Opportunity Assessment

Inclusive Waste Management in Peru:

Enabling the Business of Recycling

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By
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and
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GLOBAL FAIRNESS INITIATIVE

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EXECUTIVE SUMMARY AND OPPORTUNITY OVERVIEW

In 1992, more than 178 countries signed Agenda 21, the Rio Declaration on Environment and Development. Established at the United Nations Conference on Environment and Development (UNCED), Agenda 21 states that "the environmentally sound management of waste should go beyond the simple disposal or use by safe methods of waste produced and seek to solve the root cause of the problem trying to change unsustainable patterns of production and consumption." To this end, one of the principles put forward in Agenda 12 was the adoption of the 3Rs – Reduce, Reuse, and Recycle. OECD countries in particular have since evolved the 3Rs into an economic model that envisions that the linear flow of materials (resources-product-waste) be transformed into a circular flow (resource-product-recycled resources) capable of generating both environmental and financial returns.

In the decade following the UNCED, the Latin American country that took some of the most progressive steps toward adopting the principals and practices espoused in the Rio Declaration was Peru. Peru's promotion of the 3Rs and adoption of the framework of the circular economy across its national and local government systems has created a vibrant new economy around recyclable solid waste in the Andean nation of 32 million people. The recycling sector in Peru is relatively nascent and largely informal, but the growth and opportunity to be found in the sector is considerable, whether from an economic, societal or environmental perspective.

For the purposes of this report, the opportunity of most interest is the growth to be found in the economy and associated value chain of Integrated Solid Waste Management in Peru. To understand this economy requires an assessment of the laws and regulations that support and govern the sector, the actors involved and how value is added and extracted throughout the value chain. Additionally, we must look at the constraints each actor faces and the investment they require to maximize enterprise potential, all with the goal of unlocking the inherent economic value found in the sector.

With the support of the Mastercard Center for Inclusive Growth, this report seeks to do this by examining the legal framework that provides the foundation for progress and future growth, the key actors and their roles within the supply chain, and the best opportunities to invest in the growth and formalization of enterprises operating in the recycled waste sector in Peru. The conclusion of this report identifies significant opportunity to transform the waste management sector in Peru by engaging key actors who are well-positioned to strengthen the recycling and waste management sector as a whole while expanding new market and microenterprise opportunities.

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About the MasterCard Center for Inclusive Growth
The MasterCard Center for Inclusive Growth was created to foster collaborative relationships between academia, governments, nonprofits, the social design community, and the private sector. Through the advancement of research and strategic philanthropic investments, the Center will support and enable those historically excluded from financial services and serve as a catalyst for change. For more information, please visit www.mastercardcenter.org.

About Ciudad Saludable
Ciudad Saludable is a Peruvian NGO belonging to the Grupo Ciudad Saludable, which consists of three sister organizations: Ciudad Saludable, Peru Waste Innovation SAC, and Healthy Cities International Foundation. The Grupo Ciudad Saludable was founded to change the perception of the 109,000 impoverished and excluded recyclers in Peru and to economically empower these recyclers while developing solutions to the problem of inadequate solid waste management in Peru's cities and municipalities. For more information, visit www.ciudadsaludable.org.

About the Global Fairness Initiative
The Global Fairness Initiative (GFI) promotes a more equitable, sustainable approach to economic development for the world's poor by investing in workers, extending equal access to markets and driving balanced public policy to generate opportunity and end the cycle of poverty. Since 2002, GFI has partnered with hundreds of marginalized working communities in Latin America, Africa, and Asia to enhance economic opportunities and build sustainable livelihoods. For more information, please visit www.globalfairness.org.

ACRONYMS

DIGESA	Dirección General de Salud Ambiental e Inocuidad Alimentaria *(General Directorate of Environmental Health and Food Safety)*
D.L.	Decreto Legislativo *(Legislative Decree)*
D.S.	Decreto Supremo *(Supreme Decree)*
MINAM	Ministerio del Ambiente *(Ministry of the Environment)*
PGIRS	Plan de Gestión Integral de Residuos Solidos *(Comprehensive Solid Waste Management Plan)*
PLANAA	Plan Nacional de Acción Ambiental *(National Environmental Action Plan)*
PSO/RS	Programa de separación en Origen y recolección selectiva *(Source separation and selective collection program)*
RENAREP	Red Nacional de Recicladores del Perú *(National Network of Recyclers of Peru)*
REP	Responsabilidad Extendida al productor *(Extended producer responsibility)*

REPORT OBJECTIVE AND METHODOLOGY

Over a four-month period, the Global Fairness Initiative (GFI) and Ciudad Saludable conducted an Opportunity Assessment of the Waste Management Sector in Peru. The primary goal of the study was to illuminate the structure, market conditions and key actors in Peru's recyclable solid waste management value chain. The secondary goal was to determine the feasibility of expanding the formal capacity and access to market for the micro and small firms operating in the sector. The report was designed to assess three core elements of the posited opportunity which are presented in the following three sections.

Section 1: Waste Management Value Chain and Market Assessment: The first section provides an overview of the waste management value chain in Peru, the regulatory framework in which it operates, and the market actors and opportunities found in the recyclable waste sector in particular. The market assessment is designed to both determine the viability of enterprise opportunities in the sector and to identify current operators in the value chain positioned to leverage these opportunities.

Section 2: Ciudad Saludable's Inclusive Recycling Model: The second section provides an analysis of the existing recycling centers model and operations. This section analyzes their capacity and constraints and assesses their opportunity for growth and value-added processes.

Section 3: Opportunity Landscape: The third section provides an overview of opportunities identified to engage the sector and encourage enterprise growth in the recycled waste value chain. Each opportunity may be considered independently, but there are links between each, and combined they represent a significant chance to transform waste management system in Peru to a truly integrated locally owned, market-oriented system.

This report relied on extensive research on solid waste management processes, in-depth interviews with key stakeholders directly and indirectly involved in the recycling value chain, and direct observations of recyclers and recycling centers in the cities of Lima, Ica, Chincha, El Carmen, Sunampe, Pueblo Nuevo, Iquitos, as well as in the districts of Villa El Salvador, San Juan de Miraflores, Villa Maria del Triunfo, and Miraflores. Specific questionnaires and reporting formats can be found in the Annex sections of this report.

LEGAL FRAMEWORK

Construct

Environmental law in Peru is uniquely structured within a Constitutional framework that codifies it as the law of the people and not merely a regulatory mandate. This has enabled environmental law to hold an elevated place in Peru where it is considered a fundamental part of the shared stewardship of a shared land. As a result, environmental law does not merely define general principles – it also specifies processes for the application of the law, including establishing regulatory processes, defining the stakeholders, structures, programs and management instruments to be used, and implementing a broad set of definitions and designations that guide the oversight and management of environmental initiatives.

Functionally, environmental management and stewardship, as decreed in the Constitution, is primarily the responsibility of the provincial and municipal government. A number of provinces and municipalities have in turn reinforced national law through their own state and local policies, which together have served to both prioritize environmental issues and to put leadership of environmental initiatives in local hands. In recent years, regulations have shifted environmental responsibility even further down by prescribing that citizens themselves adhere to and enforce environmental mandates, particularly related to management of the waste they produce. Specifically, the 2017 *Supreme Decree No. 014-2017-MINAM*, and the 2016 *D.L 1278: Law of Integral Management of Solid Waste* establish terms around the rights, obligations, attributions and responsibilities of society to ensure management of sanitary and environmentally sound waste. These statutes go as far as to establish the principles of a circular economy tied to waste valorization and put responsibility on the producer of the waste to protect the environment and be accountable for the public health principals laid out in the Constitution. This responsibility does not distinguish between individuals and businesses, though many of the provisions are more relevant to waste management by enterprises than by households.

Figure 1: Peru's Constitutional Clauses on Environment

Article 2: Everyone has the right: (...) 22). To peace, to tranquility, to the enjoyment of free time and to rest, as well as to enjoy a balanced and adequate environment for the development of your life.

Article 66: Natural resources, renewable and non-renewable, are the Nation's heritage. The State is sovereign in its use.

Article 67: The State determines the national environmental policy. Promotes sustainable use of natural resources.

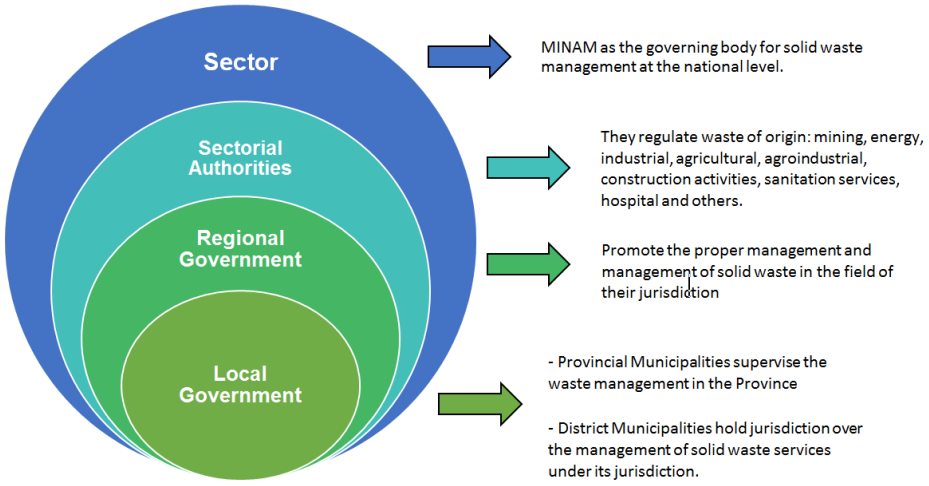
Article 195: Local governments promote development and the local economy, and the provision of public services of their responsibility, in harmony with national and regional development policies and plans.

Regulation

The regulatory structure governing waste management in Peru has four (4) basic levels of authority over the determination and application of the environmental laws. At the highest levels are the national government agencies, which determine the legal requirements for waste management within the various sectors in which solid waste is produced, such as mining, agroindustry, energy production, hospitals, sanitation, and others. These sectors each have a national authority that oversee compliance with the law by registered operators in the respective sectors. The key environmental authority in Peru, however, is held at the provincial and municipal levels, which are broadly empowered to develop policies, regulate practices, and institutionalize programs for solid waste management.

The law that establishes this principle of decentralization is *Law No. 27783 [Law of Basis of Decentralization].* This regulates the conformation of the regions and municipalities, sets the competencies of the three levels of government and determines the assets and resources of regional and local governments, and regulates government relations at different levels. For waste management and environmental stewardship it stipulates in Article 6 that municipalities shall have oversight over: a) territorial and environmental regulation; b) sustainable management of natural resources and improvement of environmental quality; and c) inter-institutional coordination and citizen participation at all levels of the National Environmental Management System. For the purposes of this report, the other law that uniquely enables citizen-led waste management at the local level is *Law No. 29419 [Law regulating the activity of waste pickers].* It establishes a framework for recycling workers' activities that is oriented to the protection, training, and promotion of social and labor development, promoting their formalization, association, and contribution to the improvement of the ecologically efficient management of solid waste in the country. A detailed summary of the relevant regulations can be found in Annex 2.

Figure 2: Peru's Waste Management Regulatory Structure



Practice

Through the decentralized regulatory structure that Peru has established for environmental protection and waste management, municipal leaders and community-based organizations and enterprises have become uniquely reliant on each other to both oversee and benefit from the management of recyclable solid waste. Under the General Waste Law, municipalities are mandated to create action plans for the management of waste and encouraged to create partnerships with the private sector and civil society to implement these plans so that they are not reliant on public service provisions. As a result, a number of municipalities have initiated innovative collaborations with actors in the recycling value chain that had previously operated on the margins, but are now fully integrated into the public scheme. A salient example of this are the formal agreements that municipalities have entered into with largely informal associations of "waste pickers" (*recicladores*) to provide household recycled waste collection in neighborhoods throughout Lima. Empowered through the "Waste Pickers Law" (Law No. 29419) and incentivized by collaborative agreement with the municipality, informal waste collectors who had previously worked on open dumps have formed micro-enterprises made up of associations of waste pickers that now provide household and business waste collection services in dedicated sections of cities. These agreements offer the associations exclusive "at source" access to the recyclable waste products that are the foundation of their livelihood, thus lowering costs, competition, and health and safety issues associated with collecting at open dumps or on the street. Municipalities in turn promote the social value and legal requirement that households and businesses sort and recycle their waste, further improving the market that the associations operate in. Municipalities have broad latitude to enter into such agreements, which functionally may reduce market competition to the benefit of the enterprise with whom they are partnered, but which firmly fall within the legal framework that enables local waste management solutions.

There is a standing, non-binding 2017 goal of recycling 60% of recoverable waste and ensuring proper treatment and disposal of 70% of non-recoverable waste, but Peru is not currently close to achieving these numbers. The country has, however, established a progressive regulatory framework that empowers local leaders to solve local environmental and waste management challenges and creates a highly enabling environment for informal operators in the waste sector to become part of and benefit from the formal waste management system. To date, the vast majority of focus by national and local lawmakers has been on actors that that produce waste (businesses and households) and those that collect waste, but the legal framework is also structured to facilitate stewardship for the large market actors in the value chain who trade in, transport, process, and transform waste. For all levels, the goals of regulation are clearly aimed at enabling greater and more effective environmental stewardship and creating opportunity

and benefit for good operators in the sector, as opposed to the more punitive approach taken by many countries of sanctioning the bad ones.

Current Landscape

Peru's government has set in place a series of policy levers and strategy tools aimed at strengthening the waste management sector while enabling development of key market players through public, private, and international investment. Government objectives, coupled with a growing demand for comprehensive waste management, are focused on handling the volume of waste in the country while promoting green growth.

Enabling an effective and sustainable integrated solid waste management is at the forefront of the Peruvian government's environmental sustainability, economic development, and macroeconomic growth initiatives. Peru has embraced green growth and undertaken commitments within the Paris Agreement and various government institutions, strategies, and plans. For example, the creation of the Ministry of the Environment (MINAM) in May 2008 marked a milestone in the development of a broad environmental institutional framework. MINAM is responsible for adapting the National Solid Waste policy and preparing and implementing comprehensive solid waste management plans (PIGARS), as well as the solid waste handling plans at the provincial and district levels (PMRS). In accordance with MINAM's goals, the Ministry has launched a series of programs and investment projects that tackle different aspects of comprehensive waste management, including Municipal Modernization Programs (PMMs), Segregation-at-Source Programs, and Formalization of Recyclers Programs. Additionally, MINAM leads information management and data collection through the solid waste management information system (SIGERSOL) and publishes regular reports and evaluations of environmental and waste management in Peru.

Peru's focus on environmental policies goes hand-in-hand with the development of strategy instruments to coordinate pro-competitiveness policies and efficient management in the public and private sectors around key areas, such as comprehensive waste management. MINAM leads the implementation of the National Plan of Environmental Action (PLANAA Peru: 2011-2021), a national environmental planning policy that set priority targets for 2021 around waste management and recycling. Following the development and publication of PLANAA, the government, in partnership with the United Nations and 800 stakeholders from the public, private and civil society sectors representing a total of 271 institutions in Peru, developed the Plan Nacional de Gestión Integral de Residuos Sólidos: 2016-2024 (PLANRES). PLANRES is a cross-sectoral and de-centralized framework that establishes guidelines in alignment with PLANAA, and by extension, the Sustainable Development Goals, and serves as the principle plan for waste management. Its objectives focus on strengthening the capacity of the waste

management value chain; promoting best practices around waste management technology; creating a legal framework on solid waste management and environmental sustainability for municipalities; strengthening SIGERSOL to collect local, regional, national data in a timely and effective manner; strengthening solid waste collection at the municipal level; coordinating investment in the national solid waste management system; and promoting private investment in the waste management system. It was designed to meet PLANAA's most ambitious goal: calling for 100% of municipal solid waste management, recycling, and proper disposal by 2021. As part of this initiative, Peru is actively seeking to create additional landfill capacity to meet basic disposal requirements and has set a goal of achieving 100% adequate treatment of waste via the 3R's (Reduce, Recycling, Reuse) and sanitary landfills by 2021. The government's goals for developing new sanitary landfills is intended to eliminate the practice of waste disposal in dumps with little active operation or environmental control. These ambitious goals reflect Peru's efforts to improve the management of municipal and non-municipal waste while strengthening the value chain.

SECTION 1: WASTE MANAGEMENT MARKET IN PERU

Over the last 15 years, Peru has experienced a period of incredible growth led by strong internal demand, inclusive poverty reduction policies, and deep macroeconomic reforms that liberalized trade and fiscal policies. At present, the Peruvian economy is the 7th largest in Latin America and has experienced sustained growth from 2003-2017, with an average growth rate of 5.9% and low inflation rates (averaging 2.9%). After a massive urbanization process over the last 60 years, Peru is a mostly urban country, with about 60% of the population living in urban areas. In addition, Peru has opened its economy to international trade, with raw materials forming the core of its exports.

This fast and widely shared growth has transformed Peru into an upper-middle income economy, with aspirations to become a high-income economy in the next 20 years. In parallel, this dynamic growth has been accompanied by increased production and consumption, and thus an increase in the generation of waste and recyclable materials. Over the last ten years, waste generation has grown by 40% per capita, reaching 0.78 kg per individual per day in 2009 and 0.83 kg per individual per day in 2014, and during this same period, investment from private, multilateral, and international funds to meet this demand through the construction of landfills, waste plants, and transfer stations totaled over S/. 2,000,000,000 (~$615 million USD).

Figure 3: Municipal Waste Generated in Urban Zones, 2014

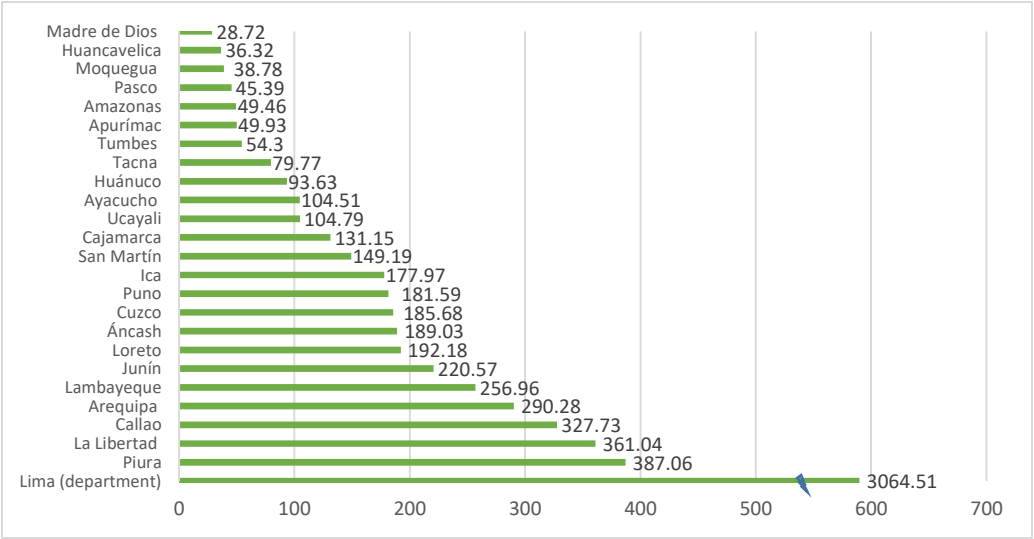
Solid Waste, Total	Solid Waste, Household	Solid Waste, Non-Household
.83kg/person/day	.56kg/person/day	.27kg/person/day
7,030,000 tons/year	4,740,000 tons/year	2,290,000 tons/year
100%	67%	33%

In Peru, approximately 7 million tons of waste is produced per year with over 70% collected from households, but only 48% of that material is properly disposed of in landfills; in many cases, waste is deposited in open-air dumps without prior treatment. Lima is the Peruvian city that generates the most household waste, with the amount doubling between 2000 and 2015 and increasing to represent over 30% of the national total in 2015. Estimations see household waste in the province of Lima growing to 16,000 tons per day by 2034 and growing across the country in parallel with expected per capita GDP growth.

The Ministry of the Environment's (MINAM) official data on recycled goods estimates that only 0.41% - or 29,099 tons - of total waste per year in Peru is recycled. However, that

figure does not accurately represent the amount of recycling material available in Peru and unofficial data estimates that approximately 14% of total waste is recycled in a given year. This discrepancy suggests that a significant amount of recycled materials come from informal work that recovers material from dumps, public roads, and informal arrangements with companies. There are also major divergences among regions with respect to available infrastructure and the availability of trash collection services.

Figure 4: Waste Generation by Region, 2014



Of the 7 million tons of solid waste collected per year, approximately 5 million tons (74%) have the potential to be either recycled or composted. The largest categories of recyclable materials include plastic bags, paper, cardboard, and other more ridged forms of plastic.

Figure 5: Potential Recycled Material of Municipal Waste Collected

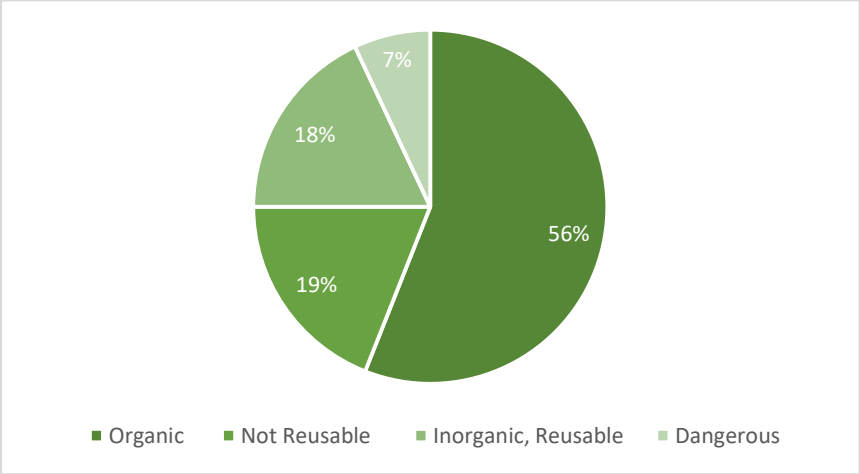


Figure 6: Municipal Waste Generation by Type

Components	Composition
Organic Material	53.16%
Foliage/Wood	2.87%
Paper	3.86%
Cardboard	3.74%
Glass	2.79%
PET Plastic	2.39%
Hard Plastic	2.88%
Bags	4.03%
Tetra Pak	0.51%
Styrofoam	0.98%
Metal	2.34%
Fabrics/Textiles	1.47%
Rubber/Leather	1.12%
Batteries	0.30%
Medical Waste	0.40%
Sanitary Waste	6.53%
Inert Waste	8.15%
Other	2.49%
Total	***100.00%***

In Peru, there are 30 dumps across 43 cities and 11 sanitary dumps that receive 38% of the generated waste from urban zones. However, the proper management of waste within these landfills is insufficient and waste is piling up, untreated, unhealthy, and forgotten. These unmanaged, open landfills create broad environmental hazards and contribute to nearly 6% of Peru's greenhouse gas emissions. They are also the cause of serious health and environmental hazards in surrounding communities, as highlighted by the flooding in northern Peru in 2017, which carried away solid waste, demolishing houses, contaminating streams and drinking water, and ultimately polluting the sea. With only 14% of Peru's annual waste being turned into recycled materials, but the potential for as much as 74% being recycled or composted, the opportunity for robust expansion of Peru's recycling sector is significant.

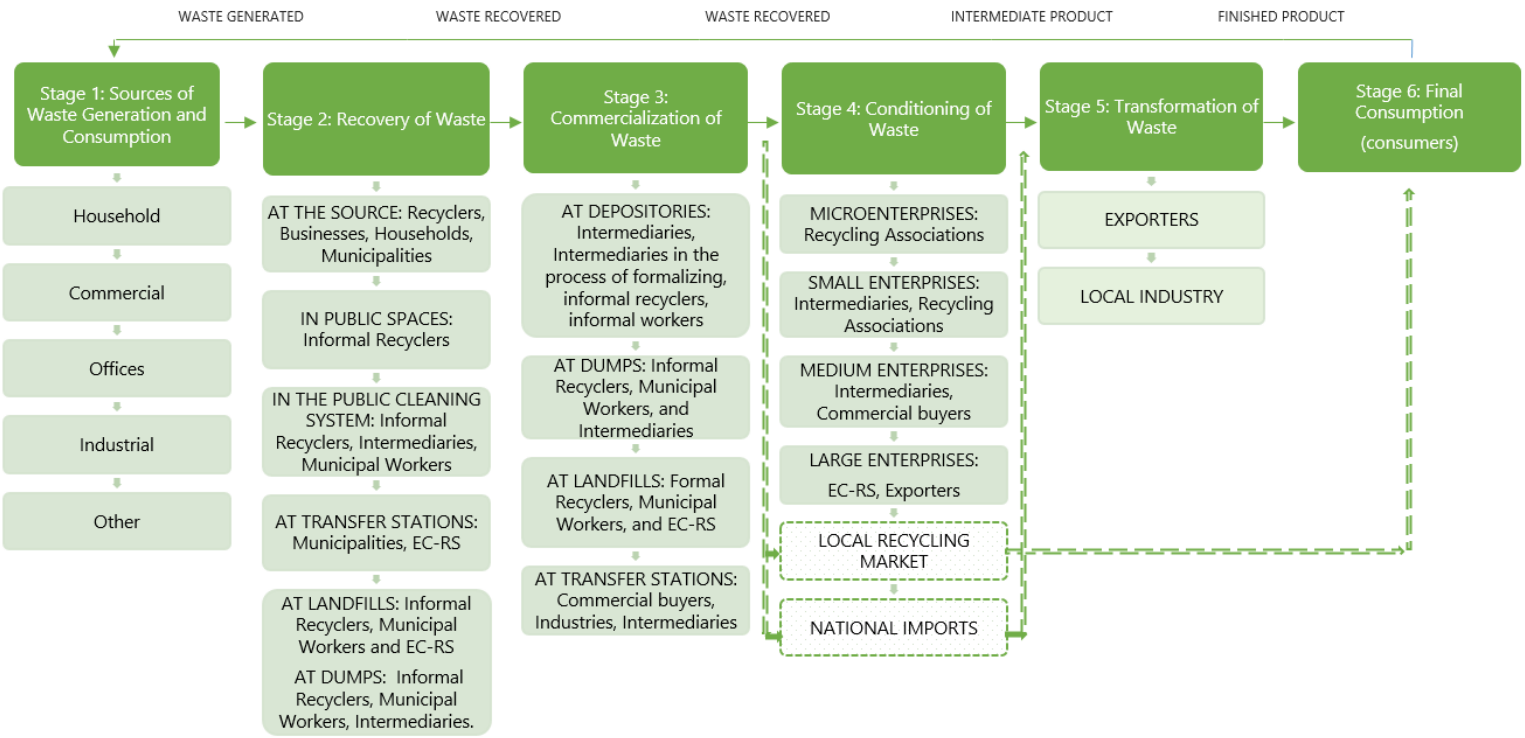
Peru's commitment to strengthening the waste management sector and value chain to enable green growth, economic development, and market competition and activity is highlighted across the various policies, planning documents, and strategy tools the government has developed. Enabling further formalization and professionalization of the sector are understood as critical to meeting Peru's economic and green growth goals, as well as increasing market demand for these services. This enabling regulatory and political

environment furthers the breadth of the recycling market and the opportunities for engagement, which are explored below.

RECYCLING VALUE CHAIN

Peru's recycling value chain is comprised of six stages – 1) Generation, 2) Recovery, 3) Commercialization, 4) Conditioning, 5) Transformation, and 6) Final Consumption. An overview of this process has been summarized in the following flow chart.

Figure 7: Flow Chart of Recycling Value Chain



Stage 1 (Generation) refers to the amount of waste generated by a particular group such as households, commercial businesses, offices, industries, or other actors. Through the analysis of per capita generation and the composition of solid waste, we can estimate the re-usable quantity, classifying it as recyclable and compostable, as well as the potential for effective segregation, essential indicators for the design of a program of segregation at the source and selective collection.

Stage 2 (Recovery) refers to the method in which the waste is collected and, where possible, segregated. For example, for households, recovery is at the source through garbage collection routes typically managed by municipalities or individual recyclers and recycler associations. The act of segregation is separating out material such as packing or food that can be reused, recycled, or consumed as swine feed and which typically have a commercial value. This is carried out formally through segregation programs at the source

and selective collection, i.e. pre-sorted at homes, businesses, and industries or informally on public roads through public cleaning services, transfer points, dumps or landfills by recyclers or public cleaning workers.

Stage 3 (Commercialization) includes the act of buying and selling reusable solid waste. This is typically carried out in either informal warehouses, formal collection centers, or final sites such as dumps and landfills. The warehouses and collection centers can range from small, family-run centers to large, professional centers.

Stage 4 (Conditioning) refers to the processing of recycled materials. This stage includes activities such as storage, cleaning, crushing or grinding, compacting, and packaging. This stage does not include treatment of any recycled materials. These processes are carried out by a range of actors from micro-enterprises to large export companies. Each actor responds to the demand of local reuse markets, large industries such as bottling companies, and exporting companies.

Stage 5 (Transformation) refers to the act of transforming the recycled materials, either through physical or chemical reprocessing, from solid waste into intermediate or final products that can be used by various buyers. Buyers can purchase raw material or recycled products for local or export markets.

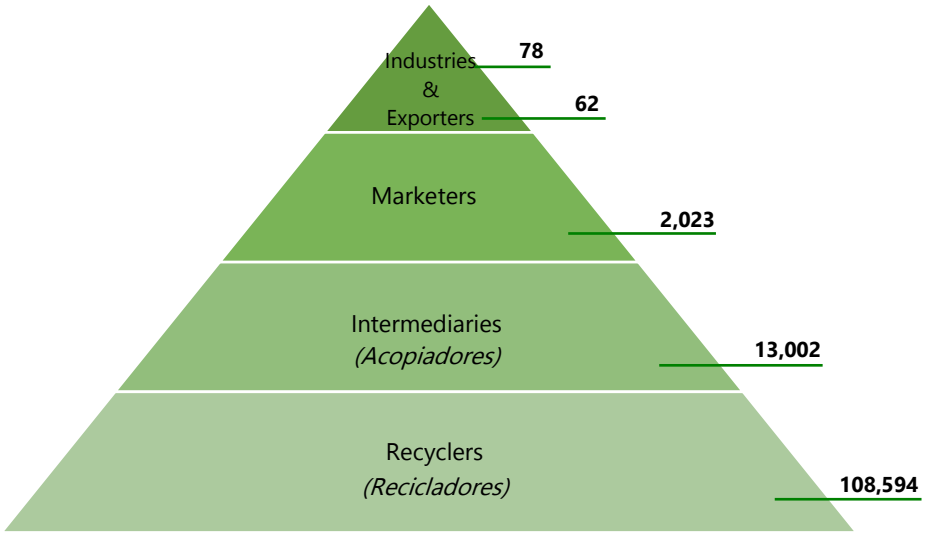
Stage 6 (Final Consumption) is the last stage of the value chain in which the recycled products are consumed or converted again into waste which would then return to the start of the recycling chain.

Across each of these stages and levels is a wide variety of movement and variation. For example, a large office building or shopping mall may have its waste collected by a municipal garbage collector or an association of informal workers. Small enterprises that store solid waste, as described in Stage 4, may sell to a local market or regional buyer. Therefore, it is important to understand that within each stage of the value chain there is tremendous variability and complexity in the movement of materials which, in turn, affects the variability of the prices.

KEY ACTORS FOR ENGAGEMENT

Within the recycling value chain, there are four key segments of actors – Recyclers, Intermediaries, Marketers, and Industries/Exporters – which can be summarized in the following Recycling Actors Pyramid.

Figure 8: Pyramid of Key Actors in Recycling Value Chain Pyramid



Recyclers

Often referred to as waste pickers or *recicladores*, the 108,594 recyclers at the base of the Recycling Actors Pyramid are the first link in the recycling value chain, recovering waste from generating sources such as open dumps, streets, residences, businesses, and other public spaces. Of the approximate 109,000 recyclers, only 13,000 (or 12%) are formal workers, either organized into recycler associations or micro-enterprises. These workers are represented by 311 waste picker organizations, of which 291 are recycler associations and 20 are Micro and Small Enterprises (MYPES). These associations and micro-enterprises operate in municipalities across the country with the largest concentration (78 organizations) in the provinces of Metropolitan Lima and Callao. A list of the Waste Picker Associations in Lima and Callao can be found in Annex 3. In addition to these formal organizations, recyclers are also represented at the national level through trade associations such as the National Network of Recyclers of Peru (RENAREP).

However, the majority of recyclers are informal workers. Informal recyclers are drawn from poor and vulnerable sectors of society; the low barriers to entry coupled with a ready income drives impoverished workers to waste picking. Waste, and particularly recyclable materials, are relatively easy to access and have both value and an accessible market to

sell to. Waste pickers, and particularly those operating on open dumps and on the streets, work in hazardous conditions and lack access to public services, healthcare, protective gear and the proper tools that might otherwise improve productivity. Due to an absence of economies of scale, informal waste pickers have weak bargaining power in the recycling value chain. With poor opportunities and insufficient earnings, informal pickers are unrecognized and unprotected actors in the waste management system – despite their clear, critical role in the market.

Opportunity Highlight - The best opportunity for engagement with recyclers is to help them organize into formal recycling associations ("Associations") that can compete for selective collection routes with municipalities and businesses, provide greater social protections including access to healthcare and social security programs, access to training programs, and eventually establish their own collection facilities.

Intermediaries

The second category of actors is the most dynamic economic group in the recycling chain, commonly known as Intermediaries (*Acopiadores*). Intermediaries represent a large variation of actors, including small and medium sized businesses or waste picker associations operating formally or informally that purchases and sells recyclable solid waste and/or provides home and selective waste collection services. Many Intermediaries operate small enterprises ranging from 50 square meters to 2,200 square meters in residential or commercial areas that are typically located close to dumps and landfills. They have little specialization and are usually limited to the purchase and sale of recycled materials – Stage 3 (Commercialization) and some elements of Stage 4 (Conditioning) including storage. Where some Intermediaries have received technical assistance or financial support, they have expanded into Stage 4 (Conditioning) such as cleaning or pressing or materials and Stage 5 (Transformation) such as the chopping of PET materials. Intermediaries typically have between 2 and 10 people working for them and require minimal capital investment and operate with between S/. 2,000 soles and S/. 10,000 soles (~$610 USD to $3,100 USD) per month. There are approximately 13,000 Intermediaries across Peru with over 8,000 operating in urban areas. A typical urban intermediary can sell between 1 to 15 tons per month.

Opportunity Highlight – Intermediaries act as the primary bridge between collection (Stage 2) and the rest of the value chain, although some Waste Picker Associations sell directly to Marketers or Exporting and Manufacturing companies. Most are small enterprises that operate informally and would benefit from formalization support as well as technical assistance to increase the volume of goods processed and their ability to capture more of the value chain.

Marketers

The Marketers are the third rung in the recycling pyramid. They are medium to large enterprises and typically operate in metropolitan trade zones and industrial zones. Marketers can be involved in Stage 3 (Commercialization), Stage 4 (Conditioning), Stage 5 (Transformation) and, occasionally, Stage 6 (Final Consumption) of the recycling value chain. Many Marketers have three locations – one location to purchase and sell recyclable waste to retailers in the surrounding areas, another location to classify, carry, and label goods, and a final location where they carry out the conditioning process, i.e. pressing chopping, packaging, and shipping. Most Marketers specialize in at least two types of waste such as A) paper or cardboard, B) PET and plastics, or C) scrap and metals to protect themselves against price instability and market volatility. Marketers typically process over 15 tons of recycled materials per month and operate with a working capital greater than S/. 30,000 soles (~$9,200) per month. In addition to large footprints, their primary assets are in equipment for the conditioning of waste such as electronic scales; paper press machines; metal, PET and plastic choppers; and vehicles for transporting materials. Given their size and asset portfolio, they can access financial services relatively easily as well as regional market technologies. Their access to the export market is conditional on whether they have secured an EC-RS license – an authorization of commercialization of solid waste - issued by the Health Sector or MINAM. Of the 2,023 Marketers estimated nationally, only 555 have EC-RS registration, but EC-RS registration is growing dramatically. Across a sample of 19 selected provinces, EC-RS registration almost tripled between 2008 and 2009 alone.

Opportunity Highlight – The majority of value in the recycling value chain is added during the Conditioning Stage (#4). As a result, Marketers are well positioned to take advantage of additional support and investment to scale their operations. Marketers that store large volumes of raw or semi-processed recycled materials fare better because they can wait longer periods of time for a more favorable price point. Given their size and asset portfolio, many Marketers have decent access to capital, although not always at the most favorable rates. Technical assistance and support to improve business practices, increase efficiencies, and strengthen operations would benefit this group.

Exporters and Industrial Companies

At the top of the pyramid are two types of actors – Exporters and Industrial Companies. These companies reuse or transform recyclable waste into final products for consumption. The group is the smallest within the value chain, although it captures a decent portion of the value added. They are characterized by a high level of specialization, technological development, organization, and financial capacity. For an overview of the financial standing of four major buyers, refer to Annex 4. There are 78 national industries and 62

export companies. For a list of all export companies, see Annex 5. National industries include recycling industries of plastic, paper, cardboard, scrap, metals and glass, as well as bottling companies that promote the use of returnable glass containers, gas companies that promote the returnable use of gas cylinders, and other industries that promote the consumption of spare parts that have been manufactured with minimal packaging. For most recyclable materials, there are a small number of large companies that dominate the market. For glass, the primary company is Owen Illinois, a multi-national corporation that is the largest buyer of recycled glass fiber for the manufacturing of bottles; they typically demand approximately 30 tons of glass per month for their processing. For PET plastic, a major company is San Miguel Industries which specializes in PET processing; San Miguel Industries requires approximately 3,000 tons of PET per month. The primary paper industries include Kimberly Clarke (Lima) that serves a national market, Productos Tissue del Perú S.A – PROTISA (Elite Brand), Papelera del Sur, and PROVESUR. Papelera del Sur can require as much as 70 tons of cardboard or paper per month, whereas PROVESUR typically requires between 15 and 20 tons per month. The primary scrap companies are Aceros Arequipa Corporation in the south and SIDER Peru in Chimbote in the north. Aceros Arequipa typically requires between 15 and 20 tons of metal scrap per month.

Opportunity Highlight – Industries and Exporters are large national and multi-national companies (MNCs) most of which are in good financial standing. The best opportunity for engagement with this group of stakeholders would be to work closely with them to negotiate more favorable purchasing agreements for Collectors and/or Marketers.

OPPORTUNITY ANALYSIS

Over the past decade, Peru has become a regional leader in championing and instituting a range of strong environmental policies, including a commitment to achieve 100% adequate treatment of waste through the 3R's (Reduce, Recycling, Reuse) model and sanitary landfills by 2021. The promotion of a circular economy is starting to take hold, although there remains significant room for growth. For example, a decade ago, 80% of the recycled material in Peru was exported and only 20% was consumed by domestic markets. Today, the opposite is true, with only 20% of recycled goods being exported. With the recent passage of Decree D.L. 1278 – The Law of Integral Management of Solid Waste - which mandates municipalities create comprehensive waste management plans that prioritize waste prevention and reduction and encourages partnerships with the private sector, the current legal framework is one of the most progressive in Latin America. In addition, outdated regulations have been replaced by more environmentally friendly policies that incentivize the use of recycled materials. For example, until as recently as 2016 there was a prohibition against the use of recycled resin in bottle production due to

a misperception of recycled plastic as "dirty." As a result, bottle manufactures had to import virgin resin for their production processes. However, once this prohibition was removed, several manufacturing companies began integrating recycled resin into their manufacturing processes, reducing costs and increasing demand for recycled materials from domestic suppliers. After D.S. 038-14 was passed, San Miguel Industries, the largest buyer of PET in Peru, invested in the required technology and increased demand from 10 tons of PET per month to 3,000 tons per month. In a similar vein, exporters have changed their business operations from exporting bulk bottles to transforming materials in-country into products such as flakes or scraps, allowing them to capture more value from the value chain and sell at higher prices. The relatively quick change in business operations as legal constraints were removed suggests that there is a strong interest and demand for recycled goods domestically.

In Peru, the three major tradable recycled materials are Paper, Plastics, and Metal. In 2016, Peru had a positive trade balance in terms of volume of paper (i.e. more paper exported than imported), although the total value of paper traded was negative, indicating that import prices were higher than export prices. For plastics, both volume and value of plastics had a negative trade balance, indicating that Peru's internal supply is still not meeting domestic demand. For metal, the trade balance was also negative for both volume and value of traded goods. A detailed breakdown of Peru's exports and imports of paper, metal, and plastics can be found in Annex 6.

Figure 9: Exports and Imports of Peruvian Recyclable Material, 2016

2016 Exports			
	Volume (Tons)	Price (USD/Kg)	Value (Thousands USD)
Paper	63,983,583	0.18	11,461,424
Plastic	26,225,681	0.58	15,280,865
Metal	104,779,064	0.54	56,421,065

2016 Imports			
	Volume (Tons)	Price (USD/Kg)	Value (Thousands USD)
Paper	63,065,683	0.20	12,527,310
Plastic	27,232,954	0.62	16,911,027
Metal	108,485,247	0.58	62,379,692

Peru is actively trying to reduce the volume of imported recycled materials to strengthen domestic markets. While Peru has the potential to supply the current demand for

imported materials, it does not currently have the capacity to do so because much of the recyclable waste is left unrecovered in poorly managed landfills or rural dumps that are inaccessible to urban markets both due to high transportation costs and lack of proper cleaning, processing, or transformation.

However, several of the challenges preventing scaling of collection capacity are being addressed through international investments. With the Government of Peru's strong commitment to environmentally friendly policies and legal frameworks, international partners have been eager to invest in building Peru's capacity to capitalize on this momentum. Partnerships with Japan's International Cooperation Agency (JICA) and the Inter-American Development Bank (IDB) have focused on building more efficient and hygienic waste management sites, introducing environmentally conscious technology, and strengthening local capacity and management structures. In addition, the Government of Peru is in discussions with the United Nations Development Programme (UNDP) to implement a Nationally Appropriate Mitigation Action (NAMA)[1] on Peru's waste management sector. The proposed NAMA is designed to complement and accelerate the existing modernization policy for solid waste management in Peru by creating incentives that increase the economic value of waste that currently goes to landfills and dumps.

With the combination of a strong government commitment to recycling, significant international investments in much needed infrastructure improvements and capacity building, and unmet demand for recycled materials, Peru's recycling industry is perfectly positioned for a dramatic expansion. Each of the actors within the recycling value chain are likely to benefit from this expansion; however, the Recyclers and Intermediaries are the best positioned for dramatic growth.

Primed for Growth – Recyclers and Intermediaries

Approximately 90% of the supply chain is represented by Recyclers and Intermediaries. Despite the significant volume processed by these actors, the overwhelming majority of both Recyclers and Intermediaries in Peru operate informally and at a relatively small scale. This has limited their ability to take advantage of the growth of the recycling sector, including selling larger quantities to buyers and capturing additional parts of the value chain. Because of the potential for growth, both are well positioned to be formalized and capacitated through the right combination of investment, technical assistance, and market facilitation to help them overcome the constraints that have limited their size and revenues.

[1] A NAMA is a set of policies and actions aimed at reducing greenhouse gas emissions which is enabled by technology, financing, and capacity-building.

For Recyclers, the primary opportunity is to support their formalization into Waste Picker Associations, which can operate as micro-enterprises. Waste Picker Associations that have access to collection facilities – either through partnerships with existing facilities or by leasing properties themselves – can run their operations as small Intermediaries and therefore would be well-positioned to take advantage of the same opportunities as Intermediaries, as outlined below.

The roughly 13,000 Intermediaries occupy a key space for enterprise opportunity due to their processing volume and their ability to link between Recyclers and Marketers or Exporters. With technical assistance around formalizing their operations, support to create bank accounts, and/or small loans to help them purchase processing equipment, vehicles, or lease larger spaces, Intermediaries could not only increase the volume of raw materials purchased and sold, but also engage in more value-added activities such as cleaning or pressing. For example, if an Intermediary was able to purchase a plastic bottle pressing machine for their facility, they could increase the volume of materials stored as well as sell the plastic at a higher price point to large buyers who only purchase plastic pre-pressed.

Another opportunity for growth for Intermediaries would be improved buyer relationships, especially with the large Industries and Exporters that transform (Stage #5) plastic, paper, cardboard, and metal into products for final consumption (Stage #6). The primary barriers for Intermediaries to engage in these sought after relationships have been insufficient volumes to meet demand, inadequate sorting processes resulting in deliveries of mixed goods (i.e. white paper and cardboard combined rather than separated), inability to deliver products in line with transportation requirements, and a lack of bank accounts or integration into a formal financial system. Based on our assessment, we believe there are a number of ways in which to address these constraints. These include increasing Intermediaries' storage and processing capacities, aggregating their supply with other Intermediaries in order to meet the higher buyer thresholds, and supporting efforts in formalizing operations such as creating bank accounts, registering vehicles, and using electronic payment processes for streamlined invoicing. If Intermediaries were able to access these larger buyers, we believe that they could increase their monthly income by as much as 50% to 60%.

There is great potential for expansion and market disruption, but given the varied capacities and levels of formalization that exist amongst Waste Picker Associations and Intermediaries, investment should be coupled with technical assistance both at the enterprise level and at the local and regional levels. For example, support in advocating for separation at source policies, arrangements with municipalities for collection routes, and increasing awareness of the importance of recycling are all necessary investments

that support the industry, and eventually the profitability, of these actors in this segment of the supply chain.

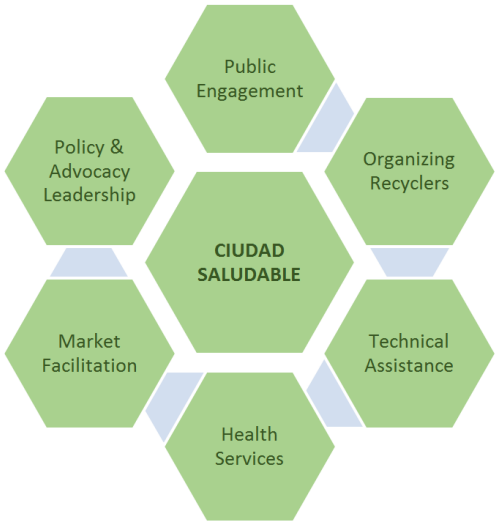
Model for Success

For more than a decade, Ciudad Saludable has worked to establish a new model for empowering highly successful social enterprises in Peru's recycling sector. Beginning at the bottom of the value chain, Ciudad Saludable has organized informal waste pickers into collectively managed recycling associations that generate employment and income for thousands of recyclers. At the top of the value chain, they have helped improve linkages between buyers and suppliers and promoted the social value and impact of recycling operators. Finally, at the heart of the value chain, they have launched a dynamic set of successful enterprises known as *Centros de Acopio de Residuos Reciclables* (CARRs) that offer a unique model for enabling actors that purchase and sell recyclable materials to maximize the regulatory, market, and technical opportunities and benefits of Peru's new recycling economy.

SECTION 2: INCLUSIVE RECYCLING MODELS

CIUDAD SALUDABLE

Figure 10: Ciudad Saludable Framework



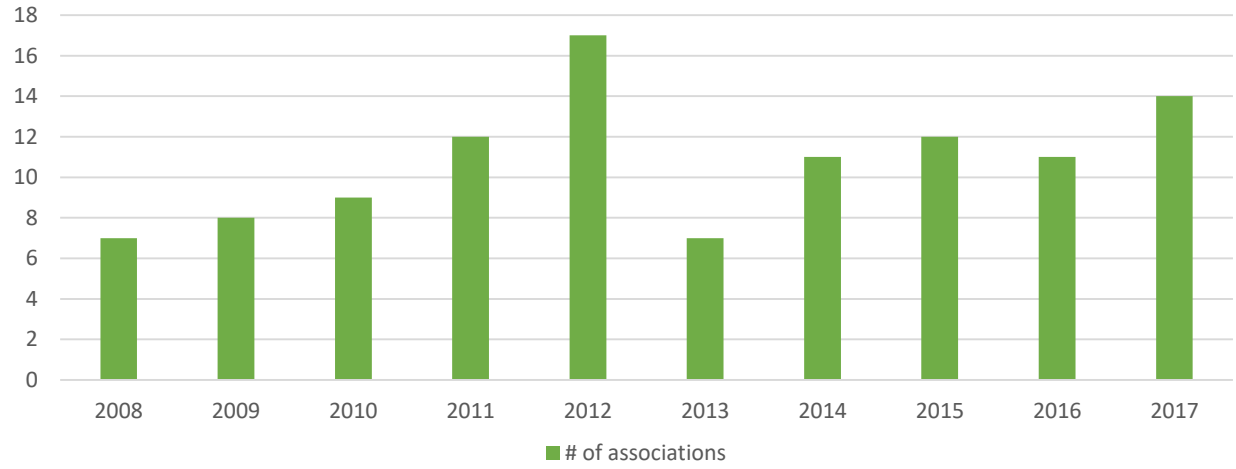
Ciudad Saludable is a Peruvian non-governmental organization (NGO) founded in 2002 with a mission to build healthy and inclusive cities. To achieve this, the organization proposes a model of environmental citizenship and sustainable management for the mitigation and adaptation to climate change from the inclusive recycling value chain. Their work is broken into three major programmatic areas: 1) inclusive recycling, 2) environmental education and communication, and 3) integral management of solid waste.

CS was founded by the Peruvian environmental leader Albina Ruiz, who was inspired to work with waste pickers originally to address the social and economic deprivations of this community of more than 100,000 highly vulnerable people in Peru. Albina conceived of an organization that enabled workers at the bottom level of the waste management value chain so they could secure greater access to and income from higher, more complex levels. In addition, she saw the opportunity to empower these waste pickers to become stewards of a burgeoning environmental movement by playing a central role as recyclers (*recicladores*) in a locally led recycled waste management system. By linking the marginalized people who handle waste with a national environmental movement in search of solutions to waste management, CS created a highly innovative model that has become internationally recognized and replicated throughout the region.

CS began its work to help address the systemic poverty, and by extension terrible living and health conditions, faced by Peru's waste pickers who survive on the collection and sale of recyclable waste found in open dumps and streets throughout the country. CS has organized thousands of Recyclers into informal and formal Associations of up to 50 members who work collectively to manage waste and strengthen their bargaining power as organized cooperatives. CS regularly relies on Association members who previously worked on dumps to help provide validation and build trust as they organize in new locations where local recyclers are not familiar with them and are often reticent. CS has a well-established set of tools and curricula to deploy in helping facilitate the transition of recyclers to associations and on to sustainable waste management enterprises. Over time,

these Associations develop into more formal micro-enterprises, supplanting Intermediaries (*acopiadores*) and selling directly to higher level Marketers and Industries and Exporters at a better price and volume.

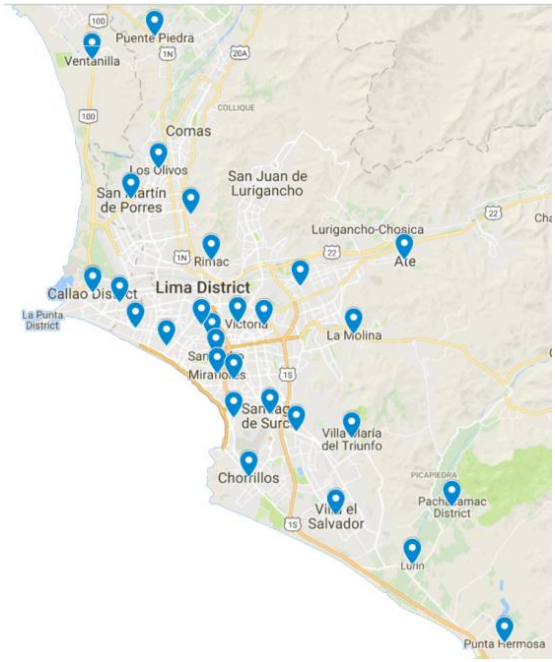
Figure 11: Association Growth per Year



CS innovated a new business model for these Associations through the negotiation of a legal framework that allowed recyclers to be integrated into the municipal waste management systems mandated by the national "waste picker" law. The new law enabled the waste picker Associations to service household and business selective waste collection needs in sections of the municipalities where the associations operate. This gives them exclusive and reliable access to recycled waste and a legitimacy afforded by the agreement with the municipality (for example, formalized Associations wear the municipal logo on their protective uniforms). In addition, municipalities work with Associations to secure low cost leases for space where the associations sort and store the collected recycled waste. Securing these spaces is the foundational step towards the recycler owned and operated *Centro de Acopio de Residuos Reciclables* (CARRs). In addition to enabling the enterprise success of recyclers, CS facilitates the provision of health services, labor protections, and social benefits afforded by right under the "waste-picker" law. To date, CS has organized over 11,500 recyclers into Associations that serve the recycled waste collection needs of thousands of individuals and households across Peru. Through these associations and the municipalities with whom they partner, CS has elevated the importance of recycling and the recycled waste value chain for millions of Peruvians.

Figure 12: Ciudad Saludable in Peru

Figure 13: CARRs Operating in Lima



To further enable the market for these recyclers and to advance the environmental movement that they support, CS also leads education, advocacy and public awareness programs in partnership with government, the private sector, and other stakeholders throughout Peru. These awareness campaigns help strengthen the waste management systems by changing behaviors around sustainability and trash; as more residents and businesses are targeted and learn about segregation programs and inclusive recycling, they are more likely to participate in recycling programs and, therefore, provide a steady supply of materials for waste pickers and CARRs.

CS is a highly dynamic organization that operates on multiple levels, but the key components of their work include public engagement, organizing recyclers, technical assistance, health services, market facilitation, and policy and advocacy leadership. Each component is weighted and applied differently across each of their programmatic areas, but are equal pillars in an integrated organizational model that engages all actors in waste management and environmental stewardship in Peru.

Since its founding in 2001, Ciudad Saludable has sensitized 9 million people in Latin America to the issues inherent in solid waste management through education and communications campaigns, trained 6,000 informal recyclers, formalized 11,500 recyclers in formal selective collection routes benefiting 5.6 million Peruvians, and worked with more than 200 municipalities to improve solid waste management. With a desire for

holistic engagement, a wide-reaching ability for community and government engagement, and technical expertise in solid waste management, Ciudad Saludable has created an innovative social enterprise model that addresses many of the challenges facing key actors in the recycling supply chain. Over the last ten years, Ciudad Saludable has established a uniquely successful model to empower highly successful social enterprises in the recycling sector.

CENTROS DE ACOPIO DE RESIDUOS RECICLABLES (CARRs)

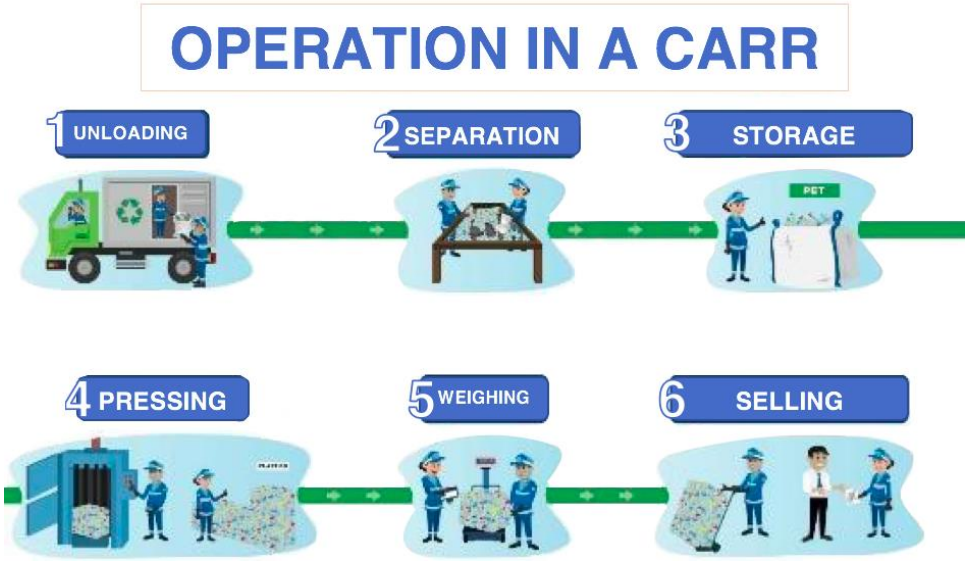
Ciudad Saludable's *Centros de Acopio de Residuos Reciclables* (CARRs) are social enterprises that facilitate partnerships between Recycling Associations and municipal governments. In this approach, municipalities and waste pickers formally organize into Associations (Waste Picker Associations) and establish contracts or cooperation agreements for performing collection services and/or recycling. Once established as Associations and operating as CARRs, these Centers function as legally recognized microenterprises with significant opportunity for valorization. Through their recycling activities, they advance a culture of inclusive recycling by delivering comprehensive services that contribute to the incomes of waste pickers, deliver vital environmental services, provide materials for local industries, and generate sustainable livelihoods for low-income citizens. The CARRs also have the advantage of working with all actors in the supply chain – CARRs buy and store materials on behalf of recyclers, sell processed or unprocessed materials to Marketers, and engage directly with large industries such as San Miguel Industrias, S.A. and single-product Exporters and processors such as Siderperu, a Peruvian steel and iron company, for scrap metal and other products. CARRs broaden their sources of income by working with private and public sector partners and lower the overall costs of recycling for municipalities, as well as contribute to national competitiveness and environmental sustainability. Therefore, CARRs offer a hybrid model combining traditional roles previously carried out by multiple actors into one efficient and sustainable entity.

The first CARR was established in 2011 and at present there are 35 CARRs operating across Peru. On average, a High Capacity CARR services 14,300 households, institutions, and companies and is actively engaged in Stages #2 (Recovery), #3 (Commercialization), and #4 (Conditioning). They collect and store an average of 850 tons per year, or 71 tons per month, and partner with between 1 to 10 Waste Picker Associations, thus providing reliable income to as many as 200 waste-workers.

OPPORTUNITY TO SCALE CARRs

CARRs operate at varying levels of low and high capacity based on capacity for efficiencies in inventory management, processing, and sales. Each CARR follows a six-stage process in processing, storing, and selling the materials. Waste Picker Association members serve in a variety of different roles at the CARRs, including in the CARR's administrative offices handling sales, inventory, and relationships with private sector buyers and government actors, while others work exclusively on activities related to selective collection and processing, including as collection vehicle drivers, sorters, and processors. CARRs also provide Waste Picker Association members with technical trainings and have conference rooms used for meetings by Association management with buyers, locker rooms with showers for workers, and lunch spaces.

Figure 14: CARR Operations



"Low Capacity" CARRs operate with limited capacity for collection, small areas for material collection, storage, and segregation, and significantly fewer association-affiliated waste pickers. These CARRs have between 5 and 10 employees and are defined as enterprises earning up to $50,000 per year. These Centers often require upgraded equipment and enhanced infrastructure to grow their capacity and meet the needs of customers with greater efficiency and scale.

Figure 15: Photos of Low Capacity CARRs

As shown above, low capacity CARRs lack storage units, advanced technology, and infrastructure to engage in higher volume collection and processing. For example, these Centers may require inventory management shifts from unorganized and unsorted recyclable waste to bagged and separated collection areas that improve productivity and efficiency, or upgraded equipment and enhanced infrastructure to grow their capacity and meet the needs of customers with greater efficiency and scale. In addition, low capacity CARRs work to design, expand, and implement residential and business routes for selective collection of recyclable waste.

"High Capacity" CARRs operate with 10 to 100 employees, function more efficiently and utilize more modern technology, including defined areas of segregation and upgraded technologies to enhance collection and processing. High Capacity CARRs earn between $50,000 and $150,000 per year. These CARRs have invested in infrastructure upgrades, including adding or enhancing bathrooms, buying more collection vehicles, and investing in additional chippers, pressers, and segregation tables. In addition, High Capacity CARRs have successfully designed and implemented broader routes for selective collection of recyclable waste, working directly with the municipal governments to establish proper documentation and certification.

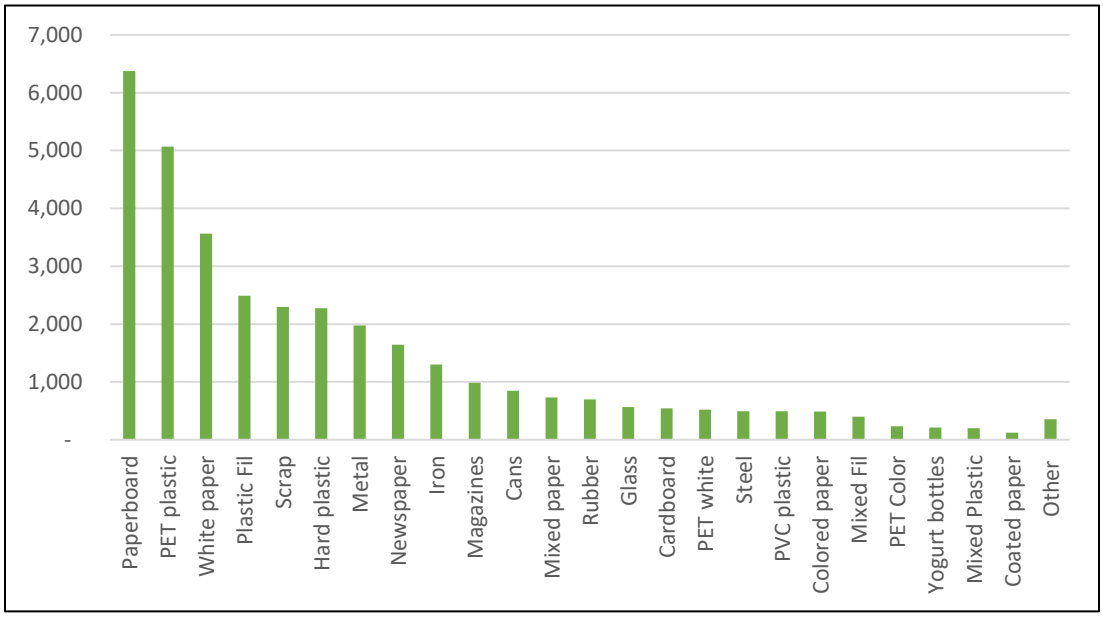
Figure 16: Photos of High Capacity CARRs

At this point in the process, many of these enterprises are operating at a high enough capacity that they are operating as Marketers and have partnerships with large firms, such as bottling companies like San Miguel Industrias, the top bottling company in Latin America. These CARRs have agreements with local governments for official routes and services, thereby gaining access to long-term supplies of recyclable materials in residential and business neighborhoods. These partnerships guarantee a steady supply of recyclable materials and many firms have committed to continuing to work with Ciudad Saludable associations and increase their supply to the CARRs. As seen in the photos above, these CARRs have access to technology and infrastructure that ease the burdens around collection, storage, and processing, but still have room for growth through increased investment. Ultimately, CARRS at "high capacity" have the opportunity to take greater ownership of the market and optimize their services.

Opportunity Spotlight – For both low and high capacity CARRs, there is a need for stronger infrastructure, access to upgraded and new technologies, access to capital, and improved buyer relationships. There are unique opportunities for both low and high capacity CARRs to capture a larger share of the market and become more competitive in Stage 3 (Commercialization), Stage 4 (Conditioning), and Stage 5 (Transformation) in the value chain.

As part of this assessment, we surveyed 4 Waste Picker Associations and 21 CARRs about their existing operations, challenges, and opportunities for expansion. A summary of collected responses can be found in Annexes 7, 8, and 9. The majority of those surveyed were Low Capacity CARRs with an average operating and storage space of approximately 70 square meters, processed approximately 1.2 tons of recycled material per month, and employed 10 people. The primary materials collected and stored are Paperboard, PET Plastics, White Paper, Plastic Fil, and Scrap. Of the 16 CARRs surveyed, they collectively process approximately 34,900 kilograms per day. Based on a financial analysis of their operations, their annual income ranges between $35,000 and $150,000 per year. An overview of the surveyed CARRs financials can be found in Annex 10. The Associations and CARRs surveyed highlighted the challenges often associated with Intermediaries.

Figure 17: Materials Processed Per Day of Surveyed CARRs, Kilograms



Most CARRs surveyed operate within the Commercialization Stage (#3) of the supply chain, limiting their operations to the purchase, storage, and sale of recycled materials. While some CARRs do some types of conditioning such as cleaning or pressing (Stage #4) and others take part in the Transformation Stage (#5) such as chopping of PET materials, the majority remain engaged in Commercialization Stage (#3) of the supply chain.

A common reason for their lack of engagement in Stage #4 and Stage #5 is due to their small size and limited financial and business capacity. For example, many CARRs operate with very minimal working capital. With such low working capital balances, it is clear that they have little ability to plan for unexpected expenditures, save for future growth including moving to large locations or purchasing equipment, or even sufficiently manage

daily operations. With a slightly higher working capital balance, they would have the flexibility to ride out market price fluctuations by choosing to store their recyclable material for longer periods of time rather than having to sell them immediately in order to keep operations moving. Furthermore, many have limited avenues in which to address this constraint, as most have not accessed formal credit mechanisms. The reasons cited for not pursuing bank loans were a lack of familiarity with the banking system and how to engage in it, limited use of bank accounts, and for those that do not own their properties, a lack of collateral to secure financing. Of those surveyed, only 7 CARRs – all in Lima – have accessed a bank account.

With limited financial flexibility, these entities are stuck in their current state of operations – unable to store more material, even if they could collect it, unable to process material because they do not have the financing to purchase the needed equipment, and unable to secure higher price points for their materials because they cannot generate the volume needed to partner with the larger Marketers and Industries or Exporters. That being said, it is clear that they have the potential to address all of these constraints and are primed to do so with the right package of investment, technical assistance, and market access. For example, based on our analysis, a typical press has a production capacity of 768 bales per month, which would generate an output of approximately 50 tons per month of PET – significantly expanding these Associations and CARRs current production capacity. With the pre-pressed materials, they could now sell the PET at 1.70 soles/kilo compared to 1.04 soles/kilo of the unpressed plastic. The cost of energy, labor, and machine depreciation would be approximately 0.30 soles/kilo resulting in an additional gain of 0.40 soles/kilo. An average CARR stores approximately 47,000 kilos of PET per month, resulting in an increase in monthly income of as much as 19,000 soles ($5,800). Another example is the conditioning of hard plastic by washing and drying it. Unprocessed hard plastic sells for approximately 1.26 soles/kilo whereas once it has been washed and dried, it can be sold for around 2.60 soles/kilo, more than doubling the price. Additional conditioning processes include chopping, grinding, and packing recyclable material all of which can result in larger portions of the value chain being captured by CARRs. A summary of the current price points, by material, for the surveyed CARRs can be found in Annex 11.

Figure 18: Constraints to and Opportunities for CARR Growth

Goals	Practical Challenges	Solutions
Increase Supply of Collected Material	Inadequate Facility Space	- Larger spaces - More efficient layouts, - Dedicated spaces for processing stages such as storage areas, unloading areas, and separation workspaces, - Improved working conditions including bathrooms and locker rooms
	Insufficient Storage Infrastructure	- Stacking and modular containers - Scaffolding and ladders - More efficient layouts - Equipment to condense size of materials (i.e. pressing, grinding, compacting, etc.)
Increase Processing Volume Increase Processing Capacity	Insufficient Technologies	- Vehicles (i.e. trucks, scooters, and *motofurgones*) for expanded collection capacity - Processing equipment (i.e. pressers, washers, shredders, compactors, segregation tables, carts, and scales) - Office equipment (i.e. desks, computers, printers, smart phones, Internet access) - Digital Financial and Payment Systems - Bank Accounts - Computers for Electronic Records
	Inadequate Safety Equipment	- Protective uniforms, including masks, gloves, boots, and aprons - Trainings on how to use safety equipment and its importance
Strengthen Relationships with Buyers	Weak or Insufficient Technical Capacity	- Technical training and assistance on new technologies, business management, government engagement, marketing and buyer relationships, and safety procedures for complex materials
	Insufficient Working Capital	- Bank Accounts - Financing
More Favorable Buyer Contracts	Insufficient Volumes and Quality for Large Buyers	- Pool collected materials with other CARRs to increase volumes - Vehicles for expanded collection capacity - Large physical spaces - Efficient use of existing spaces - Technical trainings on processing including proper sorting techniques and equipment operation - Vehicle licensing and registration (for transport to buyers)

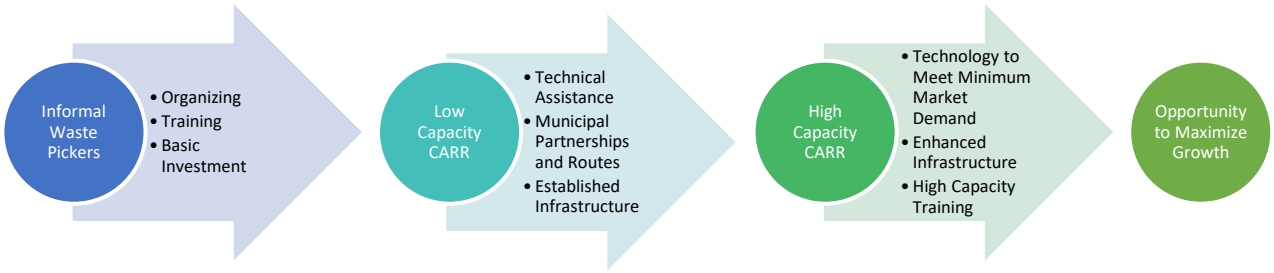
More broadly speaking, Associations and Low Capacity CARRs are unable to capture a larger share of the value chain and position themselves for growth. The various stages of professionalism influence their sustainability and dependency as legitimate actors in the value chain as purchasers seeking to work with formal, professionalized enterprises with a high capacity to meet demand and increase the value of the recyclable product. As supply continues to increase and the demand for recycling and recyclable materials grows, CARRs face the opportunity to meet the discrepancy between collected recyclable materials and the market head on. Many CARRs rent machinery and equipment for sorting and processing recyclable materials for several years, an expensive and labor-intensive process. Investments in basic technologies to maintain activity and in new equipment that handles more diverse materials, such as conveyor belts, hydraulic presses, and automatic compactors, broadens the economic activity and sustainability of the CARR. Formalizing their operations by creating bank accounts, digitizing financial records, and creating electronic invoicing system strengthens their management practices, increases efficiencies, and positions them to access financing and larger buyers who operate exclusively with online payment systems. A list of the buyers of surveyed CARRs can be found in Annex 12. CARRs operating at a higher capacity also have room for growth and improvements through linkages to larger buyers, expanded collection routes and processing capacities, and improved business management practices. The opportunity to meet market demand is within reach.

Opportunity Spotlight – Both Low and High Capacity CARRs serve a critical role in formalizing and professionalizing both the Recycler and Intermediary segment of the recycling value chain. With the right combination of targeted investment, technical assistance, and market facilitation, Low Capacity CARRs have the potential to scale up to High Capacity CARRs, thus capturing larger portions of the value chain. High Capacity CARRs have an opportunity to expand their reach, partner with larger and more professional buyers, and continue to grow the profitability of their enterprises.

OPPORTUNITY TO CREATE CARRS

In addition to enabling the growth of existing CARRs, there is an opportunity to invest in and develop new Collection Centers. The development of new CARRs shifts the formalization of the waste management system one step closer to meeting and strengthening market demand, finishing the circular economy, and strengthening the waste management sector as a whole. Associations entering the market seek to professionalize and diversify activity at the base of the Pyramid, and require robust infrastructure, equipment and technology, and training and leadership to achieve economic activity and develop into sustainable microenterprises.

Figure 19: CARR Lifecycle



The shift from informal recycling to becoming part of the formalized, collector tier begins with the recruitment and organization of at least five informal waste pickers working at dumps and in public spaces, into Waste Picker Associations with formal leadership structures, management processes, and government recognition. Informal recyclers are drawn from poor and vulnerable sectors of society seeking the relatively easy, albeit hazardous, access to waste and the immediate value associated with its sale. With poor opportunities and insufficient earnings, informal pickers are unrecognized and unprotected actors in the waste management system – despite playing an obvious, critical role in the market.

During the formalization process, Associations are trained to meet the requirements established by Law 29419 as well as municipal and district requirements. In addition, the formalization process addresses personal, familial, health and other challenges workers face, as well as the governance and organizational capacity necessary to run a successful recycling microenterprise and link with secondary value chain actors, including sourcing agents, recycling companies, and exporting firms.

Once formalized and licensed by the government, each Recycling Association is linked to a Collection Center, or CARR, that handles collection management, storage, and

separation of products. The lifecycle of onboarding new CARRs begins with the transition of informal waste pickers into organized associations that grow into financially sustainable businesses and moves through a certification process regulated by the municipal government. On average, it takes 2 months and a minimum working capital of $400 USD to formalize and certify a Waste Picker Association.

One of the main benefits of becoming a formally registered Association is the possibility of entering into agreements or contracts for recycling programs and routes that include participating households or businesses that implement separation at source waste disposal. The breakdown of goods in households, commercial offices, factories, and public waste bins, raises the productivity and incomes of waste pickers. This linkage not only expands the window of business opportunities and social inclusion for the recyclers, but also adds value to recovered waste and strengthens the recycling and waste market. Furthermore, after the formalization and licensing process, Centers gain access to funds from Peru's *Fondo de Garantía Empresarial* (Entrepreneurial Fund, or FOGEM) and the ability to participate in the export market.

As a critical economic group in the recycling chain, waste pickers' activity has substantial economic impact that is currently being lost. Incorporating informal waste pickers into the waste management and recycling system enables the expansion of Peru's recycling sector and presents the opportunity for Peru to overcome the discrepancy between formal collection and informal activity, as well as empower marginalized workers. In partnership with governments, the municipality provides the regulatory and legal framework for operation while waste pickers provide labor. Strengthening and formalizing the capacity to link to private and public sources is intricately linked to long-term sustainability of these enterprises; through partnerships with local governments and firms, the CARRs are recognized as formal entities operating in the waste management sector and have agreements with local governments for official routes and services, therefore gaining access to long-term supplies of recyclable materials in residential and business neighborhoods. In addition, by formalizing and organizing into associations or cooperatives, waste pickers secure economic enfranchisement, social benefits, and gain more equitable participation in the market.

Similar to "low capacity" CARRs, these Associations require an infusion of both working capital and technical assistance to strengthen the culture of recycling, while enhancing the capabilities of their members by providing them with the technical knowledge and access to succeed. For an Association to grow into a sustainable Intermediary-level microenterprise that handles high-level and high-volume collection, storage, processing, and/or transformation, workers must have the technical expertise on health and sanitation, inclusive recycling, and business management practices. In addition to

technical skills, workers require personal protection equipment to not only protect the recyclers from the innate hazards of their work, but also help add creditability and legitimacy through the uniformity and professionalism of the equipment. Other activities, such as creating linkages with local governments to help recyclers access existing public health services and government programs such as Seguro Integral de Salud (SIS), Peru's public health system, and Pensión 65, the state-run pension program, empower the recyclers with the necessary resources and skills to work with dignity and embeds their work in a formal, organized labor sector with public and private support.

Opportunity Spotlight – Given the untapped supply of recyclable materials, the creation of new CARRs enables inclusive economic growth for informal waste pickers and transitions them into formal Associations operating high functioning social enterprises. With its grassroots nature, minimal investment requirements, and established model, the creation of new CARRs is an extremely viable opportunity to expand the number of profitable, small and medium enterprises in the recycling sector.

SECTION 3: OPPORTUNITY LANDSCAPE

In recent years, authorities at the local and national levels within various countries across Latin America have experienced growing concerns over how they can undertake integrated waste management with a focus on sustainability and social and economic inclusion.

The growing commitment to green city management in Latin America is driven by policy priorities related to the social, health, and environmental impacts of high urbanization rates and renewed social responsibility practices. Over the last ten years, in efforts to keep pace with rapid expansion, cities across the region have moved to strengthen waste management to optimize growth patterns. Despite this, recycling is still limited, with less than 3% of solid waste generated in Latin America separated at the source and recycled. Recycling activities performed by informal waste pickers – the majority of whom are poor and socially marginalized – are responsible for up to 90% of the recyclable waste recovered from the waste stream.

Informal recycling has become an employment opportunity for thousands of people operating at varying tiers of the recycling actors pyramid. Despite their importance in the value chain, they face numerous obstacles to growth and professionalization. Across the region, common challenges for Recyclers range from dangerous working conditions and lack of access to social and health services, inadequate access to financial services, as well as legitimacy, and inconsistent volume collection – and thus, earnings. These constraints carry over to other tiers of actors, including Intermediaries, who are similarly hampered from growth due to informal operations, inconsistent supplies, and a lack of investment.

In response to these challenges and building upon a regional commitment to social and economic development and environmental sustainability, countries such as Peru, Colombia, and Brazil have developed inclusive policies and legal frameworks to drive the implementation of integrated and inclusive sustainable waste management systems. These frameworks aim to not only recognize the entire recycling value chain and waste management sector, but also empower key stakeholders including recyclers, municipalities, and firms to create efficient, responsible recycling systems.

OPPORTUNITIES OVERVIEW

For the purposes of this report, GFI and Ciudad Saludable assessed the multiple programs, priorities, and market machinations associated with the formalization process and the micro and small recycling enterprises within the recycling value chain. The goal of this assessment process was to identify opportunities to significantly expand market and

enterprise growth in the recycled waste value chain. From this assessment, three areas of opportunity were identified to engage the sector and launch, formalize, and further capacitate key market actors and enterprises. Each opportunity may be considered independently, but there are links between each, and combined they represent a significant chance to transform waste management system in Peru to a truly integrated locally owned, market-oriented system.

Opportunity 1: Formalize Recyclers

Given that the majority of Peru's more than 109,000 recyclers are informal workers, there is a clear opportunity to expand engagement with these actors to integrate them into the formal waste management framework. Recyclers are already entrenched in the recycling value chain of Peru, providing a key first link in the chain of recycled waste moving from dumps to Intermediaries, Marketers, and Industries and Exporters. In some municipalities, Recyclers represent one of the only providers of recycled waste collection, but they still operate at the margins and in deplorable conditions despite this key role.

For Recyclers, the primary opportunity is to support their formalization into Waste Picker Associations, which can operate as micro-enterprises. The formalization process recruits informal waste pickers and addresses personal, familial, health and other challenges workers face, as well as the governance and organizational capacity necessary to run a successful micro-recycling enterprise. These Associations are linked with secondary value chain actors, including sourcing agents, recycling companies, and exporting firms. As formal workers, they are able to access healthcare and social security as well as participate in vaccination programs run by government agencies.

There is also a unique opportunity to strengthen financial inclusion of Associations and their Members, the majority of whom are unbanked and rely on cash transactions. Overcoming this challenge early, coupled with financial literacy training, can lead to improved management of personal finances including increases in savings and planning for future expenses for Members as well as improved financial management, capital accumulation, and expanded investments for the enterprises.

Opportunity 2) Invest in Recycling Enterprises (CARRs)

Over time, the formalized Waste Picker Associations develop into higher function enterprises called Centros de Acopio de Residuos Reciclables (CARRs). These Centers function as legally recognized micro-enterprises with significant opportunity for valorization. Section Two of this report provided a detailed overview on the CARR model, but in summary, CARRs are innovative social enterprises that advance a culture of inclusive recycling by delivering comprehensive services that contribute to the incomes of waste pickers, deliver vital environmental services, provide materials for local industries, and

generate sustainable livelihoods for low-income citizens. CARRs are able to go beyond the storage of collected materials and take part in various stages or processing such as pressing, washing, chopping, thus capturing larger portions of the value chain and selling to Marketers, Industries, and Exporters at higher prices and larger volumes.

Given the innovative and inclusive model of CARRs, there is significant opportunity to expand the CARR model. Ciudad Saludable has launched approximately 35 CARRs over the past ten years with each social enterprise able to service as many 14,300 households, collect as much as 70 tons per month, and provide incomes to as many as 200 waste pickers. While each enterprise can operate with a significant footprint, there is room to grow the existing capacity of the CARRs. For example, investments around organizing waste pickers and expanding collection routes of Associations will increase the supply of collected materials while also establishing a reliable income for waste-pickers. Investments and technical assistance to improve the capacity and efficiency in the collection, treatment, and business management of the CARRs will help increase processing volume, reduce costs, and increase sale prices. In addition, stronger financial inclusion of CARRs coupled with improved financial management practices and technologies can help improve efficiencies, financial planning, and access to financial services. Finally, strengthening the link to private and public sources is intricately linked to long-term sustainability of the CARRs. Partnerships with municipalities create reliable sources of supply while providing value services to the community and an income for the waste-pickers. Direct linkages and strong buyer relationships with Marketers, Industries, and Exporters provide diverse sources of income for the enterprises as well as opportunities for collaboration such as buyer investment in appropriate technologies so the CARRs are better positioned to meet their needs.

In addition to investments in the existing CARRs, there is significant room for expansion of the CARR model. The majority of CARRs operate in and around the suburbs of Lima, however, the model is not restricted to those geographic areas and could easily be applied across Peru as well as the region more broadly.

Opportunity 3) – Engaging Intermediaries

Approximately 90% of the supply chain is represented by Recyclers and Intermediaries. Despite the significant volume processed by these actors, the overwhelming majority of both Recyclers and Intermediaries in Peru operate informally and at a relatively small scale. This has limited their ability to take advantage of the growth of the recycling sector, including selling larger quantities to buyers and capturing additional parts of the value chain.

There are over 13,000 Intermediaries, the majority of which are informal enterprises that trade in the market of recycled waste and operate in municipalities throughout Peru. They tend to operate on the fringes of the value chain and are often considered predatory in their treatment of waste pickers and furtive in the operation of their businesses, but they are also entrenched in the recycling sector. Intermediaries can be found in nearly every municipality in Peru and most have been working in the recyclable waste sector for multiple generations. Most are microenterprises that store and trade materials that have been collected by waste pickers or dropped at their facilities by households or businesses. They tend to work on a cash basis and on a slim margin, and many supplement their income from their recycling enterprises with other work. These enterprises have similarities to low-capacity CARRs in terms of their facilities, their operations, and the markets they engage. However, they lack the advantages CARRs have secured through partnerships with municipalities and the market facilitation led by CS.

By targeting locations that are not currently served by CS associations, and where municipal buy-in is high, there is an opportunity to capacitate Intermediaries and integrate them into a tailored municipal waste management scheme highlighted in the CARR model. Leveraging market opportunities to organize Intermediaries has already proven effective in at least a handful of efforts CS has led. In one highly successful example, CS organized a set of Intermediaries working in scrap metal to collectively sell to Siderperu, a subsidiary of the Brazilian transnational steel company Gerdau. Each of the independent scrap collectors were required to organize into registered micro and small enterprises (MYPE) to facilitate the agreement, which in turn required them to comply with labor provisions and occupational health and safety requirements. Using this model, CS successfully organized 36 independent MYPEs capable of operating with some of the advantages CS has enabled for CARRs.

In summary, because of the potential for growth, all three groups of actors identified – Recyclers, CARRs, and Intermediaries – are well positioned to be formalized and capacitated through the right combination of investment, technical assistance, and market facilitation to help them overcome the constraints that have limited their size and growth potential. Empowering these tiers of actors in the value chain is critical to supporting inclusion, improving working conditions and decent work, and strengthening the sector overall.

CONCLUSION

In its 15 years of work, Ciudad Saludable has demonstrated an unprecedented capacity to generate progress with diverse stakeholders, ranging from informal waste pickers, to government and the market actors at all levels of the recycled waste value chain. Their model and innovative interventions have proven highly adaptable to local conditions and context, but securely integrated into the larger market and regulatory framework in which they operate. As a result, they have earned international recognition for their work and are highly regarded for their leadership and guidance within Peru and throughout Latin America.

In Peru, their advocacy, education programs and public engagement have reached an estimated 9.5 million Peruvians directly or indirectly. Through the regulatory reforms they helped write and pass, they have established a model for locally-led solid waste collection and environmental stewardship that impacts the country as a whole. Through this model, they have organized over 11,500 recyclers into independent associations and enterprises and have launched 35 profit-making, collectively owned microenterprises servicing hundreds of thousands of households and businesses in Peru. These impeccable credentials and proven experience have positioned CS to launch a new phase of work aimed at transforming the value chain for recyclable waste in Peru.

Only 14% percent of waste is recycled in Peru and merely a small percentage of recyclable waste is collected from households and business annually, yet the domestic market for recyclable waste grows each year. These conditions point to an opportunity to expand the CS model and engage informal market actors including waste pickers and Intermediaries who are positioned to operate within the municipal waste collection framework CS has created. By building on CS's successful model of inclusive recycling, formalizing micro enterprises, and expanding market access, there is a meaningful opportunity to transform the waste management sector in Peru.

ANNEXES

ANNEX 1 – GLOSSARY OF TERMS

Circular Economy - The creation of value is not limited to the final consumption of resources, it considers the entire life cycle of goods. The regeneration and recovery of resources within the biological or technical cycle must be efficiently procured, as the case may be.

Collection – The act of collecting waste and transferring waste using appropriate means of transportation, and then continue its subsequent management, in a sanitary, safe, and environmentally appropriate manner.

Comprehensive Waste Management - Any technical administrative activity of planning, coordination, coordination, design, application and evaluation of policies, strategies, plans and action programs for the proper management of solid waste.

Dump - Inadequate accumulation of waste in roads and public spaces, as well as in urban, rural or vacant areas that generate sanitary or environmental risks. These accumulations exist outside the Law and lack authorization.

Eco-design - Design of products, packaging, labeled packaging or others, in order to minimize material impacts, throughout its life cycle.

Eco-efficiency - Efficient use of raw materials and supplies in order to optimize production processes and the provision of services, and to reduce environmental impacts.

Eco-labelling - Environmental information mechanism, whose purpose is to communicate to potential consumers the environmental aspects and benefits of a product or service, with the purpose of encouraging the consumption of those products or services that generate less negative impacts on the environment. Within the eco labeling you can incorporate the certifications or qualifications with which the product counts.

Extended Producer Responsibility - REP: It is an approach under which manufacturers, importers, distributors and traders manufacture or use products or packaging with eco-efficiency criteria that minimize the generation of waste and / or facilitate its recovery, taking advantage of resources in a sustainable manner and by minimizing their impact on the environment, they are responsible for the product throughout its life cycle, including the postindustrial and post-consumption phases.

Generator - Natural or juridical person that, by reason of its activities, generates waste, be it as a manufacturer, importer, distributor, merchant or user. The possessor of hazardous waste is

also considered a generator, when the real generator and the municipal governments cannot be identified from the collection activities.

Minimization - Action to minimize the generation of solid waste, through any preventive strategy, procedure, method or technique used in the generating activity.

Municipal Collection Center - Infrastructure destined to store non-hazardous solid waste that is recovered within the framework of segregation programs in source and selective collection or extended responsibility of the producer

Prioritized goods - Those goods that require special handling at the time of becoming waste, since these can be valued or require differentiated management for their final disposal. The Principle of Extended Producer Responsibility is applied to these goods, making the producer responsible for the entire life cycle of the product.

Producer - Manufacturer, importer, distributor and merchant of goods, whose responsibility extends during the life cycle of the good.

Product Life Cycle - Are the consecutive and interrelated stages of a product system, from the acquisition of raw material or its generation from natural resources to the final disposal. The stages of the life cycle include the acquisition of raw materials, design, production, transport / delivery, use, end-of-life treatment and final disposal.

Protection of the environment and public health - The integral management of waste includes the necessary measures to protect the individual and collective health of the people, in harmony with the full exercise of the fundamental right to live in a balanced and adequate environment for the development of the lifetime.

Recycling - Any activity that allows a waste to be reused through a process of material transformation to meet its initial purpose or other purposes.

Segregation - Action of grouping certain components or physical elements of solid waste to be managed in a special way.

Selective Collection - Action to collect appropriately the waste that has been previously segregated or differentiated in the source, with the purpose of preserving its quality for valuation purposes.

Shared Responsibility - The integral management of waste is a social co-responsibility, requires the joint, coordinated and differentiated participation of generators, waste operators and municipalities.

Solid Waste - Solid waste is any object, material, substance or element resulting from the consumption or use of a good or service, from which its holder detaches or has the intention or

obligation to dispose, to be managed prioritizing the recovery of waste and in the last case, its final disposition.

Solid Waste Operator Company - Legal entity that provides services for cleaning roads and public spaces, collection and transport, transfer or final disposal of waste. Likewise, it can carry out marketing and recovery activities.

Storage - Operation of temporary accumulation of waste under technical conditions as part of the management system until its recovery or final disposal.

Use of solid waste - Regain a benefit of the good, article, element or part thereof that constitutes solid waste. It is recognized as a recycling technique, recovery or reuse.

Waste Valorization - Any operation whose objective is that the waste, one or more of the materials that compose it, be reused and serve a useful purpose when replacing other materials or resources in the production processes.

ANNEX 2 – RELEVANT LAW AND LEGAL PROVISIONS

Law No. 28611, General Law of the Environment

This Law has as its principles sustainability, environmental responsibility, equity and environmental governance

> *Article I.- Of the fundamental right and duty*
>
> Everyone has the inalienable right to live in a healthy, balanced and adequate environment for the full development of life, and the duty to contribute to an effective environmental management and protect the environment, as well as its components, particularly ensuring the health of people individually and collectively, the conservation of biological diversity, the sustainable use of natural resources and the sustainable development of the country.
>
> *Article III.- Of the right to participation in environmental management*
>
> Everyone has the right to participate responsibly in the decision-making processes, as well as in the definition and application of the policies and measures related to the environment and its components, which are adopted at each level of government. The State specifies with civil society the decisions and actions of environmental management.

Supreme Decree No. 012-2009-MINAM National Environmental Policy

The National Environmental Policy aims to improve the quality of life of people, ensuring the existence of healthy, viable and functional ecosystems in the long term; and the sustainable development of the country, through the prevention, protection and recovery of the environment and its components, the conservation and sustainable use of natural resources, in a responsible manner and consistent with the respect of the fundamental rights of the person. The document also outlines the state policy guidelines on solid waste management, in order to counteract the main environmental problems in Peru, due to the lack of sanitary landfills.

Supreme Decree No. 014-2011-MINAM. National Plan of Environmental Action (PLANAA) 2011-2021:

The PLANAA is a long-term national environmental planning instrument, which is formulated based on a situational environmental diagnosis and the management of natural resources, as well as the country's potential for the use and sustainable use of these resources; similarly, it is based on the legal and institutional framework of the National Environmental Management System.

The PLANAA presents the vision of the country in environmental matters to 2021, its objectives being the same as those proposed in the National Environmental Policy. The goals that have been defined as priorities respond to the magnitude of the environmental problems and management of the natural resources identified in the country; reflect the expected changes to 2021 in terms of: water, solid waste, air, forests and climate change, biological diversity, mining and energy, and environmental governance; that, because of its impact on the quality of life and the development of the country, are of vital importance. Each of these goals can be achieved through strategic actions and activities that will be carried out by the responsible entities and society as a whole in

the three levels of government, which will be evaluated by management indicators and environmental indicators, under the supervision of MINAM.

D.L 1278: Law of Integral Management of Solid Waste

The present Law approved on December 23, 2016, establishes rights, obligations, attributions and responsibilities of society as a whole, to ensure management and management of solid waste, sanitary and environmentally appropriate, subject to the principles of minimization, circular economy, waste valorization, extended responsibility of the producer, shared responsibility and protection of the environment and health. It is applied to the activities, processes and operations of solid waste management and management, from generation to its final disposal, including the different sources of generation of such waste, in the economic, social and population sectors. Likewise, it includes the activities of internment and transit through the national territory of solid waste.

- It incorporates the concept of discard material, in order to promote and boost its use within the production processes, as part of the Product Life Cycle.

- Fuses the EPS-RS (companies providing solid waste services) and EC-RS (companies selling solid waste) in EO-RS (companies operators of solid waste), who may perform services and activities according to their technical, operational and financial capacity, thus promoting private investment.

- It promotes the sustainability of the public cleaning service and investments in infrastructure: subscription of inter-institutional agreements between municipalities and companies that provide public services, for the collection of the service.

- It incorporates the advance classification for solid waste infrastructure projects, in order to reduce the discretion in determining environmental significance by establishing the appropriate category to streamline the environmental certification process.

- It promotes the conversion of waste dumps into waste infrastructures, in order to reduce the gaps in relation to these infrastructures.

- It considers as a non-hazardous waste the sludge from the water treatment plants for human consumption or wastewater, unless the MVCS determines otherwise, in this way it is easier to use it after treatment.

- Regulation of the General Law of Solid Waste, approved by Supreme Decree No. 014-2017-MINAM.

- The present device regulates the DL1278, Law of Integral Management of Solid Residues, in order to ensure that the management and management of solid waste are appropriate to prevent health risks, protect and promote the environmental quality, health and well-being of the human person and the valorization of solid waste.

- Indicates residues that are under municipal jurisdiction, including municipal waste: residential and commercial, SPECIAL MUNICIPAL WASTE: Those that are generated in urban areas, their characteristics and volume require special handling as waste laboratory environmental testing and similar, lubricants, veterinary centers, shopping centers, mass events, demolition waste or remodeling of minor works

- The municipalities must establish a SPECIAL RATE FOR THE HANDLING (includes the collection) of this waste.

The referred Regulation establishes fifteen (15) administrative procedures:

- eight (8) correspond to the MINAM (operators, import, export and transit and definition of dangerousness)
- seven (7) to the Regional Governments, Provincial Municipalities and the National Service of Environmental Certification for Sustainable Investments -SENACE (environmental certification, and approval of projects)

Law No. 27783, Law of Bases of Decentralization

This legal norm establishes the purpose, principles, objectives and general criteria of the decentralization process; regulates the conformation of the regions and municipalities; sets the competencies of the three levels of government and determines the assets and resources of regional and local governments; and, regulates government relations at different levels.

It contemplates in its article 6 the environmental objectives, such as: a) Territorial and environmental regulation, from the approaches of the sustainability of development; b) Sustainable management of natural resources and improvement of environmental quality; and c) Coordination and inter-institutional coordination and citizen participation at all levels of the National Environmental Management System.

Law No. 27867, Organic Law of Regional Governments

The aforementioned Law establishes and regulates the structure, organization, powers and functions of regional governments. Stipulate in its article 53 ° as functions of the Regional Government in environmental matters and territorial planning among others: formulate, approve, execute, evaluate, direct, control and administer the Plans and Policies in environmental matters and territorial ordering, in accordance with the Plans of the Local Governments; also implement the regional environmental management system, in coordination with the regional environmental commissions, etc.

Law No. 27972, Organic Law of Municipalities

The aforementioned legal body contemplates in its article 1 "That local governments are basic entities of territorial organization of the State and immediate channels of neighborhood participation in public affairs that institutionalize and autonomously manage the interests of the

corresponding collectivities, being elements essential elements of local government, territory, population and organization »

Regulates in its article 80 ° the competences and functions related to Sanitation, Health and Health, indicating in literal form in its numeral 1.1 That the Provincial Municipalities, have within their specific exclusive functions «Regulate and control the process of final disposal of solid waste, liquids and industrial discharges at the provincial level ».

Law No. 29029, Law of the Municipal Commonwealth Modified by Law N ° 29341

The aforementioned legal norm is intended to establish the legal framework for the development and promotion of municipal associative relations, as indicated in Article 1.

Regulates in its article 5 the constitution of the municipal commonwealth, contemplating within this article the contributions of the commonwealth indicated in its literal 5-B), that the provincial and district municipalities that intervene in the Municipal Commonwealth make their contributions through financial transfers, in order to provide services or execute the projects for which it was established.

Law No. 26842, Ley General de Salud

It contemplates this Law in its Article V of its preliminary title, which is the responsibility of the State, the protection of environmental health.

Likewise, in its article 96 of chapter IV, it states that, in the disposal of dangerous substances and products, all necessary measures and precautions must be taken to prevent damage to human health or the environment. In addition to this, Articles 99, 104 and 107 of Chapter VIII regulate waste and the responsibility of natural or legal persons not to discharge waste or polluting substances into water, air or soil, recognizing the responsibility of the State against the protection of environmental health.

Law No. 29419, Law regulating the activity of waste pickers

It establishes the regulatory framework for the regulation of recycling workers' activities, oriented to the protection, training and promotion of social and labor development, promoting their formalization, association and contributing to the improvement in the ecologically efficient management of solid waste in the country.

It contemplates in its article 5 ° numeral 5.1) That the activity of recyclers is regulated by local governments as governing entities, within the framework of their attributions. The local regulation regime is aimed at incorporating recyclers as part of the local solid waste management system. Local governments establish norms to promote the activity carried out by non-hazardous solid waste recyclers in coordination with associations of waste pickers registered in their jurisdiction.

Likewise, section 5.2) of the aforementioned article establishes that the programs and projects of solid waste management and management implemented by local governments must include the activity of waste pickers.

It contemplates the numeral 5.3) of the mentioned article 5, that the local governments must create a record of registration of the associations of recyclers, whose members operate in their jurisdiction for the granting of the corresponding authorization and certification, which must also serve for the access of the benefits that are established in your favor. Added to this the numeral 5.4) states that, waste pickers formalized through registration in local governments have the right to exercise their activity within the framework established by this Law and its regulations, solid waste legislation and municipal regulations.

Regulation of Law No. 29419, approved by Supreme Decree No. 005-2010-MINAM

It is a device that regulates the Law N ° 29419, Law that Regulates the Activity of the Recyclers, in order to contribute to the protection, training and promotion of the social and labor development of the workers of the recycling, promoting their formalization, association and contributing to the improvement in the proper management for the reuse of solid waste.

It contemplates in its Article 7, that, in accordance with the Organic Law of Municipalities, the District and Provincial Municipalities, within the scope of its jurisdiction, are responsible for:

7.1) Prepare and implement the Program for the Formalization of Recyclers and Selective Collection of Solid Waste within the scope of their jurisdiction.

7.2) Incorporate into the Comprehensive Plan for Solid Waste Environmental Management (PIGARS) or the Solid Waste Management Plan, as appropriate, the Situational Recycling Study of the scope of its jurisdiction; the Operative Technical Plan for the selective collection of the scope of its jurisdiction; and the Education and Public Communication Program.

7.3) Incorporate a report on the implementation of the Program for the Formalization of Recyclers and Selective Collection of Solid Waste under their charge, as part of the annual reports on the management of solid waste. This report must be submitted to the Ministry of the Environment within the first quarter of each year that is initiated and prepared in accordance with the format set forth in Annex N ° 1 of the Regulation.

7.4) Coordinate with decentralized and decentralized bodies of the Ministry of Health, the implementation of vaccination programs against Tetanus and Hepatitis B, aimed at waste pickers organizations with legal status.

7.5) Implement incentive programs to promote the segregation of solid waste at the source.

7.6) Supervise the activities of segregation and selective collection of solid waste and formalization of recyclers.

7.7) Systematize the records used by recyclers organizations with legal status, referring to the amounts of solid waste that are recycled.

7.8) Conduct the Registry of Authorized Recycling Organizations legally established and registered in Public Registries.

Article 24 of this regulation states in literal form that "The District and Provincial Municipalities, as appropriate, promote the formalization of organizations of recyclers with legal status, who must comply with the technical aspects established in the Regulation, and that must be incorporated into the Program for Formalization of Recyclers and Selective Collection of Solid Waste by the municipality.

It is also the responsibility of the District or Provincial Municipality, in accordance with Article 29 of the Regulations, that based on the Situational Study of Municipal Recycling, design a Technical Operational Plan for Selective Collection, with the participation of recyclers organizations with legal status, with the purpose of standardizing the service of selective collection of solid waste operated by recyclers, as well as to progressively cover the totality of properties located in its jurisdiction.

The District and Provincial Municipalities will promote the formalization of the recycling activity, which includes the promotion of the segregation at the source, the selective collection, the conditioning of solid waste and the promotion of the creation of markets for waste that can be reused, in accordance it is indicated in article 45 of this regulation.

Supreme Decree No. 001-2012, Regulation of waste electrical and electronic equipment

The aforementioned supreme decree regulates a set of rights and obligations for the proper management and environmental management of Waste Electrical and Electronic Equipment (WEEE) through the different stages of management: generation, collection, transport, storage, treatment, reuse and final disposition, involving the different actors in responsible management, in order to prevent, control, mitigate and avoid damage to the health of people and the environment. It also establishes the responsibilities of the actors involved in the management of WEEE and that producers of electrical and electronic equipment (AEE), so that together with the municipalities, WEEE operators and consumers or users of AAE, assume some stages of this management, as part of a system of shared responsibility, differentiated and with an integral management of solid waste, which includes the extended responsibility of the producer (REP).

Supreme Decree No. 003-2013-HOUSING.

Regulation for the management and management of waste from construction and demolition activities

This legal body regulates the management and management of solid waste generated by the activities and processes of construction and demolition, in order to minimize the possible impacts on the environment, prevent environmental risks, protect the health and well-being of the human person and contribute to the sustainable development of the country.

ANNEX 3 – DIRECTORY OF WASTE PICKER ASSOCIATIONS IN LIMA AND CALLAO

DISTRICT	ASSOCIATION	N.º OF ASSOCIATES	PRESIDENT
Ate Vitarte	Asociación de Recicladores Apolo "6 "	6	Cayo Aguilar Herrera
	Asociación de Segregadores 9 de Setiembre	30	Víctor Rojas Puris
	Asociación de Segregadores de Residuos Sólidos Ate Vitarte	6	Teófilo Fernandez Gabril
Barranco	Asociación de Reciclaje de Mototriciclo Virgen del Carmen de Barranco	8	Juan Rojas Guerra
	Asociación de Recicladores y Gestión de Residuos Sólidos Fray Martín de Porres	17	Carlos Fernandez Gallegos
Bellavista	Asociación Reciclando Residuos Sólidos en el Perú	---	Edwin Julián Cajahuanca
Breña	Asociación de Recicladores Nueva Esperanza de Breña	23	Luis Ramos Sallo
	Asociación de Recicladores Vida y Salud	22	Marlo Montoya Virú
	Asociación de Recicladores Los Sauces	-	Edgard Luis Rivera Salvatierra
Callao	Asoc. de Trabajadores Recicladores Independientes del Medio Ambiente Callao	40	Raul Antonio Ochante Alarcón
	Asociación de Recicladores Los Pinos	14	Williams Pacheco Camacho
Chorrillos	Asociación Segregadores José Olaya de Chorrillos	86	Jose Chahuara Larico
	San Pedro de Chorrillos		
Independencia	Asociación de Recicladores Salvemos el Planeta	14	Nieves Cadillo García (Fiscal)
Jesús María	Asociación de Recicladores Jesús María	35	Basilio Gomez Argüís
	Asociación de Recicladores Ntra. Sra. del Sagrado Corazón Cuidando el Ambiente de Jesús María	18	---

La Molina	Asociación de Segregadores y/o Recicladores del Distrito La Molina	---	Doris Mercedes Inga Dionisio
La Victoria	11 de mayo	25	Oscar Eduardo Chapman Álvarez
	Asociación de Trabajadores en artículos Usados "Seriedad y Trabajo"	29	Fernando Pedro Chávez Pardo
	Asociación de Compra y Venta de Artículos usados "Mirando al Futuro"	32	Ernesto Catalino Balboa Sáenz
	Asociación de Segregadores y/o Recicladores Mi Perú	22	Gregorio Vílchez Sullón
Lima Cercado	Asociación de Trabajadores Siempre Unidos Limpieza y Reciclaje	28	Paulino Javier Paucar Larrauri
	Asociación de Recicladores "Segregadores Madre Teresa de Calcuta SAC."	26	Domingo Canelo Talla
	Asociación de Recicladores de Santa Beatriz	20	Manuel Carbajal Peves
	Asociación de Trabajadores Ambientales de Limpieza y Reciclaje	68	Juan Francisco Herrera
	Asociaciones Ambientales Trabajando en Limpieza Reciclaje y Residuos Sólidos	25	Fortunato Cahuana Huamán
	Asociación de Trabajadores Independientes Ambientales y de Recuperación Residuos Sólidos (Orgánicos e Inorgánicos)	12	Alejandro Villa Jaimes
	Asociación de Recicladores Santa Rosa	17	Genoveva Barrios Cárdenas
	Mirones Bajo	5	Eduardo Olivera Rojas
	Asociación de Segregadores Los Picaflores	22	Fortunato Inga Vera
	Asociación Segregadores Unidos y Cachineros	22	Alejandro Anchante Magallanes
	Asociación de Recicladores y Segregadores Antonio Raymondi	-	Carlos Alberto Quispe Pantoja

	Asociación 11 de mayo		Oscar Eduardo Chapman Álvarez
Lince	Asociación de Recicladores Ecológica de Lince	15	Isaac Pedro Gomez Villagaray
Los Olivos	Asociación de Recicladores Vida Verde	98	Maria Elena Diaz Espinoza
	Asociación de Recicladores Flor de Los Olivos	38	Santos Plasencio Altamirano
Lurín	Asociación Mine- Ingenio Artesanal Líder en Reciclaje del Medio Ambiente	6	Cristel Valeriana Astocaza Oncebay
Magdalena	Asociación de Recicladores Magdalena Ecológica	35	César Augusto García Fernandez/José Venturo Castillo
Pachacamac	Asociación de Recicladores Salvemos el Medio Ambiente del Distrito de Pachacamac	6	Juan Alberto Chavez Santamaria
	Corporación Defensa del Medio Ambiente - MANZA	3	Juan Manza Rodriguez
	Asociación de Recicladores Defensores del Medio Ambiente Zona Manchay	32	Gregorio Soto Ccarhuanayocc
Puente piedra	Asociación de Recicladores La Unión	-	José Galloso Monteblanco (Vicepresidente de Federación)
Punta Hermosa	Asociación de Recicladores Residuos Sólidos Punta Hermosa	7	Alexandra Verónica Márquez Cconochuillca
Rímac	Asociación Metropolitana de Lima Trabajadores Micro Empresarios de Residuos Sólidos	4	Apolicarpio Montiveros Sosa(ACT)
San Bartolo	Asociación de Recicladores Cruz del Sur	---	Julio Martin Rodriguez
San Isidro	Asociación de Segregadores y Recicladores La Unión	45	Juan Quispe Pantoja
San Juan de Miraflores	Asociación de Recicladores del Cono Sur	32	Eloy Quispe Apaza
	Asociación de Recicladores del Sector de Pamplona Alta	25	Elizabeth Narrea Gomez
	Asociación de Recicladores Unión y Progreso Ambiental	42	César García Barzola

	Asociación de Recicladores y Especialistas Ambientales	15	Ysabel Cupe Espinoza
	Asociación de Recicladores Señor de Los Milagros de Miraflores	17	Genaro Duran Contreras
San Luis	Asociación de Segregadores de Residuos Sólidos, Virgen del Carmen de San Luis	25	Raúl Suarez Ruiz
	Asociación de Segregadores de Residuos Sólidos San Luis Ecológico	20	Carlos Enrique Pure Rosas
	Asociación de Recicladores San Luis Saludable	15	Jorge Luis Tello Bendezú
	Asociación de Segregadores San Luis Unidos	9	Teodosia Jurado Escobar
San Martin de Porres	Asociación de Recicladores Guardianes del Medio Ambiente	15	José Bendayán Amasifuen
	Asociación de Recicladores en Defensa de la Ecología y el Medio Ambiente	20	Jorge Pérez Liñán
	Asociación de Recicladores Veladores del Hábitat y la Vida	14	Eugenio Huanca Queque
	Asociación de Recicladores Nueva Vida	7	Andres Millán Meza
	Asociación de Recicladores Sol Naciente	7	Percy
San Miguel	Asociación de Recicladores de San Miguel	19	Melitón Ángelo Sánchez Zambrano
Santa Anita	Asociación Grupo Cono Este	13	Juan Cancio Hauayllani Llanca
Santa Anita	Asociación de Segregadores y Recicladores Señor de Los Milagros del Distrito de Santa Anita	---	Andres Cortez Huamán
	Asociación de Recicladores Mi Santa Anita Limpia	11	Pedro Henry Quivio Gomez
Surco	Asociación de Recicladores Ambientales Santiago de Surco	41	Jose Luis Reyna Huapaya
Surquillo	Asociación de Recicladores 11 de abril	33	Alex Idelfonso Chahuin
Ventanilla	Asociación Ángeles Recicladores de Ventanilla	---	---

	Asociación de Recicladores Antonio Moreno de Cáceres	---	Santos Córdova Hilario
Ves	Red de asociaciones de Recicladores Ambientales de Villa El Salvador	---	Justo Isidoro Paucar Quispe
	Asociación Ecológica Recuperar	7	Domitila Carrasco Hoyos
	Asociación Virgen del Carmen VES	4	Nicanor Serrudo Cáceres
	Asociación Sembrando Vida VES	8	Yolanda Aguilar Ortiz
	Asociación de Recicladores Ambientales Tigres de las 200 Millas	5	Justo Isidoro Paucar Quispe
	Asociación Civil Ambiental Las Águilas	14	Julián Espinoza Duran
	Asociación Ecológica Villa del Mar	6	Jorge Luis Berrios Inga
	Asociación Red Ambiental Cono Sur	5	Ramiro Cardozo Carrasco
	Asociación Cambio de Vida en Avance	7	Yolanda Socorro Armas Mamani
	ARUMA	7	José Vargas Palomino
Villa María del Triunfo	Asociación de Recicladores Las Palmeras del Distrito de Villa Maria del Triunfo	11	Jose Vargas Palpa

ANNEX 4 – FINANCIAL CAPACITY OF MAJOR BUYERS

A brief financial analysis was completed for the four major buyers of recycled materials in Peru. For each company, their credit risk, purchasing capacity as measured by their working capital and solvency ratios, and debt ratios was analyzed. A summary of that analysis is provided.

Company	Primary Product	Current Assets	Current Liabilities	Working Capital	Solvency Ratio
Kimberly Clark	Paper	431,097,000	262,352,000	168,745,000	1.64
Owens Illinois	Glass	35,396,520	18,975,445	16,421,075	1.87
PROTISA	Paper and Cardboard	284,177,000	135,857,000	148,320,000	2.09
San Miguel PET Industries	PET	96,861,000	39,594,000	57,267,000	2.45

Company	Primary Product	Accounts Payable (Short term & Long Term)	Total Liabilities	Debt Ratio
Kimberly Clark	Paper	227,269,000	1,145,882,000	19.83%
Owens Illinois	Glass	31,632,929	106,450,369	29.72%
PROTISA	Paper and Cardboard	151,715,000	580,814,000	26.12%
San Miguel PET Industries	PET	225,191,000	409,844,000	54.95%

Kimberly Clark Peru S.R.L. (Paper)

Conclusion: The Company has a good financial and economic position to face its commercial obligations, although they are not taking advantage of their financial position

Owens Illinois Peru - (Glass)

Conclusion: The Company has a good financial and economic position to face its commercial obligations, although they are not taking advantage of their financial position

Productos Tissue del Perú S.A - PROTISA (Paper and Cardboard)

Conclusion: The Company has a good financial and economic position to face its commercial obligations, although they are not taking advantage of their financial position

San Miguel PET Industries -SMI (PET)

Conclusion: The Company has a good financial and economic position to face its commercial obligations and is within its respective borrowing parameters (40% to 60%).

ANNEX 5 – PERUVIAN EXPORTING COMPANIES

Exporting Company		Type of Reusable Materials Exported		
1	LATIN PLASTIC SOCIEDAD ANONIMA CERRADA	Aluminum	Iron and Steel	Copper
2	VIDRIERIA 28 DE JULIO S.A.C.	Aluminum		
3	INVERSIONES METAL SAN JUDAS TADEO S.A.C.	Aluminum	Copper	
4	RECICLAJE INDUSTRIAL METAL E.I.R.L.	Aluminum	Copper	
5	TEMA SCRAP E.I.R.L.	Aluminum	Iron and Steel	Copper
6	FIERROS &METALES N.J.D. S.A.C.	Aluminum	Copper	
7	RESIKLA S.A.C.	Aluminum		
8	J.L. APEX E.I.R.L.	Aluminum	Iron and Steel	Copper
9	EMANUEL GLOBAL RECYCLING SOCIEDAD ANONIMA	Aluminum		
10	GRUPO AMBIENTUM ECOLOGIC S.A.C.	Aluminum		
11	RECUPERACIONES Y REPRESENTACIONES NEGOCI S.A.C. R&RNEGOCI S.A.C.	Aluminum		
12	CLARO RECICLADO SOCIEDAD ANÓNIMA CERRADA	Aluminum		
13	INVERSIONES BRISA SOCIEDAD ANÓNIMA CERRADA	Aluminum	Copper	
14	J.A.V. SCRAP E.I.R.L.	Iron and Steel		
15	J Y METALES S.A.C.	Iron and Steel		
16	INVERSIONES Y COMERCIOS R&C S.A.C.	Iron and Steel		
17	ACEROS Y METALES DEL SUR E.I.R.L.	Iron and Steel		
18	TRADI S.A.	Iron and Steel		
19	ALSU E.I.R.L.	Iron and Steel		
20	BOGO CORP E.I.R.L.	Iron and Steel		
21	CORPORACION AUTO CAT S.A.C.	Iron and Steel		

22	ALGAS MULTIEXPORT DEL PERU S.A.C.	Iron and Steel		
23	COMER Y SERV DE ACCESORIOS NACIONALES S.A.C.	Iron and Steel		
24	TECNOFIL S.A.	Copper		
25	CORPORACION DE RESIDUOS SÓLIDOS DEL PERÚ S.R.L.	Copper		
26	MAQUINARIAS Y METALES KANIS SOCIEDAD ANÓNIMA	Copper		
27	RECICLADORES INTERNACIONALES DE METALES PERÚ S.A.C.	Copper		
28	INVERSIONES JAVO S.A.C.	Copper		
29	RECICLAJE Y MATERIALES E.I.R.L.	Copper		
30	FÁBRICA DE ENVASES S.A.	Copper		
31	PROVESUR S.A.C.	Paper		
32	PAPELERA DEL PERÚ S.A.C.	Paper		
33	PIERO S.A.C.	Paper		
34	CEPA HAROLD BRYAN E.I.R.L.	Paper	Plastic	
35	RECICLADORA ECOLÓGICA DE DETRITUS URBANO	Paper		
36	KIMBERLY CLARK PERU S.R.L.	Paper		
37	DEKA PLASTICS S.A.C.	Plastic		
38	IBEROAMERICANA DE PLÁSTICOS S.A.C.	Plastic		
39	DESPEGUE S.A.C.	Plastic		
40	IR PLASTIC RECYCLING &TRADING S.A.C.	Plastic		
41	PLASTIC & METALS PACIFIC S.A.C.	Plastic		
42	KING WA TANG S.A.C.	Plastic		
43	PRIME PLASTICS S.A.-PRIPLAST S.A.	Plastic		
44	ECOVERDE S.A.C.	Plastic		

45	PERUANA DE MOLDEADOS S.A.	Plastic		
46	RECICLAMAX S.A.C.	Plastic		
47	AMCOR PET PACKAGING DEL PERÚ S.A.	Plastic		
48	NEW PÉT METAL PERU S.A.C.	Plastic		
49	SADENEST E.I.R.L.	Plastic		
50	C&CC INTERNATIONAL S.A.C.	Plastic		
51	MUNDO VERDE S.A.	Plastic		
52	INVERSIONES ALESEAR S.A.C.	Plastic		
53	PUNTO LIMPIO E.I.R.L.	Plastic		
54	CORPORACION MIYASATO S.A.C.	Plastic		
55	MIN-TRUJILLO E.I.R.L.	Plastic		
56	ALPHA VISTA E.I.R.L.	Plastic		
57	INDECO S.A.	Plastic		
58	PERUPLAST S.A.	Plastic		
59	SAN MIGUEL INDUSTRIAS PET S.A.	Plastic		
60	CETCO S.A.	Plastic		
61	ENVA EXPORT PREMEX S.A.C.	Plastic		
62	ALLPA S.A.C.	Plastic		

ANNEX 6 – SUMMARY OF EXPORTS AND IMPORTS

Paper

Of the 64 million tons of paper exported in 2016, the top five destination countries were the United States, Germany, the United Kingdom, Japan, and the Netherlands. Their combined exports represent 58% of total exports.

Export of Paper (Volume and Price)					
		2015		2016	
		Volume (tons)	Price (USD/kg)	Volume (tons)	Price (USD/kg)
1	USA	19,838,396	0.16	20,002,068	0.16
2	Germany	4,299,288	0.27	4,421,283	0.27
3	UK	4,920,776	0.16	5,023,909	0.15
4	Japan	4,269,758	0.18	4,147,215	0.18
5	Netherlands	3,217,412	0.19	3,227,107	0.19

Plastic

In 2016, total exports of plastics were approximately 26.2 million tons. The top five countries, representing approximately 41% of those exports were Hong Kong, the United States, China, Germany and Japan. If you combine Hong Kong and mainland China, they represent approximately 20% of annual exports alone.

Exports of Plastic (Volume and Price)					
		2015		2016	
		Volume (tons)	Price (USD/kg)	Volume (tons)	Price (USD/kg)
1	Hong Kong	2,865,686	0.33	2,879,955	0.33
2	USA	2,370,360	0.54	2,234,865	0.51
3	China	2,133,466	1.01	2,219,665	0.89
4	Germany	1,821,537	0.52	1,901,338	0.45
5	Japan	1,720,237	0.44	1,633,445	0.41

Metal

Of the approximate 105 million tons of metal exported in 2016, the top five destination countries were the United States, Germany, Japan, the United Kingdom, and France representing approximately 47% annual exports with the USA accounting for 14.6% alone.

Export of Metal (Volume and Price)					
		2015		2016	
		Volume (tons)	Price (USD/kg)	Volume (tons)	Price (USD/kg)
1	USA	15,366,735	0.71	14,999,906	0.63
2	Germany	9,789,195	0.69	10,150,978	0.58
3	Japan	8,321,971	0.41	9,216,327	0.36
4	UK	7,962,370	0.53	8,904,987	0.45
5	France	6,162,892	0.51	6,273,202	0.44

In terms of imports, the top players are largely similar with China, Germany, and Japan remaining in the top five countries for paper, plastics, and metal. However, the United States, one of the top export countries is not a major importer for paper or metal.

Paper

In 2016, Peru imported approximately 63 million tons of paper with the top five source countries being China, Germany, India, the Netherlands, and Spain. These top five countries represent 65% of total imports.

Import of Paper (Volume and Price)					
		2015		2016	
		Volume (tons)	Price (USD/kg)	Volume (tons)	Price (USD/kg)
1	China	29,298,643	0.18	28,515,374	0.18
2	Germany	4,372,732	0.18	4,669,619	0.19
3	India	3,092,397	0.22	3,179,537	0.21
4	Netherlands	2,722,078	0.16	2,880,885	0.16
5	Spain	1,697,748	0.16	1,728,277	0.17

Plastic

For plastics, the top five countries – China, Hong Kong, the United States, Germany, and Japan - represent 52% of total 27.2 million tons of imported plastic in 2016. If you combine China and Hong Kong, they represent 40% alone.

Import of Plastic (Volume and Price)					
		2015		2016	
		Volume (tons)	Price (USD/kg)	Volume (tons)	Price (USD/kg)
1	China	7,971,328	0.6	7,661,150	0.53
2	Hong Kong	2,911,194	0.38	2,938,628	0.34
3	USA	1,343,273	0.98	1,489,246	0.88
4	Germany	1,080,764	0.63	1,072,807	0.60
5	Japan	980,705	1.02	1,047,198	0.92

Metal

Of the approximately 108.5 million tons of metal imported in 2016, the top five countries were Turkey, China, India, South Korea, and Germany. The top five countries represent 42% of total imports with Turkey accounting for 16% alone.

Import of Metal (Volume and Price)					
		2015		2016	
		Volume (tons)	Price (USD/kg)	Volume (tons)	Price (USD/kg)
1	Turkey	16,314,417	0.27	17,788,538	0.23
2	China	8,173,347	1.55	7,542,585	1.26
3	India	7,786,905	0.67	7,497,256	0.56
4	South Korea	6,882,147	0.73	6,924,387	0.62
5	Germany	6,235,589	1.06	5,842,354	1.00

ANNEX 7 – SUMMARY OF INTERVIEWS WITH WASTE PICKER ASSOCIATIONS

Opportunities for growth and expansion of Waste Picker Associations	- The municipality is more concerned with helping to sensitize housing and businesses in its jurisdiction. - There is greater interest on the part of the population to participate in the separation programs at source of solid waste. - Recycling is increased due to the interest of the population to participate in the program and it has already become a habit in the population to select solid waste. - New companies are being incorporated into the source segregation program because they have assumed a greater responsibility with the care of the environment. - There is great support from municipal officials, who already understand the work of waste pickers. - The price of recyclable material is increasing and more and more buyers are paying a better price. - Enter large companies to collect recyclable materials, such as Mall Sur, Tottus, Metro or Sodimac, because they generate a large amount of recoverable materials, thus increasing job opportunities for our partners and therefore increasing income for the benefit of our families. - Creation of a model collection center, which generated employment and added value to the product, resulting in greater economic income for the recycler and his family. - Sign agreements with companies, schools, neighborhood councils, that support recyclers delivering the recyclable materials they generate. - Improvement of collection and support routes with mobilities in the collection from the municipality. - Work with companies that want to donate the recycling or otherwise sell us the material at an affordable price. - Training provided to waste pickers, to further strengthen their organizational and business capacity. - Have a mobility of the association of recyclers. - A storage center better conditioned for the use of the association of recyclers, as well as personal protective equipment -EPPs. Incentives for the homes that support us, as indicated in Law 29419. - Support from Ciudad Saludable, which makes the population value us - In Iquitos we can find a lot of material that can be recovered thrown by the streets since even in the city the recycling work has not been promoted, there are very few companies that are dedicated to buying material, therefore the prices are low, compared to other cities in Peru.

Specific Recommendations to improve Associations' role in Recycling Value Chain	- Give an added value not to expect the middleman to buy everything when sweeping. (pressed, chopped, etc.) For this we must have more support to find a better market with better prices. - Shorten the chain of recycling i.e. try to sell the waste directly to large companies. - Several associations together to be able to commercialize solid waste in the network. - Strengthen associations, so that they can access loans and buy machinery. - Separate the waste according to the characteristics that the companies put as conditions for them to buy, directly to the organizations of recyclers. - Training so that all partners, act with the same objective and reduce internal conflicts. - Obtain a press for the reduction of the volume of materials and take advantage of the space within the collection center, in this way we will obtain more order and cleanliness in the collection center, facilitating access, product quality, added value and can be marketed to the industry properly. - To have a greater knowledge of recycling, to have modern machinery to give added value to all recyclable materials. - The collection fleet should be expanded or improved, training waste pickers to improve the status and collection system. - Improvement in the awareness, training of the enumerators and taking into account the work carried out by the recyclers and in this way informing the homes that materials are recoverable. - In marketing, you could improve the recycling process and give it a higher value and thus have more income. - Register, sensitize companies to have greater support. - Implement a complete recycling plant where not only raw material is collected and sold, but also processing the material that has value such as chopping and / or pressing it. - Materials that have no value as a raw material, we have the opportunity to process it and give it a new useful life such as glass, newspaper, tetrapack, etc.
Barriers and Challenges preventing the Associations in realizing the Opportunities	- Prices fall quite mainly in January, February and March. - The informal recyclers offer to buy usable waste to the neighbors and they are an unfair competition, because they go where they have already been sensitized. - Informal intermediaries are those that monopolize the recycling market and take the biggest profits. - In Arequipa there are companies that monopolize the market by agreeing on the prices of purchases as what happens with the companies that buy the cardboard.

	- The little commitment of all the associates to the recyclers association, leave everything to the president. - There is a lot of informal recycler that is a competition for the association and also the workers of the municipal compactors collect solid waste. - Not having your own mobility for the transfer of materials in large volumes, it would be ideal to have one in this way the mobility costs would decrease (payment of freight) - Have a financing to use it as working capital for the purchase of equipment such as machinery, tools, etc. and this would improve working conditions. - We do not have our own machinery, which makes it difficult for us to add value, since we do not have these machines we generate an additional expense when renting them, - The bureaucratic procedures in the municipalities sometimes make it difficult to move forward. - Lack of awareness in the companies so that they have more knowledge about the formalized recycler. - To have more awareness about the segregation program and thus be able to have more support from people, reaching more than 100% of the homes and businesses. - To obtain a source of financing that can help acquire the equipment and added to this training to be able to identify products that can generate higher income.
Describe the benefits created by the CARRs	- It is very beneficial because you have a roof, we have warehouses to store the waste segregated before deteriorating with the sun and water. - You already have a place to store waste in an orderly manner. - There is a space where you can change work clothes (clothing), rest and have a quiet lunch. - It has a mesh that covers us from the sun, thus avoiding exhaustion. - It provides a lot of help since before it was segregated in the streets exposed to sun and rain, in addition to suffering losses of its materials and less price for its products. - Collect larger volumes and this allows to negotiate better the sale prices. - With the formalization and organization of the collection centers, an added value can be given to each product, increasing the income to the families of the recyclers. - Informal collection centers should be formalized to avoid unfair competition - Improve the infrastructure in the aspect of having a floor and a larger structure, with bathrooms, electricity, water. - Difficulty in finding suitable places for the collection center and that the municipality provides the areas they have for it or at least helping with the payment for a period of one year of the rental of the premises.

Describe the ideal model of a collection center (CARR) that a Waste Picker Association operates	- That has hygienic services and dressing implemented, with shower and a topic. - That the entire collection center be with cement or paving. - Greater areas for a better distribution and to be able to store more volume, with this the prices are negotiated better. - Have an experienced person to administer the collection center - First, an ideal model would be to have a large collection center, which can enter large and small vehicles, large offices, dining room etc. - That the municipal authorities become aware and pay for the selective collection service to waste pickers. - A financing to increase the area of the collection center and to be able to receive and market more material. - Security, every collection center must have a security area with all the necessary implements. - Storage, adequate and orderly of all materials that arrive daily. - All the personnel of the collection center must have EPPs for their safety. - That has an area of green areas for a Biohuerto and thus be able to use organic waste. - That they provide the guarantees to be able to carry out an adequate job in which the personnel does not run risks of accidents or any type of danger. - That you have all the necessary and necessary permits. - That the personnel who work in these facilities have all the corresponding benefits in the workplace, that they have health insurance and life insurance since this work is very high risk, that it has vacations, etc.
Challenges restricting the growth of the CARRs	- The collection centers are provided in session of use by the municipality and have turned out to be small spaces. We cannot enlarge them to our needs. - The collection center is not owned by the association so they cannot invest in something that does not belong to them and be able to get their own land, but the main limitation is money since the land is very expensive. - Lack of organization of the association, requires further strengthening so that all contribute to the improvement and growth - The main restriction is that the municipalities put a lot of obstacles to authorize a collection center and that is why the number of informal recyclers increases, they do not supervise informal recyclers, much less the informal ones. - Mainly lack of support from the municipality that does not have space for the distribution of all materials, in many cases breaching the law of the recycler. - The informal recyclers do not take conscience so that they can be formalized and become aware of how they should perform a good segregation of all the material that will be marketed to formal companies.

	- One of the restrictions is the lack of support from the municipality in the publicity about the program of segregation at the source and the work of the recycler, since in this way the support of people as well as companies would be improved. In this way, deliveries of recycling could be made in the same collection if the place and work of us were made known. - The lack of interest in the value of the segregation program as there are waste pickers who do not know about the importance of being formal, as well as the lack of training and formalization of waste pickers so that they understand the importance of their work. - Lack of commitment of the municipalities other the complexity of the documentary processes to obtain the permits, the process should be simpler.

ANNEX 8 – SUMMARY OF INTERVIEWS WITH PUBLIC AND PRIVATE SECTOR REPRESENTATIVES ABOUT WASTE PICKER ASSOCIATIONS AND CARRS

Opportunities for growth and expansion of Waste Picker Associations	- Through the Municipalities, for the collection of solid waste that can be recycled. - Forming partnerships to be able to participate more strongly in formal waste management systems, get better working conditions, avoid precarious working conditions. - Your participation allows you to add to the greater care of the environment which is increasingly valued and is becoming more aware of this. - The organization of the municipalities can boost the escalation of waste picker organizations. - The municipal PLANEFA, based on supervision by the OEFA, can be a tool for compliance with the regulations. - The "maturity" of waste picker organizations, based on the Law and its Regulations, as a growth process. - Consciousness of the population on the importance of taking care of the environment with emphasis on actions to recycle, reuse - Normative frameworks of incentives to incorporate and recognize recyclers - More clarity is required from the state to define how to improve the recycling value chain. first we have to define the role of the state and recyclers within the chain, interesting things have been advanced after the law of the recycler on all issues of social inclusion, occupational safety of waste pickers, its recognition, its value as an actor within of the chain. - review the regulatory framework to where they have arrived and what is missing to reach an effective value chain - there are mixed models, one where recycling associations are effectively doing it alone, are empowered, maintain their own collection centers with their resources, have made debt for vehicles have done more self-management, this self-management understanding as well as getting support from entities financial institutions to support institutions such as Ciudad Saludable, But the other is more in the logic of the municipal collection centers is another perspective like that of Ate, Surco is the municipality that gives all the space and as it subcontracts or includes the recycler, are two different models but we would have to see really in both models as far as we got.

	- The formalized recycler can actually arrive at a selective collection to be collected. You have to see the whole issue of the costs of conditioning what we call chopping etc. - What is coming is a bit hazy, because you can have a logic of the association with collection center to be a solidary Intermediary that could be a business model of extended responsibility and that acts as to agglutinate these collection centers and receives them and then includes them or commercialize it. - The system is with intermediaries who are with a perverse look of the subject and exploit them then we must see if that perverse intermediary can work with the intermediary in solidarity or could be me I think there are two models a model of extended responsibility of the producers that create this type recíclame or evaluate if one of the associations with their collection centers that have been more self-managed are in the condition to become a supportive intermediary that buys from the others and that makes the direct articulation I think that we will be able to define what you told me "As far as the recycler goes". - One of the issues that is essential within this circuit that we have identified and we have discussed several times is the issue of the tax or the tax that paid recycled waste, and asked us to wait a little bit for the laws and everything to make a law that did not make sense at that time until the law and the regulation very specific - There are many things that transcend, the declaration of environmental defense notes a fast track 'for direct purchase. I cannot do that in my law that they have to change in the state contracting law, I have to amend the law of the regional government to make it explicit that in an emergency the regional government can come in because if not it cannot spend, in our law says cooperate but no. - Those things we want to work on a law we want to develop this year and where you can include the whole issue of exception we have already discussed with the minister that see if we need to create the superintendence and also Olaechea study is to continue making the Pro bono they are willing to continue the work, if that is an economic barrier that can prevent this circuit from working because it is a double payment if we restrict it there is much more And that is precisely why the black market occurs and the other is the institutional model and of the role that we say, ok the collection centers have another perspective the others and within this perspective see what paths exist I believe that today mechanisms in the subject of access to financing are in the market, we have already identified, I think it is more as we manage, I think that there could be what you asked me, what are the limitations, I think it is the role that already defines it.

	- That more people become aware of the care of the environment and separate their waste by helping the growth of recyclers organizations. - The growth of consumption that generates more material with potential to be recycled. - Have a mobility of their own. - A storage center. - Uniforms. - Support of some companies. - Formalization of recyclers' organizations, that is, they issue invoices for the sale of their products. - Issuing electronic invoices. - That they make a correct segregation or selection of the materials they buy and then sell. - That they be consistent in the quality of products they sell. In other words, over time, they maintain the same rigor in the selection and sale of their material. - That they have financial management capacity to foresee the growth of their business in the short, medium and long term. - The formalization that allows them to enter companies.
Specific Recommendations to improve Associations' role in Recycling Value Chain	- Extended responsibility of industrial companies to participate in the recycling value chain. - Education on value chain in schools and universities. - Education on the effect of implementing eco-efficiency actions in companies and their contribution to savings in their production processes. - Formalization of recyclers. - Specialized collection centers for the collection of waste. - Provide more technology for the processing of recovered materials, at affordable prices. - Greater intervention of the private activity. - Greater technical assistance from the national, regional and local authorities. - Monitoring of MINAM to comply with the regulations. - Implementation at scale of permanent containers in the districts for selective classification of waste. - Implement more collection and classification centers - Find balance in the added value for other waste - One of the issues that is essential within this circuit that we have identified and we have discussed several times is the issue of the tax or the tax that paid recycled waste, and asked us to wait a little bit for the laws and everything to make a law that did not make sense at that time until the law and the regulation very specific - There are many things that transcend, the declaration of environmental defense notes a fast track 'for direct purchase. I ca not

	do that in my law that they have to change in the state contracting law, I have to amend the law of the regional government to make it explicit that in an emergency the regional government can come in because if not it cannot spend, in our law says cooperate but no. - Those things we want to work on a law we want to develop this year and where you can include the whole issue of exception we have already discussed with the minister that see if we need to create the superintendence and also Olaechea study is to continue making the Pro bono they are willing to continue the work, if that is an economic barrier that can prevent this circuit from working because it is a double payment if we restrict it there is much more And that is precisely why the black market occurs and the other is the institutional model and of the role that we say, ok the collection centers have another perspective the others and within this perspective see what paths exist I believe that today mechanisms in the subject of access to financing are in the market, we have already identified, I think it is more as we manage, I think that there could be what you asked me, what are the limitations, I think it is the role that already defines it. - In the case of plastic, there are small picks where the material can be used to make plates for construction. - You can make glasses from bottles with simple tools. - Have a press or grind to process the material and make a direct sale to large companies and get more income. - That recycler organizations have agreements with local municipalities in order to enhance their actions in the urban area. - That they have stores large enough to allow them to collect and sell as much as possible, in order to minimize the cost of transportation. - Mapping and identifying all types of waste for commercialization and reuse.
Barriers and Challenges preventing the Associations in realizing the Opportunities	- Legislation that promotes which industrialists are committed to take responsibility for the waste they generate. - Legislation that promotes the inclusion of recycling courses in colleges and universities. - Access to accessible credits for recyclers organizations. - Modern administrative management of waste picker organizations (they could count on professionals to advise them to improve the techniques (professional in engineering) and improve their income (administrator). - Barriers: emphasis on business issues vs business look. Low evidence of the benefits that the regulations bring. Little transparency of municipal management. Informality - Challenges: New trends in pet demand, China is announcing that it will stop buying this material

	- There technically we need the infrastructure we have to build the whole circle really and have a country look where the big production clusters should be, there is not today, the main technical limit of values that everything has to come to Lima, there is no inverted technology the coast in one part is not in the mountains there is no in the jungle and the other is that there are intermediaries who eat you totally and many products that are lost because they are not valued, glass is not brought, cardboard is not brought, tetrapack is not brought , nothing of it and that the environment is full. The idea is how you can create clusters in some specific cities that have connectivity and that can be new centers of large storage technology is already there but you need collection centers infrastructure with technology that is already developing and collection centers that link all the sub products, is a topic that we discussed is not only that you have a collection center you have to have it with everything even with the scrap, because many of the recyclers are cachineros they receive everything between the things that is why it is important to have everything is you can not go to Sell it from one place to another and they do not want to buy certain things and if you are not in the informal market it somehow serves them. The cluster plans have to be present is much more to say the I think here because the type of technology is already more or less the type of technology for that stage is basically chopped more conditioning be thinking about technologies for the plastic that has no market price as Those woods from home and there also visited us I do not know if you know Concepts Plásticos Colombians and then when I went to Medellin I could visit them and I want to see that it is working because they always come to tell us and I have already seen it operating and they are willing to come here to make a presentation maybe we also coordinate that because the idea is that the alternative houses even for the emergency and all that would be fabulous because and now Dow, I do not know if you know the transnational packaging has already seen and said I'm going to get as a partner of that production but I am proposing something more daring than I hope it is if they put the factory at least the 01 or the 1% are actions of the recyclers because as they will provide but we will see. So I'm going to look at your agenda too to tell you and maybe there could be along with the housing ministry along with the whole social housing program if you do not think so? That can be driven by you. - The biggest challenge is for people to learn and have the habit of separating the waste and organizing to reach the waste pickers. - Lack of money and income. - Lack of machinery and transport. - That recyclers organizations have adequate legal and financial advice

	- That recyclers organizations have clear status that allows them to solve any conflict that occurs at the level of interpersonal relationships, such as legal or operational. - That the board of directors of waste picker organizations have legitimacy and representativeness to all their members - That recyclers cannot comply with occupational health and safety requirements that companies request.
Describe the benefits created by the CARRs	- They should specialize in the classification of waste, favoring better conditions for the work of waste pickers. - They can improve in technical and administrative aspects. - Could be of use by more than one organization of recyclers. - They should be spaces donated or provided by local or private authorities. - They are an organized alternative to manage waste and improve the income of families. There should be more support to include in the territorial planning or new housing complexes, spaces for collection centers. - I believe that they have made significant progress, that is, I believe that in general the experience of some areas of the country of self-management for many things of self-management, has led these centers to begin to self-manage to function. Definitely not going to be anything possible if you do not have a favorable environment among them favorable environment the tax issue, what category we give but also the services plus that have been in all the support actions that have been present I think there have advanced. - The accompaniment in other topics that are as we would say not so articulated to recycling are more of the people that I think there is a lot more work because it is very different to compare a MSE, a company in which different people who are more vulnerable and that come with a whole burden on especially women with issues also of much violence also join with each other and trust in each other to make an organization is going to be very difficult no. We love that you touch that topic because it is our concern. That is the hardest part to do because the success of this is that they stay united, exact, and if you only focus on the economic side there is a conflicting part here of values that is not going to be solved, so for more sat and tangan a beautiful center but if there are still very internal problems people will face and they will fight and tomorrow the center is over and there is going to be no sustainability and the municipality ends not believing in them. I think that there is an interesting topic of work, I think that there has been progress and those models have shown or are demonstrating that they can not do it? - They are important because they provide a place to store more material and thus obtain greater benefit. It also helps the organization.

	- The collection centers are fine since they are starting, but as they grow, the infrastructure must be improved. - That they are properly oriented. - That the personal ambitions of the members can generate conflicts of interest between them. - That it is necessary to strengthen the training of waste picker organizations so that they can market products of value and have no waste in their acquisition process.
Describe the ideal model of a collection center (CARR) that a Waste Picker Association operates	- Increased technification of the collection centers, with conveyor belts, hydraulic presses, automatic compactors to obtain better performance from the people who work there and higher production of recycled garbage. - Reuse of waste in utility items such as tables, furniture in general, pots, wallets, pet supplies, etc., which generates more employment and awareness of the importance of recycling. - They could be model recycling centers and be spaces open to the community. - They must improve the security conditions. - I believe that there really the collection centers if I think there is a role or that is because there is a great contribution that is made of the recycling system is to say in the country still to reach a selective collection and will spend a lot of time then the role of the recycler in selective collection is very important. We have the situation of the municipalities are not going to be able to pay the recyclers to do a selective collection and not do one more service because the fair ones can pay the conventional then there if there is a role for example interesting that if you cannot pay the less give the facilities I think so, the land in concession, in usufruct, as we want to call to assemble the collection center but that should be a municipal role, since there is a contribution we do something, whatever, do not I can build the center, I can not necessarily give it to you because of course, we are thinking about the big municipalities of the country, between building the collection center or a local community. You understand, I go to the communal area that also serves many people, so land , I believe that the municipalities should be clear in cleaning up land, giving land for this an interesting role because always, that is, in this logic there must be an seed of base seed that is not necessarily indebtedness etc. of the recycler proper but it is a contribution that goes from the companies and the extended responsibility of the producer and then and all the maintenance operation, exact, not keeping the plate, going from selling daily to selling biweekly or monthly you need the working capital and on top of having a machine that will gather you, a minimum structure to receive is a cost, then getting into debt for that at the beginning will not be, they will never do it. There is that seed capital, it would come

	from two parts of the companies, the space of the municipality and since that is here and from that you start to collect, the management, etc., it must be on their part, it is a financial issue for saving, the culture of saving that does not exist then is a logic. I think that is, a municipal collection center with 3 edges. - A place where the recyclers collect material in an orderly manner and when they reach an amount, you already have as a buyer a larger company with the ability to collect the material. - An ideal model would be a stockpile with lockers, of concrete material and that has a second level so that they can use the first to process the materials and that this collection center is large enough. - Work with the support of local municipalities. - That they buy as much material as possible, select it properly and store it in one place. - That they sell us with invoice all their material. - An ideal model would be a stock that is based on the regulation.
Challenges restricting the growth of the CARRs	- Insufficient work articulated between Ministries of the Environment, Health, Production. - Insufficient joint work between municipalities in different districts. - Absence of municipal support. - Zoning that does not correspond. - Limited access to credits. - Limited organization. - The location: little availability of spaces. Resistance of the neighbors. Health issues. Management issues (volume-demand). Strong presence of intermediaries. Cost of land and / or legal sanitation issues - Today under the norm there is not much restriction, even the collection centers according to the regulation of the new law we are what they have a handling of if I remember that up to 20 tons do not require ... I do not remember the exact number I can search in the norm; We are building some centers so that they do not even have environmental certification because many of the costs were very high and they did not do it, and a collection center does not have significant environmental impact so we have also worked on the instrumental part also to exonerate some within the instrument circuit of environmental management. What I believe is to detonate the market that is I think they are, there is no longer a legal barrier, now with what China is no longer going to buy, what needs to be generated there, is that there is a lot more market, energize this market, what is required of products to make your bottles etc., be it national, that comes from recycling the boxes that have always been ordered. So that's one of the things that I think have a chance in the market. - The increase in the price of land.

	- Informal median recyclers that compete with formal companies and pay more so that they later recover the IGV with the release of funds. - That the general public does not have the culture of separating their waste. - The lack of capital and the decrease in the prices of materials in seasons from December to February that do not allow their economic growth as they have payment restrictions, as well as the lack of support for waste pickers. - That not all recycler organizations have the support of their municipalities. - That some organizations of waste pickers decide to stay in the informal sector and fail to bank their operations. - The distrust among the members prevents them from respecting agreements or sharing strategic market information that could benefit all or a group of them. - Its infrastructure is very basic and does not give enough confidence to the population.

ANNEX 9 – CHALLENGES AND OPPORTUNITIES IDENTIFIED IN CARRS

Problem	Cause	Improvement Opportunity
Unloading Process		
Truck cannot park near to the segregation area.	Sorting space is quite small	Enlarge facilities for solid waste collection centers.
Risk of accidents with sharp objects	Personal protective gear not always used, despite known risk learned during trainings.	Start internal fund to purchase personal protective equipment and materials when necessary.
Risk of accidents (falls) when unloading waste.	Truck hopper is raised to unload part of the waste.	Start internal fund to purchase personal protective equipment and materials when necessary.
Risk of accidents (when the truck door opens waste can fall on top of the person carrying out this job)	High quantity of solid waste collected results in full truck which produces this risk.	Optimize operational processes in solid waste collection centers.
Three-wheeled vehicle (trimovil) makes several trips for selective collection.	The three-wheeled vehicle (trimovil) has passed its cargo capacity due to the increased participation of households in the program.	Promote getting a new vehicle or changing type of vehicle used in solid waste collection. Access to credit to purchase vehicles with greater cargo capacity.
Deteriorated uniforms, produce a bad image of recyclers in the eyes of the population.	They do not budget funds for new protective gear and uniforms for recyclers.	Start internal fund to purchase personal protective equipment and materials periodically.
Recyclers are not careful when throwing bags of waste onto the unloading area.	Recyclers do not follow the indications on how to properly unload bags in the established area.	Constantly monitor this situation.
Access to collection center	Constant rains and construction in the area. The road is not paved.	Acquisition of a vehicle with greater capacity and resistance.
Segregation Process		
Accidents at the time of segregating solid waste.	The lack of use of gloves puts at risk of accidents by sharp objects.	generate a fund to acquire a table that can work with the existing duo
There are still limitations to recognize the different types of waste.	The variety of waste components hinders easy recognition.	Strengthening capacities to recognize each type of solid waste due to the expansion of the usable solid waste market.
Inadequate postures when segregating solid waste.	Lack of furniture to work in better positions.	Design a plan to generate funds that allow the acquisition of more equipment to improve the position of waste pickers
Little efficiency of waste pickers at the time of segregation	Internal interpersonal relationships affect the performance of recyclers	strengthening through workshops to generate their own tools to solve internal relationship problems.
The waste collected during the day is not always segregated	The high amount of solid waste.	strategic planning that allows to have a plan with clear actions that improve efficiency and obtain higher performance
	Little efficiency in the process of segregation of solid waste	
Accidents at the time of segregating solid waste.	The lack of use of gloves for lack of habit.	Internal regulations that penalize fines, which allow the creation of a fund to reward the person who permanently uses their PPE.
Organic wastes inside the inorganic material.	Population does not adequately sort waste.	Strengthen awareness in the population using educational materials that can be used constantly in homes.
Storage Process		
Insufficient number of bags for the storage of PET and other waste	There is no habit of renewing bags for the storage of solid waste	Promote the renewal of the implements for the storage of solid waste.

Warehouses are not for exclusive use for each type of segregated solid waste	Limited amount of warehouses for all types of segregated solid waste	Greater amount of usable solid waste due to the fact that there is a percentage of the population that still does not participate in the PSFyRS and to increase the frequency of waste sales.
Storage capacity of the storage center to the limit.	Permanent increase in the quantity of solid waste collected. More neighbors and companies join the program and there is a more regular sale frequency that allows the circulation of materials	Expand the frequency of waste sales and implement machinery to press or chop and improve storage.
Presence of flies and bad odors.	Storage bags damaged.	Acquisition of bags for storage.
Bad posture to perform the load.	Lack of information in the right way to do load jobs.	Reinforcement of training for loading and unloading
Wear of materials used for storage.	Drag bags, sacks and little maintenance.	generate a fund to acquire more durable bins for transport and storage.
Clutter and accumulation of segregated material in the storage area is identified.	Reduced number of bags for the storage of plastic bottles (PET), hard plastic, cardboard, white paper, mixed.	Acquire more sacks to be able to store the material in an orderly manner.
Little space for the movement of personnel within the area	Reduced space for the storage area considering the volume of material received daily.	Sort the material in the bags so that you can have more space for staff travel.
Signposts in poor condition within the CARR.	It has old signs and deteriorated by the passage of time.	Replacement of signage and apply some improvements to the area.
Lack of stairs or scaffolding to store on top of other bags.	Lack of budget for acquisition.	It is necessary to acquire equipment that ensures the proper development of storage activities (a machine to lift weight).
Lack of carts to move the heavy bags	Lack of budget for acquisition.	
Pressing Process		
Disorder in the area where the press is located.	The segregated material often occupies the space intended for the pressing area.	Acquire bags to order the material and can have more space.
Risk of falls when filling the press because they do it through a table	Conditioning with pieces of wood	Have a stepladder that allows greater stability
Women cannot use	Due to the risk of falling when climbing	
Lack of equipment to move heavy load towards the balance	Lack of budget to acquire equipment	Larger capacity equipment is needed to help weigh more in less time (500 kg platform scale).
Lack of male personnel to load heavy bags	There is no male staff	
Weighing Process		
Operational problems in the balance (constant failures).	Lack of maintenance to the balance	Generate a fund for periodic maintenance of the balance
Delay in weighing	They do not use the electronic scale in the daily weighing.	Generate balance usage habits and formats for the weighing record
The scale they currently have is small for the volume of material handled by the association.	the good thing is that there is increasing recycled material increasing	Analyze the possibility of acquiring an electronic floor scale of 3 tons.
Messy control when recording the weight of the materials.	They do not use the formats properly to carry the weighing record.	Provide printed formats that allow them to keep historical control.
In manual handling there is a risk to health	Residuals of liquids in a state of decomposition exposed to contact with the skin of recyclers.	It is necessary to acquire a press that allows to give greater value to the products to be sold and to be able to store more in the space that is currently owned.
Accident risk	The instability of the bags can cause them to lose balance and fall.	
Commercialization Process		
Disorder in the area where the press is located.	The segregated material often occupies the space intended for the pressing area.	Acquire bags to order the material and can have more space.

Risk of falls when filling the press because they do it through a table	Conditioning with pieces of wood	Have a stepladder that allows greater stability
Women can not use	Due to the risk of falling when climbing	
Lack of equipment to move heavy load towards the balance	Lack of budget to acquire equipment	Larger capacity equipment is needed to help weigh more in less time (500 kg platform scale).
Lack of male personnel to load heavy bags	There is no male staff	

ANNEX 10 – FINANCIAL OVERVIEW OF SURVEYED CARRS

Region	Waste Picker Association	Income (Soles / Year)	Expenses (Soles / Year)	Cash Flow (Soles / Year)
Arequipa	Asociación de recicladores Cerro Colorado	78,720	78,715	6
	Asociación de recicladores Tiabaya	7,736	7,717	19
	Asociación de recicladores Hunter	39,885	39,874	11
	Asociación de recicladores Cayma	112,866	112,862	3
	Asociación de recicladores Nuevo Mundo	23,844	23,837	6
	Recicla vida nuevo mundo	52,149	52,146	4
Ica	Asociación Chincha reciclando por un Mundo Nuevo	25,529	20,945	4,584
	Asociación de recicladores Emprendedores de Chincha	32,645	30,514	2,131
	Asociación de Recicladores Mama Deidamia	6,771	4,655	2,116
Lima	Asociación de Recicladores Ambientales Los Tigres de las 200 Millas.	409,334	404,077	5,257
	Asociación de Recicladores Cambio de Vida en Avance	37,770	35,860	1,910
	Asociación de Recicladores Defensores del Medio Ambiente Zona Manchay.	353,617	346,200	7,417
	Asociación de Recicladores Unión y Progreso Ambiental.	315,288	310,600	4,688
	Asociación de Recicladores Señor de Los Milagros de Miraflores – ARSEMIM.	179,390	178,164	1,226
	Asociación de Recicladores y Especialistas Saludables-ARYES.	110,002	105,600	4,402
	Asociación de Recicladores Apolo 6	78,293	74,670	3,623
Loreto	Asociación de Recicladores Loreto Limpio y Sano	41,862	41,200	662

ANNEX 11 – SUMMARY OF CURRENT PRICE POINTS BY MATERIAL

	Price Point (Soles/Kg) of Top Processed Materials				
Association Name	**Paperboard**	**PET Plastic**	**White Paper**	**Plastic Fil**	**Scrap**
Recicla Vida Nuevo Mundo	0.40	1.00	0.75	0.8	0.35
ARMEC	0.36	1.00	0.70	0.8	0.30
Sumaq Pacha	0.30	0.85	0.70		0.30
ARMA - Perú (1)	0.25	1.00	1.35	0.08	0.35
ARMA - Perú (2)	0.25	0.07	0.60		
Chincha Reciclanto por un Mundo Nuevo	0.40	0.90	0.50		
Emprendedores de Chinca	0.04	0.80	0.60	0.7	
Mama Deidamia	0.27	0.80	0.50	0.7	
Tigres de las 200 Millas	0.50	1.70	0.75		0.42
Cambio de Vida en Avance	0.45	1.20	0.70		0.30
Defensores del Medio Ambiente	0.50	1.70	0.75		0.42
RUPA	0.50	1.00	0.70		0.42
Aresmim	0.40	1.20	0.70		0.40
ARYES	0.60	1.40	0.85		0.45
Apolo 6	0.50	1.10	0.70		0.42
Loreto Limpio y sano		0.30	0.30	0.6	
Average Price Point	*0.38*	*1.00*	*0.70*	*0.61*	*0.38*

ANNEX 12 – LIST OF BUYERS FOR SURVEYED CARRS

Primary Buyers of Surveyed CARRS
A&L Recicla Peru
ALVISURE
Ana María Cueva Huayllapuma
Asoc. Chincha reciclando por un mundo nuevo
AyL Recicla Peru
Chatarrería Henry E.I.R.L
Cholo Intermediario Informal
Comercial Llerena (Luis Llerena Tinagua)
Comercial Reymundo
ECASUR E.I.R.L
Esperanza Green
GRACILEY PLAST S.A.C
Lipa recicle EIRL
Maycol Galván Quispe
Papelera Aaron E.I.R.L.
Percy Condori Fernández
Planeta Verde
PROVESUR
Reciclador Miguel, Intermediario informal
Recicladora del sur
Reciclaje y servicios Amazonas EIRL
Reciclajes Múltiples
RECIMAR
SCOMAR S.R.L

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mastercard. Center for Inclusive Growth

GLOBAL FAIRNESS INITIATIVE

CIUDAD SALUDABLE