

Technical Cooperation Document

I. Basic Information for TC

▪ Country/Region:	REGIONAL
▪ TC Name:	Support to the Structuring and Implementation of Resilience and Restoration Bonds (Resbonds) in the LAC Region
▪ TC Number:	RG-T3605
▪ Team Leader/Members:	Cathala, Corinne (INE/WSA) Team Leader; Garcia Merino, Lucio Javier (INE/WSA) Alternate Team Leader; Almeida Oleas, Natalia (LEG/SGO); Basani, Marcello (INE/WSA); Champi Ticona, Diana Carla (INE/WSA); Frisari, Giovanni Leo (CSD/CCS); Sasaki, Keisuke (INE/WSA) and Natalia Almeida (LEG/SGO)
▪ Taxonomy:	Research and Dissemination
▪ Operation Supported by the TC:	.
▪ Date of TC Abstract authorization:	01 Apr 2021.
▪ Beneficiary:	TC funds will be available to national and subnational governments upon request, including Public and Private Partnerships from IDB borrowing member countries for water and sanitation-related activities. The TC will support 1 beneficiary.
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	Multidonor AquaFund(MAF)
▪ IDB Funding Requested:	US\$200,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period:	36 months (included)
▪ Required start date:	August 2021
▪ Types of consultants:	Consulting firms and individual consultants
▪ Prepared by Unit:	INE/WSA-Water & Sanitation
▪ Unit of Disbursement Responsibility:	INE/WSA-Water & Sanitation
▪ TC included in Country Strategy:	No
▪ TC included in CPD:	No
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Environmental sustainability; Productivity and innovation

II. Objectives and Justification of the TC

- 2.1 The objective of this TC is to assist national and local governments of Latin America and the Caribbean countries in mobilizing new sources of financing to fund climate resilient water and sanitation sector investments through the utilization of innovative financial instruments. The TC specifically aims to generate knowledge about Resbonds in the LAC region through the development of a comprehensive market analysis, the identification of a pilot project and the structuring of Resbonds.
- 2.2 As weather patterns shift, sea levels rise and the average global temperature increases each year, the impacts of climate change are global in scope¹. Climate change has been evidenced in several ways, such as in accelerating of the detriment

¹ Climate Change. United Nations. <https://www.un.org/en/sections/issues-depth/climate-change/>. Accessed on 26 November 2019.

of Andean glaciers, the rise of the sea level in coastal zones, variations in occurrence, intensity, and localization of rainfall, and temperature increase. Floods are one of the most common natural disasters, because of torrential rains, strong flows, or because of the combined effects of both and sometimes, they have devastating effects, causing death and high losses in infrastructure, agriculture production, private property, and economic activity.

- 2.3 For instance, jurisdictions in the Caribbean are extremely vulnerable to natural disasters and experience disproportionate losses. Those events include hurricanes, windstorms, drought, landslides, flooding, tidal waves, volcanic eruptions, and earthquakes. Out of 30 Caribbean jurisdictions, 21 are susceptible to at least 5 of the 8 types of natural disasters. Additionally, the impact of each of these disasters is disproportionate given the small economies they occur in. For example, Hurricane Katrina caused several hundred billion dollars in damage, it only represented a 1% loss of GDP to the US, while Hurricane Ivan resulted in an over 200% GDP loss for the Cayman Islands and Grenada².
- 2.4 Climate research projections estimate that windstorms will increase in intensity, enhancing the potential for substantial damage in the Caribbean. According to an IPCC report, sea level rise will cause higher coastal inundation levels for tropical cyclones, the projected increase of 10-15% for rainfall rates in storm areas (2-degree scenario), frequency of tropical cyclones will likely increase on average by 1-10%, and the global proportion of Category 4 and 5 tropical cyclones will likely increase as well³.
- 2.5 The Global Climate Risk Index analyses to what extent countries and regions have been affected by impacts of weather-related loss events. The most recent data lists Puerto Rico as the most heavily impacted Caribbean jurisdiction, with Haiti ranked fourth. Floods due to heavy rains or hurricanes in the Caribbean particularly have caused significant damage to the infrastructure and the livelihood of people (e.g., Haiti with Hurricane Matthew in 2016). Total damages from a sample of natural disasters in the Caribbean amounted to USD92.5 billion between 2015-2019.
- 2.6 In addition, worldwide, water scarcity has become a significant problem in the last few decades⁴ with droughts that have become more frequent and more severe (i.e., California and Sao Paulo droughts). Available economic data suggests that drought has a direct negative impact on the GDP of countries. As many regions become warmer due to climate change, the frequency and length of droughts are expected to increase on a global scale. Although there is no universal definition of drought, its environmental and social consequences are obvious and significant, as seen through Australia's devastating fires of 2019.
- 2.7 Countries are increasingly vulnerable to natural hazards, and when disasters strike millions of people are driven deeper into poverty. Between 1998 and 2017, climate-related and geophysical disasters killed 1.3 million people and affected 4.4 billion more. Climate change threatens to push an additional 100 million people into extreme poverty by 2030 (Hallegatte et al. 2016) and 720 million more by 2050 unless

² CCRIF SPC. 2011, P. 11. A collection of papers, articles, and expert notes: volume 2. Caribbean Catastrophe Risk Insurance Facility.

³ Intergovernmental Panel on Climate Change. Climate Change 2013: The physical Science Basis. <http://www.ipcc.ch/report/ar5/wg1/>. Accessed on 5 September 2019.

⁴ Water in the time of Drought: Lessons from five droughts around the world. Policy Brief IDB-PB-295.

something is done. Half of those most affected by natural hazards live in fragile and conflict-affected states⁵.

- 2.8 The LAC region is the second region in the world most likely to be impacted by natural disasters⁶. Those events very often impact water and sanitation infrastructure, for instance, wastewater networks. The impact of floods is magnified when superficial runoffs in urban areas transport contaminants such as heavy metals, organic loads, suspended solids, oils, and grease.
- 2.9 Many capital cities in the world such as London, Paris or Santiago de Chile have realized the economic potential of re-developing waterfronts as landmark destinations. Rivers, lakes, and coastlines attract people. Therefore, new residents and tourists arrive and new businesses sprout provided that the site meets certain environmental and aesthetic standards. This influx increases the tax base and generates wealth for the locality. Sadly, many such places are suffering from environmental degradation that discourages developers and negatively affects current residents and businesses. Examples such as Rio Bogota in Colombia, Lake Atitlan-Guatemala or the Tiete River in Sao Paulo are places where the water quality is degraded due to untreated sewage and industrial wastewater, urban and agricultural runoff, erosion, and illegal dumping.
- 2.10 Innovative financial instruments such as resilience bonds and restoration bonds (Resbonds) can help finance needed resilient infrastructure to mitigate and protect against natural disasters and environmental degradation. Resbonds may link project finance, conservation objectives and risk mitigation to create resilient infrastructure systems with reduced expected losses from ecosystem degradation and/or extreme weather events. Therefore, Resbonds can represent an innovative way to finance both risk mitigation and protection against environmental degradation and natural disasters. However, Resbonds are still very much at an incipient stage and there is currently no Resbonds program in the LAC region. In addition, only a few cases of resilience bonds have been piloted globally.
- 2.11 Only 8 LAC countries have issued green bonds so far. Brazil dominates the market with 41% of regional issuances, Chile is in second place with 25% and Mexico 14%. The water sector is the most financed at the international level but the least financed at the LAC level⁷.
- 2.12 The water and sanitation of the IDB is exploring the implementation of innovative financing schemes, defined as “ResBonds” (Resilience and Restoration bonds), for water and sanitation infrastructure projects whose purpose is either to enhance resilience or mitigation against natural hazards and climate change or enable the restoration of the quality of a given environment, for example a river, lake, coastline, watersheds or soils and groundwater at a given site.
- 2.13 There are two types of ResBonds: Resilience bonds and Restoration bonds. A Resilience bond is a financial instrument in which investors make an initial payment to fund a disaster mitigation project or resilient infrastructure. The infrastructure is expected to reduce direct and indirect damage that would have occurred without the project. A Restoration bond is a financial instrument in which investors make an initial

⁵ Center for disaster Protection, Policy brief. IDA19: a vital tool for managing crisis risk, March 2019.

⁶ (UN Office for Coordination Humanitarian Affairs, 2020).

⁷ America latina y el Caribe, Estado del Mercado de las Finanzas Verdes, 2019. Climate Bond Initiative

payment to fund ecosystem improvement projects in an area where the improvements are expected to enable economic development and prosperity for the region.

- 2.14 The instrument is built with multiple triggers that release payments to the investor based on the completion of pre-determined phases, which are evaluated according to agreed-upon factors such as: (i) the successful construction of resilient infrastructure or completion of a restoration project; (ii) the performance of the resilient infrastructure or restoration project against relevant goals and according to project-specific metrics; (iii) the impact of the resilient infrastructure or restoration project in reducing damage and generating wealth, or otherwise achieve a desired, measurable, and predefined goal for the betterment of a community, region, or a country.
- 2.15 This TC is consistent with the Second Update to the Institutional Strategy 2020-2023 (AB-3190 2). In addition, the TC is aligned with the development challenges of (i) “Productivity and Innovation” as it will support LAC countries to mobilize financing through innovative financial instruments for environmental sustainability and adaptation to climate change. In addition, the TC is aligned with the cross-cutting theme of “Climate Change and Environmental Sustainability” since it will assist countries to mobilize financing for the development of projects to adapt to climate change and environmental degradation in the water and sanitation sector. In addition, this TC is aligned with the five dimensions defined in the Water and Sanitation Sector Framework Document (SFD) (document GN-2781-8) approved by the Bank in December 2017. In the SFD, the dimensions of success and lines of action for the sector were defined, including achieving universal access to water and sanitation, improving the quality of the service, incorporating good practices in the management of infrastructure and the use of appropriate technologies, as well as the inclusion of aspects of water security. This TC is consistent with the AquaFund Multi Donor Fund (MAF) in that it promotes innovation and supports the governments of the region to achieve Sustainable Development Goals⁸ No.6 through the mitigation of the impacts of climate changes as well as the deterioration of ecosystems and water scarcity. Finally, the TC aligns with the Corporate Results Framework of 2020-2023 (GN-2727-12) in that it aligns with the cross-cutting theme of “Climate Change and Environmental Sustainability” as it will support countries with the development of climate adaptation and restoration projects in the water and sanitation sector.

III. Description of activities/components and budget

- 3.1 **Component I: Market analysis for Resbonds in LAC, Strategy and identification of pilot project.** This component will finance the development of a comprehensive analysis of the relevancy and applicability of such type of financing in the LAC countries and the water and sanitation sector. Engage with relevant stakeholders and IDB staff to develop viable approaches for a ResBonds, in particular: (i) Government officials and local stakeholders to understand needs and capabilities; (ii) relevant IDB staff in country offices and at IDB headquarters; (iii) Real estate developers to evaluate drivers for new development relevant to the enabling potential of ResBonds; (iv) Insurance markets to determine opportunities for reducing risks to insurance companies for managing flood risk for high value existing infrastructure at risk; (v) Consultancy firms and engineering firms to identify options involving hybrid (green+grey) infrastructure solutions; (vi) Possible third-party entities and not-for profit entities; (vii) law firms to identify the legal/institutional frameworks of countries to

⁸ <https://sdgs.un.org>

implement the project; and (viii) description of the selected pilot project and detailed justification of its selection.

- 3.2 As part of that analysis, a project will be identified to conduct a pilot. Engagement activities will be carried out with relevant stakeholders and IDB staff to develop viable approaches for ResBonds: (i) understand needs and capabilities; (ii) evaluate drivers for new development relevant to the enabling potential of ResBonds; and (iii) determine opportunities for reducing risks to insurance companies.
- 3.3 A pilot project will be selected and will be prioritized based on formal request from national/local governments to move ahead with the project. Additional criteria will include the environmental degradation, area prone to natural disasters (i.e. floods)
- 3.4 **Component II: Structuring of the Resbond financial mechanism for a pilot project.** This component will finance the contracting of a consulting firm to develop the documentation to structure the bond for the pilot project previously identified. This will include the financial, legal, institutional and technical documentation as well as a financing plan. Key activities to be carried out by the consulting firm include: (i) Design of the bond, including the identification and mitigation measures for identified risks and connecting them with appropriate conditional payments and returns on investment; (ii) Identification of the key end-beneficiaries of the ResBond project (population, economic players, key business owners of the affected area); (iii) market sounding to assess their willingness to pay for the positive impact produced by the ResBond project as well as assessment of the terms and conditions of the market; (iv) Organize the form/source of payment (from new or increased local tax justified by increased wellbeing in the affected area, increased real estate/property value, reduced insurance premiums; from insurance companies, as they cash out less compensation for reduced damages; from real estate developers, as they can develop properties on land with increased value; etc.); and (v) Assess mechanisms of sovereign guarantee over the repayments, to ensure that ResBond project developers/investors are paid as long as they are entitled to.
- 3.5 This component will also finance the development of a financing plan for the pilot project, which may include funding from public and private sources after having explored the following: (i) Appetite from private investors to contribute equity or debt (in the form of commercial loan or bond); (ii) Independent donors; and (iii) Crowdfunding approaches. Additional options for public funding will include funding from international financing institutions (multilateral such as IDB, Green Climate Fund, etc.; bilateral such as JICA, etc.) or public donors (USAID, MCC, etc.). The financing plan will target public, private or blended finance and will include financing terms and conditions.
- 3.6 **Component III: Dissemination activities.** As this type of financial instrument has not been implemented before in the LAC region, the component will finance the dissemination of the results obtained from the market analysis carried out in Component 1. In addition, this component will finance a knowledge product based on lessons learned from the structuring of the Resbond in Component 2. Dissemination activities will include webinars, workshops and publications.
- 3.7 The total cost of this operation is US\$200,000, which will be financed with the resources of the Multidonor AquaFund (MAF). There will be no local counterpart financing. The distribution of resources is as follows:

Indicative Budget (US\$)

Activity/Component	Description	IDB/Fund Funding	Counterpart Funding	Total Funding
Component I	Market analysis for Resbonds in LAC, Strategy and identification of pilot project	40,000	0	35,000
Component II	Structuring of the Resbond financial mechanism for a pilot project	150,000	0	140,000
Component III	Dissemination activities	10,000	0	25,000
TOTAL		200,000	0	200,000

- 3.8 Beneficiaries of the TC will include national and local governments (municipalities and state governments), which would have identified a water and sanitation project or projects impacted by climate change or environmental degradation.
- 3.9 The execution and supervision of the TC will be the responsibility of the TC team Leader, who will coordinate with the INE/WSA specialist in each country where the activities will be implemented. The monitoring of the TC will be carried out by the project team.

IV. Executing agency and execution structure

- 4.1 The TC operation will be administered and executed by INE/WSA in coordination with the Climate Change Division (CSD/CCS) and the relevant IDB Country Offices, departments and divisions of the IDB Group. The team will also coordinate with IDB Invest as appropriate. The Bank Country offices' staff, in those countries where project activities are undertaken, will liaise with and monitor the progress of the consultants.
- 4.2 The execution period is 36 months (including disbursements). The activities to be financed with this TC operation are included in the Procurement Plan in Annex and will be executed in accordance with Bank policies and procedures as follows: (i) the hiring of individual consultants will be governed by the guidelines established in policy AM-650; (ii) the hiring of consulting firms of an intellectual nature will be governed by the "Policy for the selection and contracting of consulting firms for operational work carried out by the Bank" (GN 2765-4) and its Operational Guidelines (OP-1155-4); and (iii) other non-consulting services in accordance with the "IDB Institutional Procurement Policy" (GN 2303-28). All activities foreseen for this TC operation will be included in the procurement plan and will be executed in accordance with the bidding methods and terms established.
- 4.3 TC activities will be monitored and reported annually as well as at the end of the execution period. Letters of non-objection will be obtained before any specific consultancy is carried out in a specific country.
- 4.4 Direct hiring of RESbond International Corporation has been identified during the preparation of the TC. Dr. Sudhir Murthy, CEO of RESbonds International Corporation, and former Innovations Chief at DC Water, the water utility serving metropolitan

Washington DC, has developed the trademarked⁹ (Murthy and Clarke, 2019) and patent pending (Kinter et al. 2020, Regmi et al. 2020) digital green bond concept of Resilience Bonds®. During his tenure at DC Water, the utility was the first to adopt performance-based finance. RESbonds is the only company that has developed this full-lifecycle combination financial and digital approach in the water and sanitation sector.

V. Major issues

- 5.1 One of the risks in achieving the objectives of this TC is the potential lack of interest or ownership from national governments and/or municipal governments in the proposed financial instrument. To mitigate that risk, the team as well as in-country INE/WSA specialists will be coordinating closely the structuring of the proposed activities and will be in close contact with the national/municipal agencies and sector ministries to ensure full appropriation of the activities.
- 5.2 There has not been any case of structuring of Resbonds in the LAC region and this could potentially be a barrier to the design of the bond. Decision makers and investors require access to data and knowledge that enables the formulation of projects supportive of the bond objectives. The analysis of the market and appetite for Resbonds from governments and institutional investors, as well as the use of Resbonds in other regions will contribute to gathering knowledge and data for the LAC region.
- 5.3 The current COVID-19 pandemic has been severely impacting Latin American and Caribbean countries and there is a risk that Bank mission travel may not resume until several months to the region. As a consequence, this may negatively affect the execution of the TC. However, a significant portion of the activities can be conducted online; therefore, the team deems this risk minimal.

VI. Exceptions to Bank policy

- 6.1 This TC operation does not include any exception to Bank policies.

VII. Environmental and Social Strategy

- 7.1 Following ESG's project classification process requirements, it has been determined that this TC operation falls under Category "[C](#)". No environmental assessment studies or consultations are required for those Categories.

Required Annexes:

[Results Matrix - RG-T3605](#)

[Terms of Reference - RG-T3605](#)

[Procurement Plan - RG-T3605](#)

⁹ Murthy, S. and Clarke, J. (2019) Resilience Bond Trademark, Resilience Bond Application #88114976, Registration # 5916259, U.S. Patent and Trademark Office.