

Strengthening Aluminium Traceability and Performance- Linked Support for Waste Pickers

Pilot Report from the CARE Project

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Strengthening Aluminium Traceability and Performance-Linked Support for Waste Pickers: Pilot Report from the CARE Project

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- Aluminium Stewardship Initiative (ASI)
- Compromiso Empresarial para el Reciclaje (CEMPRE Colombia)
- International Aluminium Institute (IAI)
- Canpack Colombia
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- Recycled Materials Association (ReMA)
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Contents

1.	INTRODUCTION.....	4
2.	CONTEXT AND JUSTIFICATION OF THE PILOT.....	6
3.	DESIGN OF THE INTERVENTION.....	8
3.1.	General Approach of the Pilot.....	8
3.2.	Components of the Intervention.....	9
4.	SCOPE AND ACTORS.....	10
4.1.	Actors of the Pilot.....	10
4.2.	Geographical Scope.....	11
4.3.	Temporal Scope.....	11
4.4.	Limitations of the Scope.....	11
5.	METHODOLOGY OF IMPLEMENTATION AND MONITORING.....	12
5.1.	Baseline and Starting Point.....	12
5.2.	Definition of Indicators.....	13
5.3.	Implementation and Operational Monitoring.....	15
5.4.	Methodological Limitations.....	15
6.	RESULTS OF THE PILOT.....	16
6.1.	Results in post-consumer aluminium traceability.....	16
6.2.	Operational and Organisational Results.....	18
6.3.	Economic Results and Performance Reading.....	19
6.4.	Social Results and Scope of the Support.....	19
6.5.	Scope and Limits of Downstream Route Evidence.....	20
7.	CRITICAL ANALYSIS OF THE PILOT.....	20
7.1.	What Worked.....	20
7.2.	What Did Not Work.....	21
7.3.	Identified Structural Tensions.....	21
7.4.	Strategic Learnings.....	22
7.5.	Implications for Scalability and Strategic Positioning.....	22
8.	CONTEXT AND EXTERNAL FACTORS.....	22
8.1.	Other Incentives and Parallel Programmes.....	22
8.2.	Relevant Market Conditions.....	23
8.3.	Regulatory and Normative Factors.....	23

8.4. Structural Operational Factors.....	23
8.5. Results That Cannot Be Attributed Exclusively to the Pilot.....	24
9. LESSONS LEARNED.....	24
10. IMPLICATIONS FOR SCALING AND REPLICABILITY.....	25
10.1. Potentially Replicable Pilot Elements.....	25
10.2. Necessary Conditions for Responsible Scaling.....	26
10.3. Necessary Adjustments for the Next Phase.....	27
10.4. Risks to Consider in a Scaling Process.....	27
11. CONCLUSIONS.....	28

1. INTRODUCTION

Post-consumer aluminium traceability in Colombia faces structural challenges associated with the fragmentation of the recovery chain, limited data capture at the first mile, and technical, organisational, and social gaps that affect informal waste pickers, who are central actors in the circular economy system. These conditions make it difficult to demonstrate the material's potential downstream industrial processing route, particularly when it is intended for export markets, and limit the effective integration of waste pickers into Extended Producer Responsibility (EPR) schemes and international sustainability initiatives, as well as progress towards decent livelihoods.

In this context, the CARE project—Collective Action for Recycling and Empowerment, led by the Aluminium Stewardship Initiative (ASI) and implemented by Compromiso Empresarial Para la Economía Circular (CEMPRE Colombia)—developed a pilot plan in 2025 with five waste picker organisations (two in Bogotá and three in Barranquilla). This pilot was designed as a proof-of-concept to test whether performance-linked support for circular first-mile actors could be structured in a way that could inform future exploration of downstream co-financing (e.g., via EPR or brand contributions); willingness-to-pay and long-term mechanisms were not assessed in this pilot, rather than as stand-alone social assistance. The pilot therefore prioritised practical traceability indicators and limited, enabling investments linked to verifiable delivery performance, while explicitly recognising that traceability alone does not resolve structural livelihood gaps.

The pilot starts by recognising three interconnected issues. First, post-consumer aluminium traceability is weak at its origin: information on the volume, quality, origin, and destination of the material is lost or fragmented from the collection made by waste pickers. Second, although this population has been recognised legally as service providers for public waste management, they mostly operate informally, with unstable incomes far below a decent income level, limiting their capacity to meet increasing market demands (information obtained from a [Living Income Study](#) conducted). Third, there remains a disconnection between the goals of the circular economy and EPR and the operational and social realities of the first link in the chain (from waste picker organisations as the first formalised aggregation point).

The pilot plan was designed to generate concrete evidence on the feasibility of strengthening documentary traceability from recycling organisations to exporters, while exploring options to improve first-mile visibility, under real operating conditions, without ignoring the structural limitations of the system. It was structured based on goals and performance-linked support mechanisms. Specific goals for managing aluminium by organisation were set, expressed in tonnes effectively delivered to previously identified exporters, according to the operational capacity of each organisation and existing marketing conditions. The progressive fulfilment of these goals was established as the primary proxy for documentary traceability within the pilot (documented deliveries from organisations to identified exporters), recognising that it does not capture the full depth of first-mile traceability at individual level.

The design incorporated three complementary components:

1. **Progressive (Documentary) Traceability:** Aimed at improving the visibility of the material flow from collection, sorting, and storage to delivery to the exporter.

2. **Performance-linked support mechanisms:** Promoting shared responsibility, planning, and operational discipline within participating organisations.
3. **Technical and organisational strengthening:** Recognising that technical traceability is not feasible without minimum enabling conditions to support safer and more consistent work.

The pilot's scope was limited in terms of organisations, territory, and time, and it did not aim to address structural issues such as labour informality, poverty, or systemic failures in the recycling market.

During the implementation period, the five participating organisations managed and effectively delivered 225 tonnes of post-consumer aluminium, achieving an overall compliance of 105% against the set goals. Beyond volume, the pilot generated relevant results at various social and technical levels. The pilot does not claim end-to-end chain-of-custody verification, verified closed-loop outcomes, or measurable living income improvements.

In terms of traceability, information capture was strengthened from the first mile (Sorting and Recovery Stations/ECA), practices for sorting, storage, and presentation of material were improved, and more consistent data was generated about the origin and destination of post-consumer aluminium, including flows destined for export. These advances provide early indications that documentary traceability from organisations to exporters can be strengthened (individual first-mile traceability at waste-picker level remains a gap), provided there is sustained coordination, data-sharing and (for scaling) downstream financing.

In the organisational domain, the establishment of clear goals encouraged better internal planning and process organisation, although results varied between organisations depending on their installed capacity and previous experience. In the social domain, the pilot delivered 504 support instances; available records indicate at least 188 unique waste pickers directly benefited, providing time-bound support aimed at improving basic working conditions for participating waste pickers, within the limits of the pilot scope.

However, the results of the [Living Income Study](#) conducted in parallel, using parameters for decent income, confirm that the average income of the waste picker population remains far below a decent living standard, showing that traceability, while a key enabler, is not sufficient on its own to close structural welfare gaps.

The total cost of the CARE pilot plan was COP 63,675,500 (GBP 12,995), through which 225 tonnes of aluminium were traced. Under this methodological criterion, a pilot cost-intensity proxy of COP 283,000 per tonne (GBP equivalent noted) was calculated by dividing direct pilot expenditure by tonnes delivered during the pilot period (excluding broader programme, system, and market costs). This figure should not be interpreted as a benchmark operating cost, as it includes enabling supports and excludes wider programme/system costs.

It is important to note that this indicator should not be interpreted solely as an operating cost per tonne. A significant proportion of the pilot's resources were allocated to actions aimed at improving the quality of life for waste pickers, acknowledging the challenges of informality, low incomes, and social exclusion faced by this population. These actions reflect an attempt to apply a rights-informed approach through minimum enabling measures within the limits of a pilot budget, and recognising that waste pickers are often the actors who receive the least remuneration within the post-consumer aluminium value chain.

From this perspective, the pilot's cost should be understood as an investment in traceability and the minimum enabling conditions required for first-mile participation, alongside organisational capacity building, rather than as a short-term cost optimisation exercise.

The pilot provides early indications that aluminium traceability must include all actors, starting with waste pickers, who are strategic actors for circular economy and EPR schemes seeking stronger social inclusion and more reliable upstream information. It also shows that performance-based supports can be an effective tool to structure processes and generate shared responsibility, as long as they are aligned with the real capabilities of the first formalised link.

At the same time, the pilot made its limitations clear: technical traceability does not automatically translate into substantial improvements in income or quality of life, and there is a permanent tension between market demands and the real conditions of waste pickers. The pilot's time and scope limited the ability to measure long-term impacts and validate the complete closure of the material cycle up to the final refiner.

From a strategic perspective, CARE provides an applied case with early evidence and practical learnings for broader discussions on traceability, the circular economy, and EPR in the aluminium supply chain. For its scaling, it will be crucial to move towards adaptive traceability models, strengthen coordination with EPR schemes and international markets, and deepen the integration between traceability, economic incentives, and human rights approaches, with special attention to the first formalised link in the chain.

2. CONTEXT AND JUSTIFICATION OF THE PILOT

A [diagnosis of the post-consumer aluminium value chain in Colombia was previously developed](#), with a focus on the cities of Bogotá and Barranquilla. This diagnosis allowed for the characterisation of material flows, the actors involved, and the main technical, economic, and organisational dynamics that impact its management, particularly from the collection carried out by informal waste pickers to its commercialisation and export.

The results of the diagnosis showed that the post-consumer aluminium chain in Colombia is active and consolidated in market terms, but it operates in a fragmented manner and with significant traceability gaps, especially from its collection. While waste pickers play a central role in gathering material, primarily from residential and commercial sources, their effective integration into formal circular economy schemes, EPR, and international sustainability markets remains limited.

One of the main findings of the diagnosis was the weakness in capturing, systematising, and reporting information from the material's origin. Although a significant proportion of recycling organisations have made progress in invoicing and formalisation processes, practices of partial or no reporting of managed aluminium persist, due to regulatory uncertainties, operational risks regarding the public waste management system, and cash flow pressures. These dynamics result in a loss of critical information regarding the origin, volume, and destination of post-consumer aluminium, making it difficult to demonstrate a plausible downstream industrial

processing route, subject to data-sharing agreements and additional verification, especially when it is intended for export markets.

Additionally, the diagnosis showed that the dominant model for commercialising aluminium (aluminium cans) in Colombia is oriented towards export, due to the limited national industrial capacity for its transformation. Exporters and international recycler/refiner depend on Colombian aluminium as a raw material, but they operate with heterogeneous demands in terms of quality, presentation, and volume, and without standardised mechanisms that promote long-term relationships with recycling organisations. This situation reproduces transactional relationships primarily based on price, without addressing traceability challenges or the real conditions of the first formalised link in the chain.

From the perspective of packaging producers and manufacturers, the diagnosis confirmed a structural disconnection between EPR obligations and the reality of aluminium recycling in Colombia. While there is interest in recognising and accounting for recycled aluminium as part of EPR compliance, the lack of traceability mechanisms and due diligence prevents robustly evidencing whether exported material results in closed-loop outcomes, given limited end-to-end verification and data access, even if it is reintegrated into certified industrial processes in other countries.

In the social domain, the diagnosis and the Living Income Study conducted in parallel revealed that informal waste pickers, key actors in the system, face persistent conditions of informality, unstable incomes, and significant gaps relative to decent income levels. Although aluminium is one of the materials with the highest economic value within the recyclable portfolio, its potential to improve waste pickers' incomes is conditioned by price volatility, competition with intermediaries, and the limited operational capacity of the organisations.

In this context, the CARE project identified the need to transition from diagnosis to an applied intervention that could generate concrete evidence on the feasibility of strengthening post-consumer aluminium traceability from the first mile, under real operating conditions. The pilot plan was conceived as a tool to test assumptions, identify limitations, and extract lessons, rather than as a structural solution.

The pilot was justified based on four central premises. First, that aluminium traceability is more credible when it progressively incorporates origin-level evidence, recognising the waste picker as a strategic actor in the system. Second, that technical traceability requires clear incentives and shared responsibility mechanisms to organise operational processes without disregarding the real capabilities of the first formalised link. Third, that circular economy and EPR efforts must be aligned with real market flows, including those destined for export. And finally, that any progress in traceability must explicitly consider the living conditions and rights of first-mile actors, who have historically received the least remuneration within the aluminium value chain.

Under these premises, the CARE pilot plan was designed as a limited intervention in terms of territorial scope, number of organisations, and implementation time, aimed at strengthening post-consumer aluminium traceability using an approach based on management goals, performance-based supports, and actions for technical, organisational, and welfare strengthening. Its purpose was not to resolve the structural failures of the system but to generate applied indications that could inform future decisions on scalability, replicability, and positioning

of the CARE project in broader discussions on traceability, circular economy, and Extended Producer Responsibility, both nationally and internationally.

3. DESIGN OF THE INTERVENTION

The pilot plan was conceived as an applied intervention to test an approach for strengthening post-consumer aluminium traceability from the first mile of the value chain, under real operating conditions. The pilot aimed not only to optimise volume management but also to explore whether it was possible to connect waste pickers and organisations with exporters and recycler/refiner through a shared responsibility scheme that combined traceability, performance-linked support mechanisms, and organisational and social strengthening.

Given the high levels of informality, cash-based transactions, and limited record-keeping at the individual level, requiring direct traceability from each waste picker would have introduced significant barriers to participation and reduced the pilot's ability to test a scalable model under real conditions. At the same time, individual-level traceability—under these conditions—does not necessarily enable robust verification of key aspects such as occupational health and safety, access to social protection, absence of child labour, or environmental management practices.

These aspects are more effectively addressed at the organisational level, where minimum standards, collective practices, and accountability mechanisms can be observed, strengthened, and progressively formalised.

In this context, the recycling organisation was treated as the minimum verifiable node in the chain, where material aggregation, sorting, and formal transactions take place, and where due diligence processes can begin to be structured in a consistent manner. This approach allowed the pilot to generate reliable and auditable information within its scope, while avoiding exclusion of actors operating under informal conditions.

At the same time, the pilot recognises that strengthening first-mile traceability will require, in future phases, the gradual incorporation of individual-level registration mechanisms—supported by appropriate tools, incentives, and safeguards—to improve transparency without creating barriers to participation.

3.1. General Approach of the Pilot

The pilot was designed with a practical and experimental approach, aimed at generating transferable evidence and learnings. Rather than concluding the diagnosis with theoretical recommendations, the pilot opted to test an operational approach that would answer key questions for future decision-making, such as:

- Is it feasible to progress toward traceability that recognises the waste picker as the first link, while acknowledging that individual-level proof was not consistently available in this pilot?
- What type of incentives can organise processes without distorting the market?
- Can documentary traceability and coordinated buyer relationships contribute to improved working conditions over time, and under what conditions could this translate into better livelihoods?

The pilot was structured as a focused intervention, with clear rules, explicit goals, and a defined timeframe, designed to be time-bound and to minimise dependency risk and explicitly testing whether a performance-linked approach could be credible to downstream actors as a potential basis for ongoing co-financing (e.g., via EPR or brand contributions).

The design of the pilot was based on the following working hypotheses:

- Post-consumer aluminium documentary traceability from organisations (ECA) to exporters can be strengthened when collection-level information is progressively captured (first link – waste picker), provided that clear, verifiable indicators are established and agreed upon with the involved actors.
- Performance-linked supports linked to operational goals, when combined with actions for social strengthening, can promote shared responsibility and planning within recycling organisations, while progressively contributing to reducing structural gaps of the waste pickers in the chain, without establishing contractual relationships.

These hypotheses guided both the intervention design and the mechanisms for monitoring and evaluating the pilot.

3.2. Components of the Intervention

The pilot plan was structured around four interconnected components:

- a) **Post-consumer aluminium documentary traceability (circular first-mile):** The pilot focused on improving the visibility of the aluminium flow from collection by waste pickers, through sorting and storage processes within organisations, to the effective delivery of the material to previously identified exporters. Traceability was approached from a practical standpoint, prioritising the capture of basic and verifiable information on volumes managed and material destinations, rather than complex or highly technological systems.
- b) **Management goals as performance indicators:** Specific management goals for aluminium per organisation were defined, expressed in tonnes delivered to exporters, adjusted to the operational capacity and market conditions of each organisation. These goals were established as the primary performance and traceability indicator for the pilot, allowing for objective and comparable assessment of progress and facilitating monitoring over a limited period.
- c) **Performance-linked support mechanisms:** The pilot used them as a tool to promote shared responsibility and process organisation, linking them with actions for social and organisational strengthening. This approach recognised that aluminium traceability is not sustainable without addressing structural gaps.
- d) **Enabling conditions for the first formalised link:** Actions aimed at strengthening technical, organisational, and basic welfare conditions were incorporated to allow the effective participation of waste pickers in traceability schemes, recognising the structural conditions of informality and precariousness, the pilot incorporated actions aimed at improving basic working conditions and welfare.

These supports were not conceived as income redistribution mechanisms or stand-alone assistance. They were designed as time-bound enabling investments linked to verifiable performance, to test what threshold and type of support could be credibly co-financed and sustained through downstream actors (e.g., EPR/brands) if the approach demonstrated value.

4. SCOPE AND ACTORS

The pilot plan was conceived as an applied and limited intervention, designed to generate evidence and strategic learnings on the traceability of post-consumer aluminium from the first collection stage performed by waste pickers as a strategic actor in the chain. From its formulation, the pilot set clear boundaries in terms of actors, territory, and scope, in order to maintain coherence between the objectives and expected results. This recognises that advancing towards robust, inclusive traceability systems aligned with the circular economy requires gradual and experimental processes.

In this sense, the pilot should not be interpreted as a closed or definitive approach, but as a controlled learning exercise that allowed testing assumptions, identifying limitations, and extracting lessons for the design of future interventions at a larger scale.

4.1. Actors of the Pilot

The pilot plan involved key actors from different links in the post-consumer aluminium value chain, with differentiated and complementary roles:

- **Waste picker organisations:** 5 recycling organisations registered as public service providers for waste management participated directly in the pilot implementation, acting as the first link in the chain. These organisations were responsible for the collection, sorting, storage, and effective delivery of aluminium cans, and they were the main focus of the traceability exercise. Their selection was based on criteria such as operational capacity, previous experience in managing the material, and the feasibility of coordination with exporters.
- **Waste pickers:** Waste pickers affiliated with the participating organisations played a central role in gathering material through collection routes from residential and commercial sources. The pilot explicitly recognised their strategic role as key actors in the circular economy, as well as the conditions of informality and vulnerability that characterise their participation in the chain.
- **Aluminium exporters:** 2 exporting companies participated as downstream actors in the chain, receiving the aluminium managed by the participating organisations. Their role was key to identify a downstream route to effectively deliver the material, understand international market operational requirements, and explore the feasibility of documenting export flows as part of post-consumer aluminium traceability schemes.
- **International aluminium refiner:** A global aluminium processor of aluminium cans exported from Colombia. According to the gathered information, the pilot's participating exporters deliver part of the aluminium collected in Colombia to a refiner based in Brazil. Although the refiner did not directly participate in the operational implementation of the pilot, its role is relevant to understanding the reported downstream route and validate the strategic relevance of strengthening post-consumer aluminium traceability from the first mile.
- **Canmakers,** aluminium packaging manufacturers. While they did not participate in the operational implementation of the pilot, their involvement is strategic to demonstrate the connection between the traceability efforts developed and the industrial packaging manufacturing processes.
- **Implementers, sponsors, and technical allies:**

- **CEMPRE Colombia** acted as the implementing entity of the pilot, coordinating the relationship with waste picker organisations, operational follow-up, and information systematisation.
- **ASI**, as the promoting entity of the CARE project, provided the conceptual and strategic framework, ensuring the alignment of the pilot with its Sustainability Priorities, particularly in circularity, human rights, and livelihoods.

4.2. Geographical Scope

The pilot plan was developed in two cities in Colombia: Bogotá and Barranquilla. These cities were selected due to their contrasting dynamics in the recycling market structure, methods of post-consumer aluminium commercialisation, and socio-economic conditions of the waste picker population. Additionally, they correspond to territories where CEMPRE Colombia has prior experience in implementing circular economy strategies, which allowed the pilot to be integrated with existing processes and installed capacities. In both territories, the Living Income Study of the waste picker population was also conducted, facilitating an integrated analysis of the material traceability and the first link's living conditions.

In Bogotá, the pilot allowed for the analysis of aluminium management in a more densely populated urban context, with a greater variety of generation sources and the early presence of local transformation actors. In Barranquilla, the pilot was implemented in a context strongly oriented towards export, with logistics and market dynamics influenced by proximity to ports and consumption seasonality.

4.3. Temporal Scope

The pilot plan was implemented during 2025, within a limited period that allowed for monitoring the performance of the participating organisations and documenting relevant learnings. The duration of the pilot was sufficient to observe operational patterns and goal fulfilment dynamics but limited in terms of measuring long-term structural impacts.

4.4. Limitations of the Scope

From its design, the pilot recognised several limitations that should condition the interpretation of its results:

- The pilot did not aim to solve the sector's structural informality nor guarantee decent incomes for the participating population.
- The systemic market failures of the aluminium sector, such as price volatility, competition among intermediaries, or export-related distortions, were not addressed comprehensively.
- Documented traceability was concentrated on the material's delivery to exporters, without fully validating the cycle's closure to the final processor in all cases.
- The limited number of organisations and the narrow territorial focus make it impossible to automatically extrapolate the results to other contexts or materials.
- The observed social results should be interpreted as partial contributions and not as impacts attributable exclusively to the pilot.

In this regard, the findings of the CARE pilot plan should be understood as strategic inputs for future decision-making, rather than as conclusive evidence of structural impacts. Its main value lies in generating applied learnings that inform the scalability, replicability, and positioning of the project in broader discussions on traceability, circular economy, and responsibility.

5. METHODOLOGY OF IMPLEMENTATION AND MONITORING

The implementation was developed using an applied and adaptive methodology, aimed at accompanying real processes for managing post-consumer aluminium and generating verifiable information on the traceability of the material. The methodology was designed to prioritise simple monitoring mechanisms, clear indicators, and spaces for continuous feedback with the participating actors.

The pilot adopted a practical and progressive approach, focusing on observing the performance of recycling organisations under real operating conditions, rather than imposing standardised or highly technological models. The methodology sought to balance two complementary dimensions:

- The need for reliable information on aluminium management and traceability.
- The recognition of the operational, organisational, and social limitations of the first formalised link in the chain.

5.1. Baseline and Starting Point

The diagnosis of the post-consumer aluminium chain conducted in the prior phase of the CARE project constituted the primary baseline for the pilot. This diagnosis allowed identifying the initial capacities of the participating organisations, aluminium commercialisation dynamics, the exporters' requirements, and the main information and formalisation gaps.

Additionally, the Living Income Study conducted in Bogotá and Barranquilla provided a social framework for contextualising the pilot's results, particularly regarding income, working conditions, and livelihoods of the waste picker population. Although the pilot did not aim to measure structural changes in quality of life, these inputs allowed interpreting the results from a broader sustainability and rights perspective.



Illustration 1: Traceability of aluminium cans from collection

5.2. Definition of Indicators

The pilot’s monitoring methodology was structured around a limited set of indicators, selected for their operational relevance and measurement feasibility in the context of the pilot:

- a) **Volume of aluminium managed, expressed in tonnes of aluminium cans effectively delivered to participating exporters.**

The goals defined by organisation and the associated strengthening scheme were built from a previous analysis of operational capacity, historical aluminium can commercialisation, and the current conditions of each participating organisation. The established figures were not aspirational projections but realistic parameters derived from their historical performance and the market dynamics in each territory.

The table below shows the goals defined by organisation, as well as the associated supports based on the material volume achieved.

Table 1: Goals agreed with participating organisations

Organisation	City of Operation	Buyer	Threshold 1	Threshold 2	Threshold 3	Total Goal (aligned with Threshold 3)
Organisation 1	Barranquilla	Exporter A	90	120	150	150
Organisation 2	Bogotá	Exporter A	19.2	25.6	32	32
Organisation 3	Barranquilla	Exporter A	6.6	8.8	11	11
Organisation 4	Barranquilla	Exporter A	7.2	9.6	12	12
Organisation 5	Bogotá	Exporter B	6	8	10	10
Total threshold			129	172	215	215

The strengthening scheme included three lines of action, organised into Thresholds:

- **Threshold 1 – Equipment:** Access to equipment for a percentage of the waste pickers in each organisation. This support aimed to reduce gaps associated with the lack of decent work tools, contributing to improving the basic conditions for carrying out their work.
- **Threshold 2 – Family Welfare Support:** Access to a family basket or school kit voucher for a percentage of waste pickers who showed greater growth in aluminium can collection. This support aimed to reduce short-term household pressures that can undermine operational consistency (e.g., attendance, stability and retention), thereby supporting reliable participation in the traceability model during the pilot period.
- **Threshold 3 – Wellbeing and recognition activity:** Access to an experiential outing aimed at the welfare and recognition of the waste pickers, providing a time-bound wellbeing and recognition activity intended to support engagement and retention during the pilot period; this should not be interpreted as evidence of sustained wellbeing outcomes.
- The supports provided in the pilot were designed considering the needs identified during the initial diagnosis, prioritising actions that contributed to improving basic working conditions, operational stability, and family welfare. They were never conceived as income substitutes or permanent benefits but as progressive strengthening measures within a limited budget.

During the design of the scheme, possible ethical risks or exclusion arising from the targeting of supports were analysed. Given the pilot's budgetary scope, it was not possible to cover 100% of the waste pickers linked to each organisation. Therefore, a percentage of waste pickers was prioritised due to budget constraints. For future phases, the approach should incorporate equity safeguards (e.g., minimum enabling support per organisation plus performance-linked increments) to reduce the risk of reinforcing pre-existing capacity differences.

It is important to note that the participating organisations were already involved in other projects and strengthening strategies, through which part of their waste pickers receive complementary benefits. In this sense, the pilot was integrated as an additional component within a broader ecosystem of supports, avoiding duplications and striving for a more balanced distribution of resources.

b) Progress in traceability, measured by the ability to document the flow of material from the recycling organisation to the exporter.

Along with the indicator of managed volume, traceability was supported by electronic invoices in accordance with national regulations, which showed the quantity of aluminium cans delivered to the two exporters. The exporter confirmed the delivery of the material supported by legal documentation that could support downstream traceability efforts, subject to buyer data-sharing agreements and additional verification steps in subsequent phases.

c) Organisational performance, observed through changes in sorting practices, storage, material presentation, and compliance with operational requirements.

In terms of sorting and selecting the material, it was found that there were mixtures and variable quality levels of the aluminium cans, mainly associated with the accumulation of liquids or other elements inside the cans, which affected both the weight and the final quality of the material marketed.

Additionally, some organisations were found to have limited knowledge about the technical requirements and presentation standards required by exporters to ensure effective commercialisation. This situation could result in the sale of material to actors who do not guarantee formal invoicing or with whom there are limitations for establishing dialogue and effective traceability of the material.

d) Social scope of the support, measured in terms of the number of waste pickers benefiting from the implemented strengthening actions.

These indicators were defined as operational performance measures and not as exhaustive metrics of social or structural impact.

Prior to developing the pilot plan, conditions were identified that contextualise the obtained results, including: partial ignorance of the regulations related to the provision of public waste management services (Decree 1381/2024) by some recycling organisations; high levels of informality in the recycling activity; limited information about the aluminium market prices; and, consequently, low or unstable incomes derived from the material commercialisation.

These conditions directly influence the economic capacity of waste pickers and their ability to improve their personal and family environment, which reinforces the need to interpret the results of the pilot within a broader structural framework.

5.3. Implementation and Operational Monitoring

This was carried out through periodic follow-ups with the participating organisations, including technical visits, review of material delivery records, and dialogue spaces to identify progress, difficulties, and necessary adjustments. Monitoring allowed comparing the set goals with the actual results achieved, as well as documenting differences between organisations derived from their installed capacity, local context, and commercial relationships.

Technical support was focused on strengthening existing practices and facilitating compliance with the exporters' requirements, without introducing structural changes that exceeded the pilot's scope.

Information on managed volumes and material deliveries was validated based on the organisations' records and the delivery receipts to the exporters. This process provided a proportionate level of verification for a pilot (invoice and delivery receipt checks), but it did not include independent audits or end-to-end validation.

No complex digital systems or external audits were implemented, prioritising validation mechanisms proportional to the scope of the exercise and replicable in future phases.

5.4. Methodological Limitations

The pilot methodology has limitations that should be considered when interpreting the results. Among the main limitations are the limited implementation time, the small number of participating organisations, and the inability to perform longitudinal measurements on changes in quality of life or working conditions.

Moreover, monitoring focused on the segment of the chain between the recycling organisations and the exporters, without fully validating the cycle closure to the final processor in all cases. These limitations reinforce the exploratory nature of the pilot and the need to complement its results with larger-scale, longer-term interventions.

6. RESULTS OF THE PILOT

The results of the CARE pilot plan should be interpreted in light of its applied and limited nature. Rather than measuring structural impacts, the pilot allowed for the observation of behaviours, validation of assumptions, and generation of operational evidence on post-consumer aluminium traceability, as well as the tensions and opportunities that arise when connecting traceability, market dynamics, and first-mile conditions.

6.1. Results in post-consumer aluminium traceability

a) Volume of aluminium managed

During the pilot's implementation period, the five participating organisations effectively managed and delivered 225 tonnes of post-consumer aluminium cans to the defined exporters, representing 105% of the total goals set.

Organisation	Aluminium Can Management Goal (ton)	2025 Closure	% Compliance
Organisation 1	150	173.8	116%
Organisation 2	32	30.2	94%
Organisation 3	11	4.1	37%
Organisation 4	12	9.3	78%
Organisation 5	10	7.8	86%
Total	215	225	105%

Beyond the achieved volume, the main result in this dimension was the improvement in visibility of the material flow from the first mile to export. The pilot allowed for more consistent documentation of the material's origin, its handling in the organisations, and its delivery to exporters and the identification of a plausible downstream route reported by downstream actors, not independently verified through to the final processor.

b) Progress in traceability

The traceability of the managed volume (225 tonnes) was partially informed at Stage 1 through existing reporting systems (more consistent documentation began at Stage 2 - organisations/ECA), corresponding to the material collection at the first formalised link in the chain. In this stage, waste pickers are the primary actors, as well as routes operated with the organisations' own vehicles.

The participating organisations, in their role as public waste management service providers, report mass balances to the Superintendence of Public Utilities. These records allow identifying material quantities by organisation and, in some cases, by waste picker. However, these systems do not always have verifiable individual supports documenting the material's direct delivery from the waste picker to the organisation, which presents a challenge for building stronger and more transparent first-mile traceability.

In this context, an opportunity was identified for the future implementation of digital tools or physical/electronic receipt systems that would generate direct evidence of the material delivered, strengthening transparency in quantities and market prices.

For waste pickers who sell directly to intermediaries, traceability presents greater limitations due to the absence of formal registration obligations and the lack of verifiable documentation from some informal actors.

From Stage 2, corresponding to the Sorting and Recovery Stations (ECA), traceability became more consistent. The organisations have infrastructure for sorting, storage, and preparing the material, and the main documentary support corresponds to the electronic invoice issued for sales to formal exporters or intermediaries.

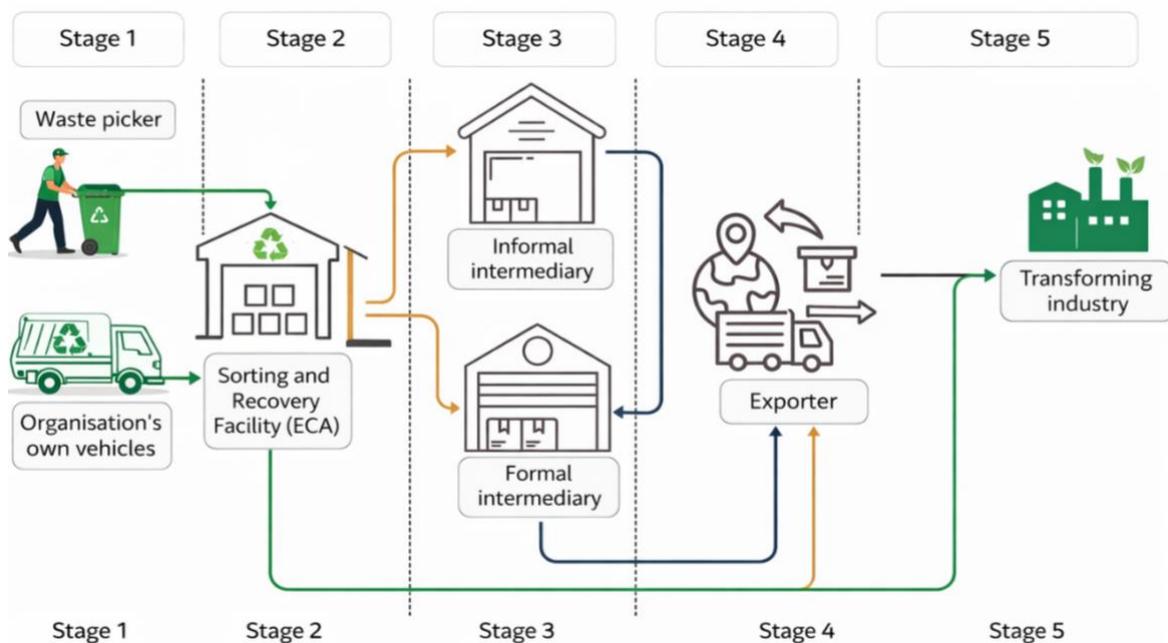


Illustration 2: Material flow from the waste picker to the canmaker

However, in some cases, the payment conditions and delivery requirements demanded by exporters can generate operational tensions, leading organisations to sell to intermediaries who offer immediate payment, albeit with greater traceability challenges.

An example of this dynamic was observed in Organisation No. 3, whose lower goal compliance was associated with their preference for intermediaries who guarantee immediate liquidity without conditioning volume or quality, a critical aspect given that aluminium cans are one of

the highest-value materials and a key source of cash flow for immediate payment to waste pickers.

Stage 3, corresponding to intermediaries, was not prioritised within the pilot's methodological scope, as the exercise focused on strengthening direct traceability between organisations and exporters. Additionally, the prior diagnosis showed that intermediaries often have little willingness to share operational information, which limits the possibility of consolidating verifiable records in this segment of the chain. They also provide liquidity and aggregation services, which means traceability approaches must address cash-flow realities rather than assume disintermediation. In Stage 4, the exporters participated as key actors in consolidating the material and sending it to the international refiner. Dialogue spaces were established with both actors during the pilot; however, the continuity of this exchange and the detailed validation of the subsequent transformation process was not fully consolidated by the closure of the pilot plan.

Stage 5, corresponding to the final refiner, allowed for the identification, based on information gathered from downstream actors. The refiner did not participate in the pilot, and no mechanism was implemented to independently verify transformation outcomes at that stage.

Additionally, it was evident that aluminium traceability is operationally feasible to strengthen documentary traceability using verifiable delivery documentation, and when coordination exists with downstream actors in the chain. However, the pilot also confirmed that traceability is affected by external factors beyond the organisations' control, such as market volatility, the differentiated demands of buyers, and limitations in the existing reporting systems.

6.2. Operational and Organisational Results

The establishment of clear management goals allowed for improvements in planning and internal process organisation in several of the participating organisations. Specifically, progress was identified in sorting, storage, material presentation practices, as well as greater attention to complying with operational requirements demanded by exporters.

However, the results also showed significant differences between organisations, associated with their installed capacity, prior experience, access to infrastructure, and territorial context. These differences confirm that traceability models cannot be assumed to be homogeneous and require adaptive approaches that recognise different starting points.

In the organisational performance component, the pilot allowed for strengthening the direct flow of aluminium from participating organisations to the prioritised exporters, reducing intermediation in some cases. This progress was reflected in the percentage of goal compliance achieved by several organisations and was associated with a better understanding of the technical and documentary requirements demanded for formal material commercialisation.

As part of the process, the exporters were asked for details on the requirements necessary for registering the organisations as aluminium can suppliers, information that was later shared and worked on with the participating organisations. Initially, some organisations showed resistance due to the volume and complexity of the documentation required—around 20 documents, including legal, financial, and operational requirements. However, this exercise helped highlight formal and administrative gaps that limited access to strategic buyers.

Although compliance with these requirements represented a challenge, especially for organisations with less administrative capacity, the process contributed to promoting greater formalisation and strengthening their profile as trusted suppliers within the value chain. It is important to note that the documentary requirements mostly respond to obligations that exporters must meet with customs and regulatory authorities, which explains the level of demand requested. However, simplifying onboarding, clarifying requirements, and improving payment terms could reduce barriers for organisations and support traceability and inclusion.

In this sense, the pilot demonstrated that access to more strategic actors in the chain does not depend solely on the volume or quality of the material, but also on the organisational and administrative capacity to meet formal commercialisation standards.

6.3. Economic Results and Performance Reading

From an economic perspective, the pilot allowed for the management of significant volumes of aluminium in a context of high price volatility. While no exhaustive measurement of income by organisation was carried out, the results suggest that aluminium continues to be one of the materials with the highest potential for generating marginal income for waste pickers, despite accounting for a smaller proportion of the total collected kilograms.

The economic performance analysis should be read with caution, as waste pickers' incomes are conditioned by multiple factors outside the pilot, such as market prices, access to recycling tariffs, and vehicle availability. In this sense, the pilot did not seek to maximise income, but rather to observe how traceability and coordination with exporters influence the operational stability of organisations.

6.4. Social Results and Scope of the Support

In the social domain, the pilot implemented a total of 504 support instances aimed at waste pickers from the five participating organisations, distributed as follows (support instances are not equivalent to unique individuals; some individuals received more than one support type):

Investment Line	Number of supports delivered	
	Barranquilla	Bogotá
Threshold 1: Equipment	117	31
Threshold 2: Family Welfare Support	117	71
Threshold 3: Experiential Outing	117	51
Total	351	153

These actions were aimed at improving basic working conditions, family welfare, and recognising the role of the waste picker in a context characterised by informality, variable, and insufficient incomes.

It is important to clarify that the total of 504 refers to the number of supports delivered and not necessarily the number of unique individuals benefited, as in some cases a single waste picker could access more than one level of strengthening. Based on the available information, it is estimated that at least 188 waste pickers directly benefited from the pilot, aside from the indirect effects associated with organisational strengthening.

The agreed supports were delivered as planned with all participating organisations, in line with the commitments made and the pilot's focus on progressively strengthening the first formalised link in the chain.

Nevertheless, the results of the Living Income Study conducted in parallel confirm that the average income of the waste picker population remains far below a decent income. In this sense, the social results of the pilot should be understood as partial contributions, not as structural transformations in quality of life.

The pilot, however, allowed for visibility into the relationship between traceability, recognition of the waste picker's role, and broader discussions on labour rights, livelihoods, and due diligence in the aluminium supply chain.

6.5. Scope and Limits of Downstream Route Evidence

A strategic result of the pilot was the identification and partial documentation of a downstream route for post-consumer aluminium through participating exporters towards industrial transformation. The pilot did not systematically verify each stage through to the final processor, and therefore results should be read as initial evidence, not full cycle-closure validation.

7. CRITICAL ANALYSIS OF THE PILOT

The CARE pilot plan allowed for the generation of applied evidence on the feasibility of strengthening post-consumer aluminium traceability from the first mile, as well as the tensions that emerge when connecting market dynamics, formalisation, and the social conditions of waste pickers. Below are the main critical findings derived from the exercise.

7.1. What Worked

a) Technical feasibility of circular first-mile traceability

The pilot confirmed that it is possible to document the aluminium flow from recycling organisations to exporters, using simple operational indicators and proportional verification mechanisms. Traceability was particularly strengthened from the organisational stage (ECA), through electronic invoicing to formal exporters and the documents that recycling organisations currently provide to regulatory entities, such as the Superintendence of Public Utilities.

b) Coordination with strategic actors in the chain

The prioritisation of exporters linked to the final processor allowed the pilot to be aligned with an export-oriented recycling route linked to industrial processing, without independent verification

of end-stage outcomes. This gave greater coherence to the exercise and strengthened its relevance for discussions on cycle closure and EPR.

c) Organisational ordering and progressive formalisation

Compliance with documentary requirements demanded by exporters drove improvements in the administrative management of some organisations, enabling them to advance towards more formal and reliable supplier profiles within the chain.

d) Focalised social strengthening

The implemented supports contributed to improving basic working conditions and welfare without substituting income or creating structural dependency, maintaining coherence with the approach of dignifying the first mile.

7.2. What Did Not Work

a) Persistent Gaps in Individual Traceability

While organisations report mass balances, there are not always verifiable individual supports documenting the material delivery from each waste picker, which limits the depth of first-mile traceability.

b) Intermediation and Incentives for Immediate Liquidity

The existence of intermediaries offering immediate payment, without conditioning quality or documentation, continues to be a strong incentive for organisations, especially in contexts where liquidity is critical to sustain operations and make immediate payments to waste pickers. This highlighted that traceability requirements can conflict with cash-flow constraints and payment timelines, shaping buyer choices even when organisations recognise the value of formalisation.

In this scenario, moving towards traceability schemes that focus solely on the organisational segment could prove insufficient and even obscure the role of the waste picker as the actual first link in the chain. Therefore, any traceability effort must explicitly recognise their contribution in material collection from the generation point and seek mechanisms that integrate them directly and verifiably.

c) Budget Limitation and Partial Coverage

The strengthening scheme could not cover all the waste pickers linked to the organisations, which limits the pilot's direct social scope.

d) Cycle Closure Not Fully Documented

Although the route to the final processor was identified, a comprehensive verification system was not consolidated up to the industrial stage, which limits the robustness of the documented cycle closure.

7.3. Identified Structural Tensions

The pilot revealed tensions that cannot be resolved solely through technical intervention:

- Traceability vs immediate liquidity
- Formalisation vs limited administrative capacity
- Demands of international markets vs structural informality of the first mile
- Volume and quality vs the social conditions of the waste picker

These tensions confirm that traceability is not merely a technical issue, but a systemic one.

7.4. Strategic Learnings

From the previous analysis, the following relevant learnings for future phases have emerged:

- Traceability should begin at the first mile, but it requires simple tools adapted to the real context of the waste picker.
- Access to strategic buyers depends not only on material quality but also on organisational and documentary capacity.
- Performance-linked support mechanisms should be aligned with the progressive strengthening of the waste picker as the first actor, avoiding punitive or solely volume-based approaches.
- Traceability can become an enabler for due diligence in human rights, but it does not replace public policies or structural reforms.
- For exported aluminium to be recognised within EPR schemes, more robust documentation and institutional coordination will be required.

7.5. Implications for Scalability and Strategic Positioning

The pilot plan provides early evidence that it is feasible to build post-consumer aluminium traceability from waste picker organisations as the first formalised aggregation point in the chain, provided there is effective coordination with recycling organisations and exporters that connect this effort with international industrial transformation chains.

Scaling appears plausible under certain conditions, but would require:

- A longer temporal duration
- Technological tools for individual traceability
- Regulatory alignment with EPR
- Financial schemes that reduce dependency on informal intermediaries

From a strategic perspective, the pilot plan stands as an applied case that provides evidence for broader discussions on inclusive circular economy, due diligence in human rights, and traceability in global supply chains.

8. CONTEXT AND EXTERNAL FACTORS

The analysis of the pilot plan results should be interpreted in light of a set of external factors and structural conditions that influenced its development.

8.1. Other Incentives and Parallel Programmes

The participating organisations in the pilot do not operate in isolation. Several of them are linked to other projects, organisational strengthening strategies, and programmes related to circular economy, formalisation, EPR, or provision of public waste management services. Consequently:

- Some of the organisational capacities observed cannot be attributed exclusively to the pilot.
- Some waste pickers were already receiving complementary support from other initiatives (e.g. house improvement under the plastics EPR).
- Administrative and operational strengthening responds to cumulative processes over time.
- The pilot was integrated into this ecosystem of interventions, aiming to complement, not replace, existing efforts.

8.2. Relevant Market Conditions

The post-consumer aluminium market in Colombia is characterised by:

- High price volatility, influenced by international markets and exchange rates.
- Competition between exporters, intermediaries, and scrap dealers.
- Incentives associated with immediate cash payment.
- Differences in quality and material presentation requirements.

These dynamics directly influenced the behaviour of organisations, particularly in decisions related to cash flow and buyer choice.

Goal compliance did not solely depend on the technical support provided by the pilot, but also on the price and liquidity conditions present during the implementation period.

8.3. Regulatory and Normative Factors

The participating organisations operate as public service providers for waste management in the complementary activity of recovery and must comply with reporting requirements to the Superintendence of Public Utilities.

The identified limitations in partial material reporting, the risk of observations in mass balances, and the lack of recognition of non-residential sources constitute external factors that affect traceability and cannot be resolved solely through pilot interventions. However, these factors present an opportunity to seek effective traceability.

Furthermore, the current EPR regulations do not fully recognise exported aluminium as valid compliance, which limits the structural incentives for consolidating international traceability chains.

8.4. Structural Operational Factors

The first formalised link in the chain faces structural conditions that influence the pilot's results:

- Persistent labour informality
- Unstable and insufficient incomes
- Dependence on immediate liquidity
- Heterogeneous administrative capacities

These conditions existed before the pilot and continue to impact the sustainability of traceability.

8.5. Results That Cannot Be Attributed Exclusively to the Pilot

In light of the aforementioned factors, it is important to specify that:

- The organisational improvements observed also respond to previous strengthening processes.
- Variations in the volume commercialised may be influenced by favourable or unfavourable market conditions, both in aluminium can prices and other recyclable materials. This is especially relevant considering that the organisations' income comes from a multimaterial portfolio, so their collection and commercialisation decisions respond to comparative dynamics between different waste types, not solely to the aluminium market behaviour.
- The living conditions of waste pickers did not present structural transformations attributable to the pilot.
- Coordination with exporters and processors relies on pre-existing commercial relationships.
- The pilot should be understood as an enabler and generator of learnings, not as a structural sector reform programme.

9. LESSONS LEARNED

a) Traceability based on volume is feasible, but insufficient as a proxy for sustainability

Using delivered tonnes as the main indicator allowed for the simplification of monitoring and internal process organisation. However, the pilot showed that volume does not necessarily reflect structural improvements in traceability or living conditions.

In some cases, the focus on meeting goals could generate operational pressure without addressing structural limitations such as insufficient infrastructure, administrative weaknesses, or dependence on volatile prices.

This suggests that volume is a good starting point, but it cannot be the only indicator in a traceability model with a rights-based approach.

b) Structural tension: performance-linked support mechanisms vs. inequality in capacities

The performance-based supports scheme worked as an operational organisation mechanism in organisations with greater installed capacity. However, the pilot showed significant differences between organisations.

In organisations with lower infrastructure or commercial experience, the approach may have reinforced existing gaps, as those in a better initial position achieved greater compliance and access to support.

This raises a relevant tension for scaling: an approach strictly based on performance may reproduce internal inequalities if it does not incorporate levelling mechanisms.

c) Tension between international market demands and key actors' real capacities

The pilot confirmed that exporters operate under technical and commercial standards that are not always compatible with the operational conditions of waste pickers.

Requirements such as minimum delivery volumes, homogeneous quality, or total absence of contaminants impose logistical and control capacities that, in some cases, exceed the real conditions of the first link.

The approach used in the CARE project sought to close this gap through progressive strengthening, but the experience shows that aligning international markets with the popular recycling economy requires deeper structural adjustments than what a pilot can offer.

d) Tension between volume and wellbeing

The pilot sought to integrate traceability with a social approach. However, the results show that increasing or formalising the volume managed does not automatically translate into significant improvements in decent income.

This evidences that technical traceability is an enabling condition, but not sufficient to transform livelihoods.

The implicit expectation that greater traceability would progressively lead to greater wellbeing must be approached with caution.

e) The temporal limitation affected both sample size and depth of change

The limited time of the pilot had structural implications:

- It did not allow for consolidating internal cultural changes in organisations.
- It prevented measuring commercial stability over complete price cycles.
- It was not enough to build sustained trust relationships with exporters.
- It did not allow for fully validating the cycle closure to the final processor in all cases.

Therefore, the observed results should be read as initial behaviours, not as evidence of structural transformation.

10. IMPLICATIONS FOR SCALING AND REPLICABILITY

The CARE pilot plan generated applied evidence on the technical feasibility and structural limitations of strengthening post-consumer aluminium traceability from the first mile. Its results do not constitute a closed or fully validated approach, but they allow for identifying conditions under which a similar scheme could be scaled or replicated responsibly.

Scaling should be understood as a gradual, adaptive, and contextual process, not as a linear expansion of the original design.

10.1. Potentially Replicable Pilot Elements

Based on the accumulated experience, the following components are identified as replicable:

a) Management goals as an operational organisation tool

The establishment of clear goals, expressed in tonnes effectively delivered to formal buyers, proved to be a useful tool for structuring monitoring, generating operational discipline, and facilitating progress measurement. This component is replicable as long as the goals are defined based on real capacities and not aspirational projections.

b) Performance-based support schemes

Linking support to goal achievement promoted shared responsibility and greater ownership of the process by the organisations. The approach is replicable as a management mechanism, as long as it incorporates equity criteria and does not deepen gaps between organisations with different development levels.

c) Simplified and verifiable traceability approach

Prioritising simple indicators (delivered volume, formal invoicing, validation with exporters) allowed for implementing traceability without complex technological systems. This approach is replicable in contexts where technological sophistication is not viable, as long as a minimum verification standard is maintained.

d) Integration of the social component as an enabler

Explicitly recognising that technical traceability requires minimum conditions to dignify work is a replicable learning. The experience suggests that market processes are more stable when organisational strengthening and basic welfare actions are integrated.

10.2. Necessary Conditions for Responsible Scaling

The pilot shows that the approach cannot be mechanically transferred to other contexts. For replicability, the following conditions should be met:

a) Existence of formal buyers willing to participate

The approach depends on the possibility of validating formal deliveries to downstream actors. Without this coordination, traceability loses consistency.

b) Minimum installed organisational capacity

Organisations with extremely low formalisation, infrastructure, or governance levels may require a prior strengthening phase before implementing a goal-based scheme.

c) Regulatory clarity and institutional stability

Understanding and applying the regulatory framework (public waste management service, electronic invoicing, EPR) is a necessary enabler. Regulatory ambiguities may affect traceability.

d) A period longer than one year

A broader implementation period would allow for the evaluation of operational stability, commercial sustainability, and potential progressive impacts on income.

10.3. Necessary Adjustments for the Next Phase

The pilot experience suggests that scaling would require substantive adjustments in the design:

a) Complement volume with qualitative indicators

Incorporating metrics on organisational governance, commercial stability, material quality, and waste picker retention would provide a more comprehensive evaluation than volume alone.

b) Incorporate levelling mechanisms

To prevent the scheme from reproducing inequalities, differentiated supports or phased approaches could be included based on organisational starting points.

c) Strengthen downstream traceability

The pilot showed difficulties in systematically documenting cycle closure to the final processor. Scaling would require more formal agreements with exporters and processors.

d) Adjust Performance-linked support mechanisms design

The approach could evolve towards mixed supports and incentives that recognise not only volume but improvements in quality, stability, and regulatory compliance.

e) Deepen economic analysis

A future phase should incorporate more robust measurements of net income, operational costs, and price volatility, to better understand the relationship between traceability and livelihoods.

10.4. Risks to Consider in a Scaling Process

Scaling the approach used in the CARE project involves risks that must be explicitly managed:

a) Risk of Over-promising Social Impacts

The experience is consistent with the fact that technical traceability does not automatically guarantee improvements in decent income. Presenting the approach as a structural solution could create unrealistic expectations.

b) Risk of Reinforcing Internal Inequalities

A scheme strictly based on performance may benefit organisations with greater prior capacities.

c) Risk of Dependency on Specific Market Actors

Traceability depends on specific commercial relationships. Changes in prices, buyers, or export conditions may affect the approach's sustainability.

d) **Risk of Distorting Incentives**

Short-term goals could incentivise prioritising volume over quality or organisational sustainability.

e) **Reputational Risk**

If complete traceability to the final processor cannot be demonstrated, the approach may face challenges in international due diligence scenarios.

11. CONCLUSIONS

The pilot plan allowed for evaluating, under real conditions, the feasibility of strengthening post-consumer aluminium traceability from the first mile in Colombia. The results show that it is possible to build traceability mechanisms from the waste picker, as long as there is effective coordination with recycling organisations, exporters, and industrial actors linked to international transformation chains.

The pilot confirmed that aluminium traceability is not solely a technical challenge but a structural one. Immediate liquidity dynamics, competition with informal intermediaries, and market volatility directly influence commercialisation decisions. In this context, traceability competes with short-term incentives, reinforcing the need to integrate economic and social considerations in any scalable approach.

In the organisational domain, compliance with formal requirements demanded by exporters allowed organisations to strengthen their administrative capacities and move towards more robust supplier profiles. However, this process revealed technical and documentary gaps that limit some organisations' access to strategic buyers. Progressive formalisation emerges as an indispensable component for consolidating more transparent supply chains.

In the social domain, the pilot implemented 504 strengthening supports, directly benefiting at least 188 waste pickers. While these actions contributed to improving basic working conditions and welfare, no structural transformations in income or quality of life were observed, confirming that traceability alone does not address the gaps in decent income.

From a circular economy and EPR perspective, the pilot allowed for documenting the material flow to the export stage and identifying a plausible downstream route to an international processor, based on downstream information. However, more robust verification mechanisms are still needed to consolidate the full cycle closure and advance in recognising exported aluminium within regulatory schemes.

In summary, the pilot plan stands as an applied exercise that demonstrates the technical feasibility of traceability and provides strategic learnings about its limits. The next phase should focus on strengthening individual registration tools, expanding territorial coverage, strengthening coordination with industrial actors, and exploring instruments that reduce tensions between formalisation and immediate liquidity. Only then will it be possible to move towards an inclusive traceability model that simultaneously contributes to material circularity and dignifying the work of waste pickers.