

TC Document

I. Basic Information for TC

▪ Country/Region:	REGIONAL
▪ TC Name:	The Integrated Economic-Environmental Modeling Platform
▪ TC Number:	RG-T3626
▪ Team Leader/Members:	Banerjee, Onil (CSD/RND) Team Leader; Damiani Marti, Octavio Jorge (CSD/RND); De Salvo, Carmine Paolo (CSD/RND); Murguia Baysse, Juan Manuel (CSD/RND); Negret Garrido, Cesar Andres (LEG/SGO); Valle Porrua, Yolanda (CSD/RND)
▪ Taxonomy:	Research and Dissemination
▪ Operation Supported by the TC:	.
▪ Date of TC Abstract authorization:	21 Feb 2020.
▪ Beneficiary:	Argentina, Brazil, Bolivia, Colombia, Costa Rica, Ecuador, Haití, México, Perú, Uruguay
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	OC Strategic Development Program for Sustainability(SUS)
▪ IDB Funding Requested:	US\$175,000.00
▪ Local counterpart funding, if any:	US\$0
▪ Disbursement period (which includes Execution period):	24 months
▪ Required start date:	July 2020
▪ Types of consultants:	Firms and individuals
▪ Prepared by Unit:	CSD/RND-Env, Rural Dev & Disaster Risk
▪ Unit of Disbursement Responsibility:	CSD-Climate Change and Sustainable Development Sector
▪ TC included in Country Strategy (y/n):	N
▪ TC included in CPD (y/n):	N
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Environmental sustainability

II. Objectives and Justification of the TC

- 2.1 The Integrated Economic-Environmental Modeling (IEEM) Platform is a decision support system that integrates the value of natural capital into public policy and investment. The latest advances in methods have linked IEEM with spatial ecosystem services modeling (IEEM+ESM) enabling estimation of policy impacts on indicators such as Gross Domestic Product (GDP), income and employment, but also on wealth, natural capital and ecosystem services, all in a quantitative, comprehensive and consistent framework. The consistency of IEEM+ESM results with the System of National Accounts, the global standard for tracking economic growth, is a particularly powerful feature for communicating results and policy advice with Governments. The IEEM+ESM Platform has been subject to external scientific peer review and validation through numerous leading scientific journals in the field of economics, as well as the IDB's own peer review process. The IEEM+ESM Platform is the first of its kind and is gaining global recognition as the cutting edge of integrated economic-environment analysis for sustainable economic development policy design.
- 2.2 IEEM insights enable decision-makers to quantitatively assess synergies and trade-offs in strategies and investment portfolios to achieving complex policy goals including

those embodied by national development plans, climate agreements, the Sustainable Development Goals, and green growth targets. Results are spatially explicit which significantly enhances its potential for place-based and spatial targeting of public policy and investment. At the IDB, IEEM is being applied as a core platform for the assessment of the economic viability of Sovereign Guaranteed Operations and is gaining traction as tool that can be deployed rapidly by country economists in responding to urgent questions of public policy.

- 2.3 IEEM is beginning to be applied in various countries in the region by government institutions including Central Banks to inform public policy and decision making. For example, in Costa Rica, IEEM has been applied to examining the economic and environmental impacts of decarbonization, liberalization of the rice market and reductions in fuel taxes. In Colombia, IEEM is being used to evaluate green growth strategies and the implementation of a payment for ecosystem services program. In Guatemala, IEEM has been applied to analysis of strategies to make progress towards the Sustainable Development Goals. One key lesson learned from previous IDB investments in IEEM is the importance of seeking champions withing government institutions for collaborating in pushing the IEEM agenda forward. While good intentions and strong motivation are important, prior experience with economy-wide modeling frameworks is highly desirable and facilitates IEEM application immensely.
- 2.4 Efforts are underway to expand the user-base of IEEM through development of OPEN IEEM which is an online platform that will enable open access to all IEEM tools including IEEM models, databases, technical guides and a suite of parameterized ecosystem services models. Since IEEM is a new and highly innovative decision support system, efforts are required to inform and create demand for IEEM, as well as customize tools for the specific conditions and demand of countries in the region. This Technical Cooperation (TC) will advance the development of IEEM+ESM and its application in the region. Specifically, this TC will: (i) customize IEEM and ecosystem services modeling tools for 10 countries; (ii) develop new partnerships with government institutions to customize IEEM+ESM models and co-develop applications; and (iii) disseminate IEEM through advancing the development of the OPEN IEEM Platform and building capacity for its use in the region.
- 2.5 This TC's value-added is that it catalyzes current activities to develop the IEEM Platform and encourage its use in governments and the IDB. For example, the Policy-Based Loan "Support to Costa Rica's Decarbonization Plan" (CR-L1142 and CR-T1201) is applying IEEM in its analysis of investment portfolios and is building capacity for IEEM application. The operation "Strengthening the Environmental Ministry in Uruguay" (UR-L1157) applied IEEM in its design and is being used to develop economic instruments for improving agricultural practices. This application was critical for demonstrating the economic benefits of environmental investments. The operation for the "Sustainable Development of San Pablo, Brazil's Coastline" (BR-L1530) is applying IEEM+ESM in its design and in valuing the ecosystem service benefits of the loan. IEEM is being applied in Haiti to examine trade policy impacts on trade and food security through "Support to the Preparation of the Rural Development Program with Watershed Approach" (HA-T1247). Finally, IEEM is generating evidence on the economic impacts and trade-offs involved in recovery strategies for COVID-19 across the region including in Peru, Ecuador, Bolivia and Colombia.
- 2.6 IEEM analysis, funded by the UK's HM Treasury, has been commissioned to contribute to the high profile Dasgupta Review on the Economic of Biodiversity which will feature prominently in Convention on Biodiversity's Fifteenth Conference of the

Parties. The IDB's Economic Sector Work project "Advancing the IEEM Platform" is supporting the development of a pilot OPEN IEEM. Customization, application, dissemination and capacity building with IEEM through this TC will leverage and accelerate the process of developing OPEN IEEM and encouraging the application of IEEM in key decision-making government institutions in the region and the IDB.

- 2.7 This TC is aligned with the Bank's Update to the Institutional Strategy 2010-2020, specifically, the mainstreaming of the cross-cutting issues of climate change and environmental sustainability. The IEEM Platform enables IDB operations to target protection and enhancement of natural capital and environmental services in a quantitative way and unambiguous way. This TC is aligned with the IDB's Sector Framework Document for the Environment and Biodiversity which proposes continued development and application of IEEM. Integrating natural capital and the environment in policy and decision-making is precisely the value-added of the IEEM+ESM Platform when compared with other decision support systems. Finally, this TC is aligned with the Ordinary Capital Strategic Development Program for Sustainability, specifically, the strengthening of institutional capacities focused on environmental sustainability.

III. Description of activities/components and budget

- 3.1 The table below provides an overview indicative budget for the TC and its components.

Indicative Budget (US\$)

Activity/Component	Description	IDB/Fund Funding	Total Funding
Component I. IEEM Customization	Customization of IEEM and ecosystem services models for 10 countries	35,000	35,000
Component II. Partnerships and applications	Develop/build partnerships and implement 3 IEEM applications with partners.	30,000	30,000
Component III. OPEN IEEM, capacity and communication.	Develop OPEN IEEM and deliver capacity building.	110,000	110,000
TOTAL		175,000	175,000

- 3.2 This TC consists of three main components, specifically:
- 3.3 **Component I. Customize IEEM+ESM models for 10 countries with local country data.** The 10 countries were chosen on the basis of having the minimum data required for the development of IEEM models. IEEM models are primarily based on each country's System of National Accounts and System of Environmental-Economic Accounts where they exist. In the absence of environmental accounts data, local data is sourced to calibrate some of IEEM's environmental modules such as land use, greenhouse gas emissions and water consumption. Additional local data is required for IEEM model regionalization which enables IEEM to be linked with spatial ecosystem services modeling. IEEM models will be regionalized by state or

department based on local data including agricultural census data and land use land cover spatial data.

- 3.4 Ecosystem services models, specifically, carbon storage, sediment retention, nutrient retention and water supply models will be parameterized for each of the 10 countries. The InVEST suite of ecosystem service models developed by Stanford University's Natural Capital Project will be used in this first instance. Where local data does not exist, models will be parameterized based on reliable global data sets. Through this process, scenario-ready data packets will be prepared for each of the ecosystem services models enabling users to access data packets and apply the analysis-ready ecosystem services models in their own ecosystem services assessments without minimal data processing and parameterization. The time and cost savings of developing this public good cannot be understated and will enable ecosystem service-based analysis to be generated in near real time. In the past, the most time-consuming costly part of ecosystem service assessments has been in data collection and preparation.
- 3.5 The expected result of this activity are the tools capable of generating policy and investment advice that is based on the best available economic, biophysical and spatial data. Data collection, processing and model parameterization will be undertaken in close collaboration with IDB country office specialists, economists and government institutional collaborators.
- 3.6 **Component II. Build partnerships with governments in the region in the application of IEEM and apply it to at least 3 countries to priority questions of public policy and investment as identified by government collaborators.** The country office of the respective country will play an important role in the identification of government partners and in the definition of priority questions to be examined. The three countries where applications will be pursued will be based on country demand and the potential to add value to previous applications and collaborations. The expected outputs of this activity are three applications of IEEM. The expected outcomes are the integration of natural capital and ecosystem services values in decision making and improved dialogue with governments which can inform the design of IDB operations in the region.
- 3.7 Working closely with these countries will enable the model customization undertaken in Activity One to be closely aligned with the interests of government in terms of the questions of public policy they may like to explore and to develop shared ownership of IEEM tools. The results of these applications will be used to generate policy briefs and scientific journal papers, the first of which is important for informing policy discourse and the second to continue subjecting our methods to external peer review and validation.
- 3.8 **Component III. Contribute to the development of OPEN IEEM and communicate and build capacity for IEEM.** This component includes contributions to the development of OPEN IEEM which will enable users to 'test drive' IEEM through an online Platform. This Platform will serve as the home of all IEEM project outputs including all IEEM and ecosystem service models, technical and user guides, papers, policy briefs, infographics and all other IEEM media that has been developed over the last 6 years. The first expected outcome of this activity is that the IEEM project will take on a life of its own as users in the region and across the globe will be able to access all IEEM tools, apply them in their own analysis and build on and update them

as needed. The development and implementation of a communications strategy is integral to this component.

- 3.9 This component includes the organization and delivery of a three-day regional virtual event for 10 participants in government to learn the basics of how IEEM can be applied to informing policy discourse and decision making in government. It is anticipated that IDB country office specialists and economists will also participate. A package of learning materials will be prepared and distributed prior to the event. It will be designed in such a way to facilitate reuse in future training events. The second expected outcome of this activity is raised awareness, demand and capacity for the application of IEEM in the region and its application by government. All intellectual property arising from this TC will be the property of the IDB. The beneficiaries of all components of this TC will be the 10 countries that have been identified for model development, as well as the over 20 countries for which IEEM models have been developed as all IEEM tools will be made openly available through the OPEN IEEM Platform. This public good will be available for use by everyone, including government institutions, academic institutions and firms in and beyond the region.

IV. Executing agency and execution structure

- 4.1 Given this TC's regional character and antecedents, the IDB is the executing agency for this TC. The IEEM Platform was initially developed by the IDB in 2014 and its continued methodological advances and dissemination have been led by the IDB due to the highly specialized and innovative nature of IEEM tools. The IDB has a strategic vision for the IEEM project and has implementing this vision since the project's inception. The IDB has funded the development of IEEM through dedicated resources of one Technical Cooperation, one completed Economic Sector Work proposal and one Economic Sector Work proposal in progress. In addition, funding has been allocated to IEEM application on a project-specific basis for the evaluation of IDB operations and policy advice. Requests have been routinely made for the IDB to provide support to beneficiary governments in customization of the IEEM Platform, as well as collaboration on IEEM application and capacity building.
- 4.2 It is expected that in the medium run, the IEEM Platform will take on a life of its own, particularly through the development of OPEN IEEM which is supported by this TC. Specifically, once IEEM has reached critical mass in the region, different modes of support will become feasible. Increasingly, experts in the region outside of the IDB are gaining capacity in IEEM and thus will be well-positioned to undertake public policy and investment analysis with IEEM for government and other institutions. Greater expertise in the region could enable south-south cooperation arrangements and support to arise. At this stage, IDB support may be provided on a very targeted basis such as organizing capacity building sessions or further advancement of IEEM methods, for example. Efforts to apply IEEM in the economic analysis of IDB operations will continue. Nonetheless, this process takes time; building human capacity is not a short-run commitment. As an example, after almost three years of engagement with both the Central Bank of Costa Rica and the National Planning Department of Colombia, these institutions have adopted IEEM as the tool of choice for evaluating various questions of public policy.
- 4.3 The IDB's procurement policies apply to the execution of this TC. The activities to be carried out under this operation have been included in the Procurement Plan (Annex) and will be executed in accordance with the Bank's established procurement methods,

namely: (a) for hiring of individual consultants, as established in the policy AM-650; (b) Hiring of consulting firms for services of an intellectual nature according to GN-2765-4 and its associated operating guides (OP-1155-4).

V. Major issues

- 5.1 There are no major issues to discuss though one concern involves managing IDB policies and protocols for bringing OPEN IEEM online. To mitigate delays in making the OPEN IEEM Platform public, the Team is engaging early with the relevant IDB actors (ITE and KIC) so that IDB policies and protocols are clear and the development of OPEN IEEM is undertaken following established workflows for bringing IDB websites online.
- 5.2 One potential risk to this TC is related to the maintenance of the OPEN IEEM Platform. It is anticipated that the IDB will be the appropriate manager of this public good and maintain OPEN IEEM in the short-run. To ensure long-run sustainability, opportunities for collaboration and financing of OPEN IEEM will be sought by the Team with institutions such as the World Bank, the United Nations Environment Programme and the United Nations Statistical Division, and the Food and Agricultural Organization of the United Nations.

VI. Exceptions to Bank policy

- 6.1 This TC requires no exceptions to IDB policies.

VII. Environmental and Social Strategy

- 7.1 This TC has an ESG classification of Category C.

Required Annexes:

[Results Matrix_48863.pdf](#)

[Terms of Reference_38858.pdf](#)

[Procurement Plan_23942.pdf](#)