income.
- Up to 2.8t of waste can be diverted from landfill for reuse per year by one waste picker operation.
- Expanding the recognition of materials for reuse in funds for diverted material could further incentivize waste pickers to scale their reuse operations.
- Reuse sales, particularly for second-hand clothing, can generate up to a third of a waste picker’s income.

Conclusion

The operations in Cuenca showcase the persistence and adaptability of waste pickers who sustain reuse economies through informal markets and strong interpersonal networks, even in the absence of institutional support. These practices highlight the potential for formalizing second-hand markets, improving access to infrastructure, and recognizing reuse within municipal incentive schemes to strengthen livelihoods and extend material lifecycles.

3.3. Case study Machala - Godos Plaza Center

Godos Plaza Center is a pioneering Ecuadorian organization that has evolved from traditional scrap trading into a model circular economy hub in the southern coast of Ecuador. Established nearly three decades ago by Franklin Godos, the enterprise redefined its operations in 2014 to promote material reuse, repair, and recycling across diverse waste streams after attending a circular economy seminar at the University of Cuenca. By 2020, it had consolidated into a “Circular Economy Yard,” integrating environmental education and community participation into its business model.

Circular Economy in Practice

Every year, the Center diverts over 3,660 tons of materials from landfills—ranging from electronics, plastics, paper, cardboard, textiles, and organics—and reincorporates them into productive cycles. Godos Plaza Center promotes the reuse of all common urban materials. Table 5 shows the materials collected, percentage derived for reuse and relevant notes on preparation for reuse.

Material	Amount collected in t/year	% derived for reuse	Notes
Clothes	6	80%, other 20% sent to landfill	Washed, dried and ironed in the facilities to increase interest. Bought in bulk, sold per item
Plastics such as buckets, shampoo and chlorine containers	400	40%	Mainly used for refill by local entrepreneurs selling paint, home-made shampoos and detergents
Electric and electronic waste	3000	22%	Higher depending on the equipment, with refrigerators it reaches 79% via repair and refurbishing. They obtain parts from other equipment they receive
Cardboard	250	50%	Obtained from the two main commodities available in town, banana and shrimp producers, sold to buyers around the country.

Table 5. Materials collected and derived for reuse at Godos Plaza Center

Plan Trueque and “Yo Reciclo por mi Vida”

At the heart of the initiative is an innovative barter system known as Plan Trueque or “Yo Reciclo por mi Vida.” With over 300,000 participants, the program allows citizens to exchange recyclable materials—paper, plastics, metals, textiles, and small appliances—for points that can later be redeemed for goods such as refurbished refrigerators, or household items. Participants may also opt for an annual cash-out equivalent to their accumulated materials, which can reach USD 20–30 per month per household.

The network extends across 84 neighborhoods, schools, and universities, including the University of Machala, local councils, and municipal governments. This community infrastructure ensures a steady supply of sorted materials while raising awareness about responsible consumption and waste reduction.

Social and Environmental Impact

By transforming waste into value, the program reduces landfill use, cuts greenhouse gas emissions, and builds a sense of environmental citizenship. The initiative also generates inclusive employment by linking waste pickers and households to a structured, transparent circular system. Half of the 47 employees at Godos Plaza Center

are former waste pickers who were chosen due to their specific abilities in sorting and have been upskilled into repairing operations. During the COVID-19 pandemic, the model proved resilient—using accumulated materials to produce essential goods such as computers for children to be able to attend school virtually—demonstrating how community-based circularity can enhance local resilience.

Lessons Learned

- Diverse material streams ensure operational stability and inclusive participation.
- Community incentives foster long-term behavioral change and trust.
- Local partnerships with municipalities and schools amplify impact and education.

Conclusion

Godos Plaza Center exemplifies how Ecuadorian enterprises can embed circular economy principles beyond recycling, linking reuse, repair, and resource exchange to community well-being. Through Plan Trueque and Yo Reciclo por mi Vida, the company demonstrates that sustainability and social inclusion can coexist—transforming waste into dignity, participation, and opportunity.

3.4. Other reuse initiatives with inclusive elements

3.4.1 CEREP

The Ecuadorian Corporation for Extended Producer Responsibility (CEREP) is a collective mechanism designed by Proyección Futura to enable companies within the same sectors to comply jointly with EPR obligations. In addition to supporting regulatory compliance, the system has facilitated the development of several voluntary EPR initiatives across the country, beginning with national policy frameworks addressing tires and electronic waste.

Proyección Futura is currently developing a voluntary EPR scheme for food packaging and snack wrappers. As part of this process, ten of the country's largest companies have been engaged to analyze market dynamics and identify viable mechanisms for implementing the system.

According to Proyección Futura, voluntary collective schemes play a critical role in preparing companies to meet future regulatory requirements. More importantly, they help demonstrate what is feasible in practice, thereby informing the establishment of realistic and effective EPR targets. Although the results of the pre-feasibility study remain unpublished, representatives indicated that the first pilot project will be launched in the coastal city of Salinas in collaboration with the waste pickers' association 28 de Noviembre and the GIZ project Marine Litter Prevention (MarLi) and in the cities of Cuenca and Quito.

3.4.2 Huella Verde

This circular economy certified B Corp specializes in eliminating SUPs in food courts of shopping malls by replacing them with reusable dishware, cutlery, and glassware supported by an industrial washing and logistics system. In 2025, it surpassed 50 million disposables avoided across 11 malls since they began operating, equivalent to over 742 tons of plastic, over 2,600 tonnes of CO₂ emissions prevented and nearly 93 million liters of water saved (Huella Verde, 2025). A recent lifecycle assessment that includes the comparison of manufacturing of both SUPs and ceramics up to their waste disposal based on an equivalent functional unit shows that Huella Verde reduces 70% of CO₂ emissions and 50% of water consumption with their system (Bravo & Valencia, 2025).

In some of the food courts where they operate, they also take over source separation of organic waste and recyclables as they have first contact with the waste as it is generated. Across all its sites between 2017 and

2024, the company reports recovering over 1.4 million kg of organic waste and nearly 94,000 kg of recyclables. They do this in collaboration with multiple waste pickers' associations, foundations and environmental managers. The collaboration with waste pickers always depends on their reliability and reporting capacity. Even though this limits eligibility, some associations like Papi Corre in Manta have directly benefitted by obtaining both the inorganic recyclable fraction to redirect into production and using the organic waste to begin and scale pig farming operations, making it a new reliable source of income. Though waste pickers are not directly involved in reuse in this case, this reuse business model has enabled them access to waste in shopping malls.

Employment generation is also central to Huella Verde's model. It directly employs 66 people, and created 26 new jobs in 2023 alone. It implemented an employability program with the International Organization for Migration (IOM) to incorporate migrants, refugees, and vulnerable populations into its workforce, arguably reducing internal and foreign migration in the country, a key driver towards waste picking as well (Valencia, Solíz, et al., 2023). Through this initiative, the company offers formal contracts that offer schedule flexibility, training in food safety and circular operations, and stable incomes. Furthermore, Huella Verde co-founded the reusa.ec initiative with Mingas por El Mar to promote reuse in small beach restaurants by providing glasses and dishware; they also donate dishware to schools.

● 3.4.3 ReciVeci

This social enterprise promotes inclusive recycling by connecting waste pickers with citizens, companies, and institutions. It began as a volunteer-driven citizen initiative in Quito in 2015, aiming to foster stronger connections and mutual respect between communities and waste pickers and to increase recovery of recyclable materials. Over time, it formalized into a social enterprise with tools like the ReciVar (which helps citizens locate and coordinate material drop-offs or pickups) and services aimed at businesses that support waste management and CE goals with waste pickers such as waste sorting at events, selective collection for companies and co-design of alternative uses for problematic waste. Through these activities, ReciVar has helped improve the visibility, organization, and income of waste pickers, providing fair compensation, training to improve service provision and occupational health, and more stable routes of supply for their recyclable materials.

The Glass Hub (Hub de Vidrio by ReciVar) is a dedicated center launched in September 2023 to more systematically collect glass in Ecuador's center-north region. The Hub buys glass (by color, and for both recyclable and returnable bottles) directly from waste pickers, intermediaries, and the general public, facilitating traceability as they are collecting and sharing data regarding sources, colors and other relevant information regarding this material. In its first year of operation, it recovered 1,000 tonnes of glass, worked with over 100 glass suppliers, 70% being waste pickers, and provided each waste picker with an additional USD 50/month, representing a 30% increase in their income¹² (ReciVar, 2025). The Hub operates with fair pricing, separation by color, and incentives for higher volume deliveries. Approximately 2% of all the glass they obtain corresponds to refillable bottles from sodas, beer and water. They have aimed to redirect this material back to deposit systems instead of recycling but they have yet to reach buying agreements from distributors or the owning companies to cover the logistics. This occurs because the existing logistics and deposit-return schemes established are highly effective (some companies report up to 97% recovery of their containers). The Glass hub aims to strengthen data systems to also monitor glass flows and impacts given that the Ministerial Agreement 121 from 2016 for increasing glass recycling and recycled glass content of up to 40% has had no official data published by the government.

● 3.4.4 Cervecería Nacional

Currently, 81% of its sales are in returnable containers (glass bottles) that can be reused up to 40 times, and once they reach end-of-life, the glass is broken down and reprocessed into new bottles (*Empaque Circular | Cervecería Nacional Ecuador*, 2025). From 2023 onward, 75% of their Pony Malta (malt) bottles are made from recycled plastic via a partnership with Enkador which mechanically recycles food-grade PET via collaboration with waste picker support organizations such as Fundación Redes con Rostro and ReciVar) to collect materials across Ecuador (notably in the province of Manabí) and integrate them into their circular packaging and recycling schemes.

¹² Less than 19% of glass is recovered nationally despite the material's high recyclability (ReciVar, 2025)

3.4.5 Arca Continental

Aims to promote 100% reusable or recyclable packaging and has updated its goals to reach 80% collection of locally marketed packaging by 2035. In cities like Guayaquil and smaller towns, they have faced significant challenges in recycling and recovering containers for reuse. In Ecuador, Arca develops PET bottles in partnership with San Miguel Industrias (SMI), using 25% recycled resin and producing refillable PET bottles. Currently, 40% of their beverage sales in Ecuador are in refillable containers, with a target of reaching at least 50% by 2035. Since 2016, the company has increased investment in returnability, including a USD 23 million investment in logistics. In 2024 they made an investment of USD 60 million in refillable packaging and awareness campaigns. Returnable PET bottles can be reused up to 15 times, while glass bottles—mainly used in the HORECA (Hotels, Restaurants and Coffee shops) sector—can be reused up to 25 times based on their current system. PET returnables are more common in local stores, where Arca has focused its returnability efforts, including a pilot project with MiniComisariatos (a retail chain), now expanding countrywide. While they work with around 800 recyclers through their DAR recycling project, returnability initiatives have not yet involved waste pickers directly but could have agreements with associations to collect refillable bottles from their storage facilities once necessary volumes have been collected to justify transport.

3.5. Summary of the case studies

Figure 5 summarizes inclusive reuse as it is facilitated by waste pickers but also how reuse business models increase access to reusable and recyclable materials for waste pickers due to their operations as presented with this latter section. This figure also includes other actors in the popular and solidarity economy who, although not part of this study, facilitate reuse. These include artisans, seamstresses, tailors, shoemakers, electromechanical technicians, people who rent costumes and equipment, among others. Their roles are also relevant in the inclusive circular economy and must be supported to prevent them from disappearing. Alliances between waste pickers and associations or individuals who carry out repair and rental work could strengthen inclusive reuse and the local economy.

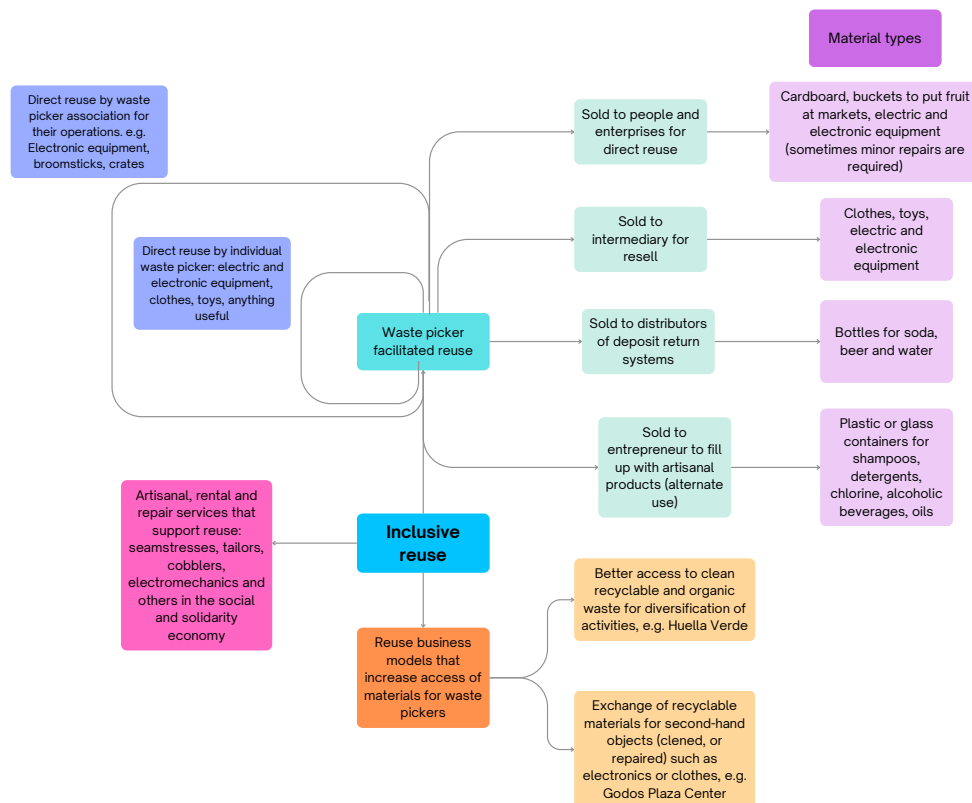


Figure 5. Inclusive reuse activities in evaluated case studies in Ecuador

4. A systemic perspective for intervention: Lessons learned, barriers and opportunities.

One of the key concerns regarding reuse in comparison to recycling is understanding their differences, starting from the technical definition. Table 6 summarizes some of the key characteristics. It is worth noting that due to the lack of a recognized market in most of the reuse practices, standardized pricing is not available and seldom reported. This also affects the ability to conduct more repair and refurbishment that could lead to higher profitability. Nonetheless, this would require more dynamic capabilities to be developed by waste pickers and associations such as repair or design work but is more attractive than recycling as the main profit is taken by those who hold the infrastructure and technology to perform the reprocessing for raw material (Uvarova et al., 2023). Waste pickers in both cases provide the logistics services, and in the case of refillable systems those would account for reverse logistics where there is high need of coordination with external actors and coordination across the supply chain to improve recovery (Uvarova et al., 2023).

Characteristics	Recycling	Reuse
Technical definition	Separation and reprocessing of materials and components from products and systems to subsequently be used as raw material input for the same or different use or function (ISO 20887:2020)	The using again of a product, object or substance that is not waste for the same purpose for which it was conceived, possibly after repair or refurbishment (Basel Convention, 2017). Use of products or components more than once for the same, or other purposes, without reprocessing (ISO 20887:2020).
Sourcing and maintenance	Dumpsites, landfills and curb side collection. Better pricing can be obtained with materials in better conditions.	Mainly through curb side collection that maintains better quality and thus grants higher margins (there are reports of dumpsite and landfill collections). Many times waste pickers are gifted materials (clothes, shoes, toys, electric equipment, etc). To maintain good conditions, storage facilities should be available (for materials to be covered, dry and safe).
Material streams	Plastic, cardboard, paper, WEEE. Prices vary depending on condition	Plastic, cardboard, electrical and electronic equipment, wooden boxes, styrofoam coolers, textiles (mainly as clothes). All must be in good condition to qualify for reuse sales.
Commercial strategy	Through direct sales or intermediaries.	Mainly through intermediaries for independent waste pickers. Associations sell via distributors or find consistent buyers for specific needs such as sacks and boxes for the food market or packaging for artisanal soaps, detergents and shampoos.
Market characteristics	Established, follows stock market practices.	Highly informal with the exception of refillable systems.
Policy recognition	Widely addressed with multiple laws with specific requirements and standards being developed at national and local levels.	Mentioned in policy as part of the waste hierarchy but seldom operationalized into indicators.
Social-ecological impacts in the value chain	Virgin material replacement, high infrastructure needs and capital costs.	Lifespan extension, little infrastructure required and low cost to prepare for reuse (washing, mending). Ultimately reduces overall material demand (both virgin and secondary) and waste volumes, reducing associated socio-economic costs.

Table 6. Recycling and reuse comparison

The cases in Quito, Cuenca, and Machala demonstrate that reuse led by waste pickers can be both socially and economically viable, even under highly informal conditions. Locally, success has hinged on the presence of infrastructure, organization, and trust-based community relationships. In Quito, the establishment of ECO-CEGAM facilities enabled ASOQUITUMBE to diversify materials, maintain inventories, and secure higher reuse margins—between 1.5 and 10 times higher than recycling prices—demonstrating that access to municipal infrastructure and stable buyer relations are critical enablers. Similarly, Cuenca’s experiences show that even without formal support, established networks of waste pickers and resellers can sustain local reuse economies through informal markets. In Machala, the Godos Plaza Center illustrated how private sector leadership combined with social inclusion can build scalable, transparent reuse systems supported by community participation and reverse logistics.

Across contexts, reuse remains hindered by systemic barriers. These include limited formal recognition of reuse within policy frameworks, insufficient data and traceability mechanisms, and the absence of standardized pricing or safety standards, especially for reused electrical appliances and textiles. Waste pickers’ limited access to capital and storage restricts their ability to accumulate reusable inventories, while the high cost of formal market stalls and the risk of displacement by local authorities discourage reuse activities to impede their scalability. Additionally, the lack of integration of reuse activities within municipal incentives, such as Cuenca’s Inclusive Recycling Fund (FRI), results in undervalued social and environmental contributions. These challenges point to the need for adaptive, place-based interventions that address the institutional gaps and uneven access to infrastructure that constrain inclusive reuse.

Incorporating educational programs on repair, particularly in CEGAMs, could enhance skill specialization and create new employment niches. By leveraging Ecuador’s strong legal foundation for inclusion, local experiences offer lessons on how reuse can move from a marginal activity to the cornerstone of a just circular economy, informing broader Latin American transitions toward systemic circularity. Furthermore there is an opportunity for hybrid models that blend municipal facilitation with community initiative and private participation to further mainstream reuse. The examples of Huella Verde and Godos Plaza show that formal reuse value chains can also improve waste pickers’ access to recyclable waste, thereby increasing their income. Table 7 summarizes the barriers and opportunities identified via the systemic map and the case studies.



Category	Barriers	Opportunities
Institutional and Policy	<ul style="list-style-type: none"> Lack of quantitative targets or indicators for reuse in national and municipal policies. Misclassification of recycling as reuse in the Single-Use Plastics (SUPs) Law and related regulations. Exclusion of waste picker associations from fiscal incentives such as the IRBP. Weak enforcement and monitoring capacity to ensure compliance and inclusion. No integration of reuse as a recognized EPR compliance pathway. Insufficient municipal ordinances explicitly recognizing reuse and the role of waste pickers. 	<ul style="list-style-type: none"> Establish ambitious national and local targets to shift emphasis from recycling to reuse. A list of useful indicators is provided in Annex 2. Integrate reuse and refill systems into EPR frameworks to recognize waste pickers' contributions. Introduce social eligibility criteria in fiscal instruments (e.g., IRBP) for inclusive access. Expand municipal commodatum facilities for reuse sorting, repair, and storage. Extend the role of waste pickers beyond recycling to all waste diversion activities to promote these activities and pay for the waste diversion service. Institutionalize inclusive recycling and reuse roundtables in major municipalities.
Economic and Market	<ul style="list-style-type: none"> Limited access to capital, storage, and transport infrastructure. Volatile and informal pricing in second-hand markets. High stall rental costs and risk of eviction for informal sellers. Lack of structured supply chains linking waste pickers to consistent buyers. (Risk) Competition from the importation of "donated" used American clothing through bales (pacas) that distort prices and generate a surplus of supply. 	<ul style="list-style-type: none"> Establish dedicated reuse markets and permanent stalls in municipal markets and support the safety of existing ones. Create a national association of second-hand sellers for collective bargaining. Promote repair and refurbishment enterprises led by waste pickers (especially in CEGAMs). Develop differentiated pricing mechanisms for reused materials to stabilize incomes. Strengthen partnerships with social enterprises such as ReciVeci, Huella Verde, and Godos Plaza Center can increase access to recyclable and reusable materials for waste pickers.
Technical and Infrastructural	<ul style="list-style-type: none"> Lack of accessible repair and refurbishment facilities. Insufficient training in maintenance, safety for repair and refurbishment operations. Absence of quality control mechanisms for reused electrical or textile items. 	<ul style="list-style-type: none"> Designate trained repair specialists within CEGAMs and waste picker associations or collaborate with repair associations and professionals. Implement peer-to-peer training programs to build repair and reuse skills. Develop low-cost, decentralized infrastructure for washing, repairing, and testing reusable items. Introduce simple quality assurance guidelines for reused goods.
Social and Organizational	<ul style="list-style-type: none"> Low formalization levels of reuse activities. Gendered constraints (childcare, mobility, unpaid labor). Fragmented coordination between associations, municipalities, and enterprises. Limited visibility and recognition of reuse within CE narratives in local policy. Perceived risk of wrongful origin of reused products, such as stolen goods, particularly at markets. 	<ul style="list-style-type: none"> Encourage peer-to-peer repair and reuse learning networks within waste picker associations. Introduce a dedicated system for reuse collection such as dedicated days, containers or bags to directly go to waste pickers expanding the occasional donation. Facilitate the traceability of origin via registered donations for reuse in inclusive recycling apps such as ADRI¹³ and ReciApp.
Environmental and Systemic	<ul style="list-style-type: none"> Continued prioritization of recycling over reuse in environmental policy and funding. Lack of data on reuse volumes and avoided emissions. Limited integration of reuse metrics in climate or CE reporting. 	<ul style="list-style-type: none"> Demonstrate higher greenhouse gas emissions reduction potential of reuse compared to recycling. Develop national data systems to monitor reuse flows and avoided emissions. Align reuse initiatives with Ecuador's constitutional Rights of Nature and climate commitments.

¹³ Aplicación de Reciclaje Inclusivo (ADRI) (Inclusive Recycling App) being deployed by RENAREC.

5. Recommendations

Ecuador's circular economy framework provides an advanced legal foundation through the Organic Environmental Code (COA, 2017), the Organic Law of Inclusive Circular Economy (LOECI, 2021), and the Organic Law for the Rationalization, Reuse and Reduction of Single-Use Plastics (2020). However, these instruments have yet to translate into measurable and enforceable outcomes for reuse. Current policy emphasis remains overwhelmingly focused on recycling, leaving reuse as an aspirational rather than operational goal. To align with the waste hierarchy and maximize economic, social and environmental returns, ambitious national and municipal targets for reuse should be introduced to progressively displace recycling as the primary circular strategy. Such targets could be expressed in terms of tonnage or percentage of materials diverted through reuse systems, coupled with clear monitoring indicators and integration into extended producer responsibility (EPR) frameworks.

Deposit-return systems such as the Redeemable Tax on Non-Refillable Plastic Bottles (IRBP), though successful in mobilizing material recovery and stimulating PET collection, inadvertently fostered speculative behavior and concentrated market power among large recyclers and intermediaries. Its design excluded waste picker organizations from the refund mechanism, despite their pivotal role in collection. Consequently, waste pickers found themselves defending a policy that did not materially benefit them, diverting attention from more equitable reforms. Future iterations of fiscal incentives should therefore include social eligibility criteria, ensuring that waste pickers and associations can directly operate the system, access benefits, and mechanisms that discourage market speculation. Complementary to this, EPR schemes must move beyond recycling and explicitly recognize reuse and refill systems as compliance pathways. There is growing tension between government efforts to promote bans or redesigns for reuse and industry's preference for waste-to-energy and chemical recycling (WIEGO, 2022). Ecuador can bridge this gap by prioritizing reuse-based EPR compliance, which has higher labor intensity and lower environmental impacts.

At the operational level, the lack of a structured reuse chain and valuation system remain the largest barriers to scaling inclusive reuse. Currently, economic gains are shared within associations but remain volatile and under-quantified. Developing standard valuation methodologies and introducing differentiated pricing for reusable items, particularly for glass, plastics, and textiles, would strengthen traceability and improve income stability. Moreover, institutionalizing reuse functions within existing municipal infrastructure could enhance capacity to scale reuse. Where there is municipal involvement such as in CEGAMs, municipalities could designate a specialized member trained in repair and refurbishment, responsible for maintaining product quality and training interested waste pickers who could then train others. This decentralized, peer-to-peer approach would be more accessible and cost-effective than centralized training programs, particularly for women waste pickers balancing work and family obligations.

Structuring the reuse market also requires new organizational and spatial arrangements. CEGAMs and other municipally-supported projects should monitor the amount and prices of materials being sold for reuse to understand the market and create policy that strengthens this waste diversion mechanism. The creation of an Association of Second-Hand Sellers under the umbrella of RENAREC would formalize trade, enable collective bargaining, and allow for joint investments in logistics, branding, and safety compliance. In parallel, municipalities should establish dedicated reuse markets or permanent stalls within existing public spaces. These would reduce informal competition, prevent displacement by local authorities, and legitimize reuse within the urban economy. Such spaces would also create visibility for citizen engagement and education on reuse, promoting behavioral change and greater appreciation for the social value of waste pickers' work. To attract new participants and clients, this could be done by emulating Repair Cafes¹⁴ in collaboration with academia and social organizations.

Finally, community participation and separation at source should be strengthened to increase both the quantity and quality of reusable materials. This can be done with a separate bag, container or specific day when reusables are taken out by households. Public awareness campaigns and partnerships with schools, neighborhood associations, and private enterprises could further reinforce these practices. Mobile applications currently focused on inclusive recycling such as ReciApp and ADRI could add a section for reusable items to be better classified and improve data collection providing better incentives for users. Despite low margins, waste pickers' reuse activities demonstrate remarkable self-organization and initiative; supporting them through formal recognition, inclusive fiscal instruments, and infrastructural access would amplify their contribution to Ecuador's circular transition.

¹⁴ <https://www.repaircafe.org/en/>

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Annex 1: Case study methodology

a. Quito

Qualitative data was collected over a period of two months, including notetaking based on participant observation, and 16 semi structured interviews with waste pickers members of the following associations, (part of RENAREC):

1. Asociación de Servicios de Reciclaje Eugenio Espejo Colinas del Norte
2. Asociación de Gestores Ambientales Mayoristas “Ñuca Kawsay”
3. Asociación de Servicios de Reciclaje Gestores Ambientales de Quitumbe “ASOQUITUMBE”
4. Asociación de Servicios de Reciclaje Manos Unidas “ASOSERECIMANU”

The data gathering took place in three different locations in Quito: at a sorting facility in the North of the city (1), a wholesale market (2), and two CEGAM - Centros de Educación y Gestión Ambiental (Environmental Education and Management Centers) (3; 4) in the center-South (see Fig A1). The CEGAMs are spaces managed by the Municipality of Quito through the Metropolitan Public Company for Integrated Solid Waste Management (EMGIRS EP), for the collection and commercialization of recyclable materials. In Quito, there are six CEGAM enters, where materials recovered from the waste stream by waste pickers and/or bought



Figure A1: Distribution of Quito Waste Pickers' operations

form packaging producing industries are sorted, partially treated for recycling and sold to intermediaries or directly to recycling companies.

Quantitative data was gathered over a 2 month period, consisting of type of material, monetary (costs and revenues) as well as weight or unit data, at the ECO-CEGAM Quitumbe with the support of ASOQUITUMBE members.

b. Cuenca

Qualitative data was collected over a period of one month and included notetaking based on participant observation, 14 semi-structured interviews, and one group interview with waste pickers who are members of the following associations part of RENAREC, the National Network of Waste Pickers of Ecuador:

1. Asociación de Recicladores de Pichacay (El Valle)
2. Asociación de Recicladores de Feria Libre
3. Asociación de Recicladores de Ricaurte

Data collection took place in several locations in Cuenca, including interviewees' homes, during their waste collection shifts on the streets, and at the Feria Libre Market, one of the largest markets in Cuenca, which sells goods ranging from fresh produce and meats to clothing and household items.

Quantitative data was gathered over a one-month period at a market near Feria Libre and included information on the types and weight of materials and objects sold by a waste picker as well as cost and earnings from sale.

c. Machala

Franklin Godos was interviewed initially on June 24th, 2024 and later on as a follow up on October 15th, 2025. The numbers on materials collected are estimates by Godos and were not directly monitored by the researchers.

d. Informational interviews for inclusive reuse

Meetings of 45 to 120 minutes were conducted with representatives of the Ministry of Environment and Energy (previously of Water, Environment and Ecological Transition), Ministry of Production, Foreign Trade and Investments, Huella Verde, Arca Continental, ReciVeci, Enkador, the Ecuadorian Corporation for Extended Producer Responsibility (CEREP) and RENAREC. The data reported from Cervecería Nacional was obtained from its website.

Annex 2: Indicators for inclusive reuse

During the development of this case study, one of the researchers - Melanie Valencia- participated in the roundtable for the development of the National System of Inclusive Circular Economy (SNECI) which will be the organism in charge of monitoring the advancement of an inclusive circular economy in the country. The roundtable aimed at improving the governance system and indicators of the SNECI. The following indicators are presented as desirable to promote inclusive reuse in the system. RENAREC can begin collecting data to show their statistical viability.

Indicator Domain	Indicator Name	Definition	Unit of Measure	Policy Use and relevance
Material Flow & Waste Diversion	Tons diverted (for reuse) from landfill	Total weight of materials diverted from landfill directed towards reuse	t/year	Comparable to recycling diversion metrics. Ideal to use tons diverted for all materials and purposes and divide towards reuse, animal feed, composting, and others, as it would strengthen data availability for decision making.
	Average reuse cycles	Average number of times a product is reused	Number of cycles	For deposit-return systems to report
	Inclusive deposit return systems	Amount of materials recovered by deposit return systems with waste pickers	# of items or tons/year	LOECI and COA compliance for waste picker prioritization
	Inclusive Extended Producer Responsibility programs (EPR)	EPR programs that involve waste pickers	#	LOECI and COA compliance for waste picker prioritization
Economic & Livelihood	Income from reuse	Average income from reuse activities per waste picker	USD/month	Measures livelihood contribution, this could be done via billings that do not charge value added tax (notas de venta) or reports such as those developed by CEGAMs
	Share of income from reuse	Percentage of total income from reuse	%	Shows economic importance of reuse
	Revenue per ton (reuse)	Revenue generated per ton of reused material	USD/t	Allows comparison with recycling
	Reuse value multiplier	Ratio of reuse revenue to recycling revenue	Multiplier	Justifies prioritizing reuse, just as done in this case study with Asoquitumbe's data

Indicator Domain	Indicator Name	Definition	Unit of Measure	Policy Use and relevance
Social Inclusion & Labor	Waste pickers engaged in reuse	Number or share of waste pickers involved in reuse	# / %	Tracks inclusive participation
	Gender participation in reuse	Share of women in reuse activities	%	Recognizes care duties equity
	Formal second-hand market access	Waste pickers with legal access to reuse markets	#	Indicates formalization progress
	Jobs created via reuse	Jobs in repair, washing, resale, rentals	#	Shows employment intensity. Supports the social and solidarity economy. Can be done based on the CIU ¹⁵
Infrastructure & Capacity	Reuse-enabled facilities	Facilities supporting reuse activities	#	Tracks public and private investment in markets, refillable infrastructure and others.
	Access to commodatum infrastructure	Associations with municipal reuse infrastructure	#	LOECI compliance
	Repair & refurbishment capacity	Facilities or trained individuals for repair	#	Supports quality & safety
	Training coverage	Waste pickers trained in reuse/repair	# / % of total waste pickers	Workforce upgrading, national census of waste pickers would need to be consistently updated

¹⁵ International Standard Industrial Classification of all economic activities

Indicator Domain	Indicator Name	Definition	Unit of Measure	Policy Use and relevance
Market & Governance	Municipalities with inclusive diversion ordinances	Municipalities that update their ordinances operationalizing reuse with indicators that also monitor this activity as performed by and prioritized for waste pickers	#	Tracks public policy adoption and advancement
	Stable reuse buyers	Regular buyers or contracts for second-hand goods, particularly useful for municipally-supported infrastructure	#	Market stability
	Direct sales rate	Share of reuse sold without intermediaries	%	Improves value capture for waste pickers
	Standard pricing coverage	Materials with reference reuse prices	%	Reduces price volatility
	Reuse recognized in EPR	EPR schemes accepting reuse as compliance	Yes/No + #	Structural policy change
Environmental & Systemic	GHG emissions avoided via reuse	Estimated emissions avoided	tCO2-eq/year	Climate reporting such as nationally determined contributions to the Paris Agreement
	Virgin and recycled material displacement	Reduction in virgin and recycled material demand	t/year	Resource scarcity and lifecycle approach
	Plastic pollution prevention via reuse	Plastics kept in reuse systems	t/year	Plastics policy alignment, national examples exist already with Huella Verde
	Reuse vs recycling impact ratio	Emissions avoided per ton reused vs recycled	Ratio	Evidence-based prioritization

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Ñuca kawsay association's storage area in the wholesalers market in Quito. Photo Credit: Melanie Valencia.

Waste picker leader in Asoquitumbe's operation at the ECOCEGAM.
Photo Credit: Melanie Valencia.



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