

REQUEST FOR EXPRESSIONS OF INTEREST **CONSULTING SERVICES**

Selection # as assigned by e-Tool: RG-T3427-P001

Selection Method: Full Competitive Selection

Country: Regional (Colombia, Uruguay)

Sector: Water and Sanitation

Funding – TC #: ATN/KP-17529-RG

Project #: RG-T3427

TC name: Case Study of Nexus in South Korea and Utilization for LAC countries

Description of Services: The selected firm will identify successful Water-Energy-Food Nexus cases in Korea and the Nexus project demand of the LAC region. A pre-feasibility study will be carried out in Colombia and Uruguay after prioritizing potential Nexus projects.

Link to TC document: <https://www.iadb.org/en/project/RG-T3427>

The Inter-American Development Bank (IDB) is executing the above-mentioned operation. For this operation, the IDB intends to contract consulting services described in this Request for Expressions of Interest.

Expressions of interest must be delivered using the IDB Portal for Bank Executed Operations

(<http://beo-procurement.iadb.org/home>) by: February 14, 2020 5:00 P.M. (Washington D.C. Time).

The consulting services (“the Services”) include:

- i) Identify successful Nexus cases of the Korean government by investigating their laws, regulations, and policies to promote integrated management of water, energy, and food resources
- ii) Review existing Nexus projects of the LAC region and identify the legal and institutional framework of Colombia and Uruguay focused on the Nexus agenda
- iii) Support to prioritize pilot projects and conduct Nexus scenario analysis for the selected pilot projects
- iv) Conduct pre-feasibility studies for the selected pilot projects in Colombia and Uruguay, respectively.

The timeframe for this consulting services is approximately 20 months.

Eligible consulting firms will be selected in accordance with the procedures set out in the Inter-American Development Bank: [Policy for the Selection and Contracting of Consulting firms for Bank-executed Operational Work](#) - GN-2765-1. All eligible consulting firms, as defined in the Policy may express an interest. If the Consulting Firm is presented in a Consortium, it will designate one of them as a representative, and the latter will be responsible for the communications, the registration in the portal and for submitting the corresponding documents.

The IDB now invites eligible consulting firms to indicate their interest in providing the services described below in the Terms of Reference for the assignment. Interested consulting firms must provide information establishing that they are qualified to perform the Services (brochures, description of similar assignments, experience in similar conditions, availability of appropriate skills among staff, etc.). Eligible consulting firms may associate in a form of a Joint Venture or a sub-consultancy agreement to enhance their qualifications. Such association or Joint Venture shall appoint one of the firms as the representative.

Interested eligible consulting firms may obtain further information during office hours, 09:00 AM to 05:00 PM, (Washington D.C. Time) by sending an email to: raulmu@iadb.org

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TERMS OF REFERENCE

Case study of Water-Energy-Food Nexus in Korea and utilization for LAC countries

Regional (Colombia, Uruguay)

RG-T3427

<https://www.iadb.org/en/project/RG-T3427>

Case Study of Nexus in South Korea and Utilization for LAC countries

1. Background and Justification

- 1.1. Established in 1959, the Inter-American Development Bank (“IDB” or “Bank”) is the main source of financing for economic, social and institutional development in Latin America and the Caribbean. It provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors of its borrowing countries.
- 1.2. Water, energy, and food are indispensable resources. Being inextricably linked to each other through the Water-Energy-Food (WEF) Nexus, they always require a suitably integrated approach to ensure resource security. This strong interaction between water, energy, and food is expected to be even more significant in the future due to global climate change, population growth, and rapid urbanization. This is especially relevant, considering that, according to the FAO, agriculture alone nowadays accounts for 70 percent of total global freshwater withdrawals, making it the largest user of water.
- 1.3. Although these resources are closely related to each other, the public and private sectors usually manage them separately. However, as population growth and industrialization drastically increase the use of resources, the lack of integrated management has begun to cause severe inefficiencies and conflicts in resource management across all industries. In LAC, 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, more than 60 percent of the urban population in Colombia lives near the Magdalena and Cauca river basins while the basins contain only 13 percent of the national water availability. Sparsely populated Amazon region, on the other hand, has much of the country’s surface water. In the case of the electricity sector, almost 70 percent of the electricity demands for both Colombia and Uruguay are covered by hydropower sources.
- 1.4. According to the IDB’s Institution Strategy 2010-2020, the IDB has identified ‘low productivity and innovation (2B.2)’ as one of the pervasive challenges of the region which limits endogenous economic growth in a sustainable way. Nexus approach, as an innovative way of efficient resource management, has great potential to boost the

efficiency of resource utilization and to improve low productivity. This TC and related consulting works will contribute to providing 'Inclusive infrastructure and infrastructure services (3B, 3.5e)' of the LAC region through 'Multi-sectorality (4A.2)' approach.

- 1.5. As part of the national strategy for promoting the new industry, technological innovation, and efficient use of resources, Korea has been actively conducting projects and researches on Nexus. For example, the Korean government has built multipurpose dams since the 1960s for efficient use of water resources with limited financial resources. For the same reason, Korea recently put much effort into the Integrated Water Management System (IWRM) applying ICT technology and Floating Solar Photovoltaic (FPV) power plants. The Ministry of Trade, Industry and Energy (MOTIE) has developed 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 the production of agricultural products and bioenergy production technologies having the Nexus concept in mind.
- 1.6. For these reasons, this TC and consulting work will support selected LAC countries to pursue a sustainable way of economic growth by the Nexus approach and to share practical Nexus experiences of the Korean government as an example of integrated and efficient water resource management.

2. **Objectives**

- 2.1. The ultimate objective of this consulting work is to support efficient planning and integrated management of water, energy, food resources of LAC countries to ensure water and food security, sustainable agriculture, and energy production.

3. **Scope of Services**

- 3.1. This consulting services will cover research and investigation into the regulations, policies, business environment, and case studies on WEF Nexus limited to the LAC region and Korea.
- 3.2. General research on the Nexus environment and existing projects will be conducted throughout the LAC region. However, the Nexus scenario analysis and pre-feasibility study will only be conducted in Colombia and Uruguay as they have expressed their interest and have been selected as beneficiary countries.

4. **Key Activities**

- 4.1. Identify and review successful Nexus cases in Korea
 - Review the laws, regulations, and policies that the Korean government has developed to

promote integrated management of water, energy, and food resources. The selected firm will closely work with ministries and their related entities of the Korean government such as Ministry of Land, Transport and Maritime Affairs, Ministry of Trade, Industry and Energy, and Ministry of Environment.

- Identify WEF Nexus cases of Korea and classify them into different categories. The classification criteria will be determined by each topic or a social issue to be addressed.
- Review the Nexus cases and select best practices for each category considering background, scope, scale, cost-benefit effectiveness, efficiency, financing plan, applicability to other countries, and overall impact of the project.

4.2. Review successful Nexus cases and identify demands for LAC countries

- Conduct general research on the water, energy, and agriculture industries to review Nexus environment and to figure out existing projects of the LAC region. Classify the Nexus projects into the previously defined category.
- Review the legal and institutional framework of the LAC governments which have expressed an interest in Nexus projects, if they have a ministry or institution which leads the Nexus agenda, or if one of them is in charge of integrated resource management of the country, and how the discussions and collaborations have been made among them .
- Aligned with the development strategy of beneficiary countries as well as the IDB and its water and sanitation division. Conduct survey directly or indirectly with the LAC government officials to identify their demands on Nexus with specific areas in priority.
- Identify and screen potential Nexus projects of each country and seek ways to share knowledge and experiences on Nexus between Korea and the LAC region.

4.3. Support to select potential pilot projects and apply Nexus scenario analysis

- Carry out additional surveys, questionnaires, and interviews to prioritize Nexus projects of each country. Potential pilot projects will be selected to proceed with Nexus scenario analysis and pre-feasibility study considering the development strategy and opinion of the beneficiary countries.
- Analyze the current water, energy, and food balances of the selected regions by figuring out the supply and demand of each resource. The amount of water supply, energy generation, and food production will be compared with its current consumption.
- Analyze future water, energy, and food balances of the same regions by applying WEF Nexus scenarios. Existing resource development plans will also be considered to estimate future resource balances.
- Compare the resource balances and Nexus scenarios before and after applying the pilot project. Justify the necessity of the pilot project focused on the most vulnerable area.

4.4. Pre-feasibility studies for the pilot projects

- Detailed structure and activities of the pre-feasibility study will be determined once the specific pilot projects are selected by the previous activities. The basic structure and

suggested activities will be as follows:

- (i) **Project overview and basic data analysis:** This activity stipulates and collects project basic data such as background and purpose of a project, selection process, implementation agency, contents of a project, project location, total estimated costs, project effects and results. Also, it analyzes natural, living, social, and economic environments of a project identifying similar cases.
- (ii) **Economic analysis:** Economic analysis is comprised of elements that can be quantified by analytical frameworks. This activity includes demand-benefit-cost estimations and analysis, economic feasibility evaluation, and financial feasibility analysis. While an economic feasibility analysis measures the costs and benefits of a public project from the perspective of an entire nation or society, financial feasibility focuses on actual monetary costs and cash flows from the perspective of individual parties responsible for a project. Ways to attract private investment and the potential of Public-Private Partnerships (PPPs) will be assessed in this activity.
- (iii) **Technical-physical analysis:** Integrative modeling of WEF resources or Nexus analytical tool will be applied to assess water availability of the target region and its surrounding area as a base of alternative analysis for infrastructure planning and pre-design (i.e. hydrological modeling, water balances, energy demands, land use, food production, environmental data, etc.). This analysis will facilitate finding synergies and constraints of the selected Nexus project as a sustainable infrastructure.
- (iv) **Policy analysis:** Policy analysis includes elements that are among social benefits or costs resulting from a project but cannot be quantified by the framework of cost-benefit analysis. Nevertheless, these elements are important enough to be considered to evaluate the feasibility of a project. This analysis will verify political consistency and willingness of a government by looking into its political directions and plans, willingness to pursue a project, level of project preparedness, and so on. Various risks in pursuing projects such as the possibility of financing and socio-environmental impacts will be examined in this category. Also, an alternative analysis will consider IDB's E&S safeguards policies and standards.
- (v) **Comprehensive evaluation:** The final step of a pre-feasibility study is putting the results of both economic and policy analysis together to make a final decision on whether to go ahead with the project. A multi-criteria analysis will be used in this step to bring out an optimal alternative and determine the feasibility of a project which satisfies multiple project objectives.

5. Expected Outcome and Deliverables

5.1. A consultancy work plan should be submitted before the initiation of this project. The work

plan will describe detailed activities to accomplish the objectives and schedule of the project. Proper allocation of human, financial, and material resources will be presented through the work plan.

- 5.2. A report on the WEF Nexus of Korea and the LAC region should be submitted, which includes the key activities in 4.1, 4.2, and 4.3. The first part of the report will cover the policies and efforts of the Korean government to promote integrated resource management as its WEF Nexus best practices. The second part of the report will mainly deal with identifying potential Nexus projects based on the environment and demand of each beneficiary country. The last part will include the result of Nexus scenario analysis for potential projects of Colombia and Uruguay.
- 5.3. A consultancy work plan to carry out pre-feasibility studies in Colombia and Uruguay, respectively. The format, structure, schedule, and any other contents of the pre-feasibility studies should be agreed among the firm, IDB, and beneficiary countries.
- 5.4. A pre-feasibility study report for each beneficiary country. The report should include both quantified and qualified opinions which can be reasonable grounds for beneficiary countries' officials to comprehensively decide whether the pilot project would be worthwhile to proceed to the feasibility study stage. The structure and components of the pre-feasibility study will be specified after the selection of pilot projects along with the basic activities in 4.4.

6. Project Schedule and Milestones

6.1. Project Schedule

| Activities | Year | 2020 | | | | | | | | | | | | 2021 | | | | | | | | | | | |
|--|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Project Execution | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contract formalization | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOR, REOI, and RFP preparation | | | | | | | | | | | | | | | | | | | | | | | | | |
| RFP package preparation and submission | | | | | | | | | | | | | | | | | | | | | | | | | |
| Proposal evaluation and negotiation | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conducting the main consulting work | | | | | | | | | | | | | | | | | | | | | | | | | |
| Component 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nexus case studies in Korea | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nexus project identification in LAC | | | | | | | | | | | | | | | | | | | | | | | | | |
| Component 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nexus pre-feasibility study of Colombia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nexus pre-feasibility study of Uruguay | | | | | | | | | | | | | | | | | | | | | | | | | |

6.2. Milestones

| Milestone # | Milestones | Due date |
|-------------|---|--------------|
| 1 | Submit the consultancy work plan in 5.1 | Mar 1, 2020 |
| 2 | Submit the Nexus report in 5.2 | Feb 1, 2021 |
| 3 | Submit the pre-feasibility study plan for 5.3 | Jun 1, 2020 |
| 4 | Submit two pre-feasibility reports in 5.4 | Dec 31, 2021 |

7. Reporting Requirements

7.1. The selected firm should follow the above-mentioned project scope, activities, schedule and milestones in a timely manner. Every deliverable including plans, reports, and proposals should be written in both English and Spanish.

8. Acceptance Criteria

8.1. The team leader of the Technical Cooperation (TC) team will decide whether the deliverables are acceptable or not. Internal meetings will be held within the TC team to decide and to figure out if the deliverables meet requirements of this consultancy. If the deliverables do not comply with the requirements, the selected firm will be obliged to revise and supplement the deliverables.

9. Other Requirements

9.1. The firm should demonstrate their capacity and experience to form a team with the following characteristics:

- Expertise in the policies, laws, and regulations of the Korean government focused on WEF Nexus or integrated water resource management (IWRM)
- Expertise in developing successful water infrastructure projects at the international level
- Experiences in developing successful WEF or IWRM projects at the international level
- Experiences in conducting WEF or IWRM pre-feasibility studies
- Experiences in WEF Nexus scenario analysis
- Extensive experiences providing high-level advice to national governments
- Work or research experiences in Latin America and the Caribbean region focused on water resource management and water infrastructure
- Work experiences with multilateral development organizations
- Resources to communicate and access documents in English, Spanish, and Korean
- The consulting services may only be provided by the nationality of a Bank's member country

10. Supervision and Reporting

10.1. After the consulting firm submits the work plan, the IDB and consulting firm will have meetings at least once a month on a regular basis. Every TC team member can give comments on the deliverables to secure the quality of deliverables.

11. Schedule of Payments

11.1. Payment terms will be based on project milestones and deliverables. The Bank does not expect to make advance payments under consulting contracts unless a significant

amount of travel is required. The Bank wishes to receive the most competitive cost proposal for the services described herein.

11.2. Payment Schedule

| Deliverable | % |
|-------------------------------------|-------------|
| After submission of milestone one | 20% |
| After submission of milestone two | 20% |
| After submission of milestone three | 20% |
| After submission of all milestones | 40% |
| Total | 100% |