**TC ABSTRACT**

1. **Basic project data**

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| * Country/Region: | Regional (Colombia and Uruguay) |
| * TC Name: | Case study of Nexus in Korea and utilization for LAC countries |
| * TC Number: | RG-T3427 |
| * Team Leader/Members: | Raul Muñoz Castillo, Team Leader (INE/WSA); Byungwoo Gil, Seulkie Lee, Marilyn I. Guerrero (INE/WSA); and Cesar Negret (LEG/SGO). |
| * Indicate if: Operational Support, Client Support, or Research & Dissemination. | Client Support |
| * Date of TC Abstract: | February 2nd, 2019 |
| * Beneficiary (countries or entities which are the recipient of the technical assistance): | Colombia, Uruguay, Dominican Republic |
| * Executing Agency and contact name: | Inter-American Development Bank (IDB) through its Water and Sanitation Division (INE/WSA) |
| * Donors providing funding | Korea Poverty Reduction fund (KPR) |
| * IDB Funding Requested: | US$ 550,000.00 |
| * Local counterpart funding, if any: | N/A |
| * Disbursement period (which includes execution period): | Execution: 24 months  Disbursement: 30 months |
| * Required start date: | August 1st, 2019 |
| * Types of consultants (firm or individual consultants): | Consulting firms and individual consultants |
| * Prepared by Unit: | Water and Sanitation Division (INE/WSA) |
| * Unit of Disbursement Responsibility: | Water and Sanitation Division (INS/WSA) |
| * Included in Country Strategy (y/n): | No |
| * TC included in CPD (y/n) | No |
| * Alignment to the Update to the Institutional Strategy 2010-2020: | Low productivity and innovation (2B.2),  Strengthening the IDB’s comparative advantages to harness catalytic capability – Guiding Principle 2: Multi-sectorality (4A.2) |

1. **Objective and Justification**
   1. The objective of this TC is to contribute an efficient planning and integrated management of water, energy, food resources in LAC countries to ensure water and food security, sustainable agriculture, and energy production by applying the Nexus cases of Korea such as multipurpose dams and floating photovoltaic power plants.
   2. Water, energy and food are indispensable resources for the life of people. These three resources, known for the Water-Energy-Food Nexus for their close interaction, are inextricably linked each other that they always require a suitably integrated approach to ensure resource security. According to the FAO, agriculture accounts for 70% of total global freshwater withdrawals making it the largest user of water[[1]](#footnote-1). In the case of industrial water withdrawals, almost 75% of them are used for energy production.[[2]](#footnote-2) Also, the food production and its supply chain are known to contribute 30% of total global energy consumption[[3]](#footnote-3). It is important to note that this inextricable linkage among water, energy and food is expected to be more significant in the future due to global climate change, population growth, and rapid urbanization.
   3. Although people have known from past experience that the resources are closely related to each other, it was more common for both the public and private sectors to manage them separately. However, as population growth and industrialization drastically increase the use of resources, the lack of integrated management has begun to cause serious inefficiencies and conflicts in resource management across all industries. In the case of LAC countries, the unevenly distributed water resources and the high dependency on hydropower and/or agriculture industry further highlight the importance of integrated resource management applying the Nexus concept. For example, the Peruvian Amazon basin contains 97.5% of the country’s surface water while it covers only 30% of the population.[[4]](#footnote-4) In Paraguay, a single hydropower plant provides over 99% of the country’s electricity generation[[5]](#footnote-5) and the share of agriculture in GDP is almost 18% which is the highest in LAC countries.[[6]](#footnote-6)
   4. The Inter-American Development Bank has been supporting it strategically through various programs. The Energy Division (INE/ENE), Rural Development and Disaster Risk Management Division (CSD/RND), as well as Water and Sanitation Division (INE/WSA) actively generate knowledge on interdisciplinary interaction promoting integrated planning. The Water and Sanitation Division (INE/WSA) is developing analytical tools and case studies to support the decision-making process of public policies and water infrastructure planning.[[7]](#footnote-7)
   5. As part of the national strategy for promoting new industry, technological innovation, and efficient use of resources, Korea has been actively conducting projects and researches on Nexus. The government of Korea, for example, has built many multi-purpose dams for efficient use of water resources since 1960s. For the same reason, Korea recently put much effort into Integrated Water Management System (IWRM) applying ICT technology and Floating Solar Photovoltaic (FPV) power plants. In the case of the Ministry of Trade, Industry and Energy (MOTIE), they have acquired much knowledge in integrated energy management and energy efficiency by establishing the world’s largest smart grid demonstration complex. The Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) is actively promoting energy and water saving technologies in production of agricultural products and bio energy production technologies having the Nexus concept in mind.
2. **Description of activities and outputs** 
   1. **Component 1:** **Case studies on Nexus in Korea and** **Identification of potential Nexus projects for LAC region (US$200,000).** This component will finance a series of activities to identify potential Nexus projects in LAC region applying experiences of Korea. The first activity will identify successful Nexus cases of Korea. Their contents such as background, project scope, cost and benefit will be reviewed and effectiveness and efficiency through the integration of water, energy and food will be assessed. The second activity will identify demands for Nexus in LAC region by mapping water, energy and food needs in different countries as a part of preliminary identification of pilot projects. Surveys will be conducted with IDB member countries to confirm their interest and environment for potential Nexus projects which correspond to the potential Nexus projects identified by the first activity. At the end of this activity, a workshop will be held for LAC countries which showed much interest on Nexus. The workshop will comprise lectures and site-visits on the Nexus cases related to major areas of interest of Korea and the participant countries. Each participant country will submit a proposal to develop a new Nexus project in accordance with the development strategy of both the participant country and the IDB water and sanitation division. After the workshop, two or three potential projects will be selected to proceed with pilot pre-feasibility studies. The third activity will evaluate the expected outcomes of the selected potential projects from a Nexus perspective. Nexus scenario analysis will be applied to each potential project for the comprehensive management of water, energy, food resources.
   2. **Component 2: Pilot pre-feasibility studies on Nexus projects (US$300,000).** This component includes activities for conducting pilot pre-feasibility studies. The number of pre-feasibility studies will be determined once specific projects and countries are selected by component 1. Pilot study will include scope of project, implementation scheme and analysis on the social and economic environments.

* 1. **Component 3: Knowledge and experience dissemination (US$50,000).** This component includes activities for dissemination of knowledge and experiences generated by the TC. Every cost associated with the preparation, publication, and translation of reports will be covered by this component. Additional workshops will also be held for the officials of LAC countries who are interested in promoting the Nexus.

1. **Budget**

**Indicative Budget**

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| **Activity** | **Unit** | **Amount (US$)** |
| **Component 1.** **Identification of potential Nexus projects in LAC region** | | |
| * Identification of successful Nexus cases of the Korean government | 3 months | 50,000 |
| * Survey on the Nexus demand in LAC region | 3 months | 50,000 |
| * Evaluate the expected outcomes applying Nexus scenario analysis | 6 months | 100,000 |
| **Component 2. Pilot pre-feasibility studies on Nexus projects** | | |
| * Pilot pre-feasibility studies on Nexus projects | 2 projects | 300,000 |
| **Component 3.** **Knowledge and experience dissemination** | | |
| * Workshops for the officials of LAC countries | 2 times | 40,000 |
| * Reports preparation, translation, and publication | 3 reports | 10,000 |
| **Total** | | **550,000** |

1. **Executing agency and execution structure**
   1. One of the main goals of a Nexus approach is to promote sustainable and efficient resource use through integrated management of different areas which have been treated separately. Therefore, it is imperative that the executing agency has both experiences and knowledge in various areas including water, energy, and food. In this respect, the IDB not only has great expertise in every sector but also easily mobilizes human resources through country offices than any other agencies in LAC region. For these reasons, this TC will be executed and monitored by the IDB through the Water and Sanitation Division (INE/WSA) under the supervision of Raul Muñoz Castillo ([raulmu@iadb.org](mailto:raulmu@iadb.org)). All contracting and procurement activities in the Procurement Plan will be carried out in accordance with the Bank policies as follows: (a) AM-650 for Individual consultants; (b) GN-2765-1 and Guidelines OP-1155-4 for Consulting Firms for services of an intellectual nature and; (c) GN-2303-20 for logistics and other related services; (d) Operational Guidelines for Technical Cooperation Products (GN-2629-1).
2. **Project Risks and issues** 
   1. Although the risks identified for this TC are minor, there is a potential lack of interest or lack of understanding on the Nexus from government officials, which may limit the thorough analysis of the sector. The operation will mitigate this risk by actively engaging government officials from the early stage of the TC.
3. **Environmental and Social Classification**
   1. Given the involvement of this TC in institutional strengthening and policy dialogue, negative environmental and social impacts are not foreseen. Consequently, this TC has been classified as C category.

1. FAO, 2011, AQUASTAT - Water withdrawal by sector [↑](#footnote-ref-1)
2. UNESCO, 2014, The United Nations World Water Development Report, the 5th edition [↑](#footnote-ref-2)
3. UNESCO, 2012, The United Nations World Water Development Report, the 4th edition [↑](#footnote-ref-3)
4. Bellfield. H, 2015, Water, Energy, Food Security Nexus in Latin America and the Caribbean [↑](#footnote-ref-4)
5. [IRENA, 2015, Renewable Energy Policy Brief - Paraguay](http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA_RE_Latin_America_Policies/IRENA_RE_Latin_America_Policies_2015_Country_Paraguay.pdf?la=en&hash=9DD71986E5F6998AE3F782C3AEDBA3EFC9F32E2D) [↑](#footnote-ref-5)
6. [World Bank, 2017, World Development Indicators: Structure of output](file:///C:/Users/seulkiel/Desktop/wdi.worldbank.org/table/4.2) [↑](#footnote-ref-6)
7. [IDB, 2015, (RG-T2660) Development of Case Studies of the Water-Energy-Food Nexus in Latin America](https://idbg.sharepoint.com/teams/EZ-RG-TCP/RG-T2660/10%20Operation%20Approval/Documento%20de%20Aprobaci%C3%B3n%20%5b39918320%5d.PDF) [↑](#footnote-ref-7)