TC Document

I. Basic Information for TC

▪ Country/Region:	Regional
▪ TC Name:	Supporting Climate and Disaster Risk Assessment Processes to Foster Resilient and Sustainable Development
▪ TC Number:	RG-T3328
▪ Team Leader/Members:	Maricarmen Esquivel (CSD/CCS) Team Leader; Melissa Barandiaran (VPS/ESG) Alternate Team Leader; Sergio Lacambra (CSD/RND) Alternate Team Leader; Daniela Zuloaga (VPS/ESG); Alfred Grunwaldt, Maria Alva and Giovanni Frisari, (CSD/CCS); Gines Suarez (CSD/RND); Hori Tsuneki (CSD/RND); Ivonne Jaimes (CSD/RND); Maria C. Ramirez (INE/INE); Carolina Verissimo (LEG/SGO); Liza Lutz (LEG/SGO).
▪ Taxonomy:	Research & Dissemination
▪ Date of Abstract authorization:	September 13, 2018
▪ Beneficiary:	Inter-American Development Bank borrowing member countries
▪ Executing Agency:	Inter-American Development Bank
▪ Donors providing funding:	Sustainable Energy and Climate Change Multi-Donor Trust Fund–MSC (US$1,100,000) Strategic Development Program for Sustainability–SUS (US$400,000)
▪ IDB Funding Requested:	US$1,500,000.00
▪ Local counterpart funding:	US$375,000.00 (in-kind)
▪ Disbursement period:	36 months
▪ Required start date:	January 1st, 2019
▪ Types of consultants:	Individual consultants and consulting firms
▪ Prepared by Unit:	Climate Change Division (CSD/CCS)
▪ Unit of Disbursement Responsibility:	Climate Change & Sustainable Development (CSD)
▪ TC Included in Country Strategy:	N/A
▪ TC included in CPD:	N/A
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Productivity and innovation, and Climate change and environmental sustainability

II. Objectives and Justification of the TC

2.1 The objective of this Technical Cooperation (TC) is to implement, improve, and build capacity on methods and tools for climate change (CC) and disaster risk (DR) analysis and the identification of resilience opportunities in the preparation and implementation phases of projects and investment portfolios. Specific objectives include: (i) an increase in projects that integrate CC, DR and resilience during their design and execution; and (ii) client countries and financial institutions in the Latin America and Caribbean (LAC) region with greater access to innovative methods to identify and manage climate risks. The results and lessons learned from the execution of this TC will be instrumental in helping the Inter-American Development Bank's (hereinafter referred to as IDB or Bank) member countries make a transition towards a more effective upstream risk and resilience assessment process. In a highly dynamic global change context, this can make a difference for countries to successfully achieve their sustainable development goals and adaptation commitments under their National Determined Contributions.

2.2 The effects of CC and disasters triggered by natural hazards pose a significant threat to sustainable development in LAC. As noted by the Bank's Technical Note What is Sustainable Infrastructure, the region is one of the most vulnerable to the impacts of CC. In 2017 it experienced severe losses from natural events, including floods in Peru and Colombia that costed US$3.1 billion and resulted in 329 fatalities. Vergara et al. (2013) estimate that CC will cause damages estimated at US$100 billion per year across the region by 2050. The impact of CC is a growing concern, as it increases the vulnerability of assets and reduces the predictability of future infrastructure needs.

2.3 As part of sustainable planning, development projects should take current and future DR and resilience opportunities into account in their design, construction, and operation phases. However, classic design and construction practices generally do not include these beyond standard building codes and design parameters, and most do not include CC considerations. Proper studies and considerations are not usually carried out as part of operations themselves. To address this challenge, countries in the region have identified the need for clear methodologies and resources to undertake risk and resiliency studies to better understand and address vulnerability while accounting for uncertain variables as part of project decision-making processes.

2.4 In line with adaptation priorities set forth in the Paris Agreement and the needs of countries in the region in terms of upstreaming CC and DR assessments into their investments, the Bank, through its Community of Practice on Resilience,[1] has designed a methodology to identify and conduct these assessments on relevant projects.[2] The approach has been developed internally by the Bank with the support of external consultants, and the methodology's steps have been piloted in more than 17 Bank-financed projects. The methodology is now ready for broader implementation and improvement as it continues to be refined through its application.[3]

2.5 Decision Making Under Deep Uncertainty (DMDU)[4] is also one additional element of this methodology in cases in which a resource planning exercise requires a complex multicriteria analysis with many uncertain variables. The need for such type of methods has been the center of work of the international scientific community in the last decade. There have been significant advances, not only in the improvement of climate models and algorithms for conducting powerful statistical analysis but also in the use of analytical frameworks such as the DMDU. This method allows the identification of robust investments under a large set of plausible scenarios by using statistical and scenario discovery tools to characterize the key vulnerabilities of investments and/or policies. In

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[1] The Community of Practice in Resilience is an interdivisional multidisciplinary team of IDB specialists and consultants that aims at mainstreaming resilience in IDB sectors and projects. Experts from CCS, ESG, RND, HUD, TSP, ENE and WSA have been involved in this community of practice.

[2] This methodology was elaborated under operation ATN/OC-15237-RG, including its application in 4 projects (two in preparation, two in execution), and a peer review. The methodology will be published in December 2018. It is well aligned with other similar efforts in the Bank such as two training courses on DR analysis (including the effects of CC) organized in 2016 and 2017 and the Small Private Online Course (SPOC) and the Massive Open Online Course (MOOC) currently being developed by KIC and RND, CCS and ESG on DRAs (including the effects of CC) in public investment systems, which will further strengthen capacities in the LAC region.

[3] Lessons learned so far from these pilots include the need to complement hazard and CC information with project criticality and project structural characteristics, and the importance of having a qualitative analysis phase, before embarking on more complex quantitative analysis to help avoid generating studies that might be too costly (in terms of time and funds) and general to influence designs. For more information, please see Technical Summary: Project Climate and Disaster Risk Assessment Methodology. A learning by doing approach has been critical to arrive to the current methodology, which will itself be improved by a continuation of this lessons learned process.

[4] Decision Making Under Deep Uncertainty (DMDU) comprises a group of methods used in complex processes where key decisions could be affected by deep uncertainty of controlling variables. One DMDU method is Robust Decision Making (RDM) which is currently being used to account for deep uncertainty of CC models' projections.

conjunction with stakeholder outreach, it helps define new options and develop adaptive strategies based on identified thresholds and signposts. The Bank used this method in the preparation of an operation in Bolivia, BO-L1080, Multipurpose water and irrigation program for the municipalities of Pucarani, Batallas and El Alto, and is currently preparing additional studies using this method. In all cases, a capacity building component is included to ensure the method could be replicated in future programs.

2.6 Financial regulators and supervisors have acknowledged the threat posed by climate-related risks for the stability of financial markets, both via *physical risk* and *transition risks,*[5] and consider as part of their mandate and the responsibility to ensure financial systems are resilient to these risks (NGFS, 2018). In the case of the physical risks, by decreasing economic productivity and damaging assets (buildings, fields, plants), climate-related extreme events have significant impacts on the performance of financial institutions and the solidity of their balance sheet as loan defaults amongst borrowers increase, return on investments decrease and compensation requests to insurers grow (Klomp, 2014; NCFA-GIZ, 2017). As a result of such growing evidence, in 2015 the Financial Stability Board created a Task-Force for Climate-related Financial Disclosures (TCFD) to help financial markets identify, assess, manage and disclose climate risks.[6] As the recommendations from the TCFD take hold and the new Network produces its first results, central banks and financial regulators in the LAC region are assessing their role, tools and challenges to identify and understand climate risks for their countries and estimate their potential impacts for the resiliency of their countries' investments and financial markets.

2.7 This operation is aligned with the Productivity and Innovation development challenge of the Update to the Institutional Strategy 2010-2020 (AB-3008), as well as with the CC and environmental sustainability cross-cutting theme. The LAC region is very vulnerable to CC risks, which can result in significant human and economic losses. Integrating climate risk and resilience opportunities in countries' project cycles, including approaches to take uncertainty into account and to bring these risks into financial terms, is both an innovative and pragmatic approach that can contribute to the improvement of both CC and productivity indicators.

2.8 The operation is also aligned with the IDBG Climate Change Action Plan 2016-2020 (GN-2848-4). IDB's work on CC, DR and resilience opportunities in the project cycle is also framed within the Bank's Sustainable Infrastructure for Competitiveness and Inclusive Growth,[7] the Disaster Risk Management Policy (OP-704),[8] and the Climate

[5] For transition risks, a misalignment of the financial institutions positions on the national and international commitments towards CC mitigation exposes investors to losses due to new policies, technological changes and innovation that aim to incentivize economic activities more aligned with climate targets (BoE, 2017).

[6] More recently, in December 2017, 18 central banks (including the Central Bank of Mexico) have established a new Network for the Greening of the Financial System (NGFS) to enhance the resiliency of financial systems. IDB is supporting these efforts for regulators and regulated entities by leading the work on Climate Risk in the Climate Action for Financial Institutions Initiative, and by promoting the dialogue with supervisors and regulators in public events such as the AdaptAmericas Event in Panama in May 2018 and the Climate Finance Day in Mexico in September 2018. TCFD recommendations, released and endorsed by the G20 in 2017, have received the support of more than 500 institutions for their implementation (TCFD, 2017).

[7] The Strategy notes that infrastructure and the services derived from its utilization need to respond to the challenges that countries in our region face, including CC adaptation and natural disasters.

[8] Policy OP-704 stipulates that "IDB financed public and private sector projects will include the necessary measures to reduce DR from natural hazards to acceptable levels for both the Bank and the Borrower." The Policy OP-704 Guidelines define a procedure to assess project DR (including CC) that includes: (i) project screening and classification, integrated in the safeguards system; and (ii) a Disaster Risk Assessment (DRA) if the project is classified as high risk (and for moderate risk projects depending on the case). Also, per the Bahamas Resolution, the Bank made a commitment to screen all relevant projects for climate risk by 2018.

Change Sector Framework Document. This Project is aligned with the MSC objectives as specified in GN-2435-6, in particular with the area of adaptation to CC, and with the goals of developing a screening tool in order to assess and mitigate climate risk in new Bank projects, and mainstreaming climate risk in country investments, including financing CC vulnerability and risk assessments, and identification of adaptation measures. The TC also targets the commitments made in April 2016 by the Boards of Governors of the IDB and IIC to increase the volume of climate-related financing to 30% of operational approvals by the end of 2020 and to access external sources of concessional financing and contributes to the objectives of the Strategic Development Program for Sustainability (GN-2819-1).

III. Description of Activities/Components and Budget

3.1 **Component 1. Implementation of climate change and disaster risk and resilience assessments in IDB projects and capacity building (US$630,000).** This component will: (i) implement more broadly the tools and methodologies that the Bank has produced to assess CC, DR and resilience opportunities in projects in preparation and implementation. Activities may include qualitative analyses such as mode of failures analyses, and quantitative CC and DR analyses. Lessons learned will be documented for each. The Technical Summary: Project Climate Change and Disaster Risk Assessment Methodology provides additional in-depth information; and (ii) support internal and external clients in LAC and within the Bank to improve their understanding, knowledge and experience related to the assessment of CC, DR and resilience opportunities at the project level, and to standardize minimum criteria. Activities include training of stakeholders on risk and resilience at the project level (ministries, academia and relevant sectors at the Bank) to ensure the sustainability of these processes.

3.2 The expected outputs include: (i) CC and DR assessment and resilience opportunities for at least 4 IDBG projects in preparation, and two CC and DR site visit reports for projects in implementation; and (ii) design of core curriculum and implementation in 4 workshops to build the capacity of at least 30 stakeholders (internal and external) on CC and DR assessment at the project level.

3.3 **Component 2. Robust Decision Making (RDM) in planning processes (US$400,000).** This component will finance the application of the RDM method to a group of relevant IDB-financed projects. To this aim, a consulting firm will be hired to carry out the studies, which will be based on four key pillars: (i) exploratory analysis; (ii) vulnerability analysis and adaptations; (iii) participatory deliberations of stakeholders; and (iv) capacity building to facilitate replication of the approach. Specifically, the first uses models to plot the possible outcomes of hundreds to millions of combinations of options and uncertain futures. The second, identifies the conditions in which certain decisions or strategies will not work well and then tests alternatives to find those that are more robust. The third, uses the product of exploratory analysis with interactive decision support tools to highlight key exchanges between robust options across a broad range of objectives to support decision making processes. Because of the versatility of this method, it is ideal for the development of infrastructure master plans or any other planning process that requires the consideration of many uncertain future scenarios. The selection of projects will be based on a set of criteria that include data availability, level of complexity and country interest. The aim is to illustrate advantages and disadvantages of this complementary approach to assess CC vulnerability and risks.

3.4 Expected outputs: (i) RDM applied to two projects to manage climate risks and other associated uncertainties; and (ii) 50 local planners trained in the use of RDM.

3.5 **Component 3. Production and implementation of climate risk management tools in financial markets for Central Banks and Financial Supervisors (US$400,000).** This component will support central banks and financial supervisors (of banking, investment and insurance markets) in the region in developing tools, protocols and analytical instruments to identify climate risks and estimate the resiliency of the financial system (or of a part of it) to climate-related shocks, including extreme events and/or sharp policy/technological transitions. The component will focus on the production of customized and practical methods to capture climate relevant data and translate them into financial metrics that could be used by financial analysts and risk managers in regulating and supervising entities, for example integrating climate variables in supervisors' stress testing exercises, as well as to incorporate these into their decision-making process of prudential policies to implement.[9]

3.6 Expected outputs: support central banks/regulators in: (i) the production of climate related data sets (geospatial and time series data) to be integrated into financial analyses; (ii) the development of analytical methods to translate climate-related data into financial risks; and (iii) the implementation of a pilot exercise to identify the key climate risks for a specific jurisdiction, assess the exposure of the financial system to such risks and produce exposure metrics.

3.7 **Component 4. Supervision and monitoring of activities (US$70,000).** The TC will finance, with MSC resources, a technical CC and DR assessment expert, with risk modeling skills, to carry out technical supervision of the activities, particularly the CC and DR assessments. The IDB personnel, in addition, will support and supervise the execution of this TC through their sector knowledge and will specifically provide technical and strategic assistance to high level trainings and meetings. By financing these costs, the Bank's administrative budget is not being complemented nor supported.[10]

3.8 The total amount of funding needed to achieve the expected outputs is US$1,875,000, of which US$1,100,00 will be provided by the Sustainable Energy and Climate Change Multi-Donor Trust Fund (MSC), US$400,000 will be provided by the Bank's Ordinary Capital Strategic Development Program for Sustainability (SUS), and US$375,000 shall correspond to in-kind counterpart contributions.[11]

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[9] The development of such tools will draw insights from the analysis of instruments and metrics available for financial institutions under the work for the Climate Action in Financial Institutions, and from the best practices and experiences from the region and internationally, as highlighted in the comparative research in operation RG-E1577: "*Strengthening financial stability through the adoption of climate risk considerations in central banks and financial regulators' policy and regulatory instruments in Latin America".* Note that this type of analysis could be implemented for the financial system as a whole (as in the case of the Central Bank of The Netherlands) or for specific segments (e.g. insurance as for the California Insurance Commission). The work under RG-E1577, which will serve as a basis for Component 3, will produce two reports: (i) a comparative analysis on international practices for supervisors and regulators when assessing and managing climate risks in financial systems; and (ii) a quantitative estimation of the impacts of climate risks in the Brazil financial systems through disaggregated data at the municipality level.

[10] The amount allocated for supervision activities includes the costs associated with the participation of Bank sector specialists in the program for purposes of monitoring and supervising of the TC products and collaborating with the consultants and stakeholders involved during the elaboration of the products and the capacity building activities. This is required to be able to monitor the products and to disseminate them to all the beneficiaries.

[11] The counterpart contribution shall correspond to the time contributed by counterpart staff and office space under each component as indicated in the Indicative Budget chart. Details on the referred in kind counterpart contribution will be provided and commitment letters from the entities providing such in kind counterpart contributions will be obtained by the Bank as a requisite for disbursement.

Indicative Budget (US$)

Component	IDB/MSC	IDB/SUS	Counterpart	Total
Component 1. Implementation of climate change and disaster risk and resilience assessments in IDB projects and capacity building	630,000	0	175,000	805,000
Component 2. RDM in planning processes	0	400,000	100,000	500,000
Component 3. Production and implementation of climate risk management tools in financial markets for Central Banks and Financial Supervisors	400,000	0	100,000	500,000
Component 4. Supervision and monitoring of activities	70,000		0	70,000
Total	1,100,000	400,000	375,000	1,875,000

3.9 The TC includes dissemination and capacity building activities for internal and external stakeholders on CC and DR assessment.[12] Training will include stakeholders that can replicate this knowledge, including in academia. The team will be responsible for the preparation and submission of the project report through the Technical Cooperation and Reporting module (TCM) in Convergence, in which it will highlight the products and results obtain from the studies under this TC.

IV. Executing Agency and Execution Structure

4.1 The Bank will act as the executing agency based on its technical and operational capacity. The Bank is in a process of mainstreaming CC, DR and resilience opportunities throughout its project pipeline in accordance with its Operational Policy OP-704 and the Bahamas Resolution of 2016. The execution by the Bank will help strengthen the sectoral coordination needed to achieve this more widely within the Bank and with client countries. The execution period is expected to be 34 months and the disbursement period 36 months. The administrative and technical supervision, as well as the internal and external coordination for the delivery of the final products will be the responsibility of CSD/CCS, which will work jointly with CSD/RND and VPS/ESG.

4.2 Bank procurement policies will be followed in the bidding processes of these activities. For contracts with consulting firms, the Policy for the Selection and Contracting of Consulting Firms for Bank-executed Operational Work (GN-2765-1) will apply. For contracts with individual consultants, the AM-650 Complementary Workforce (CW) Policy will apply. For the dissemination expenses and other services (workshops, catering, printing and publishing, etc.), policies of corporate procurement (GN-2303-20) will be followed.

4.3 Prior to initiating the implementation of the activities of the TC in any selected beneficiary country, the corresponding no-objection will be obtained from the liaison entity with the Bank in each country.

4.4 The purpose of Component 1 is to support ongoing efforts at the Bank to help operations in the project cycle undertake CC and DR assessments when needed (to be known at or before ERM). Time is of essence so as not to delay operations in their approval process. A small group of firms and consultants capable of carrying these specialized studies has been identified, based on previous work with the Bank in other operations

[12] This will be done in close coordination with the Bank's SPOC and MOOC on DR assessment (including the effects of CC) in public investment systems.

including in ATN/OC-15237-RG (see Table 1 in the Technical Summary: Project Climate Change and Disaster Risk Assessment Methodology for more information).[13]

V. Major issues

5.1 The main risk of this TC is that relevant interventions proposed in the CC and DR assessments are not undertaken, or if undertaken are not maintained. To mitigate this risk and ensure sustainability of the proposed measures, the team will work closely with relevant projects to ensure that the measures proposed are implementable, and that project maintenance plans take the measures into consideration. The team will also ensure that CC and DR issues are incorporated as part of supervision plans of the projects being supported through this operation, thereby ensuring sustainability beyond its execution period.

VI. Exceptions to Bank policy

6.1 There are no exceptions to the Bank policy.

VII. Environmental and Social Strategy

7.1 It is not anticipated that the activities of this TC will have negative direct or indirect social or environmental impacts, as it has been classified as Category “C” per the Environment and Safeguards Compliance Policy (OP-703) (see the Safeguard Screening Form and the Safeguard Policy Filter Report).

Required Annexes

- Annex I: Results Matrix
- Annex II: Terms of Reference
- Annex III: Procurement Plan

[13] Note that this does not exclude other firms from being able to participate. This will also depend on the subsector of the projects being supported, as particular sector skills might be required in addition to CC and DR assessment skills. As per provision of GN-2765-1, Single Source Selection may be appropriate in this case as it presents a clear advantage over competition, given that the tasks represent a natural continuation of previous work carried out by the respective firms, and given that the work is highly specialized and only a small number of firms are qualified for the assignment.