



Project Statement Santiago

Tackling Illegal Dumping Sites in Santiago
to Build Urban Resilience

SANTIAGO



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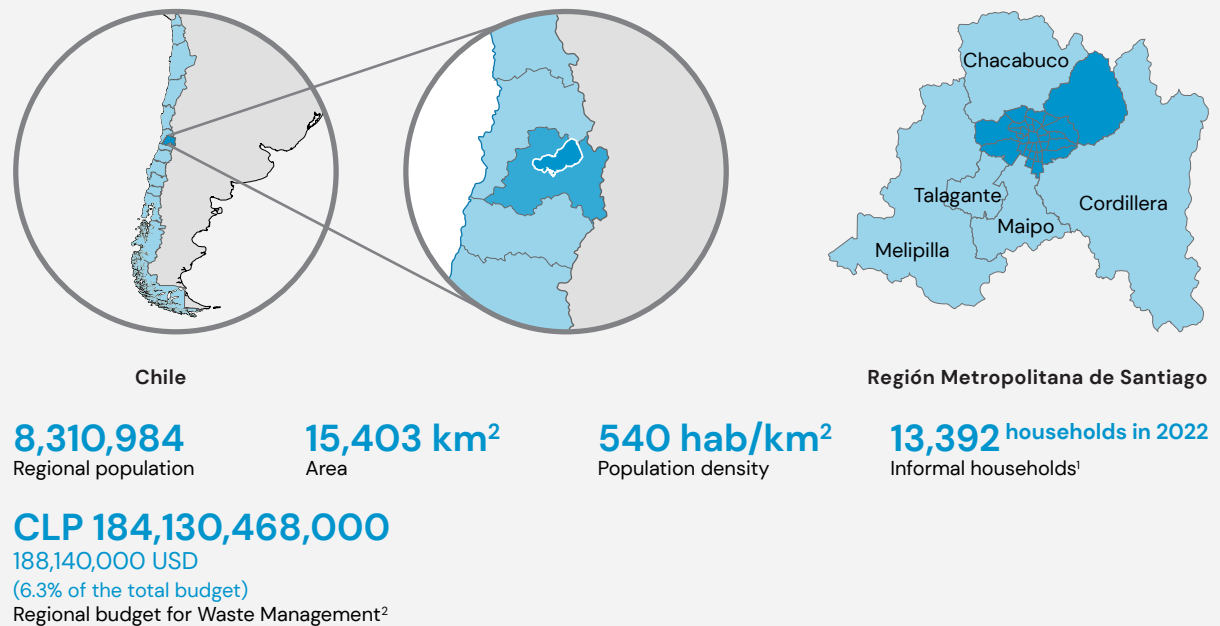
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1. City Context

The Metropolitan Region of Santiago, one of the sixteen regions into which Chile is divided, encompasses the province of Santiago, the capital of the country and its primary urban center. It is divided into four provinces and two governorates, which are in turn subdivided into 52 communes. The Metropolitan Region of Santiago consists of 34 urban communes and 18 rural communes.

The region is administered by the Regional Government of Santiago (GORE), an autonomous body responsible for planning and preparing projects that promote the economic, social, and cultural development of the region (Constitutional Organic Law 19.175, 1993). In turn, each commune is administrated by its respective municipality, whose purpose is to meet the needs of the local community and ensure their participation in the economic, social, and cultural progress of the communes, as established in Law 18.695 on municipal organization. Figure 1 presents the main indicators characterizing the region and its position in Chile.

FIGURE 1
Socio-demographic indicators of the Santiago Metropolitan Region



¹ Defined as "precarious settlements of 8 or more households that inhabit land irregularly, lacking at least 1 of 3 basic services (electricity, potable water, and sewage system), and whose dwellings form a defined social-territorial unit."
² Sum of the 52 budgets for cleaning and beautification services of the municipalities of the region. Budget item 22-08.

The Metropolitan Region of Santiago is closely related to the Maipo River, whose basin covers 90% of the regional surface (DGA, 2014). Its main tributary is the Mapocho River, which crosses the city of Santiago from northeast to southwest, and its sub-basin drains the northern part of the main basin. The Mapocho River has a length of approximately 110 km, and its basin covers an area of 4,500 km² (DGA, 2014). The river passes through sixteen communes, hosting 3,193,000 inhabitants, equivalent to 38% of the regional total (INE Projection, 2022).

One of the risks in the basin is the movement of solid waste through the watercourses passing through urban areas. The Mapocho River crosses a large part of the city before joining the Maipo River on its way to the sea, creating risks due to urban pollution. The Circularity Assessment Protocol (CAP), developed by the University of Georgia, estimates that the amount of loose litter in the environment is 3.34 items/m², mainly consisting of cigarette butts (38%) and plastic waste (30%) (University of Georgia, 2023).

Furthermore, Ergas and Thiel (2022), from the University of La Serena, conducted a National Waste Sampling in Chile's Rivers in 2022 and estimated a density of 1.6 items/m² on the banks of the watercourses, indicating some leakage of waste from the city into the river. Lastly, in addition to waste leakage from the city, the study by Ergas and Thiel identified several areas along the banks of the sampled rivers with significant waste accumulation. As a result, the authors estimated some 50 waste accumulation sites per 10,000 m² of riverbanks of the Maipo and Mapocho rivers.

In 2021, approximately 3.8 million tons of Municipal Solid Waste (MSW) were generated in the Santiago Metropolitan Region, equivalent to a daily production of 1.25 kilograms per capita (SINADER, 2021). The following table outlines the main roles of the actors involved in local waste management and how these roles change with the implementation of the Extended Producer Responsibility (REP) Law.



Summary of roles and responsibilities in waste management and within the Extended Producer Responsibility Law

Regional Strengthening Law (Law 21.074 of 2018)	<p>It confers upon the GORE the authority and responsibility to:</p> <ul style="list-style-type: none"> → Provide strategic guidelines for waste management within the territory. → Establish conditions for the location of final disposal sites and treatment infrastructure. → Finance studies to define the location conditions for the disposal of different waste generated in the region. → Allow municipalities to establish agreements with the regional government for the latter to carry out tasks related to municipal cleanliness and beautification.
Organic Municipalities Law (Law No. 18.695)	<p>Establishes that it is the municipality's mandate to manage cleanliness and beautification in the commune, including domestic waste removal. Additionally, municipalities can issue municipal ordinances. For example, on March 31, 2011, the municipality of Rancagua (VI region) promulgated EXEMPT Ordinance 902, which in Article 10 states: "Depositing or disposing of papers, waste, or garbage of any kind, unused items, vegetative waste, or any kind of refuse in public or private places is prohibited, whether or not such restriction is indicated."</p>

In 2016, the Framework Law for Waste Management, Extended Producer Responsibility, and Recycling Promotion (Law No. 20.920), or REP Law, was enacted. Prior to the publication of this norm, there were no legal instruments associated with recycling and waste valorization in Chilean legislation, making the norm highly relevant to waste minimization goals.

The REP Law aims to "reduce the generation of waste and promote its reuse, recycling, and other forms of valorization through the establishment of extended producer responsibility and other waste management instruments, with the purpose of protecting people's health and the environment" (Law No. 20.920, 2016, p. 1). The responsibilities are defined below.

Actor	Responsibility
Management Systems (SIG):	For the proper execution of this norm, producers will finance individual or collective management systems (SIG) that will ensure compliance with the obligations and goals related to the norm. These systems will procure for the collection and valorization of packaging and packaging waste by duly authorized waste managers.
GORE:	Can assist in coordinating with municipalities and facilitating the exchange of knowledge and capacity development.
Municipalities:	Can fulfill a waste management role, directly participating in the collection, storage, and/or handling of materials or other activities related to the operation of the law. For this purpose, various SIGs can sign collaboration agreements with the different municipalities in the territory.

2. Translating the Challenges into Opportunities

Building on the Urban Ocean® Gap Assessment

Translating the challenges

Illegal Dump Sites and Micro-dumps³

- Information about the number of micro-dump sites varies. According to the latest survey conducted by the GORE, there are 700 micro-dump sites in the region⁴. According to interviews conducted in these areas, it is estimated that there are around 1,300, while other sources estimate up to 3,700 micro-dump sites, covering an area equivalent to the size of the Providencia commune. In any case, the figure is alarming and is a cause for concern in the region.
- In 2021, there were at least 54 illegal dump sites (VIRs) in the region (Ossio and Faúndez, 2021, and data from the Regional Health Authority, 2022).⁵
- An estimate suggests that approximately 70% of the waste in these illegal dump sites and micro-

dump sites consists of construction and demolition materials (CDW), which are currently not subject to a recovery promotion mechanism through the REP Law (Ossio et al., 2020).

- The lack of detailed information about these VIRs and micro-dump sites, including location and risks, is a critical concern for the Regional Government (GORE) and the municipalities in the region.

Risks of Illegal Dump Sites and Micro-dumps

In June 2023, a weather front in the central and southern regions of Chile caused flooding and river overflow. The heavy rain and floods revealed an issue that often goes unnoticed in the daily life of the city: the costs and risks associated with VIRs – more than 880 tons of waste that contributed to flooding had to be removed from the Mapocho River alone. Additionally:

- The proximity of VIRs to surface waters has a negative impact on soil and water health. Soil is affected by erosion, decreasing its quality. Water is contaminated through the leaching process (toxic substances filtering into groundwater flows). This

results in the deterioration of water quality and, consequently, becomes a threat to public and environmental health.

- VIRs and micro-dump sites also generate emissions of volatile organic compounds (VOCs) and carbon dioxide (CO₂) due to the decomposition of organic matter under compression or with little oxygen, or discarded products emitting toxic substances like solvents and additives.
- According to the Study of Illegal Dumpsite Location Analysis conducted in Lampa Municipality in the Metropolitan Region of Santiago (Bravo E. 2019), 33% of illegal dumpsites were located near riverbeds.
- In Chile, there are between 60,000–180,000 informal waste pickers, of which around 28% live in the Metropolitan Region of Santiago. More than half of these are women. Many children and pregnant women are exposed to diseases because informal waste pickers often retrieve devices from micro-dump sites.

³ Illegal dumpsites are those with an area of more than (1) hectare, while micro-dumps are those with an area of less than 1 hectare.

⁴ Survey of 29 municipalities (56% of the total). Figures from the Waste Department of the GORE.

⁵ In August 2023, a more updated report from the Regional Health Authority revealed 112 illegal dump sites in the Metropolitan Area of Santiago.

3. Tackling Illegal Dump Sites in Santiago to Build Urban Resilience

Opportunity Owner: Regional Government of Santiago (GORE)

Estimated Timeline: 24 months

Estimated Total Cost: USD\$ 1.018.481

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Opportunity Vision

The primary purpose of this project is to contribute to the elimination of illegal dump sites in the Metropolitan Region of Santiago. To achieve this objective the project must complement and reinforce the actions that are already underway in the city to establish a more robust, efficient, and inclusive waste management system. The central focus is on addressing illegal dump sites and micro-dump sites from a perspective that emphasizes coordination, data collection and analysis, as well as environmental education. This is a top priority for GORE and is recognized as a complex issue that requires a comprehensive approach to generate social, environmental, and economic benefits for citizens.

The Resilience Strategy of the Metropolitan Region of Santiago, developed in March 2017, references the significant problem in solid waste management. This problem is considered chronic and is exacerbated by

the lack of centralized coordination for comprehensive waste management, limited education regarding recycling in both households and the commercial sector, and the concentration of illegal dump sites and micro-dump sites in peripheral and vulnerable areas. In response, the Resilience Strategy proposes the creation of the Comprehensive Program for the Eradication and Conversion of Illegal Dumpsites and Micro-Dumps, known as "Zero Waste."

Therefore, GORE is actively seeking and testing solutions to the issue of illegal dump sites in the city. For example, it established the Regional Committee for the Fight Against Illegal Dump Sites, which includes a presidential delegate, the main municipalities affected by the problem, the regional secretariats of Public Works, Transportation, Housing, Health, and Environment, as well as Regional Councilors, among others. To support the work of this Regional Committee, this project aims to redouble collaborative efforts with the construction industry to prevent the generation

of C&D dump sites. This will be achieved by providing tools, targeted at municipalities, for monitoring the flow of waste, providing precise and dynamic information about dumping and waste in the communes, thus enabling them to take timely action upon detecting abnormal situations. Through a participatory process that included workshops and consultations, this project was designed to complement the initiatives already being led by the GORE and prevent redundancies with those being carried out by other entities, including inspection and recycling programs within the city. On the contrary, the project contributes to a sustainable long-term solution for these challenges.

In this context, the GORE is committed to leading implementation of high-impact solutions for the territory, in collaboration with industry and municipalities. This will be done by leveraging technology and leveraging actors who are committed to improving waste management. Ultimately, the project supports the achievement of goals aligned with

the National Waste Policy 2018–2030, which includes the priority action of "developing and implementing a strategy to control and eradicate illegal dumpsites," as well as the 2040 Roadmap of the Ministry of the Environment, which includes goals such as increasing material productivity by 30%, increase of 30% in the recycling rate of municipal solid waste, and a reduction of 10% in the solid waste per inhabitant.

FIGURE 2

Image of flooding in the Mapocho River due to a weather front in June 2023



4. Project Outline

Goal

To reduce and control the emergence of illegal dump sites and micro-dump sites in the Metropolitan Region of Santiago through complementary initiatives that will foster a sense of ownership and concern for environmental conservation among construction companies and citizens. The long-term goal is to prevent plastics from reaching the ocean due to poor waste management in the city.

Specific Objectives

1. Conduct a "Diagnosis of VIRs: the Contribution of Communities and Businesses" in the Metropolitan Region of Santiago. The aim is to design public policies and find concrete solutions to combat VIRs and micro-dump sites and build the capability to monitor them.
2. Promote a culture of recycling and circular economy in the construction sector by collaborating with key stakeholders in the region, including certification and training entities. Provide tools to companies and their employees for maintaining best practices associated with waste management.
3. Promote the culture of recycling and environmental care in communities with more challenges associated with VIRs through workshops targeting strategic audiences and urban interventions that raise awareness for the protection of communal spaces.
4. Develop or adapt a digital platform to estimate the volume of waste generated per square meter of construction or demolition work, capturing data such as tons generated and material composition. The platform will help monitor construction and demolition projects online across different communes in the Metropolitan Region of Santiago and provide tools for supervision to prevent informal disposal in VIRs.
5. Encourage companies to use the digital platform by offering a seal validated by national and international entities, thereby granting recognition and positioning to participating entities.
6. Within 18 months of the project, aim to have at least 10% of construction projects in the metropolitan region, roughly equivalent to 50 projects, registered on the platform, along with at least 20 waste management and recovery entities⁶.
7. Recover at least 45% of waste that is technically manageable within the participating projects.

⁶ According to data from IConstruye, there are approximately 500 construction projects throughout the Metropolitan Region of Santiago. Considering the subset of projects currently reporting in SINADER (approximately 50%), the target set for the project's execution timeframe (2 years) is considered reasonable and ambitious. This has been validated through interviews with managers and stakeholders in the construction industry, as well as projects that are actively implementing recycling practices in their daily operations.

Beneficiaries

The primary beneficiaries of this project, identified through participatory workshops with public and private stakeholders as part of Urban Ocean, as well as interviews and reviewed literature, include:

- Municipalities, primarily Puente Alto, Renca, Conchalí, Pudahuel, San Bernardo, Melipilla, Cerro Navia, Quinta Normal, Lampa, Lo Espejo, Quilicura, Colina, La Pintana, Buin, Maipú, El Bosque, Curacaví, Peñalolén, and Lo Prado. Estimated 224,951 residents⁷.
- Demolition companies.
- Construction companies.
- Construction waste management companies.
- Construction waste valorization companies.
- Waste transport companies.
- Real estate companies.
- Manufacturers of construction materials.

Components

The project is divided into three components:

A. Illegal Dumping Diagnostic – The Contribution of Communities and Businesses: The objective of the diagnosis is to understand the issue of illegal dump sites and micro-dump sites for waste management in the region. Data is collected on all types of waste found in dump sites, including volume, composition, and origin. This diagnostic will enable an evidence-based approach to defining public policy and designing projects, serving as a baseline for the project.

B. Traceability Platform for Construction Waste – The objective of this component is to develop and/or adapt a digital tool (platform) to enhance the traceability of construction waste in the Metropolitan Region of Santiago, allowing both the GORE and various municipalities to monitor the generation and final disposal of waste produced by construction projects within the region. The platform will aim to regulate and promote circular economy practices, particularly recycling, in the construction industry.

C. Capacity Building, Education, and Environmental Awareness – The objective is to raise awareness among the population about the importance of properly managing bulky waste, electrical and electronic equipment waste and construction waste to prevent the emergence of VIRs and micro-dump sites. It aims to create educational opportunities that

can vary according to the needs and characteristics of the community and the professionals it targets. It is important to tailor the material and examples to the local context to make it relevant and useful for the participants. Therefore, this component targets the community and professionals in the construction industry, waste managers, and companies related to VIRs.

⁷ Census 2017. Link <https://ine-chile.maps.arcgis.com/apps/webappviewer/index.html?id=d0bff7af90384faa98d6ff69faa0d6d2>

5. Project Implementation Matrix

TABLE 1
Activities and products of the implementation phase and predicted timeline

Implementation Matrix				Timeline							
				Year 1				Year 2			
Component	Sub-Component	Resources/ Status	Technical Assistance Required	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Illegal Dumping Diagnostic - The Contribution of Communities and Businesses.	Data Collection - Definition of Terms of Reference (TOR) for data collection, including methodology.	TOR defined for the Mapocho River mapping of illegal dump sites Pleiades neo satellite image with resolution of 30cm and 6 bands of the Metropolitan Region of Santiago	TOR definition for remaining data collection								
	Waste characterization in illegal dump sites and micro-dump sites	1 site selected for waste characterization at the Mapocho River	Selection of additional sites with statistical relevance Waste characterization in multiple locations								
	Legal and regulatory framework review to prevent illegal dump sites	Motion Bill 15111-06 amending various legal provisions to prevent and penalize the creation of micro-dump sites and facilitate their removal by municipalities	Legal and regulatory framework review regarding materials that are not prioritized in the EPR law and are typically found in illegal dump sites								

Illegal Dumping Diagnostic – The Contribution of Communities and Businesses.	Socio-economic and Environmental Analysis of the impact of illegal dump sites in the city	Report with recommendation to the GORE on how to prevent hotspots of illegal dumping sites in the Mapocho River (contracted)	Socio-economic and environmental evaluation of the impact of illegal dumping sites in the city, including rural and urban areas (e.g. transport, emissions, informal sector risks etc.)										
	Evaluation of installed capacity for waste collection and management in the city	City waste profile outlines key stakeholders; waste collection and treatment infrastructure Circularity Assessment Protocol, 2023.	Detailed report on the installed capacity for waste collection and management in the city, particularly targeting material leakage, and material typically found in illegal dump sites										
	Final report with key recommendations for the GORE and municipalities		Final report with key recommendations for the GORE and municipalities on how to prevent illegal dumping sites and micro dump sites										
Traceability Platform for Construction Waste.	Stakeholder mapping	Preliminary identification of key stakeholders	Detailed identification of key stakeholders (including outreach strategy, risks etc.)										
	Solution Design – Develop "make-ups" and user views to validate the solutions with potential users (functionalities, modules and user profiles)	Case studies from similar platforms	Solution design and validation strategy										
	Platform Development or Adaptation and licencing – development of algorithm for waste generation estimation by CDW works, geolocation of valorization locations, eco-equivalency study		Platform development										

Traceability Platform for Construction Waste.	Business case development	Case study on sustainable construction seal	Business case development, including the sustainable construction seal alternative																
	Dissemination – Activation of the platform and monitoring scheme	It will be led by the GORE in partnership with municipalities	Monitoring and Evaluation framework development, including definition of valorization goals with construction companies																
	Implementation – activation of the platform		Implementation plan																
	Monitoring, evaluating and continuous improvement		Continuous improvement plan																
Environmental Education	Stakeholder mapping for educational program	Preliminary identification of stakeholders	Detailed stakeholder mapping and outreach strategy to support the development and delivery of the environmental education component																
	Construction Companies Module	Preliminary definition of key concepts, standards and tools to be delivered to construction sector professionals	Educational module for construction companies professional																
	Community Module	Preliminary definition of key concepts, standards and tools to be delivered to citizens and communities	Educational module for citizens and communities (it includes outreach plan with communities, such as workshops, communication campaigns, etc.)																
	Public Sector Module	Preliminary definition of key concepts, standards and tools to be delivered for public sector professionals working in the environmental and sanitation departments	Educational module for public servants																

Environmental Education	Outreach strategy and invitation for educational program	This will be led by the GORE	Outreach strategy and invitation for educational program Module's validation with SENCE.									
	Implementation of trainings and workshop activities		Implementation of trainings and workshop activities (or sub-contract).									
	Awareness activities on illegal dump sites	1 river cleanup completed, and 1 river cleanup planned with volunteers that includes basic concepts on waste management and illegal dump sites	Awareness campaign plan with execution led by the GORE									

6. Expected Impact of Project Components

The reduction in the generation of illegal dump and micro-dump sites, improved control and traceability of construction waste, involvement and oversight by municipalities, training for industry professionals, public awareness, and a better understanding of the diagnosis of VIRs and micro-dump sites in the Metropolitan Region of Santiago will result in:

Social Impacts



Improved quality of life and well-being: Studies have shown that people living near landfills face a higher risk of respiratory diseases and lung cancer due to the inhalation of harmful gases in these areas. This risk is even more significant for children (Mataloni et al., 2016). The project aims to help the city assess the impact of VIRs on the quality of life of the population and reduce the presence of VIRs. Through reduction of dump sites, it seeks to contribute positively to the community's quality of life.



Increased sense of security for citizens: In February 2023, Chile Vision broadcasted a report titled "Micro-dumps." In this report, the illegal disposal of solid waste in landfills and micro-dumps was associated with a concept created by residents of these areas: "The Garbage Mafia." This concept is created by communities residing in areas surrounded by VIRs and micro-dump sites. The phrase itself symbolizes danger and insecurity as they inhabit an area that, due to its condition and occupation, is associated with illegal activities.⁸



Increased property valuation and, consequently, more equitable distribution of the city's added value: According to reports from the Inmobiliario Portal, the cheapest homes are found "outside Greater Santiago," such as Buin, where a 50.94-square-meter property with two bedrooms and one

bathroom is offered for \$27,000 USD. In contrast, similar apartments in the municipalities of Padre Hurtado, Peñaflo, and Melipilla can cost \$80,500 USD. On the other hand, a report by the consultancy firm Tinsa in 2021 stated that the most expensive municipalities per square meter to live in were Lo Barnechea, Vitacura, Las Condes, and La Reina, where Lo Barnechea's square meter costs \$3,700 USD. It is worth mentioning that none of the high-valuation municipalities have illegal dumps. Only Vitacura has 14 micro-dump sites, which account for only 8% compared to the municipality with the most micro-dump sites in Santiago. VIRs and micro-dumps are not the only determinants of housing prices, but they can contribute.



Gradual reduction of neighborhood dumps and illegal landfills through the generation of territorial identity and a sense of belonging, based on environmental awareness campaigns and promotion of reporting. These campaigns promote greater equity in the territory and the recovery of communal spaces.



Reduction in diseases caused by rodents, cockroaches, and other vectors.

⁸ This document does not intend to pass any judgment on this group of individuals. The purpose is simply to present their impact on social media.

Economic Impacts



Economies of scale: With a greater supply of recyclable raw materials, the production of goods made from recycled materials becomes more economical (as there is more supply). Consequently, materials can be sold at competitive prices, promoting the purchase of products made from recycled materials by the market. This is essential for achieving a sustainable model for the national recycling industry. The Extended Producer Responsibility (EPR) law will help boost the demand for recycled materials as ambitious material valorization targets need to be met. Additionally, once the necessary regulatory changes are made, these circular materials can be incorporated into construction projects.



Reduced costs in waste management for construction projects: The RCD Roadmap has identified that companies can achieve savings of at least 25% by promoting recycling on construction sites. Some materials, especially those that are easier to valorize, such as iron, have a high market value and generate income through their sale⁹.



Savings in municipal resources and reduced waste management service expenses: The eradication of VIRs, depending on the extraction method, size, and tons of waste deposited in them, can cost \$1,721.93 USD per hectare, not considering the perimeter closure of the area or educational measures to prevent their reappearance¹⁰. On the other hand, in the report "Micro-dumps" broadcasted by Chilevisión, the mayor of the Municipality of La Pintana indicated that cleaning two kilometers of micro-dumps cost the municipality approximately \$87,000 USD, and they currently spend \$250,000 USD per month on cleaning micro-dumps in her municipality. Due to the rainy season at the end of June 2023, some municipalities in the



Metropolitan Region of Santiago, as well as the GORE itself, had to allocate resources to clean rivers because they carried more than 800 tons of garbage, creating blockages under bridges. This impacted nearby homes due to overflows and flooding.

Increase in job opportunities by promoting circular employment, new businesses, and valorization solutions. According to the International Labour Organization, in a study conducted in 2018, global employment in the waste management sector is growing rapidly. The data from this report suggest that "employment in the formal and informal sectors currently amounts to around 64 million people, and by 2030, it is expected that the number of workers in the waste sector will increase by approximately 70% worldwide, accounting for an additional 45 million jobs." This trend is also expected in Chile with the enactment of the EPR law. However, for the purposes of this project, the demand for jobs related to compliance and better regulatory performance should be strengthened by the existence of oversight tools and the creation of instruments for recognizing companies that practice good waste management.





The use of technology within the project will result in time savings for construction site managers and municipal officials who will have access to timely information aligned with waste traceability. This will allow for a transparent view of costs, income, and savings obtained through the implementation of more circular practices on construction and demolition sites. This transparency can encourage more construction projects to participate in the initiative. Ultimately, technology can help strengthen the recycling market by facilitating more seamless, coordinated, and efficient collaboration among various stakeholders in the chain, as well as promoting competitive material flows.


⁹ 1.16% of the average total budget for a construction project is allocated to solid waste management. If these wastes are valorized, an estimated savings of around 25% to 40% of the total budget can be achieved. RCD Roadmap: Circular Economy in Construction 2035. Link: <https://ods9.org/resource/569/hoja-de-ruta-rcd-economia-circular-en-construccion-2035>


¹⁰ Gestión de los residuos sólidos municipales, en la ciudad del Gran Santiago de Chile: desafíos y oportunidades, Óscar C. VÁSQUEZ.


Environmental Impacts


 Reducing waste transport trips to illegal landfills would help reduce the carbon footprint of transportation. It is common to encounter trucks that may not have the necessary permits to operate (e.g., not having up-to-date vehicle inspections), which worsens the emission of Greenhouse Gases (GHG).

 Burning of waste is a common method used to dispose of bulky waste. This releases toxic gases and particles into the atmosphere, which can have a negative effect on air quality, human health, and nearby fauna.

 Illegal dump sites often contain a variety of waste that can release toxic gases and particles into the air. This affects climate change because the degradation of organic matter in the waste produces a mixture of gases composed mainly of methane and carbon dioxide (CH₄ and CO₂), which are well-known greenhouse gases. Therefore, the elimination of illegal landfills can help reduce the risk of diseases, reduce GHG emissions from dump sites, and improve the air quality for people living nearby.

 According to the Environmental Assessment Guide for the Soil Natural Resource (2019), VIRs alter the chemical and physical properties of the soil due to the accumulation of contaminants and various chemicals, including heavy metals. Additionally, leaching processes alter its nutritive value, resulting in changes in pH, soil compaction, and erosion, leading to a loss of drainage capacity and the potential for new problems, such as increased flooding zones, negatively impacting the quality of life of area residents and associated pollution vectors. In summary, eliminating illegal landfills is crucial to protect soil quality and prevent long-term damage to human and environmental health.

 Reducing VIRs has a positive impact on the water component. The presence of illegal dump sites can lead to severe contamination of water sources, potentially reducing the amount of water available for human and agricultural use. Contamination can alter water characteristics such as color, odor, and taste, making it less safe for various uses. These VIRs can contaminate both surface waters and aquifers, spreading contaminants through processes such as leaching, dissolution, and direct transport. All of this has a negative impact on aquatic biodiversity, as it reduces the quantity and variety of species capable of inhabiting these water sources.

 According to the 2019 Guide for Vegetation and Wildlife, VIRs cause total or partial loss of plant formations through destruction or habitat loss. Periodically, some birds migrate and stop for food. During this time, they may consume waste disposed of in illegal dump sites, which can have a negative impact on birds by ingesting plastics, aluminum, cardboard, gypsum, and other materials. The continuous availability of food from these points is causing certain members of migratory species not to migrate due to easy access to food. Therefore, eliminating VIRs will have a positive impact on wildlife.

The project is directly and indirectly related to several Sustainable Development Goals (SDGs), including: SDG 1, 3, 4, 6, 8, 9, 11, 12, 13, 14, 15 and 17.

7. Institutional Arrangement

The Project's leadership is anchored in the Metropolitan Regional Government (GORE) since the issue it aims to address affects multiple municipalities. Oversight, a crucial and complementary component of this Project, should be carried out in partnership with the Regional Ministry of Health, the Carabineros, and the Environmental Unit of the Municipalities. The Regional Ministry of Health has the authority to impose fines on those who contribute to the creation or growth of micro dump sites by illegally depositing waste in VIRs. The Environmental Unit should be responsible for monitoring constructions visible on the platform and potentially conducting visits to those that are not ensuring the traceability of their waste in order to ensure the maintenance of good practices in this regard.

Strategic partners that will raise awareness about the initiative, engage companies, establish the desired certification, and ensure the continuity and sustainability of the Project, should ideally include the Chilean Chamber of Construction, the Association of Municipalities (AMUCH, ACHM, MSUR, ADOM), the Construct 2025 Program (CORFO), and the Chamber of Commerce (due to its connection with the possible creation of a WEEE - Waste Electrical and Electronic Equipment - recycling system).

A budget overview can be found below. For a detailed budget, please contact the project lead.

TABLE 2

[Budget Summary](#)

	Year 1 (USD)	Year2 (USD)	Total (USD)
Illegal Dumping Diagnostic - The Contribution of Communities and Businesses	74.250	0	74.250
Traceability Platform for Construction Waste	344.744	201.026	545.770
Capacity Building, Education, and Environmental Awareness	186.462	212.000	398.461
Total	605.456	413.026	1.018.481

