**TC Abstract**

1. **Basic Information**

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| * Country/Region: | Regional. |
| * TC Name: | Support for the development of innovative solutions to improve the drinking water supply and sanitation services in urban areas. |
| * TC Number: | RG-T3598 |
| * Team Leader/Members: | Team Leader: Sergio Perez Monforte (INE/WSA); Alternate Team Leader: Maria Eugenia de la Peña and Silvia Ortiz (INE/WSA); Romina Kirkagacli (VPC/FMP); Byungwoo Gil (INE/WSA); Seulkie Lee, Manuela Velasquez, Maria Rodriguez, Francisco Gonzalez, Diana Barquero and Marilyn Ivette Guerrero (INE/WSA); and Lady Paniagua (CID/CDR). |
| * Indicate if: Operational Support, Client Support, or Research & Dissemination. | Research and Dissemination |
| * Beneficiary (countries or entities which are the recipient of the technical assistance): | Regional-CID (Dominican Republic, Haiti and Costa Rica) |
| * Date of TC Abstract: | 1 December 2019 |
| * Donors providing funding: | Knowledge Partnership Korea Fund for Technology and Innovation (KPK) |
| * IDB Funding Requested: | US$750.000 |
| * Local counterpart funding, if any: | N/A |
| * Disbursement period (which Includes Execution period): | 30 months (execution 24) |
| * Required start date: | February 2020 |
| * Types of consultants: | Consulting firms and individual consultants |
| * Prepared by Unit: | INE/WSA |
| * Unit of Disbursement Responsibility: | INE/WSA |
| * TC included in Country Strategy (y/n): | NA |
| * TC included in CPD (y/n): | NA |
| * Alignment to the Update to the Institutional Strategy 2010-2020: | Key Challenges: Low Productivity and innovation (2B.2), Social exclusion and inequality (2.b.1). |

1. **Objectives and Justification**
   1. The main objective of this TC is to support the implementation of innovative solutions to improve water and sanitation management in urban areas of the Dominican Republic, Haiti, and Costa Rica based on the Korean experience.
   2. The Inter-American Development Bank (IDB or Bank) has been supporting the Santiago Aqueduct and Sewer Corporation(CORAASAN in Spanish), a public company that provides water and sanitation services in the province of Santiago de los Caballeros, to improve the drinking water service in the metropolitan area through operation DR-L1007. The operation, amounting to 25 million, is at an execution level of 94% within 6 months of closure. The Corporations of Aqueduct and Sewerage (CORAA in Spanish) constitute the public organisms, autonomous, with juridical personality and own and independent patrimony, that have as mission to provide services of potable water and sewerage, with quality and efficiency, to the residents of the different demarcations. The Bank also supports the National Institute of Potable Water and Sewerage (INAPA in Spanish) through operation DR-L1041, which is worth 70 million. The provinces covered by this operation, in which the provision of water and sanitation services is carried out by INAPA, are the following: (i) San Pedro de Macorís; (ii) San Cristobal; (iii) Elias Piña; (iv) Bahoruco; (v) Independencia; (vi) Barahona; and (vii) San Juan. Infrastructure investments in these provinces are under way. Other provinces with the institutional and patrimonial conditions in infrastructure to implement this type of contract are San Juan (232,783 inhabitants), San Pedro Macorís (290,488 inhabitants), Puerto Plata (321,597 inhabitants) and La Vega (201,637 inhabitants).
   3. Within the operation was included to accelerate the processes of decentralization and improvement of the management of INAPA a model of bidding for results in the province of San Cristobal. The innovative bidding model included within the same contract different activities such as: (i) contracting works of rapid impact; (ii) acquisition of goods such as vehicles or leak detection equipment; (iii) main personnel for the management of the water company; and (iv) training of local personnel. The results included indicators such as improvements in unbilled water, increased revenues or improved water quality. The initial results of this contract show that it is a promising way to improve the management of Dominican companies.
   4. The Dominican Republic counts 10,520,000 people, 79% of whom live in urban areas. The coverage of drinking water services in urban areas in 2015 was 97%, up from 83% in 2000. However, this coverage level decreases considerably if the criterion of safely managed is considered because the lack of continuity and quality of service is not adequate in many areas of Dominican cities. Additionally, the value of the NRW (Non-Revenue Water) is very high, reaching values above 70% in many cities, such as CORAASAN or the cities managed by INAPA. This is consistent with the low level of existing water metering and the high-water consumption that in some cities, such as Santiago de los Caballeros, exceeds 600 liters per person per day in some sectors.
   5. By 2015 in urban areas of the Dominican Republic, 25% of households were connected to sewerage, 51% to septic tanks and 9% had latrines. The percentage of septic tanks has doubled in the last 15 years, since in 2000 was only 24%. This means that there are about 2 million septic tanks in urban areas. On the other hand, only 10 to 12% of the urban population's wastewater is treated. The average gap between the coverage of drinking water and sewerage is 56% with values of 56% for CORAAPLATA 39% for CORAAVEGA and 71% for the aqueducts managed by INAPA. Recently the IDB supported the development of the EFD (Excreta Flow Diagram) of the municipality of Alajuela in Costa Rica with the provisional result that a significant percentage of the sludge from the septic tanks are not handled safely.
   6. Septic tanks are simple solutions from a technological point of view; however, the management of the entire sanitation chain, particularly the management of faecal sludge from this type of solution, presents challenges. Septic tanks must be emptied mechanically from time to time, depending on the type of solution and the daily volume of sludge accumulating. The complexity of this type of intervention stems both from the institutional challenge posed by the enormous diversity of actors involved (households, informal private sector or not, regulators, local governments) and from the absence of a homogenizing effect in reference to the polluting loads achieved by collective models such as sewerage. In recent years, sludge management has received special attention within the sanitation sector with the appearance of tools such as the excreta flow diagram (EFD) that allows a complete analysis of the sanitation chain. The determination of the quantity and quality of faecal sludge, as well as the management of geospatial information related to emptying truck routes or the location of septic tanks are areas with enormous possibilities for the use of innovative technologies. Improved management of sludge from individual solutions is part of the Optimal Sanitation initiative being developed by the Bank. The specific aspects of spatial information management developed for sludge management will serve to feed the SaniBID platform and will therefore be applicable in other countries.
   7. One of the most prevalent problems in the region is the low connection of users to sewerage networks, especially in cases where families already have an individual solution, due to limited housing space, high associated service costs, lack of suitable builders or other family priorities. A connection rate of only 50 to 70 per cent has been observed in many Bank and other donor projects. Low connectivity prevents the health benefits of sanitation from materializing.
   8. Korea has extensive experience in using innovative technology and analysis tools for optimization and management in domains as broad as SMART CITIES or water resources. Korea Government has supported municipalities to improve their efficiency in water management through the public entities such as KEITI (Korean Institute of Industry and Environmental Technology) and K-water. This is combined with numerous companies that are at the forefront of developing applications for mobile devices such as phones and tablets. As a result, the value of NRW in Korea is 14.8%, and it is only around 5~6% in the case of big cities such as Seoul and Busan. In sanitation, wastewater treatment plants designed, built and operated in Korea are among the most efficient in the world in parameters such as treated water quality or energy efficiency. In addition, Korea is a leader in the manufacture of intelligent meters and drinking water operators have extensive experience in so-called smart water management.
   9. This TC is consistent with the Bank's Institutional Strategy Update 2010-2020   
      (GN-2788-5) and responds to the following development challenges: (i) Low levels of productivity and innovation; and (ii) Social exclusion and inequality since it will contribute to reducing gaps in access to services that are basic to the development of a region in an equitable and inclusive manner and to improving the efficiency of water and sanitation services.
2. **Description of activities/components and budget**
   1. **Component 1.** Implementation and development of innovative technologies in water and sanitation companies. This component will collaborate with leading Korean institutions in this sector such as KEITI (Korea Environmental Industry and Technology Institute) and K-water. An action plan for the implementation of smart water management will be developed, as well as a proposal for funding for Korean smart metering equipment for Dominican and Haitian water companies. Additionally, this component will allow the support the development of selected innovative solutions in the field to improve the efficiency of sludge management, mainly aimed at: (i) management of geospatial information relating both to the location of trucks and septic tanks; and (ii) automation of the collection of information relating to the volumes of septic tanks and the fundamental parameters of fecal sludge. The places pre-selected to test these innovations would be Alajuela in Costa Rica and a Dominican city to be defined.
   2. **Component 2.** Developmentof optimal sanitation strategies in five (5) cities. Based on Korean experience in the four (4) pre-selected cities of the Dominican Republic and one (1) in Costa Rica will be supported through this component. The sanitation strategies will include at least the following axes: (i) action plan to improve the management of sludge from individual solutions; (ii) connectivity to the existing sewerage network; and (iii) optimization of wastewater treatment plants. Action plans will be presented in a workshop and a strategy will result in improving the management of sludge from individual solutions throughout the Dominican Republic.
   3. **Component 3.** Preparation of tender documents based on technical assistance by results in four Dominican water utilities. Training workshops will be developed for the different Dominican companies to transfer the experience acquired in San Cristóbal. This component will support the development of feasibility studies and tender documents necessary for the development of ATPR contracts in at least four (4) provinces. The pre-selected cities are San Juan, San Pedro de Macorís, Puerto Plata and La Vega.
   4. Component 1 complements the previous components to highlight that the first one has a technological innovation approach as opposed to the other two where the innovation focuses on other areas such as model bidding specifications (case of ATPR type contracts) or inclusion of the sludge management that has not been traditionally the responsibility of water and sanitation utilities in the Dominican Republic as well as in many other countries in Latin America and the Caribbean Region.
   5. The total budget of the TC will reach US$750,000.

**Indicative budget (US$)**

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| **Component** | **Amount** |
| **Component 1 -** Implementation and development of innovative technologies in water and sanitation companies | 250,000 |
| **Component 2 –** Developmentof optimal sanitation strategies in five cities | 300,000 |
| **Component 3** - Preparation of tender documents based on technical assistance by results in four Dominican water utilities. | 200,000 |
| **TOTAL** | **750,000** |

1. **Executing agency and execution structure**
   1. The executing agency for this TC will be the Inter-American Development Bank (IDB), through the Water and Sanitation Division (INE/WSA), as it is a regional research and dissemination TC whose purpose is to support for the development of innovative solutions to improve the drinking water supply and sanitation services in urban areas. Following the operational guidelines for technical cooperation operations, the Bank is the Executing Agency and has no counterpart. INE/WSA will be responsible for the administration, planning, control and supervision of the financial resources allocated, as well as all activities related to the adequate preparation and programming of the operation.
2. **Major issues**
   1. A potential risk is the change in the commitments of partner governments in the water sector and water companies regarding their innovation agendas. In order to mitigate this risk, these agendas will be institutionalized and the revenue they represent for the institutions will be clearly visible. Another risk is the mobility of personnel within institutions. To alleviate this risk, the creation of training material that can be used by different actors will be influenced in order to provide continuity to the lines of training and awareness-raising.
3. **Environmental and Social Strategy**
   1. Because of their nature, the components financed in this operation will not have negative environmental or social impacts. This TC is classified as "C".