

TC Document

I. Basic Information for TC

▪ Country/Region:	ECUADOR
▪ TC Name:	Improving solid waste management and inclusive circular economy in Ecuador
▪ TC Number:	EC-T1441
▪ Team Leader/Members:	Grau Benaiges, Javier (INE/WSA) Team Leader; Correal Sarmiento, Magda Carolina (INE/WSA) Alternate Team Leader; Oyamada Kroug, Jorge Ruben (INE/WSA) Alternate Team Leader; Piamonte Velez Carolina (INE/WSA); Rosero, Maria De Los Angeles (CAN/CEC); Rihm Silva, Juan Alfredo (INE/WSA); Carlos Guiza (INE/WSA); Youngmin Oh (INE/WSA); Urquijo, Lee (ITE/IPS); Diaz Gill Virginia Maria (LEG/SGO) Youngmin Oh (INE/WSA); Urquijo, Lee (ITE/IPS); Diaz Gill Virginia Maria (LEG/SGO) Youngmin Oh (INE/WSA); Diaz Gill Virginia Maria (LEG/SGO)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	.
▪ Date of TC Abstract authorization:	22 Sep 2023.
▪ Beneficiary:	Ecuador through the Ministry of the Environment, Water and Ecological Transition (MAATE)
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	Korea Poverty Reduction Fund(KPR)
▪ IDB Funding Requested:	US\$600,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	30 Months
▪ Required start date:	April 2024
▪ Types of consultants:	Firms and Individuals
▪ Prepared by Unit:	INE/WSA-Water & Sanitation
▪ Unit of Disbursement Responsibility:	CAN/CEC-Country Office Ecuador
▪ TC included in Country Strategy (y/n):	y
▪ TC included in CPD (y/n):	y
▪ Alignment to the Update to the Institutional Strategy 2020-2023:	Social inclusion and equality; Productivity and innovation; Institutional capacity and rule of law; Environmental sustainability; Gender equality; Diversity; Indigenous People; Afro-descendants

II. Objectives and Justification of the TC

- 2.1 The objective of this technical cooperation (TC) is to support the improvement of solid waste management in Ecuador with a vision of climate change mitigation and an inclusive circular economy, through the execution of activities in the city of Cuenca, on the island of Galapagos, and at the national level. Leveraging the South Korean experience in sustainable waste management, technologies, and information.
- 2.2 Ecuador is a Latin American country with over 17.7 million inhabitants¹ with a GDP per capita of USD 5,809 a year, lower than Latin America's average of USD 7,922 per

¹ <https://www.cepal.org/es/subtemas/proyecciones-demograficas/americ-latina-caribe-estimaciones-proyecciones-poblacion/estimaciones-proyecciones-excel>

person per year² During 2021, Ecuadorians generated an average of 344 kilograms of municipal solid waste per person per year, higher than the average of Brazil, Peru, Colombia, and Bolivia. Despite the amount of solid waste taken to sanitary landfills being higher (73%) than the average in the region (46%), in 2021, 80.9% of the municipal solid waste produced in the country was collected, compared to 84.7% in LAC.

- 2.3 The transition to a circular economy and mitigation of methane are current challenges in Ecuador, according to the [solid waste and circular economy data hub](#) administered by the IDB, the country only valorized by composting or recycling³ 0.7% of its municipal solid waste, compared to 4.39% in LAC. The panorama of waste management in Ecuador indicates an accelerated upward trend of waste generation, which will require expanding waste collection, transport, and management. Also, as disposal of waste has limited lifespan and the system is mainly linear (consume and dispose), changes in the waste scheme to a more circular system whilst increasing efficiency are main challenges for Ecuador.
- 2.4 Regarding greenhouse gas (GHG) emissions from the waste sector, Ecuador is the 10th country in LAC, producing in 2021 5.76 million tons of CO₂ equivalent (5.54 million tons of CO₂ equivalent correspond to methane emissions).⁴ Methane mitigation is highly relevant as:⁵ (i) methane has a higher global warming potential compared to carbon dioxide (86 times for a 20-year period) and a shorter atmospheric lifetime (12 years), causing much more warming in fewer years; (ii) methane emissions have doubled since pre-industrial times, becoming the second most abundant GHG and responsible for 30% of global warming effects; (iii) mitigation results can be achieved cost-effectively as over 60% of measures to mitigate methane have low costs; (iv) the waste sector is the third largest anthropogenic source of methane (20%). Recent studies from satellites reveal that city-level methane emissions are 1.4 to 2.6 times larger than usually reported in emission inventories, and landfills contribute up to 50% of those emissions.⁶
- 2.5 Ecuador, like the LAC region, has an upward generation of municipal solid waste, which increases the pressure on current and future facilities for management. Also, there is an urgent need to guarantee access to solid waste collection and efficient transportation to minimize the environmental impact of the sector. Impact which includes the mitigation of methane emissions and the pollution of aquatic resources. Moreover, waste recovery rates are extremely low, resulting in great challenges for embracing a circular economy approach. Finally, there is a need to develop an information system that can identify opportunities for the solid waste sector in Ecuador. The lack of circular economy in the waste sector in Ecuador may relate to lack of infrastructure for waste segregation and valorization, and an absence on data that can reflect the gaps in the sector.
- 2.6 Solutions must be implemented throughout the waste management chain. Leading solutions include reducing waste generation, promoting segregated collection, transport, and treatment, closing open dumpsites, and minimizing the release of solid

² <https://statistics.cepal.org/portal/cepalstat/dashboard.html?theme=2&lang=es>

³ Solid Waste and Circular Economy Hub of the IDB <https://hubresiduoscirculares.org/> .

⁴ <https://climatedata.imf.org/pages/country-data>

⁵ <https://www.ccacoalition.org/en/content/benefits-and-costs-mitigating-methane-emissions>

⁶ Maasakkers, J. et. al. (2022) Using satellites to uncover large methane emissions from landfills, Science Advances

waste to the environment. These solutions are holistic as they include adequate waste management under a circular economy framework. Also requiring the updating of information, policies, and innovation schemes to reach the sector's goals.

- 2.7 Given the increasing amount of municipal solid waste produced in Ecuador, the role of stakeholders⁷ in minimizing, separating, and valorizing it is fundamental. LAC informal sector's role in the circular economy's value chain, carrying out the valorization and classification activities, are relevant as these sectors also benefit from the improvement of their social conditions and labor.⁸ Behavioral change strategies, social inclusion, and campaigns have demonstrated to be key in improving waste separation and classification. Studies in the region analyze, from a gender perspective, the initial separation of waste at home, providing insights on the importance of gender within this first separation phase. López and Espinoza (2020) point out that in Costa Rica, households headed by women are more likely to separate waste by a magnitude of five percentage points.
- 2.8 Solid waste collection in some LAC countries is mainly carried out by men, and the participation of women can vary from 18% in Uruguay to 58% in Bolivia⁹. Female participation can reach a third of the total number of people who work in the recovery/segregation of solid waste in LAC. Often, behind the work of the man dedicated to the collection of the RS in the public space, the classification and cleaning in the home are added, usually invisible, and carried out by the women and the family. This mix between domestic and work at home means an overload of work for women and girls¹⁰. A study carried out by the IDB (2015)¹¹ found that in the Ecuadorian Sierra, the participation of women in the collection can vary between 70% and 80%, while in coastal cities the participation of women varies between 28% and 32 %. For ethnicity, this study found that 82% of the collectors surveyed define themselves as mestizos, followed by whites and Indigenous people with 6% each.
- 2.9 **Justification.** Considering the above-mentioned challenges in the municipal solid waste sector, actions across distinct levels (national, subnational, and operative), are a strategic approach for improvement in the sector. Therefore, this TC supports actions on policy and regulations at the national level to support the transition to a circular economy; technical and financial studies of facilities for solid waste management with a circular economy approach at the operators' level in Cuenca, and local differential approaches for strategic environments such as the Galapagos Islands. Whilst supporting data gathering that allows to identify gaps for increasing circularity in the sector.
- 2.10 Coordination between governing bodies must be close and permanent. At the national level, the Ministry of Environment, Water and Ecological Transition (MAATE) is responsible for the planning, regulation, and national control of the Integral Management of Solid Waste (GIRS, Spanish acronym), subject to supervision from the states. Decentralized municipal autonomous governments provide GIRS services in their districts and solid waste producers, subject to the principle of extended

⁷ Including operators, social organizations, households, industries, national and local government.

⁸ <https://blogs.iadb.org/agua/es/apoyando-el-reciclaje-inclusivo-en-america-latina-y-el-caribe/>

⁹ Riofrío, Gustavo y Cabrera, Teresa (2012). *Trabajadoras por la ciudad: aporte de las mujeres a la gestión ambiental de los residuos sólidos en América Latina*. Lima, Perú: CLACSO.

¹⁰ Op. cit. Pp 26, 49-51.

¹¹ BID et al (2015). *Reciclaje inclusivo y recicladores de base en el Ecuador*. Iniciativa regional para el reciclaje inclusivo. [DOI](#).

producer responsibility (EPR), are responsible for the management of their products throughout its lifecycle. Currently the MAATE executes the Project for Solid Waste Management and Inclusive Circular Economy (GRECI, Spanish acronym) to contribute to the National Development Plan and Sustainable Development Goals (SDGs) and improve the environmental conditions of the country, defining priority interventions that require support from the international cooperation.

- 2.11 At the operator level, the Municipal Waste Collection Utility from Cuenca (EMAC EP, Spanish acronym), the third-most populated city in the country, faces challenges such as the transport of waste using conventional garbage collection vehicles, not designed to travel long distances (but to collect garbage in populated areas). This conventional mode of work forces the operator to have a greater number of collection vehicles, making the operation not only more costly but also more inefficient. To correct this problem, EMAC EP has been analyzing the possibility of implementing intermediate facilities (transfer stations). The transfer station analysis includes waste treatment facilities to reduce the amount of waste taken to landfills, increase selection/valorization, and reduce GHG emissions (mainly methane) in the municipality. The operator requires support for undertaking the technical and financial studies of these approaches and the selection of the best scenario.
- 2.12 There is also an interest in developing solutions adapted to island contexts. The Galapagos Islands present challenges in solid waste management given the absence of land for infrastructure, their environmental relevance, and the difficulty of connecting with other territories to create economies of scale. In addition, the municipality of Santa Cruz, has made efforts to develop selective waste collection and incentives for the recovery of waste. However, challenges persist in traceability, collection, and technologies that allow progress in the solutions proposed in favor of a circular economy. Similarly, Galapagos could benefit from the scalable solutions gathered for waste collection, management, and technologies adapted for this context. This TC supports the Galapagos Islands in reviewing their waste management status and identifying differential solutions.
- 2.13 **Lessons learned from IDB operations.** The IDB's current portfolio shows an increasing interest among countries in improving solid waste management with a circular economy model. The Bank approved in 2022, loans totaling US\$247 million, matching the previous US\$209 million from the whole active portfolio. It is expected that the demand will increase as solid waste becomes a major challenge in LAC, where the circular economy and climate change are priorities for the sector. Lessons learned in previous projects have shaped the priorities and activities established in this TC. Firstly, several investment loans in countries in the region have shown that it is fundamental to guarantee access to financial resources that allow projects to go beyond the operational phase.¹² This requires building local capacities including a financial vision in all the projects. Experiences exchanged among countries with relevant advances can boost these events. Secondly, previous projects financed by the IDB show the relevance of having data and monitoring guidelines to reflect the effectiveness of project results. The inclusion of monitoring, tracking, and access to information is vital. Thirdly, in previous waste management projects, the relevance of having actions on distinct levels (national and local) and with various aspects (policy, planning, and project development) has been highlighted as required to remove

¹² Loans include [AR-L1151](#), [AR-L1342](#), [BL-L1021](#), [DR-L1156](#), [HA-L1106](#), [PE-L1153](#), [GU-L1188](#), [ME-G1012](#)

barriers in the sector. Synergies and lessons learned will be promoted with IDB Lab related to a circular economy in Ecuador, including the work of Latitud R with recycling processes in the country.

- 2.14 The IDB manages the [Waste and Circular Economy Hub for LAC](#), a digital platform that harmonizes and publishes data and statistics for the sector, bringing experience with the use of information as a tool to identify challenges and review policies. The Bank is also developing the regional initiative “Too Good to Waste” to mitigate methane emissions from the waste sector in LAC, with a portfolio of projects to mitigate methane, build capacities, and analyse financial sustainability. This project in Ecuador, supported by the South Korean government, aims to reduce methane emissions in the waste sector through improved separation and recovery of organic materials as well as the reduction of mixed-up landfilling. It will be considered a part of the methane reduction initiative in Ecuador. Therefore, a vast interest and compromise from the IDB in the TC’s proposed actions are aligned with climate action, especially for methane emissions.
- 2.15 **Strategic alignment.** This technical cooperation (TC) is aligned with the Second Update of the IDB Institutional Strategy 2020-2023 (AB-3190-2) and is aligned with the development challenges of: (i) Productivity and Innovation by having a focus on aiding in the provision of infrastructure services and efficient public services through the integration of innovative solutions that will contribute to economic growth. The TC will support the improvement of innovation ecosystems in Ecuador’s service providers and in the Galapagos context; and (ii) Social Inclusion and Equality by supporting interventions that promote universal and sustainable access to quality and affordable waste management, highlighting recycling as a relevant social component in Ecuador. The TC is also aligned with the cross-cutting areas of: (i) Climate Change and Environmental Sustainability by financing innovative solutions that result in less GHG emissions by the sector and a circular economy vision; (ii) Institutional capacity and rule of law by supporting interventions that promote policies and regulations in the MAATE to transform the solid waste sector in Ecuador. With a focus on circular economy, sustainability, climate change, gender, and inclusion, and (iii) Gender Equality and Diversity, by developing studies about the work performed by women and diverse groups in the solid waste value chain. The TC also aligns with the IDB Group Corporate Results Framework 2020-2023 (GN-2727-12) level 2 indicator 2.4 “Households with improved access to water and sanitation (#)”.
- 2.16 Regarding the donor and the expected exchange experience promoted in this TC, South Korea has been known for its universal service of safely managed waste treatment services and digitalized operations with innovative technologies, accompanied by enabling policies and regulations. Korea's experience in integrated policy planning, such as the circular economy and operations of innovative facilities, is now observed as a growing demand in LAC. Considering that South Korea has achieved it in a remarkably brief period, its experience will provide a meaningful case study adaptable to LAC countries. Particularly, the Korea Fund for Poverty Reduction and Social Development (KPR) seeks the improvement of living conditions, access to social services and strengthening public sector. Aligned to this TC as components 1 and 3 relate to expanding access to sustainable waste management services, and component 2 will strengthen MAATE in policy and data for the sector.

- 2.17 Finally, the TC aligns with Ecuador's country strategy¹³ (2022-2025) which includes as a priority area of work with the IDB the support of policies to improve investment, planning, and basic infrastructure management of water and sanitation, with a focus on ensuring the budgeting, environmental, and social sustainability approach.

III. Description of activities/components and budget

- 3.1 **Component 1. Technical and Financial Studies for Solid Waste Treatment Facility (US\$280,000).** This component supports the development of technical and financial studies for an intermediate treatment facility in Cuenca, increasing transport efficiency and promoting solid waste sorting and valorization. Reviewing the appropriate treatment and waste flows of interest such as organics and recyclables.
- 3.2 These activities can help mitigate GHG emissions from final disposal and increase the lifespan of the sanitary landfill, through the valorization of solid waste and its deviation from final disposal. **Main activities** include: (i) technical studies to establish an intermediate treatment facility between the existing landfill and the waste collection area, recognizing the invisible work performed by women at home as part of the recycling value chain; (ii) conducting of a technical and financial assessment on the possibility of adding an intermediate treatment facility for transfer, sorting, recovery and treatment; (iii) Local Government collaboration by supporting the prioritization of target sites where the facility can be installed; (iv) social analysis, based on the operators current data, to (a) identify the situation in which women, indigenous people and people of African descent have work opportunities in the intermediate treatment facility; and (b) in cooperation with the local government, analyze residents' opinions regarding the project. This study should investigate whether people residing in the surrounding area work informally in the collection and classification of solid waste activities. This is to verify if there is an invisible female workforce that is not receiving remuneration for their work.
- 3.3 The **main products** of the component are the following: (i) a technical and financial study of the intermediate treatment facility for solid waste management in Cuenca, a report on the resident's perception to establish it and the state (based on the operator's information) of gender and diverse groups for inclusive workforce, recognizing the invisible work performed by women as part of the recycling value chain (¶2.8). (ii) Knowledge sharing space for the beneficiaries' project and South Korean experience.
- 3.4 **Component 2. South Korea-Ecuador cooperation for the development and strengthening of national policies and waste statistics for the integral management of solid waste (US\$160,000).** This component will develop long and medium-term public policy instruments at country level for the integral management of waste and non-hazardous materials, based on EPR and pay as you throw principles. Gathering and updating data, as well, as designing new indicators for the national waste platform of Ecuador. These policy instruments will receive support on circular economy approaches and digital waste data systems from the South Korean experience, such as Korea's Allbaro System, and will help promote a long-term collaboration by matching waste management agencies under the Ministry of Environment and with waste management agencies of the central and local governments in Ecuador. The plan will also have a special focus on the circular economy, climate action, tariff systems, and inclusive recycling with a gender

¹³ <https://www.iadb.org/en/about-us/country-strategies>

approach. **Main activities:** (i) Design of a public policy or regulatory instrument at the national level with and gender, diversity, and inclusion approach; (ii) Design indicators and collect the data aligned with the Waste and Circular Hub managed by the IDB and the South Korean technological experience; and (iii) the development of knowledge-sharing sessions for case studies and regulatory analysis through seminars, webinars, presentation of project results, production of publicity materials, blogs, infographics, and on-site visits with and gender, diversity, and inclusion approach.

- 3.5 The **main products** of the component are: (i) a national public policy/regulatory plan for integrated management of solid waste, enhancing a vision of circularity, financial and technical sustainability with and gender, diversity, and inclusion approach. Derived from an assessment of the existing legal framework focused on municipal governments (subnational governments). (ii) Solid waste data gathering and validation of indicators for the national information system administered by MAATE. Indicators to be developed include employment, inclusive recycling, gender, and diversity among others; (iii) Knowledge sharing space for policy analysis and case studies with the support of the South Korean government and experiences. Including the development of an informational/educational brochure with the key features of the data, this awareness material must have a gender, diversity, and inclusion focus.
- 3.6 **Component 3. Galapagos Islands waste management policy evaluation and technical analysis support (US\$160,000).**
- 3.7 This component will conduct a policy evaluation and project preparation in two municipalities in the Galapagos Island (San Cristobal and Isabela) with the vision of scaling it up to other populated islands of the Galapagos Islands. **Main activities:** (i) Galapagos solid waste management evaluation including the analysis of traceability mechanisms, monitoring technology and its relationship with end-users about the collection model for waste management and the incentive to recycle via EPR; (ii) on-site inspection of current facilities and visits to locations where additional installations are possible; (iii) technical and financial study of a waste treatment facility in the Galapagos Island with the participation of the private sector and government agencies, including a roadmap to improved waste management levels in other islands of the Galapagos aligned with component 2 and the closure of current dumpsites. The closure of dumpsites and other waste treatment facility study includes social aspects as gender, diversity, Indigenous people, and afro-descendants situation, and their role in the waste management chain.
- 3.8 The main **products** of the component are: (i) a context and baseline analysis on main challenges and opportunities for the Galapagos waste management services (including EPR, circular economy, dumpsite closure, among others). (ii) Technical and financial study for collection and recovery facilities for waste, including tracking, financial sustainability, consumer behavior, and dumpsite closure. Due diligence on the enabling environment for technology, facility implementation and closure of dumpsites. Including social aspects as gender, diversity, Indigenous, and afro-descendants' situation.
- 3.9 The Bank will own the intellectual property rights of the products and deliverables financed by this TC. Products should gather, when appropriate, audiovisual material, images, or testimonies for the showcasing of the implementation of the process in Ecuador, highlighting significance and expected impacts. If gathered, this material will be shared via information repository. Knowledge disseminated by the TC will use the

brand manual of the IDB, including the use of the flag of South Korea alongside the IDB logo.

- 3.10 The total amount of this TC is US\$600,000, which will be financed by the Korea Fund for Poverty Reduction and Social Development (KPR), there will be no local counterpart funding.

Indicative Budget

Component	Description	IDB/KPR	Total
Component 1	Technical and Financial Studies for Solid Waste Treatment Facility.	280,000	280,000
Component 2	South Korea-Ecuador cooperation for the development and strengthening of national policies and waste statistics for the integral management of solid waste	160,000	160,000
Component 3	Galapagos Islands waste management policy evaluation and technical analysis support	160,000	160,000
Total		600,000	600,000

IV. Executing agency and execution structure

- 4.1 According to the Ministry of Finance request the Bank will execute this technical cooperation. The TC will be executed by the Bank through the specialists in charge of Ecuador's portfolio from the Water and Sanitation Division (INE/WSA). The IDB Country Office in Ecuador (CAN/CEC) will act as the Unit of Disbursement Responsibility (UDR), in charge of coordinating with the MAATE.
- 4.2 This execution arrangement is justified under OP-619-4 Annex II as: (i) the Bank's experience in implementing technical support in the areas of solid waste management will more effectively contribute to the achievement of the objectives of the TC, within the established times; and (iii) the need to maintain and generate a strategic dialogue for programs of this type, in which the Bank has an important role as an "honest broker" and where various interested parties could have different interests in relation to the programs and the works being financed under the TC.
- 4.3 **Procurement.** The disbursement period of the TC is 30 months. Activities to be financed with this TC operation are included in the Procurement Plan Annex IV, which includes the hiring of individual consultants and consulting firms to achieve the objectives of the components and will be executed in accordance with Bank policies and procedures as follows: (i) policy AM-650 for individual consultants; (ii) the hiring of consulting firms of an intellectual nature will be governed by the GN 2765-4 and its Operational Guidelines (OP-1155-4); and (iii) other non-consulting services in accordance with Policy GN 2303-28.

V. Major issues

- 5.1 The main risks associated with this TC are: (i) the low institutional capacity of the country in solid waste management; and (ii) low involvement of local governments in project implementation. To mitigate these risks, the components include knowledge sharing and capacity building to strengthen the results and lessons learned in the TC. As such, the sustainability of the TC will be focused on providing the beneficiaries with

the required tools and pathways for the projects to achieve financial sustainability, therefore operating after the assistance from the Bank has been completed by including in studies, policies and plans the components of sustainability and operation.

VI. Exceptions to Bank policy

6.1 This TC does not contemplate any exceptions to Bank policy.

VII. Environmental and Social Aspects

7.1 This TC is not intended to finance pre-feasibility or feasibility studies of specific investment projects or environmental and social studies associated with them; Therefore, this TC does not have applicable requirements of the Bank's Environmental and Social Policy Framework (ESPF).

Required Annexes:

[Request from the Client_9763.pdf](#)

[Results Matrix_7512.pdf](#)

[Terms of Reference_76473.pdf](#)

[Procurement Plan_89271.pdf](#)