

TC Document

I. Basic Information for TC

▪ Country/Region:	BELIZE
▪ TC Name:	Support to Integrated Water Resources Management
▪ TC Number:	BL-T1126
▪ Team Leader/Members:	Grau Benaiges, Javier (INE/WSA) Team Leader; Nalesso, Mauro (INE/WSA) Alternate Team Leader; Arias Andrade, Carlos (INE/WSA); Bryant, Alexis (CID/CBL); Champi Ticona, Diana Carla (INE/WSA); Guiza Ceron, Carlos Andres (INE/WSA); Lacal Bereslawski, Julia Carolina (INE/WSA); Lucien Chung (INE/TSP); Lugo Moreno, Monica Bibiana (LEG/SGO); Lunstedt Tapia, Christian (VPC/FMP); Munoz Castillo, Raul (INE/WSA); Theresa Schutz (INE/WSA); Watson, Brodrick Raylando (VPC/FMP) Lunstedt Tapia, Christian (VPC/FMP); Munoz Castillo, Raul (INE/WSA); Theresa Schutz (INE/WSA); Watson, Brodrick Raylando (VPC/FMP)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	.
▪ Date of TC Abstract authorization:	06 Aug 2021.
▪ Beneficiary:	Belize
▪ Executing Agency and contact name:	Ministry Of Natural Resources, Petroleum And Mining
▪ Donors providing funding:	OC Strategic Development Program for Infrastructure(INF)
▪ IDB Funding Requested:	US\$250,000.00
▪ Local counterpart funding, if any:	US\$25,000.00 (In-Kind)
▪ Disbursement period (which includes Execution period):	24 months
▪ Required start date:	Feb. 1 2022
▪ Types of consultants:	Firms and Individuals
▪ Prepared by Unit:	INE/WSA-Water & Sanitation
▪ Unit of Disbursement Responsibility:	CID/CBL-Country Office Belize
▪ TC included in Country Strategy (y/n):	Yes
▪ TC included in CPD (y/n):	Yes
▪ Alignment to the Update to the Institutional Strategy 2010-2020:	Environmental sustainability; Productivity and innovation

II. Objectives and Justification of the TC

- 2.1 The objective of this Non-Reimbursable Technical Cooperation is to assess the conditions of water resources in critical watersheds in Belize and support the development of the institutional and legal framework for water resources management in Belize.
- 2.2 Even though water is the most ubiquitous resource on earth, 97.5 percent of it is saline. Only 0.26 percent (90,000 Km³/year) of the global freshwater reserves are accessible for human consumption. About two thirds of it, known as green water, evaporates back into the atmosphere and hence is not directly available. Latin America and the Caribbean (LAC) counts with nearly 33 percent of this amount of freshwater, but even though it may seem sufficient to satisfy the needs of the region, it cannot be fully utilized due to spatial and temporal mismatch between availability and demand. This

grim scenario is made worse by climate change, which will affect availability (between 13 to 15% on average) and also the intensity of extreme events like droughts.

- 2.3 For this reason, it is of the utmost importance that countries in LAC carry out efficient and sustainable management of water resources supported by informed decision-making based on science and technology to allow adequate planning, taking into account all related variables to sustainably operate water distribution and storage systems, and better manage hydrological extremes (droughts and floods). This, in turn, would significantly increase their capacity for adaptation and resilience.
- 2.4 Climate change is threatening social and economic outcomes in LAC. Key climate change effects include a rise in average temperatures, changes in precipitation patterns, increased frequency and intensity of extreme events, changing discharge patterns in the Amazon River and western Andes, rising sea levels, acidification and increased coral bleaching in the Caribbean, and retreat of glaciers, among others. Belize, Haiti, and Jamaica are already among the countries considered to be acutely vulnerable to climate change, and by 2030, another seven borrowing member countries of the IDB are expected to be added to that category.
- 2.5 Belize is not an exception to the grim scenario described above. Belize's economy continues to be based on agriculture, tourism, and other sectors that rely heavily on the availability of freshwater resources. Belize has been prone to cyclical hurricane damage, tidal wave, floods, and wind damage, which have affected agriculture, tourism, and infrastructure, among other sectors, severely affecting the economy. Between 1931 and 2016, 33 hurricanes or tropical storms either made landfall in Belize or passed close enough to cause damage or the loss of life.¹ In addition to this, within the last decade, some areas in Belize experienced drought on a yearly basis. Belize's 2019-2020 dry season was the worst in almost four decades and has reportedly led to about US\$25 million (1.3% of GDP) losses in agricultural production.
- 2.6 To address the risks brought by droughts, floods and other weather-related extreme events, in 2010, the National Integrated Water Resources Policy was finalized. The Government of Belize (GOB) passed legislation establishing the National Integrated Water Resources Authority (NIWRA) as a statutory body to help encourage the efficient use of Belize's water resources. However, there is still much work to do to implement the legislation approved as part of the National Integrated Water Resources Policy.
- 2.7 Water resources management is complex and requires the integration of a series of technical and institutional processes that must be developed in a continuous and coordinated manner. These processes depend on the availability and quality of data, on how such data is used to produce the information necessary for taking decisions, and on the existence of institutional and legal capacities that enable taking such decisions. This TC will strengthen the Ministry of Natural Resources, Petroleum and Mining and the National Hydrological Service (NHS) to implement and execute the integrated water resources management activities and legislation passed over the last decade.
- 2.8 The proposed TC is consistent with the Bank's 2025 Vision and with the Second Update to the Institutional Strategy 2020-2024 (AB-3190-2). In relation to the 2025

¹ Nine of these were classified as catastrophic. The incidence of extreme events has increased in recent years; out of the 33 hurricanes or tropical storms registered since 1931, 13 were recorded between 2000 and 2016

Vision, the TC focuses on water security in Belize, a country that is particularly vulnerable to the effects of climate change such as sea-level rise, natural disasters, and changing precipitation and temperature patterns. In relation to the Second Update to the Institutional Strategy 2020-24 (AB-3190-2), the TC is aligned with the development challenge of Productivity and Innovation as it is aimed at promoting state of the art technology and innovation in hydrometeorology. It is also aligned with the cross-cutting issues of Climate Change and Sustainability as it tries to assist Belize in getting better prepared to face the threats of climate change.

- 2.9 The TC is aligned with the Ordinary Capital Strategic Development Program for Infrastructure (GN-2819-1) as it is aligned with the objectives of improving the design and monitoring of public policies and the transmission of lessons learned in the infrastructure sector and generating and deepening sector knowledge on good infrastructure practices. The TC is also consistent with the IDB Group Country Strategy Update 2020-2021 for Belize, which has Climate Change and Disaster Risk Management as one of the new strategic priorities.

III. Description of activities/components and budget

- 3.1 **Component I: Assessment of Water Resources in Critical Areas (USD\$100,000).** This component, to be financed with IDB resources, will support the closing of the knowledge and groundwater data gaps in Belize, allowing the periodic evaluation of groundwater resources. Under this component, a consulting firm will be hired to design a platform for groundwater monitoring to promote knowledge on the needs for the protection and conservation of groundwater, as well as to encourage the development of national projects for the management and governance of aquifers. Once the consultancy is completed, the platform will be transferred to the NHS, who will be responsible for its operation and maintenance.
- 3.2 **Component II: Design of an Action Plan to implement the National Integrated Water Resources Management Act (USD\$40,000).** This component, to be financed also with IDB resources, will finance the design of an action plan to help implement the National Integrated Water Resources Management Act, by identifying existing gaps and recommending detailed measures and actions to address them. This will include the evaluation of the existing institutional and technical capabilities and will specifically cover: i) the capacity of the national organizations to analyze and apply data; and ii) the assessment of current human resources and the identification of human resources requirements in order to fully implement the Act. A policy workshop will be organized to inform as well as obtain inputs from policy makers and advisers in relevant GOB ministries and agencies. The main objective of this workshop is to provide information regarding the findings of the analyses conducted, allowing participating agencies to formulate proposals with respect to the strengthening of the NHS and other agencies involved in water resources management.
- 3.3 **Component III: Capacity Strengthening for Integrated Water Resources Management (USD\$100,000).** This component, to be financed with IDB resources, will be aimed at increasing the capacities of the NHS in operational hydrology through both distance and face to face training courses. Areas that have been prioritized include: i) training courses aimed at training Hydrology Technicians; ii) Basic Hydrological Sciences; iii) Hydrological Sciences and Hydrometeorology. These training activities will allow, amongst others, for participants to learn how to perform field measurements and station inspections for streamflow equipment and rain

gauges. Additionally, it is expected that hydrological forecasters will benefit from training in advanced hydrological modeling topics.

- 3.4 Well drilling in Belize has been practiced in a variety of modalities ranging from formal training to on-the-job training and others learnt/passed down from one generation to the next. Recently, challenges have been encountered in the drilling techniques and problematic well drillings in different soil types for which many of these wells are abandoned and new locations are explored. Such occurrences often result in wastage of time and financial resources and ultimately many boreholes being drilled and abandoned. Employing international standard practices in well drilling techniques, well development and well installation will undoubtedly improve efficiency in human resource capacity and minimize wastage of financial resources. Ultimately, it will assist in improving groundwater management and offer the opportunity to characterize the area as it relates to identifying well bearing strata for water resources management purposes. The TC will finance the hiring of a firm to train personnel from NHS and other Government ministries such as the Ministry of Rural Transformation, Community Development, Labor and local Governments on well drilling with an emphasis on alternative and innovative well drilling techniques and machinery.
- 3.5 In addition to this, the south of Belize has many high flow rivers emanating from the Maya Mountains Massif caused by the elevation and results in flash flooding. The NHS has several manual gauges installed that are read twice daily (6am and 6pm). Despite having community involvement in the process of data capturing, at times it is difficult to reach field observers to get the necessary data required for flood forecasting purposes. Additionally, it is challenging to capture the fluctuations in the hydrograph because readings are only done twice a day. Automation of these stations would enable real-time transmission data to the central office to improve flood early warnings as well as the ability to capture the fluctuations in the hydrograph. In order to automate the stations, with IDB resources, data loggers, antenna, sensors (in-situ), enclosures and field laptops will be procured.
- 3.6 **Administration and Audit.** This component will be financed using both Bank and counterpart resources. The audit costs will be covered with Bank resources (USD\$10,000). Local counterpart resources will be in-kind and for general support to the execution. NHS, which will be the executing unit of this TC, is staffed with personnel that is technically and administratively capable for managing projects funded by multilateral funding agencies.

Indicative Budget (US\$)

Component	Description	IDB	Counterpart Funding (In-Kind)	Total Funding
Component 1	Assessment of Water Resources in Critical Areas	100,000		100,000
Component 2	Design and Implementation of an Action Plan to implement the National Integrated Water Resources Management Act	40,000		40,000
Component 3	Capacity Strengthening for Integrated Water Management	100,000		100,000
Administration and Audit	Project Execution Unit		25,000	25,000
	Audit	10,000		10,000
Total		250,000	25,000	275,000

- 3.7 **Disbursement and Execution Period.** The TC resources will be disbursed within 24 months and executed within 20 months from the date of effectiveness of the TC Agreement.
- 3.8 **Monitoring and Supervision.** The monitoring and supervision of the TC will be carried out by the Bank, specifically by the Team Leader and the Alternate Team Leader from the Bank's Water and Sanitation Division (WSA) in collaboration with the Country Office in Belize (CID/CBL).

IV. Executing agency and execution structure

- 4.1 The Executing Agency will be the National Hydrological Service, a unit within the Ministry of Natural Resources, Petroleum and Mining. Its mission is to enforce the water policy of the Government of Belize for the orderly and coordinated management, development and use, conservation, and protection of Belize's water resources.
- 4.2 The NHS is the sole entity responsible for the sustainable management of water resources in Belize. As such, the TC will be executed by this agency. While this agency does not have previous experience in executing IDB projects, it sits within the Ministry of Natural Resources, Petroleum and Mining, responsible for the execution of an active loan (Solid Waste Management Project II - BL-L1021) and several Technical Cooperation projects. It is important to note that the TC would be comprised of only two consultancies plus training activities, which would make the TC straightforward to manage administratively and from a fiduciary point of view.
- 4.3 **Reporting and Accountability.** The Executing Agency undertakes to prepare an initial work program, semi-annual progress reports, within thirty days after the end of each calendar semester, and a final program report, within three months after completion of the last activity of the TC. These reports will focus on program activities and finances, as well as results achieved. The format of these reports will be agreed between the Executing Agency and the Bank.
- 4.4 **Procurement of goods and consultants.** Procurement will be conducted in accordance with the Policies for Procurement of Works and Goods and Policies for Selection and Contracting of Consultants financed by the IDB, contained in GN-2349-15 and GN-2350-15 and in accordance with the provisions laid down in the grant funding agreement and procurement plan of the program, which will be updated as necessary.
- 4.5 **Direct Contracting.** The World Meteorological Organization (WMO) has been providing technical assistance to the NHS in recent years and its performance has been highly satisfactory. As part of these activities, WMO has been aiding the National NHS via the programs operated for Hydrology within the WMO Scope. The WMO is a specialized agency of the United Nations, and its mandate is to provide the framework for international cooperation and coordination in meteorology, climatology and operational hydrology. WMO directly supports its partners at global, regional, sub-regional and national levels in, amongst others, capacity development of National Meteorological and Hydrological Services by developing and improving human resource as well as technical and institutional capacities and infrastructure. In order to guarantee the correct training of NHS personnel, and as established in document GN-2350-15 paragraph 3.11 (c) for very small assignments, and (d) when only one firm is qualified or has experience of exceptional worth for the assignment, the WMO may be contracted directly for up to US\$80,000 to provide training to NHS and other agencies in Belize in topics covering hydrology and hydrometeorology.

- 4.6 **Audit and Final Evaluation** will be carried out in accordance with the Financial Management Policy for Projects financed by the Bank (OP-273-2). The Executing Agency will hire an independent auditor acceptable to the Bank to audit the financial statements to be submitted within 120 days of the date of the last disbursement. The budget provision for the financial audit is US\$10,000. The program will include a final evaluation report which will describe and analyze progress in reaching the targets contained in the results matrix of the TC. This final evaluation will be carried out by the Bank.
- 4.7 **Conditions to be fulfilled prior to first disbursement.** The appointment of a project coordinator, procurement officer and a financial specialist who will oversee the implementation of this TC will be a condition to be fulfilled prior to first disbursement.

V. Project Risks and issues

- 5.1 The main risks of this project are related to the lack of experience of the NHS in executing Bank-financed operations, the need to ensure appropriate coordination among key government agencies, and the absence of data to assess the conditions of water resources in Belize. In relation to the first risk related to the lack of experience by the NHS, it is important to note that this TC will only comprise two consultancies, thus reducing the execution complexities. In addition to this, the Bank will provide all the necessary accompaniment to the executing agency and will promote training by the Solid Waste Management Authority within the same Ministry.
- 5.2 In relation to the second risk, the interventions proposed in this TC would require proper coordination among various GOB agencies such as the NHS, the Ministry of Natural Resources, Petroleum and Mining, the Department of the Environment, the Department of Rural Transformation, among others. However, given that the National Integrated Water Resources Management Act and the Policy establish a well-defined structure to implement the approved legislation, there should not be major issues in having the National Hydrological Service as the main implementing agency of this TC.
- 5.3 As for the risk on the absence of quality and quantity of data for water resources to conduct the activities of the TC, the TORs make reference to this potential lack of data and will request the consultants to consider databases of other private organizations and/or apply significant statistical techniques to fill the data gaps.

VI. Exceptions to Bank policy

- 6.1 There are no exceptions to Bank policies.

VII. Environmental and Social Strategy

- 7.1 It is not anticipated that the activities to be financed in this TC will have negative direct social or environmental impacts. The TC will finance consultancies, training and equipment to improve hydrometeorological data collection. It will not include any procurement of works.

Required Annexes:

[Request from the Client - BL-T1126](#)

[Results Matrix - BL-T1126](#)

[Terms of Reference - BL-T1126](#)

[Procurement Plan - BL-T1126](#)