

TC Document

I. Basic Information for TC

▪ Country/Region:	REGIONAL
▪ TC Name:	Water Security, Circular Economy and Wastewater-to-Resource (WW2R) in Latin America and the Caribbean: Analytical Research and Case Study Implementation
▪ TC Number:	RG-T3477
▪ Team Leader/Members:	Munoz Castillo, Raul (INE/WSA) Team Leader; Carcasci, Giulia (INE/WSA); Gonzalez Medina, Francisco De Asis (INE/WSA); Greco, Maria Sofia (LEG/SGO); Lopez, Liliana M. (INE/WSA); Machado, Kleber B. (INE/WSA) Castillo, Raul (INE/WSA) Team Leader; Carcasci, Giulia (INE/WSA); Gonzalez Medina, Francisco De Asis (INE/WSA); Greco, Maria Sofia (LEG/SGO); Lopez, Liliana M. (INE/WSA); Machado, Kleber B. (INE/WSA)
▪ Taxonomy:	Research and Dissemination
▪ Operation Supported by the TC:	.
▪ Date of TC Abstract authorization:	30 Apr 2019.
▪ Beneficiary:	IDB borrower member countries
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	LAIF grant to CC and W&S(LAF)
▪ IDB Funding Requested:	US\$400,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	24 months Execution period: 18 months
▪ Required start date:	15 of August 2019
▪ Types of consultants:	Consulting Firm
▪ Prepared by Unit:	INE/WSA-Water & Sanitation
▪ Unit of Disbursement Responsibility:	INE-Infrastructure and Energy Sector
▪ TC included in Country Strategy (y/n):	No
▪ TC included in CPD (y/n):	No
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Social inclusion and equality; Productivity and innovation; Institutional capacity and rule of law; Environmental sustainability

II. Objective and Justification

- 2.1 With approximately one third of the global water resources and precipitations (Mejía, 2014), Latin America and the Caribbean (LAC) is the continent with the greatest availability of water per capita. However, the availability of the resource is highly seasonal and unevenly distributed between countries and regions, generating areas with high levels of water stress. In addition, the growing demand for water derived from the population increase, the decrease in water availability caused by the effects of climate change, and the competition between different water uses place additional pressures on the availability of the resource.

- 2.2 In addition to availability challenges, another critical aspect is water quality. In the LAC region, the main source of water pollution originates from the lack of wastewater treatment. The environmental impact caused by the discharge of these waters threatens the natural ecosystems, and negatively affect the health of the inhabitants with direct and indirect exposure to these waters.
- 2.3 The Sustainable Development Goals (SDGs) seek to halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally by 2030. This goal represents a major challenge for the LAC region, where only 37%¹ of wastewater is treated, and the experiences of reuse are isolated.
- 2.4 The lack of adequate access to water and sanitation has important economic consequences. Data from the World Health Organization (2012)² estimated the global economic losses associated with inadequate water supply and sanitation in US\$260 billion for each year, corresponding to 1.5% of the Gross Domestic Product of the 136 countries included in the study. On the other hand, it was estimated that the economic benefits of achieving universal access to basic sanitation amounted to almost US\$140 billion annually, US\$20 billion of which for the LAC Region. The study estimates the benefit-cost ratio for the necessary interventions in sanitation in the LAC Region at US\$7.3 for US dollar invested. Similarly, a study by Lixil and Oxford Economics of 2016³ has estimated the economic losses caused by inadequate sanitation for the LAC region in more than US\$22 billion.
- 2.5 The primary objective of this analytical work is to promote a paradigm shift in the LAC region's approach to circular economy in water, and specifically in wastewater through resource recovery; thus, promoting the integration of the concept of Wastewater-to-resource (WW2R). WW2R increases the economic benefits of treatment systems and provides additional benefits that can be captured by the served population (energy, nutrients, biosolids). In particular, this work will promote the prioritization and design of investments in the context of a circular economy in which wastewater is considered as an asset and a resource to be utilized rather than a liability, while promoting at the same time integrated, regional watershed planning. This work will provide water specialists from governments and financing institutions in client countries with the analytical underpinnings necessary to plan, design and implement sustainable financial, environmental, social, institutional, regulatory, and economic solutions. Besides promoting a paradigmatic shift, an additional objective of this work is to advocate for an increase in wastewater management and treatment in the region.

¹ Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG Baselines. Geneva: World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), 2017.

² Hulton, G., & World Health Organization. (2012). Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage. World Health Organization.

³ Lixil, Oxford Economics, Water Aid. (2016). The true cost of poor sanitation.

- 2.6 This TC will include 2 beneficiary countries. The countries that are preliminarily considered for this project are Colombia, Ecuador, Argentina y Brazil. However, the Component 1 of the TC will include the final selection of the countries.
- 2.7 The TC is consistent with the Update of the Institutional Strategy 2010-2020 (GN-2788-5) and is aligned with the following challenges: i) social exclusion and inequality, taking into account that interventions in wastewater recovery could increase the adequate access to water and sanitation; ii) low productivity and innovation, increasing the sustainability and resilience of the water systems together with the availability of quality water. The TC is also aligned with the cross-cutting aspects of: i) climate change and sustainability, through the financing of activities that will result in improving the resilience and sustainability of the water and sanitation services and ii) institutions and the rule of law, by proposing measures to support governance, institutional framework and regulatory frameworks for the integration of the principles of circular economy in the water and sanitation sector of the Region.
- 2.8 In addition, the TC is aligned with the Sectoral Framework for Water and Sanitation (SFD, document GN-2781-8) approved by the IDB in December 2017, which reaffirms the necessity to support countries in working towards universal access and improvement of the quality of the sanitation service, including the treatment of wastewater, reuse and proper management of solid waste.

III. Description of activities/ components and budget

- 3.1 To reach the above-mentioned goals, this TC will finance the following components:
- 3.2 **Component 1 – Review of existing experiences, and kickoff workshop.** This component includes the realization of a Diagnostic and of a Kick-off Workshop. The objective of the Diagnostic is to systematize the rich knowledge and experience that exists on the topics of integrated planning, financing and regulation of wastewater treatment, resource recovery, and water quality improvement investments and their associated trade-offs in a river basin context. The objective of the Workshop is to collect inputs and recommendations from key stakeholders from the region that will be used for the design and implementation of Component 2; and to select the two basins in two different countries that will be beneficiary of Component 2.
- 3.3 This component includes 2 activities: the realization of a diagnostic, which will include i) the best practices present in the region in terms of integrating wastewater management in the city's natural resources, urban and economic cycle and to capture the best innovations around the world that could be applicable to the region; ii) a regional analysis to establish an updated baseline on collection and treatment gaps and a preliminary assessment of investment levels (capital and O&M) and the financial gap; iii) the factors that have ensured the successful sustainable operation of wastewater facilities. The data collection will be based on

primary and secondary literature reviews, stakeholder interviews, and field visits to successful case studies.

- 3.4 The second activity is the organization of a kick-off workshop which will gather the key stakeholders involved in the project, which might include national and local authorities, water operators, and other actors included in the strategic territorial planning, NGOs, universities and research centers. The aim of the workshop is to present the proposed project methodology and technical work, while at the same time collect valuable inputs and recommendations that will be used for a more informed and effective formulation, design and implementation of Component 2. The identification of the two basins in two different countries for the implementation of Component 2 will be realized based on the information collected in the Diagnostic, and the inputs from the workshop. The selection of the countries and basins will be carried out taking into account the following criteria: (i) watersheds with presence of users for competitive use of the water resource; (ii) lack or little management and integrated basin governance; and (iii) interest of the government entities benefited.
- 3.5 The products associated with these activities is a Diagnostic consisting of an analysis of the problems with existing models of wastewater management, the justification for integrated watershed planning, and a description of the institutional reforms that promote wastewater management through integrated basin level planning; and a regional workshop.
- 3.6 **Component 2 – Innovative models for wastewater planning, financing and regulation.** This component will focus on developing and operationalizing alternative approaches using modelling tools in the two selected basins in two different countries, to promote a paradigm shift on basin planning, infrastructure investments and wastewater management approach. This application of the analytical framework using modeling will focus on:
 - 3.7 promoting a *Basin Planning* approach, by promoting a strategic focus to move from ad hoc and isolated wastewater solutions to integrated regional planning;
 - 3.8 developing new *Infrastructure Investments* plans by identifying financial criteria to improve the prioritization of investments in terms of potential benefits given limited resources and the innovative financing mechanisms to ensure the sustainability of the services for sanitation, wastewater and related activities, including the use of results-based financing, impact investment, and at the financial engineering of innovative designs that properly incorporate principles of integrated urban water management. The activity will aim to provide a clear understanding of needed institutional arrangements and new policies to promote investments in wastewater, to ensure sustainable outcomes and successfully coordinate with other sectors. The activity will therefore highlight the financing gaps and will propose a new approach to finance, design, and implement wastewater projects and programs in the region.

- 3.9 identifying alternatives to the *Wastewater management approach*, that is alternative approaches to wastewater and stormwater management in cities, including but not limited to green infrastructure, wastewater reuse, energy recovery, and the combination of these approaches with more traditional Wastewater treatment plants designs. In particular, the activity will elaborate a framework to guide staff (both from the IDB and the public sector) in client countries to understand how to design investments with resource recovery objectives, what is the proper institutional, legal, and regulatory arrangements required, how to conduct economic analysis of alternative designs, and how to structure the financial engineering of the investment. The goal is also to identify opportunities through efficiencies in expenditures, energy savings and energy generation from wastewater, reuse of wastewater effluent, nutrient recovery and beneficial uses of biosolids.
- 3.10 The product associated with these activities is an analysis that will include a discussion of the role of modeling in decision-making including data availability, definition of the problem, selection of the model, and identification, modeling and prioritization of potential solutions. The analysis will include as well a review of case studies in the region that can demonstrate the implementation of the WW2R approach, specifically in terms of innovative designs that properly incorporate principles of WW2R, and that look at upstream, integrated basin-planning.
- 3.11 **Component 3 - Knowledge Dissemination, Advocacy and Capacity Building.**
The objective of this component is to support the dissemination and capacity building processes related to the activities of the previous components. The activities financed include conducting stakeholder consultations, disseminating outputs and sharing knowledge, developing messages and products to reach global audiences, and providing capacity building support to client countries. Activities will include an initial workshop with key policy makers in the selected countries to provide a clear understanding of the current challenges, identify the basins of interest, and collect inputs and recommendations for the design of the project; and a final regional workshops to present the findings of the report and to disseminate knowledge and results.
- 3.12 The products associated with these activities include 1) web-based social media and interactive tools, and 2) workshops and conferences, with emphasis to regional events. Open - source models that do not require the purchase of licenses will be used and, where appropriate, free code models to be able to extend capacities or relate them to other tools, if necessary. The project does not envision the purchase of goods and equipment.
- 3.13 This TC will have a total cost of US\$400.000,00 funded through the LAIF Grant to Climate Change and Water and Sanitation.

Indicative Budget (in US\$)

Component/Product	Quantity	Unit Price	IDB Funding	Total Cost
Component I			15,000.00	15,000.00
1.1 Diagnostic	1	5,000.00	5,000.00	5,000.00
1.2 Workshops	1	10,000.00	10,000.00	10,000.00
Component II			335,000.00	335,000.00
2.1 Model analysis	2	167,500.00	335,000.00	335,000.00
Component III			50,000.00	50,000.00
3.1 web-based social media and interactive tools	1	20,000.00	20,000.00	20,000.00
3.2 Organization of workshops	4	7,500.00	30,000.00	30,000.00
TOTAL			400,000	400,000

IV. Executing agency and execution structure

- 4.1 The executing agency of this TC will be the Inter-American Development Bank (IDB), through the Divisions of INE / WSA. The agreement with the donor states that the IDB will be the executing agency of the technical cooperation's financed with LAIF resources. This TC is a Research and Dissemination TC that aims to propose analytical lines of work of the Bank oriented to contribute to the sustainable management and use of the resource and to the multisectoral planning of water infrastructure, thus favoring the economic and social development of the Region. More specifically, through this TC it is intended to pilot methodologies and technical tools for the design and implementation of water infrastructure projects that the Bank can implement in other countries of the region. Following the operational guidelines for technical cooperations, the Bank is the Executing Agency and has no counterpart. INE / WSA will be responsible for the administration, planning, control and supervision of the assigned financial resources, as well as all activities related to the proper preparation, programming and monitoring of the operation.
- 4.2 Monitoring will be based on the documentation generated. No formal evaluation will be undertaken, but an end-of project report will be prepared by the team. This report will summarize the execution, the results obtained, as well as the lessons learned for future projects of this nature.
- 4.3 In this regional technical cooperation, we consider it important to keep the Technical Cooperation Offices (OTC) of AECID informed, and to coordinate especially with them in the countries where singular actions are carried out. We also remember the commitment to coordinate with the Delegations of the European Union (DUE), which should be informed about the implementation and usefulness of technical cooperation. The OTCs should be aware of meetings held with the DUE.

- 4.4 Concerning the visibility of the project, and including the management of publications, use of logos, and confidentiality, the IDB will ensure to comply with the obligations included in section 12 of the Donor agreement.
- 4.5 The activities to be executed under this TC have been included in the Procurement Plan and will be executed in accordance with the Bank's established procurement methods, namely: (a) Recruitment of individual consultants, as established in the AM -650; (b) Hiring consulting firms for services of an intellectual nature according to GN-2765-1 and its associated operational guides (OP-1155-4) and (c) Hiring of logistic services and other services other than consulting, according to the Policy GN-2303-20.
- 4.6 Prior to the initiation of activities in the beneficiary countries, the Team Leader will be responsible for obtaining a letter of non-objection from the liaison country office with the Bank.

V. Major issues

- 5.1 Institutional capacity and readiness to engage in an inter-sectoral digital solution exercise: This risk will be mitigated through swift promotion of dialogue and application of mechanisms for active involvement of public sector specialists and authorities, leveraging existing relationships between Bank Sector Departments, Bank Country Departments and LAC Governments, as well as VPS and VPC expertise.
- 5.2 Sustainability: This knowledge generated by the activities of this TC will be systematized and will create a methodology to support replicability in the region.

VI. Exceptions to Bank Policy

- 6.1 No exception to Bank policies is foreseen.

VII. Environmental and Social Strategy

- 7.1 There are no environmental and social risks. The TC will rank in category C by ESG.

Required Annexes:

- ✓ [Results Matrix](#)
- ✓ [Terms of Reference](#)
- ✓ [Procurement Plan](#)