

Technical Cooperation Document

I. Basic Information for TC

▪ Country/Region:	REGIONAL
▪ TC Name:	Supporting the Design of Long-Term Adaptation Pathways in the Face of Climate Risks in Peru and Colombia
▪ TC Number:	RG-T3812
▪ Team Leader/Members:	Fernandez-Baca, Jaime (CSD/CCS) Team Leader; Grunwaldt, Alfred Hans (CSD/CCS) Alternate Team Leader; Almeida Oleas, Natalia (LEG/SGO); Ceva Alvarez, Mariana Daniela (CSD/CCS); Cruz Moreno, Paula (INE/TSP); Delgado, C. Raul (CSD/CCS); Esquivel Gallegos, Maricarmen (CSD/CCS); Garcia Negro, Alvaro (CSD/RND); Gomez, Juan Carlos (CSD/CCS); Hori, Tsuneki (CSD/RND); Iju Fukushima, Ana Saori (CCS/CPE); Paez Rubio, Tania (INE/WSA); Saavedra Gomez, Valentina (CSD/CCS); Salazar Echavarria, Carlos Alberto (CSD/RND); Sandoval Pedroza, Jose Manuel (CSD/CCS); Suarez Vazquez, Gines (CSD/RND); Zuloaga Romero, Daniela (VPS/ESG)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	.N/A
▪ Date of TC Abstract authorization:	.N/A
▪ Beneficiary:	Ministerio de Ambiente y Desarrollo Sostenible de Colombia y Ministerio del Ambiente del Perú
▪ Executing Agency:	Inter-American Development Bank
▪ Donors providing funding:	Strategic Climate Fund(SCX)
▪ IDB Funding Requested:	US\$1,000,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period Execution period:	24 months
▪ Required start date:	April 15th, 2021
▪ Types of consultants:	Firms and individual consultants
▪ Prepared by Unit:	CSD/CCS-Climate Change
▪ Unit of Disbursement Responsibility:	CSD/CCS-Climate Change
▪ TC included in Country Strategy:	Yes
▪ TC included in CPD:	No
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Productivity and innovation; Institutional capacity and rule of law; Environmental sustainability; Gender equality

II. Objectives and Justification

- 2.1 The effects of climate change (CC) and disasters triggered by natural hazards pose a significant threat to sustainable development in Latin-America and the Caribbean (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 estimated in US\$3.1 billion and resulted in 329 fatalities. Vergara et al. (2013)¹ estimate that CC will cause damages

¹ Vergara et al (2013). The Climate and Development Challenge for Latin America and the Caribbean. Options for climate-resilient, low-carbon development. Inter-American Development Bank. Washington DC.

estimated at about 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.

- 2.2 Adaptation and climate resilience enhancement are strongly emphasized in the Paris Agreement (Article 7) and includes a call for all countries to engage in national adaptation planning processes. Additionally, governments are expected to submit a new iteration of Nationally Determined Contributions (NDCs) by the Conference of the Parties 26 (COP26), 2021. The early design of Long-Term Strategies (LTS)² for adaptation and resilience, and the design of aligned NDCs represents an opportunity for raising ambition and anticipating costs, managing trade-offs, and ensuring a just transition,³ while identifying immediate policy reforms and investment priorities necessary to effectively plan and accelerate adaptation.
- 2.3 Long-term adaptation can bring important development benefits. Investing US\$1.8 trillion between 2020 and 2030 globally in early warning systems, climate-resilient infrastructure, improved dryland agriculture crop production, global mangrove protection, and investments in making water resources more resilient could generate US \$7.1 trillion in total net benefits⁴ (Global Commission on Adaptation, 2019). Naturally, the transformation will also bring new challenges and costs that need to be anticipated to develop lines of action around them. For instance, making infrastructure more climate-resilient can increase upfront costs by 3%, but has benefit-cost ratios of about 4:1 (Global Commission on Adaptation, 2019). Nevertheless, estimations on the cost of adaptation as of the end of the first decade of this century are estimated to be less than 0.5% of the region's GDP (Bárcena, Alicia and others, 2020), and resilience and disaster risk prevention yield benefits of about four to seven times the cost in terms of avoided and reduced losses (Moench, Mecheler, & Stapleton, 2007); (MMC, 2005); (Mechler, 2016); (Kull, Mechler, & Hochrainer-Stigler, 2013); (UNDRR, 2011). Understanding the economic and social benefits of climate adaptation actions, such as avoided human and economic losses, economic savings, jobs creation, preservation of ecosystems, and health benefits, will be key for designing successful long-term plans for adaptation.
- 2.4 Adaptation is a priority for countries in the region. The latest LEDSenLAC study⁵ found that, from 21 analyzed countries, 91% included adaptation on their NDCs. As of February 2021, 12 countries⁶ of the region have updated their NDCs and almost all of them have enhanced the adaptation component of their NDC. In addition, several countries of the region are developing their LTS for adaptation. As such, governments of the region have been increasingly requesting support to the IDB on different strategies to include climate resilience into their development planning processes, institutional systems and also into infrastructure projects.
- 2.5 Long-term planning for adaptation will require profound institutional, economic and cultural transformations. In addition, long-term planning for adaptation needs to incorporate uncertainties associated to the projections of climate change impacts' temporal and spatial distributions, as well as uncertainties that can also affect the

² There is no formal definition for the concept "LTS for adaptation" in the Paris Agreement. Therefore, we use LTS for adaptation and "long-term planning for adaptation" interchangeably.

³ Understood as a transition to a zero carbon and economy that creates quality jobs and leaves no one behind.

⁴ Avoided losses, economic benefits and social and environmental benefits

⁵ "[*Hacia un Desarrollo Resiliente bajo en Emisiones en America Latina y el Caribe: Progreso en la implementación de las Contribuciones Nacionalmente Determinadas*](#)". Published in March 2020.

⁶ Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Jamaica, Mexico, Nicaragua, Panama, Peru, Suriname.

successful implementation of structural and non-structural measures to increase climate resilience, such as technology costs, international markets, demand and supply of different services, land-use changes and conflicts, among others. In the face of such complexities, governments are not only in need of better understanding of climate hazards, exposure, vulnerability, and risks, but as well of analytical support that can inform decision-making processes for long-term planning for climate resilience.

- 2.6 This TC aims to provide support on the development of analytical studies for long-term resilience to the Governments of Colombia and Peru. Support on analytical studies comes timely as both countries are developing long-term strategies for both adaptation and mitigation: Colombia is planning to submit its 2050 LTS before COP26 while Peru is in the process of updating the 2030 Peruvian Climate Change Strategy, extending its horizon to 2050. Additionally, both countries included climate risks-related targets in their updated NDCs (submitted in December 2020).
- 2.7 Specifically, this TC will support governments on the analysis and modelling of CC adaptation options through climate-risks and long-term adaptation pathways studies. The main outcome of the project is the identification of priority infrastructure (gray and green) measures to increase resilience against climate-risks as well as the identification of nonstructural measures such as relevant policies and laws, public awareness raising, and training and education. The adaptation and prioritization options will be identified through an integration of complex modelling on climate hazards, exposure, vulnerability and risks with decision-making processes based on co-construction workshops with relevant stakeholders where metrics of success such as socio-economic benefits and costs, as well as other relevant uncertainties will be identified.
- 2.8 The IDB, through NDC Invest and the French Development Agency (AFD), are jointly supporting the Government of Colombia in the development of the study “Climate Risk and Adaptation Strategies for the 2050 Long Term Strategy of Colombia” that will directly inform the Colombian LTS. The first phase of this study, which is at the *Departamento* level, should be completed during 2021 and the second phase, developed on municipal level, will be financed by this TC. One of the preliminary results is the update of the probabilistic wind threat model that was used to update the country's structural design standard specifically for the reconstruction of the archipelago of San Andrés, Providencia and Santa Catalina.⁷
- 2.9 Peru will update its climate change strategy using as a basis the recently developed National Adaptation Plan (NAP), where five thematic areas were prioritized. One of the objectives of the NAP is to contribute to the implementation of the adaptation measures (MACC) at the national and subnational level. This TC will support the Ministry of Environment (MINAM) in the NAP implementation by evaluating climate risks and proposing adaptation measures, aligned to the MACC. In addition, it aims to support MINAM inform projects to be prioritized in the National Infrastructure Plan for Competitiveness (PNIC). The first PNIC was supported by the IDB and published in 2019.
- 2.10 Recommended methodologies for this type of studies include Probabilistic Risk Assessment (PRA) and Decision Making Under Deep Uncertainty (DMDU). Both approaches seek to recognize and address uncertainty. In a PRA, all the risk components (threat including the effects of climate change, exposure and vulnerability) are modeled and mathematically integrated in a probabilistic manner recognizing, quantitatively incorporating, and formally propagating uncertainty throughout the model. Thus, the

⁷ The results of the study will be published in the following link: <https://e2050colombia.com/>

model can statistically represent the probability of all possible events, even those that have not yet occurred, which transforms it into a prospective model capable of representing all scientifically possible events. DMDU (Groves and Lempert, 2007; Fischbach et al., 2015) defines multiple solicitation scenarios from the start (e.g. threat scenarios, climate change projections, project vulnerability) and possible actions generally at the strategic level (e.g. adaptation strategies such as climate-risk insurance and specific sectoral adaptation policies), and although uncertainty is not explicitly quantified as in the probabilistic assessment, all scenarios are assessed by analyzing the risks and benefits. One example of an DMDU method is Robust Decision Making (RDM). RDM is an innovative method to conduct analysis to long-term plans with multiple objectives and high uncertainty, evaluating options for risk reduction, costs, and benefits. RDM's problem scoping is built with inputs from relevant stakeholders, collected through rich discussions in a series of stakeholder consultations. In the end, with input from relevant stakeholders, agreement is sought on possible actions by selecting robust actions that maximize benefits for the entire likely range of possible conditions.

- 2.11 The selected methodology for the projects executed under this TC uses both approaches where the DMDU functions as the decision-making framework and the PRA functions as the calculating engine. The process can be summarized as: (i) a Probabilistic climate Risk Model (PRM) is built consisting of four modules: hazard, exposure, vulnerability and risk. This is a scientific model capable of modeling the selected climate hazards (e.g. flooding, storm surge, hurricanes) and the exposed assets' susceptibility of being affected or damaged (vulnerability) and it computes the expected economic and human losses (direct and indirect); (ii) a DMDU framework is established where multiple uncertainties, risk reduction actions and performance metrics are proposed to be tested;⁸ (iii) under the DMDU framework and using the PRM as the calculating engine, risk is computed for all the combinations of uncertainties and risk reduction actions; (iv) the actions are evaluated by their performance under multiple uncertainties and futures using the metrics defined (these usually include cost-benefit type of metrics and analyses conducted to assess performance); and (v) a prioritized list of actions that represent the most robust actions (that in general perform well under the wide range of uncertainty) is obtained.
- 2.12 The COVID-19 pandemic is having tremendous health and economic impacts throughout the world, and Colombia and Perú are no exceptions. After implementing fiscal and monetary measures to address immediate health and economic impact, both countries will have to design and implement economic recovery packages for the medium and long-term. Thus, it will be central for the proposed projects to align with the national stimulus packages and at the same time to promote a "*build back better approach*". As mentioned, green investments can bring significant social and economic benefits and can, therefore, serve as spearheads for economic recovery. In the short term, it will be crucial to promote projects and programs that not only aim to build a resilient future, but to promote job creation, boost economic activity, and that evaluate timelines and risks. Additionally, it will be relevant to assess the long-term growth potential of projects and programs (for instance, reducing air and water pollution), and alignment to a decarbonized future. A proper balance and evaluation of these criteria will need to be included in the prioritization analysis. As mentioned, one of the strengths of methods such as RDM is that, through a "build-together" participatory process with relevant stakeholders, projects/strategies can be prioritized using metrics of success that go

⁸ As countries will be implementing economic recovery plans due to the COVID-19 crisis, the performance metrics will align to the goals of national stimulus packages put in place by countries.

beyond the classic cost-benefit approach and that include criteria aligned to metrics of success of national stimulus packages.

- 2.13 Women and men experience the impacts of climate change differently, with women disproportionately affected due to gender inequalities. In recent years, the global consensus has recognized that mainstreaming women's rights and gender equality in climate change mitigation and adaptation activities is not only essential, but also maximizes the effectiveness of interventions, programs and resources. However, women are underrepresented in decision-making on climate issues (female representation averaged 33%⁹ on constituted bodies in the UNFCCC and 22.5%¹⁰ in the principal climate finance mechanism boards). Both Peru and Colombia have incorporated a specific gender approaches into their NDCs and development of Climate Change Strategies. As such, the activities supported by this TC will incorporate climate gender considerations so as align to the national priorities of addressing the climate change and gender challenge.
- 2.14 This TC seeks to: (i) inform about the climate change risks in specific prioritized sectors of Peru and Colombia; and (ii) inform about adaptation options in light of such climate change risks for improving decision-making processes related to structural and non-structural planning. No other similar work has been conducted for these countries, but the activities under this TC will complement the work of other IDB operations that support the development and implementation of NDC and resilience in general in the region, such as: ATN/MC-17416-RG "*Financing the Design and Implementation of Nationally Determined Contributions*"; ATN/MC-17402-RG "*Consolidate the presence of NDC Invest in the Region*"; ATN/AC-17538-RG "*Support for Building Transportation Systems Resilience to Climate Change*"; ATN/JF-17864-RG "*Rolling-Out of the Methodology to Enhance Resilience to Disaster Risk and Climate Change Risk in IDB Projects*"; ATN/AC-18143-RG "*Strengthening resilience in Latin America and the Caribbean*". In addition, this TC will be executed in close coordination with ATN/OC-18176-RG "*Support to the implementation of Long-Term Strategies in LAC*", and ATN/FR-18228-RG "*Informing the design of Long-term Decarbonization Strategies*" as they will support countries to inform the design and implementation of LTS.
- 2.15 The TC is consistent with the Second Update to the Institutional Strategy (AB-3190-2), and is aligned with: (i) the development challenge of *productivity and innovation*, as it enables the identification of climate-resilient pathways that will help governments ensure that resources are invested in resilient initiatives that are in line with countries' priorities, and are productive in terms of their goals and benefits; (ii) the cross cutting theme of *institutional capacity and the rule of law*, as it enables national institutions to improve decision-making processes in the design/prioritization of project pipelines; (iii) the cross-cutting theme of *CC and environmental sustainability*, as it contributes to reduce the exposure of structural and non-structural potential investments to climate change risks, through the provision of data and information to improve the design of project pipelines; and (iv) the cross-cutting theme of gender and diversity, as it includes gender considerations to improve women's participation in decision-making processes related to climate change. The operation is aligned with Indicator 25 of the IDB Contributions to Development Results of the IDB Group Corporate Results Framework, 2020-2023, as it will support governmental agencies to inform decisions that enhance long term climate resilience. This TC is also consistent with the objectives of the objectives of the Pilot Program for Climate Resilience (PPCR) as it

⁹ UNFCCC. 2019. Gender Composition. Report by the secretariat

¹⁰ UCN. 2015. Gender and Climate Finance: New Data on Women in Decision-Making Positions

aims to inform decision making processes, specifically the design of project pipelines aligned to climate-resilient pathways, and to integrate climate information in decision making processes.

III. Description of Activities/Components and Budget

- 3.1 **Component 1. Second phase of the study “Climate Risk and Adaptation Strategies for the 2050 Long Term Strategy of Colombia” (US\$419,000).** This component will finance the second phase of the study Climate Risk and Adaptation Strategies for the 2050 Long Term Strategy of Colombia. The first phase is using PRA at the “*Departamento*” level for prioritized hazards and sectors. With this information at “*Departamento*” level, broad structural and non-structural measures are being identified to reduce vulnerability. Resources from this TC will focus on the evaluation of different detailed adaptation measures at “Municipality” level for the entire national territory¹¹ using the RDM approach. The inclusion of levers or metrics that align to COVID recovery packages and principles will be discussed with local stakeholders and included to the extent possible. In addition, a minimum of women’s participation will be required in all workshops to ensure the integration of gender considerations in the analysis.
- 3.2 **Component 2. Climate risks and adaptation in Peru (US\$554,000).** This component will finance a climate risk and adaptation study in prioritized regions of Peru. The study will use PRA to statistically represent the probability of all possible risk events in prioritized thematic areas and hazards prioritized in the National Adaptation Plan, even those that have not yet occurred, which transforms it into a prospective model capable of representing all scientifically possible events.¹² The study will also evaluate different detailed adaptation measures, aligned to the adaptation actions proposed in the MACC and the criteria to prioritize projects in the PNIC, using the RDM approach. The inclusion of levers or metrics that align to COVID recovery packages and principles will be discussed with local stakeholders and included to the extent possible. In addition, a minimum of women’s participation will be required in all workshops to ensure the integration of gender considerations in the analysis. In case that the Peruvian authorities change after the presidential elections of 2021, the TC will be broadly socialized with new authorities of MINAM in charge.
- 3.3 The Ministries of Environment of Peru and Colombia will be the counterparts of the respective projects. A Steering Committee (SC) including relevant institutions for the scope of the respective analyses will oversee the projects’ progress (already active in the case of Colombia). The SCs will also define the list of participant institutions for the respective workshops. Considering the priority that both countries have attributed

¹¹ The country counts with data and products that can be used for such analyses: (i) [Atlas de Riesgo de Colombia: revelando los desastres latentes](#), which developed a compendium of multihazard risks’ models and results, without climate change effects; (ii) the [Tercera Comunicación Nacional](#), which developed an integrated climate change study in which climate vulnerability and climate risks were jointly addressed for the first time; (iii) the [Sistema Integrador de Información sobre Vulnerabilidad Riesgo y Adaptación or SIIVRA](#), under development and which gathers the most updated information in an interactive system; and (iv) the [Índice de Riesgos del DNP, which developed](#) a qualitative capacity assessment at the municipal level. All data is public and available for use, and/or can be complemented using open available data.

¹² National data available will be used: climate threats, exposure and vulnerability data from the recently developed National Adaptation Plan; information from CENEPRED; climate scenarios developed for the Third National Communication, by SENAMHI; gridded hydrometeorological database from PISCO. All data is public and available for use, and/or can be complemented using open available data.

to gender and decision-making in climate policies, we will actively collaborate with the SCs in ensuring representation of women in the workshops.¹³

- 3.4 This TC will be financed with US\$1,000,000 from the Strategic Climate Fund (SCX) and does not include local counterpart.

Indicative Budget (in US\$)

Activity/Component	PPCR Funding	Total
Component 1. 2 nd phase climate risks and adaptation in Colombia	419,000	419,000
Component 2. Climate risks and adaptation in Peru	554,000	554,000

Activity/Component	PPCR Funding	Total
Contingencies ¹⁴	27,000	27,000
Total	1,000,000	1,000,000

IV. Executing Agency and Execution Structure

- 4.1 Due to the regional nature of this TC and since it is originated at the initiative of the Bank, in accordance with Appendix 10 of the Operational Guidelines for Technical Cooperation Products (GN-2629-1), the Bank will act as the executing agency through CSD/CCS by request of the beneficiaries. All activities will be executed in close coordination with the Ministries of Environment of Colombia and Perú. As such, the Bank will follow its procurement policies and guidelines related to contracting processes: (i) individual consultants will be hired according to the guidelines established in policy AM-650(ii) consulting firms of an intellectual nature will be hired according to the "Policy for the selection and contracting of consulting firms for operational work carried out by the Bank" (GN-2765-4) and its Operational Guides (OP-1155-4); and (iii) other non-consulting services in accordance with the "IDB Institutional Procurement Policy" (GN-2303-28). IDB personnel 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.¹⁵ All knowledge products derived from this Technical Cooperation will be the Bank's intellectual property. Knowledge products will be published through the Bank's web page and other means accounted for in the indicative budget.
- 4.2 Most of the assignments to be carried out under this TC are planned to be competitive according to the guidelines of the GN 2765-4 Policy. However, some small assignments under US\$100,000 to support specific activities may be needed, for which Single Source Selection method process will be evaluated as per Section II, C, 2.9, (b) of the Operational Guidelines for the Selection and Contracting of Consulting Firms in Bank-Executed Operational Work.
- 4.3 Additionally, CCS will coordinate with other participating IDBG departments and liaise with other key initiatives and stakeholders (including CCS Specialists in Country Offices) involved in adaptation and climate resilience activities especially from HUD, RND and INE. CCS will coordinate the activities of this TC. Prior to the start of any

¹³ It is expected broad participation of government institutions in the workshops. An in-kind counterpart contribution has not been included as the final list of government institutions has not yet been defined.

¹⁴ US\$ 27,000 is set aside to cover unexpected costs not included in the components items budgeted amount. CIF allows up to 10% of the total project budget amount to be allocated as contingencies.

¹⁵ The amount allocated for supervision activities includes costs associated with the participation of IDB specialists in the program to supervise products and collaborate with stakeholders in the preparation of products and capacity building activities. This will enable products' review and dissemination to beneficiaries.

activity, coordination meetings will be held with the respective Country Representatives, Chiefs of Operations, and/or Country Specialists regarding the actions that will be carried out.

V. Major Issues

- 5.1 The operation faces the risk related to the lack of publicly available environmental/social and climate data that has the desired level of quality for the studies to be carried out. As such, the studies could be longer and costlier than originally expected. To mitigate these risks, the team will: (i) use the latest methodologies and statistical tools to manage and effectively use limited amounts of data under high uncertainty; (ii) identify global, public and readily available data from satellites that is in the required format and scale for key variables to be analyzed, and (iii) involve national hydro-meteorological institutes through sectorial ministries participating in the proposed studies; they can collaborate with national expertise and provide quality-reviewed hydro-climatological information/data.
- 5.2 To mitigate the COVID-19 risks, all workshops will be designed to be conducted both in-person and virtually. Travel restrictions can also impose risks related to data collected in field visits. However, the execution is expected to start by the end of the 2021, when most restrictions in the countries of the region are expected to be eased.

VI. Exceptions to Bank policy

- 6.1 There are no exceptions to the Bank Policy.

VII. Environmental and Social Strategy

- 7.1 Per the Environment and Safeguards Compliance Policy of the IDB (OP-703), the operation has been classified as “Category C” (see the [Safeguards Screening Form](#) and the [Safeguards Policy Filter](#)).

Required Annexes

[Request from the Client - RG-T3812](#)

[Results Matrix - RG-T3812](#)

[Terms of Reference - RG-T3812](#)

[Procurement Plan - RG-T3812](#)