

Belize Water and Sanitation Program for Rural Areas (BL-L1045)

Environmental and Social Analysis Environmental and Social Management Plan

Document Datasheet


<p><u>Project Proponent</u> Belize Social Investment Fund</p>	<p><u>Project</u> Belize Water and Sanitation Program for Rural Areas (BL-L1045)</p>			
<p>During the preparation of the Belize Water Supply and Modernization Program (BL-L1045), the Belize Social Investment Fund commissioned, with technical cooperation resources from the Interamerican Development Bank, the preparation of an Environmental and Social Analysis for the sample works under the Program.</p> <p>The purpose of this ESA is to provide an environmental and social assessment of the sample works under the Program against IDB's Social and Environmental Policy Framework.</p>	<p><u>Client</u> Interamerican Development Bank</p> <p><u>Contract Date</u> February 2023</p>			
Document History				
1	ESA First Version (draft)	FS, MK, JG, VB	FS	19/03/23
2	ESA First Version (Fit for Disclosure)	FS, MK, JG, VB	FS	20/03/23
Revision	Description	Authors	Approved	Date
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Abbreviations

AoI	Area of Influence
CoC	Code of Conduct
CSO	Civil Society Organization
DAoI	Direct Area of Influence
DOE	Department of the Environment
EA	Executing Agency
E&S	Environmental and Social
EHSS	Environmental, Health, Safety and Social
ESA	Environmental and Social Analysis
ESAP	Environmental and Social Action Plan
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMPc	Construction Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESPF	IDB's Environmental and Social Policy Framework
ESPS	Environmental and Social Policy Framework
GHG	Greenhouse Gas
GoB	Government of Belize
GRM	Grievance Redress Mechanism
IAoI	Indirect Area of Influence
IDB	Interamerican Development Bank
KBA	Key Biodiversity Area
LMP	Labour Management Procedure
MRD	Ministry of Rural Transformation, Community Development, Labour, and Local Government
NEMO	National Emergency Management Organization
OA	Operational Area
OSG	On-site Generation
PM	Particulate Matter
PPE	Personal Protective Equipment
SCADA	Supervisory Control and Data Acquisition
SEP	Stakeholder Engagement Plan
SIF	Belize Social Investment Fund
USD	United States Dollars
VWB	Village Water Boards

1. Introduction

The objective of this Environmental and Social Analysis (ESA) is to **evaluate the environmental and social risks and impacts** of the projects in the **representative sample** of the Belize Water and Sanitation Program for Rural Areas (BL-L1045), hereinafter "the Program".

The general objective of this program is to contribute to improve the quality of water services in Belize's rural areas through the following specific objectives: (i) improving the drinkability of water in rural areas; and (ii) strengthening the institutional capacity of Belize's water sector.

The Program, with a total cost of USD 4.64 million, will be executed by the Belize Social Investment Fund (SIF), financed with a loan operation with the Inter-American Development Bank (IDB).

This Environmental and Social Analysis was developed as part of the environmental and social evaluation process of the Program. Its purpose of which is to predict, identify, assess, and correct potential environmental and social risks and impacts that the activities of the projects that are part of the representative sample of the Program, and to ensure that the projects comply with the requirements established in the Environmental and Social Performance Standards (ESPS) contained in the IDB Environmental and Social Policy Framework.

1.1 Objectives

The specific objectives of the Environmental and Social Analysis were:

1. Carry out the expedited diagnosis of the Environmental and Social Baseline of the Project Intervention Areas, as well as the legal and institutional regulatory framework.
2. Identify and assess the main environmental and social impacts and risks on the physical, biological, and socioeconomic environment, in the Construction, Operation and Closing stages of the Project.
3. Identify the mitigation measures and management procedures to minimize the impacts and risks assessed and outline the contents of the Project's Environmental and Social Management Plan.
4. Identify stakeholders and develop a Stakeholder Engagement Plan.

1.2 Scope

This document summarizes the process of environmental and social evaluation of the works of the representative sample of the Program, as described in Chapter 2.

Table 1 below presents the outline and organization of the content of this Environmental and Social Analysis.

Table 1 - Contents of the Environmental and Social Analysis

Chapter Number	Title	Description
1	Introduction	This chapter describes the development and structure of the ESA, including the context and objectives.
2	Program and Projects Description	This chapter provides a description of the Program, the projects in the representative sample, their design, and technical specifications.
3	Legal and Institutional Framework	This chapter describes the applicable legal framework, including IDB's Environmental and Social Policy Framework.
4	Environmental and Social Baseline	This chapter summarizes the basic information available about the physical, biological, and socioeconomic environment within the Program intervention areas.
5	Environmental and Social Impacts and Risks	This chapter summarizes the methodology used to assess the project's impacts on the physical, biological, and socioeconomic environment, and the results of that analysis.
6	Environmental and Social Management Plan	The ESMP identifies the mitigation measures for the expected environmental and social impacts and risks, and the procedures for adequate environmental and social management by the executors, including definition of institutional roles and responsibilities for implementation.
7	Conclusions	This chapter summarizes the conclusions and environmental and social feasibility of the Program.
References		List of references and documents used during the evaluation.
Annexes		Includes annexes with guidelines to be considered for the proper environmental and social management of the Project.

2. Program and Projects Description

This chapter presents a description of the Belize Water and Sanitation Program for Rural Areas (BL-L1045), including objectives, components, and costs, as well as the projects that are part of the representative sample of the Program.

2.1 Background and Justification

While the Belizean economy has begun to recover following the devastating impact of the pandemic, the economic contraction affected the country's capacity to invest in basic services such as Water and Sanitation (W&S), especially in rural areas, where more than 50% of the population lives.¹

In Belize's rural areas, water services are mostly provided by Village Water Boards (VWB), community-based organizations that administrate, operate, and maintain the systems. VWB manage and operate 108 water supply systems in approximately 130 villages, each with less than 4,000 inhabitants, representing about one-third of the country's population.

The Ministry of Rural Transformation, Community Development, Labour, and Local Government (MRD) is the government agency responsible for the monitoring of water services in rural areas, providing financial oversight and capacity building support to VWB. MRD is the entity that also supports the structuring of VWB and approves tariffs set at the village level.

Under the Village Councils Act (VCA) of 2003, VWB must be composed by seven members (president, treasury, secretary, among other positions set in the Act). VWB members are not elected by the village. The VCA establishes that five (out of the seven) members be appointed by MRD and the other two be automatic appointees: the Chairperson of the Village Council (VC) and a member of the Council nominated by the VC. When it comes to investments, VWB do not cover the upfront costs needed to build the water distribution systems. These costs are borne by the national government. Historically, the Belize Social Investment Fund (SIF) has been the agency responsible for the construction of most new water systems in rural areas. VWB are not regulated by the Public Utilities Commission (PUC), an agency established in 1999 to regulate the electricity, telecommunications, and water and sanitation sectors.

Water service provision in rural areas faces several challenges such as: i) the lack of water disinfection equipment and/or practices; ii) the low financial sustainability of VWB; and iii) the inadequate staff capabilities and lack of standard procedures to properly operate and maintain the systems. All these challenges affect the capacity of VWB to maintain service quality among existing customers and to contribute to the rapid and premature equipment and infrastructure deterioration.

Information provided by MRD, estimates that only 38% of VWB are actively disinfecting water, in all cases through a chlorination system based on calcium hypochlorite.² The remaining 62% are not. In

¹ Statistical Institute of Belize (SIB), 2022.

² A 2021 IDB report on water disinfection in Belize identified that some of the reasons for not chlorinating are: (i) the fear of using chlorination system incorrectly; and (ii) concerns raised by consumers about the taste and smell of water (high chlorine smell and taste especially in households close of the water distribution tank). MRD also found that 26 water systems have chlorinators that are not working.

most cases, the chlorination equipment installed when systems were built stopped working for lack of proper Operation and Maintenance (O&M).

A 2021 IDB report on water disinfection identified that, even when there is an operational chlorination system in place, VWB typically do not disinfect for four main reasons: (i) lack of financial liquidity to purchase the chlorine; ii) mobility and supply chain issues that make the purchasing of the chlorine challenging and expensive; iii) fear of using chlorination systems incorrectly; and (iv) concerns raised by consumers about the taste and smell of water (high chlorine taste and smell especially in households close to the water distribution tank).³

lack of active disinfection explain low levels of tap water consumption as users do not trust the quality of the water system. This is why bottled water consumption (for drinking purposes) in rural Belize is extraordinarily high, despite the low-income levels of its population³.

Preliminary 2022 Census data for 23 villages shows that 58% of the households are buying bottled water, at an average cost per gallon of US\$ 0.44Y. In some of these villages, more than 80% of the households are purchasing bottled water on a regular basis.

2.2 Objectives

The general objective of this program is to contribute to improve the quality of water services in Belize's rural areas through the following specific objectives: (i) improving the drinkability of water in rural areas; and (ii) strengthening the institutional capacity of Belize's water sector.

2.3 Components

The Program is structured in two components:

1.1 Component 1. Improved water service quality (IDB-OC: US\$3,000,000; IDB-GRF: US\$600,000⁴).

This component will finance the installation of innovative disinfection technologies in rural villages, namely on-site generation (OSG) options with two alternatives depending on water supply conditions: (i) OSG sodium hypochlorite, recommended when no quality problems are detected in raw water; and (ii) OSG mixed oxidants, recommended when water quality problems are detected in raw water, such as the presence of iron, manganese, or organic matter. This component will also finance small rehabilitations at the system level, including pipe replacement, electromechanical equipment, and storage tanks.

1.2 Component 2. Institutional strengthening of the water sector (IDB-OC: US\$550,000; IDB-GRF: US\$40,000).

This component will finance training for VWB on O&M, financial management and water sources' protection, as well as the development and deployment of a financial management system to address the issue of manual bookkeeping. It will also finance training to promote the participation of women and migrants in VWB. It will also finance information campaigns at the household level on tariff payment, water conservation and use, and tap water consumption. In addition, it will support the implementation of pilot to identify the effect of introducing micro-

³ [Mapping Income Poverty in Belize Using Satellite Features and Machine Learning](#), IDB, 2020.

⁴ This component will explore financing the improvement in the quality of service to villages with a high presence of migrants.

metering on water consumption and service payment. It will also finance a study to identify the potential of innovative technologies in improving the environmental conditions of the New River, including an analysis on the impact of these technologies in ameliorating certain pollution parameters generated by industrial and wastewater discharges such as phosphorus, total coliform, and dissolved oxygen.

Project Management, Audit and Evaluation (USD 0.5 million). Remaining resources will cover management and supervision costs as well as the operation's external audits and intermediate and final evaluations.

2.4 Costs and Financing

The total cost of the Program is **USD 4.64 million**.

The operation will be executed as an investment loan structured as a Multiple Works Program, as it will finance technically similar but mutually independent works.

The execution and disbursement period will be **five years**.

2.5 Implementation Arrangements

The borrower and Executing Agency (EA) will be the Belize Social Investment Fund (SIF). As EA, SIF will be responsible for administration of the loan resources and the fulfilment of the operation's objectives.

2.6 Expected Benefits

It is estimated that each dollar invested in drinking water in the region's rural areas yields a return of US\$8.2 per dollar.⁵ Globally, access to drinking water reduces episodes of diarrhoea by 75%.⁶ High incidence of diarrhoea in children hinders absorption of nutrients they need to grow and could lead to malnutrition.⁷ There is also a correlation between the availability of water services and productivity and income. Lack of access to water leads to lost labour productivity due to sickness-related absenteeism and/or the need to care for sick children. Time spent obtaining water from sources far from home also affects the potential for income generation. In rural areas, the greatest economic benefit of water availability is the time saved fetching water, which can be used instead for productive activities that generate household income.⁸

⁵ Agénor, Pierre Richard (2013): Public Capital, Growth and Welfare. Analytical Foundations for Public Policy. Princeton University Press. This return is estimated for Latin America and the Caribbean.

⁶ Wolf, Jennyfer & Hunter, Paul & Freeman, Matthew & Cumming, Oliver & Clasen, Thomas & Bartram, Jamie & Higgins, Julian & Johnston, Richard & Medlicott, Kate & Boisson, Sophie & Prüss-Ustün, Annette. (2018). Impact of Drinking Water, Sanitation and Hand Washing with Soap on Childhood Diarrhoeal Disease: Updated Meta-Analysis and –Regression. Tropical Medicine & International Health. 23. 10.1111/tmi.13051.

⁷ UNICEF (2021). Reimagining WASH. Water Security for all.

⁸ Pickering, A.J. and Davis, J. (2012) Freshwater Availability and Water Fetching Distance Affect Child Health in Sub-Saharan Africa. Environ. Sci. Technol., 2012, 46 (4), pp 2391–2397.

The program is expected to directly benefit at least 15,000 households which will gain access to water with improved quality in approximately 30 rural villages. The program is also expected to strengthen about 30 Village Water Boards (VWBs).

2.7 Description of Projects in the Representative Sample

For the purpose of the environmental and social assessment of the Program, a representative sample of projects was defined. This sample contains projects which are of a similar complexity and nature of those to be financed under the Program, and amount to about 30% of the total Program cost.

The Program is structured in two components, the first one aimed at the improvement of water systems in rural areas, and the second one financing institutional strengthening activities in the water sector.

It is expected that most of the environmental and social impacts and risks will materialize during the implementation of **Component 1**. This ESA focuses on the environmental and social analysis of projects under Component 1.

During preparation a representative sample of 20 rural villages distributed in all Belize's districts (Belize, Cayo, Corozal, Orange Walk, Stann Creek, and Toledo) was surveyed (Figure 1).

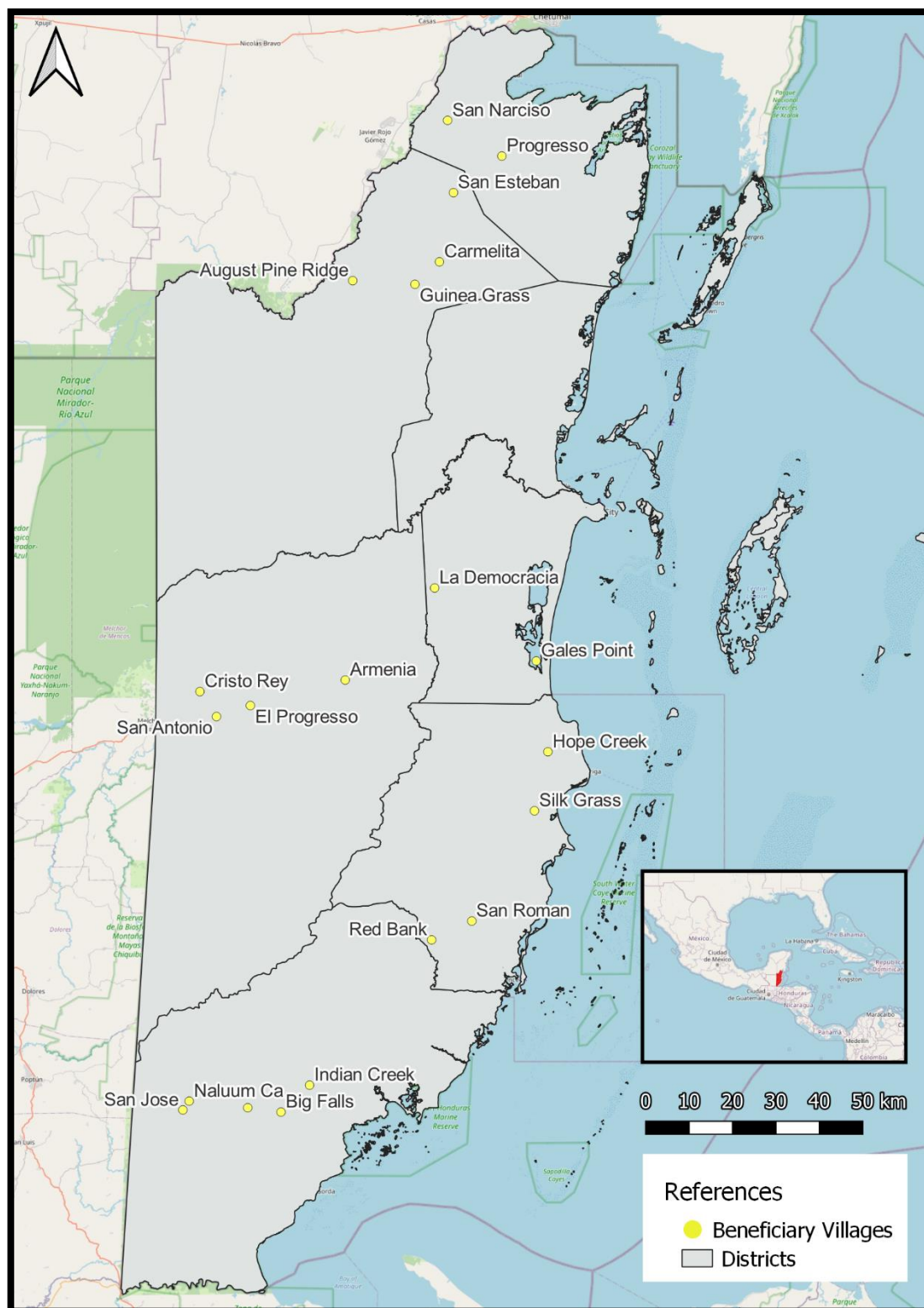


Figure 1 - Villages in the Representative Sample of Program BL-L1045

Total investment for these 20 villages is estimated at US\$1,460,000 (about 40% of Component 1 budget).

Table 2. Households and Water Service in the Sample Villages⁹ (source: BL-L1045 Technical Annex)

District	Villages	Total Households	Total Households with Public Supply	Public Supply Coverage
Cayo	Armenia	410	347	84.63%
Orange Walk	August Pine Ridge	523	410	78.39%
Toledo	Big Falls	250	227	90.80%
Orange Walk	Carmelita	479	432	90.19%
Cayo	Cristo Rey	524	482	91.98%
Cayo	El Progreso (7 Miles)	230	188	81.74%
Belize	Gales Point	148	83	56.08%
Orange Walk	Guinea Grass	936	721	77.03%
Stann Creek	Hope Creek	258	249	96.51%
Toledo	Indian Creek/Golden Stream	555	198	35.68%
Belize	La Democracia	108	85	78.70%
Corozal	Progreso	358	294	82.12%
Stann Creek	Red Bank	386	341	88.34%
Cayo	San Antonio	1,245	1,062	85.30%
Orange Walk	San Estevan	563	502	89.17%
Toledo	San Jose/Naluum Ca	1,020	824	80.78%
Corozal	San Narciso	714	558	78.15%
Toledo	San Pedro Columbia	342	276	80.70%
Stann Creek	San Roman	595	535	89.92%
Stann Creek	Silk Grass	534	406	76.03%
	Totals	10,178	8,220	80.76%

During the preparation of the Program, a team of consultants collected information at the village level to identify the type of disinfection system to be installed and the main rehabilitation needs.

The survey included the analysis of water samples from each system for physicochemical and bacteriological parameters such temperature, pH, organic matter content, iron, manganese, and E-coli. It also collected data on the VWBs' financial performance and the degree of women participation in management positions.

The details of the existing system are summarized in the following table:

⁹ Draft data from the 2020 Census (still not verified) for 20 villages that were surveyed during preparation.

Table 3. Data from the Survey of the Sample Villages (source: BL-L1045 Technical Annex)

District:	Village Name:	Water Charges (BZ\$/month or BZ\$/gal)	Percentage of household are metered?	Collection Compliance	Average O&M expenses (BZ\$/month)	Capacity of the storage tank (gals)	Electrical Power Supply	Status of the disinfection system?	Members in the waterboard	VWB member women
Cayo	Armenia	\$15.00	80%	100%	\$7,807.84	20000	B.E.L	Manual	7	2
Orange Walk	August Pine Ridge	\$10.00	0%	50%	\$4,038.08	20000	B.E.L	N/A	3	0
Toledo	Big Falls	@\$0.01/gal-1200	90%	75%	\$5,161.09	20000	B.E.L	N/A	4	0
Orange Walk	Carmelita	\$10.00	2%	75%	\$2,994.26	20000	B.E.L	Fully Functional	4	1
Cayo	Cristo Rey	\$15.00	0%	50%	\$3,828.92	20000	B.E.L/Solar	N/A	7	2
Belize	Democracia	\$10.00	18%	50%	\$862.41	20000	B.E.L	Fully Functional	0	5
Cayo	El Progreso (7 Miles)	\$10.00	0%	100%	\$1,294.61	20000	N/A	N/A	5	1
Belize	Gales Point	\$12.00	0%	0%	n/d	13500	B.E.L	N/A	7	3
Orange Walk	Guinea Grass	\$8.00	0%	25%	\$3,356.57	20000	B.E.L	N/A	4	3
Stann Creek	Hope Creek	\$15.00	40%	100%	\$3,590.57	20000	B.E.L	N/A	7	3
Toledo	Indian Creek/Golden Stream	@\$0.02/gal-1200	90%	50%	\$3,552.72	20000	Generator	N/A	6	0
Corozal	Progreso	\$10.00	0%	100%	\$6,482.42	20000	B.E.L	N/A	3	1
Stann Creek	Red Bank	@\$0.01/gal-2000	90%	75%	\$4,564.35	20000	B.E.L	Manual	3	0
Cayo	San Antonio	\$10.00	0%	50%	\$4,032.37	20000	N/A	Manual	7	2
Orange Walk	San Esteban	\$7.00	0%	25%	\$3,722.65	20000	B.E.L	N/A	1	0
Toledo	San Jose/Naluun Ca	@\$0.01/gal-1000	90%	75%	\$3,269.64	20000	Generator	N/A	3	1
Corozal	San Narciso	\$10.00	0%	100%	\$2,923.63	20000	B.E.L	Fully Functional	5	1
Toledo	San Pedro Columbia	@\$0.01/gal-1000	90%	100%	\$7,712.46	20000	B.E.L	Fully Functional	5	0
Stann Creek	San Roman	@\$0.01/gal-1500	50%	75%	\$2,923.97	20000	Generator	N/A	4	0
Stann Creek	Silk Grass	\$10.00	60%	50%	\$2,617.38	13500	B.E.L	Disconnected	2	1

A Project Profile at the village level was developed on the basis of this information, which details the proposed rehabilitation investments. The average rehabilitation cost per village is expected to be around US\$ 30,000.

An example of the project profiles is included below. The proposed investments are summarized in the following table.

Table 4. Example Project Profile for Rehabilitation (source: BL-L1045 Technical Annex)

Rural Water Rehabilitation			Carmelita/Tower Hill Villages		
Water System Infrastructure Characteristics			Water Quality Test Results		
1.00 Source	1 Well/s		Temp ^a	25.9 °C	
2.00 Pump	7.5 Hp		pH	6.8 Unit	
3.00 Tank (Ground)	20000 Gal.		T. S. Solids	<4 mg/l	
3.00 House Holds	750 No.		Manganese	0.038 mg/l	
4.00 Connections	600 No.		Iron	0.07 mg/l	
5.00 Micrometering	0 %		Hardness (CaCo3)	650 mg/l	
6.00 Billing	\$10.00 Quota		E. Coli	<1 cfu/100ml	
7.00 Power	BEL Good				
Water Board Governance/Frame work					
1.00 No. of Member.	4				
2.00 No of Women	1				
3.00 Income	\$2,778.47				
4.00 Expenses	\$2,994.26				
Observations					
1.00 No bulk metering, per quota billing (only business are metered at \$0.01/gal)					
2.00 Chlorination system fully functional, however disinfection is done periodical dependent on affordability.					
3.00 Tower Hill was a secondary addition to Carmelita's Water system.					
4.00 Two separate VWBs, one in Carmelita and one Tower Hill to carry out collection.					
5.00 Tower Hill was reached its physical expansion, however population and demand growth is still possible.					
6.00 Exposed pipes are evident in creek crossing.					
Issues highlighted by the Water Board					
1.00 Source					
1.10 Well insufficient capacity from March to June yearly.					
1.20 Sand sediments in dry season is evident.					
2.00 Infrastructure					
2.10 Unreport water leaks are a major concern.					
2.20 Unauthorized water connection					
2.30 Lack of micro metering allows for water mismanagement by residents.					
2.40 Disinfection equipment is operational.					
2.50 Exposed pipe in some area are intentionally sabotaged.					
3.00 Operation					
3.10 Manual pumping, float switch needs replacement.					
3.20 Pumping occurs 24hrs to keep up with demand.					
4.00 Maintenance					
4.10 Limited repairs to distribution networks					
Rehabilitation/Restoration Requirements					
1.00 Fence and pump house door need attention.					
2.00 Tank requires complete chang of railing and access ladder.					
3.00 Distribution networks requires replacement of pipes and placement in proper trenches.					
Cost Estimates					
Summary					
Item			with Ca(ClO) ₂	w/o Ca(ClO) ₂	
1.00 Power Supply			800.00 \$	800.00 \$	
2.10 Ca(ClO) ₂ Disinfection Equipment			2,470.00 \$	- \$	
2.20 Pump House Infrastructure/Protection			3,300.00 \$	3,300.00 \$	
3.00 Water Tank Infrastructure/Protection			12,900.00 \$	12,900.00 \$	
4.00 Wells			14,630.00 \$	14,630.00 \$	
5.00 Others			- \$	- \$	
Contingency 15%			5,115.00 \$	4,744.50 \$	
Total Cost with Ca(ClO) ₂ Chlorination or OSG			39,215.00 \$	36,374.50 \$	
No.	Description	Qty	Unit	Unit Cost	Cost
1.00 Pump House/Power					
1.01	BEL transformer	0	Ps.	\$10,000.00	\$0.00
1.02	Power Line	0	Ft.	\$75.00	\$0.00
1.03	Service Entrance	0	Ea.	\$500.00	\$0.00
1.04	Cut off Switch	0	Ea.	\$50.00	\$0.00
1.05	Electrical Panel/PLC	0	Ea.	\$600.00	\$0.00
1.06	Over-Load Protection	1	Ps.	\$400.00	\$400.00
1.07	Under-Load Protection	1	Ps.	\$400.00	\$400.00
1.08	Lightning Protection System (Grounding Mats)	0	Ea.	\$2,000.00	\$0.00
1.09	Lighting and Power Outlets	1	Ps.	\$300.00	\$300.00
1.10	Installation (wiring, wire, conduits and all ancillary material)	1	Ps.	\$600.00	\$600.00
2.00 Pump/Chlorination House					
2.10 Disinfection Ca(ClO) ₂ equipment					
2.11	Chlorine Dosing Pump	1	Ea.	\$1,800.00	\$1,800.00
2.12	Chlorine Solution Tank	1	Ea.	\$500.00	\$500.00
2.13	Pressure Switch	1	Ea.	\$70.00	\$70.00
2.14	Flow Sensor	0	Ea.	\$1,500.00	\$0.00
2.15	Testing Spigot/Tap	1	Ea.	\$100.00	\$100.00
2.20 Infrastructure/Protection					
2.21	Fence	0	Ft.	\$20.00	\$0.00
2.22	Fence Gate	30	Ft.	\$60.00	\$1,800.00
2.23	Doors Metals 6ft with Dead Bolt	1	Ea.	\$1,500.00	\$1,500.00
2.24	General Rehabilitation (Painting and Ancillary Masonry Works)	1	Ps.	\$1,100.00	\$1,100.00
2.25	New Chlorination House	0	Ea.	\$5,400.00	\$0.00
2.26	Chlorination Solar Panel		Ps.	\$15,000.00	\$0.00
3.00 Water Tank Infrastructure and Protection					
Elevated					
3.01	Bulk Meter 3" (Turbine type)	1	Ea.	\$1,500.00	\$1,500.00
3.02	Pipe Straps 3"	0	Ps.	\$150.00	\$0.00
3.03	Faulty Valve 3"	0	Ea.	\$500.00	\$0.00
3.04	Leaky Fittings	0	Ps.	\$500.00	\$0.00
3.05	Float Switch/Valve	0	Ea.	\$120.00	\$0.00
3.06	G.I. Access Ladder & Safety Cage: Complete w/ installation	1	Ea.	\$3,000.00	\$3,000.00
3.07	G.I. Railing Complete w/installation	120	Ft.	\$55.00	\$6,600.00
3.08	Fence	0	Ft.	\$20.00	\$0.00
3.09	Gate	30	Ft.	\$60.00	\$1,800.00
3.10	Painting of Tank (any other rehab. to be covered in contingency)	1	Ps.	\$7,500.00	\$7,500.00
3.11	Tank sealing		Ps.	\$15,000.00	\$0.00
4.00 Well					
4.01	2" G.I. Pipe Support	2	Ea.	\$120.00	\$240.00
4.02	3" Brass Gate Valve NPT(Replacement/New)	4	Ea.	\$500.00	\$2,000.00
4.03	3" Brass Check Valve NPT (Replacement/New)	1	Ea.	\$600.00	\$600.00
4.04	Fittings Replacement/New	1	Ps.	\$1,200.00	\$1,200.00
4.05	Pressure Gauge Assembly (preferable oil filled)	1	Ps.	\$300.00	\$300.00
4.06	Testing Spigot/Tap Assembly (QC)	1	Ps.	\$140.00	\$140.00
4.07	Bulk Meter Assembly	1	Ea.	\$1,500.00	\$1,500.00
4.08	Pipe and Labour	1	Ps.	\$500.00	\$500.00
4.09	Electrical Protection Assembly (Conduits)	1	Ps.	\$150.00	\$150.00
4.10	Security Fence	0	Ft.	\$20.00	\$0.00
4.11	Fence Gate	0	Ft.	\$60.00	\$0.00
4.12	Concrete Pad	12	syd.	\$150.00	\$1,800.00
4.13	Well Service Air Release Valve	1	Ea.	\$1,200.00	\$1,200.00
4.14	General Installation	1	Ls	\$5,000.00	\$5,000.00
4.15	Well Pump and Down Pipe	0	Ps.	\$2,500.00	\$0.00
5.00 Others					
5.01	Transmission Line 4" PVC Class 200	0	ft.	\$8.00	\$0.00
5.02	Trenching for 4" Transmission Line	0	ft.	\$10.00	\$0.00

For this sample of villages, a detailed analysis of the most appropriate disinfection solution was also carried out comparing three main options: dosing of a calcium hypochlorite solution, on-site generation and dosing (OSG) of sodium hypochlorite and OSG of mixed oxidants (hydrogen peroxide and sodium hypochlorite).

The average cost per village of the supply and installation of the disinfection equipment is expected to be around US\$ 40,000.

The following table summarizes the results of this analysis and the equipment, cost and expected investment and O&M cost of these options.

Table 5. Cost of Disinfection Equipment (source: BL-L1045 Technical Annex)

District:	Village Name:	Water Consumption (Gal/d)	Chlorine needed with mixed oxidants (kg Cl eq./y)	Required Capacity of Mixed Oxidant Generator (lb Cl/d)	Chlorination points (#)	OSG Equipment S&I CAPEX (US\$)	OSG Salt consumption (kg/y)	OSG Power consumption (Kwh/y)	OSG OPEX (US\$/y)	Ca(ClO) ₂ OPEX (US\$/y)
Cayo	Armenia	108,948	263.4	0.80	2	78,263	843	1,739	811	4,365
Orange Walk	August Pine Ridge	120,918	292.4	1.77	1	39,131	936	1,930	900	4,845
Toledo	Big Falls	97,062	234.7	1.42	1	39,131	751	1,549	722	3,889
Orange Walk	Carmelita	179,844	434.9	2.63	1	55,844	1,392	2,870	1,338	7,206
Cayo	Cristo Rey	48,258	116.7	0.70	1	39,131	373	770	359	1,934
Belize	Democracia	19,740	47.7	0.29	1	39,131	153	315	147	791
Cayo	El Progreso (7 Miles)	34,230	82.8	0.50	1	39,131	265	546	255	1,372
Belize	Gales Point	27,132	65.6	0.40	1	39,131	210	433	202	1,087
Orange Walk	Guinea Grass	163,800	396.1	2.39	1	39,131	1,267	2,614	1,219	6,563
Stann Creek	Hope Creek	62,244	150.5	0.91	1	39,131	482	993	463	2,494
Toledo	Indian Creek/Golden Stream	66,318	160.4	0.97	1	39,131	513	1,058	493	2,657
Corozal	Progreso	52,920	128.0	0.77	1	39,131	409	845	394	2,120
Stann Creek	Red Bank	86,478	209.1	1.26	1	39,131	669	1,380	643	3,465
Cayo	San Antonio	209,790	507.3	3.06	1	55,844	1,623	3,348	1,561	8,406
Orange Walk	San Esteban	108,108	261.4	1.58	1	39,131	836	1,725	804	4,332
Toledo	San Jose/Naluum Ca	51,324	124.1	0.75	1	39,131	397	819	382	2,056
Corozal	San Narciso	197,274	477.0	2.88	1	55,844	1,526	3,148	1,468	7,904
Toledo	San Pedro Columbia	97,230	235.1	1.42	1	39,131	752	1,552	723	3,896
Stann Creek	San Roman	84,042	203.2	1.23	1	39,131	650	1,341	625	3,367
Stann Creek	Silk Grass	123,270	298.1	1.80	1	39,131	954	1,967	917	4,939
Total						871,898	15,002	30,942	14,426	77,690

The supply and installation of the disinfection equipment will include a public information campaign on the advantages of the new disinfection system and training and support for one year to the VWBs and pump operators on the O&M of the disinfection equipment and rehabilitated production infrastructure.

Selection of the Disinfection Technology. The disinfection options considered in the analysis were selected on the basis of an a study of water treatment and disinfection challenges in Belize's small towns and rural villages carried out in 2022. The study evaluated disinfection technologies in seven locations (see Figure 2): Placencia and Caye Caulker, managed by the BWS, and Hopkins, Sarteneja, Chunnox, Independence, and Monkey River, managed by MRD. For common technology options (direct dosing of chemical agents, use of physical agents and OSG of chemical agents), the following disinfection agents were also analyzed:

- Dosing of chemical agents: chlorine gas, sodium hypochlorite, calcium hypochlorite, chlorine dioxide, and hydrogen peroxide.
- Physical agents: ultraviolet radiation.
- OSG: sodium hypochlorite, chlorine dioxide, mixed oxidants (sodium hypochlorite + hydrogen peroxide), and ozone.

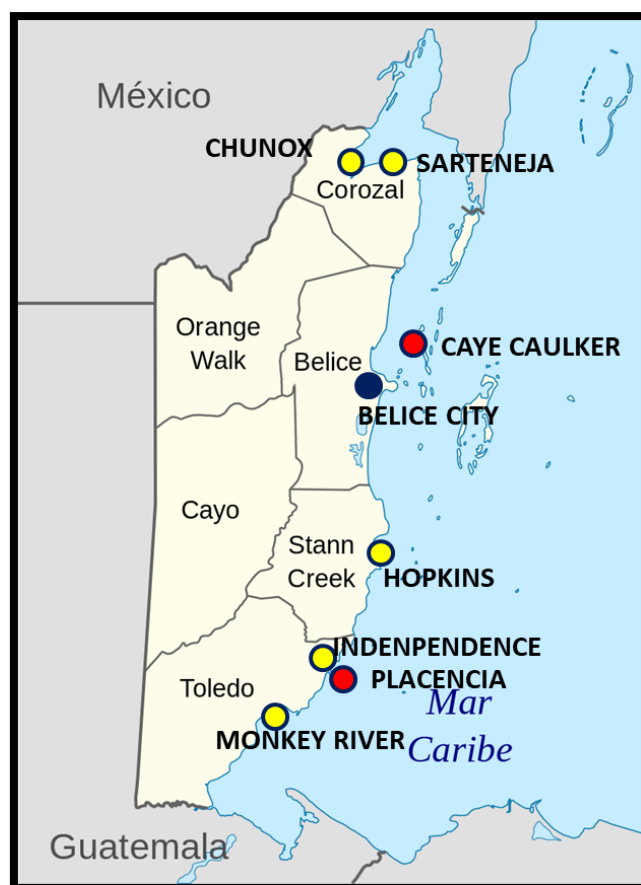


Figure 2. Locations of the Disinfection Study (source: BL-L1045 Technical Annex)

For the selection of the most appropriate disinfection agent, different factors were considered:

- Disinfection capacity
- Residual disinfection effect (guarantees residual presence in the distribution network)
- Influence on water quality and organoleptic properties (odor and taste)
- Ease of purchase in Belize
- Ease of installation
- Presence of dangerous substances
- Robustness and reliability of the technology
- Investment and Operation & Maintenance costs

The study concluded that the most appropriate option for water supply disinfection for Belize is OSG of chemical disinfectants, with two alternatives depending on water supply conditions:

- OSG of sodium hypochlorite (NaClO): the use of this option is recommended when there is security that there are no water quality problems, as in the case of systems that use desalinization with reverse osmosis (RO);
- OSG of mixed oxidants ($\text{NaClO} + \text{H}_2\text{O}_2$): the use of this combination of disinfectants is recommended when water quality problems are possible in the water, such as odor or high concentrations of iron, manganese, or organic matter.

The analysis evaluated capital investment costs (CAPEX) and operating expenses (OPEX) for the recommended technologies. It was found that even though CAPEX is higher than other disinfectants

options, such as the dosing of calcium hypochlorite (commonly used in Belize), OSG alternatives have significant lower OPEX.

Table 6. Summary Rehabilitation and Disinfection Investments and M&O (source: BL-L1045 Technical Annex)

District:	Village Name:	Water Consumption (Gal/d)	Chlorine needed with mixed oxidants (kg Cl eq./y)	Required Capacity of Mixed Oxidant Generator (lb Cl/d)	Chlorination points (#)	OSG Equipment S&I CAPEX (US\$)	OSG Salt consumption (kg/y)	OSG Power consumption (Kwh/y)	OSG OPEX (US\$/y)	Ca(ClO) ₂ OPEX (US\$/y)
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Cayo	Cristo Rey	48,258	116.7	0.70	1	39,131	373	770	359	1,934
Belize	Democracia	19,740	47.7	0.29	1	39,131	153	315	147	791
Cayo	El Progreso (7 Miles)	34,230	82.8	0.50	1	39,131	265	546	255	1,372
Belize	Gales Point	27,132	65.6	0.40	1	39,131	210	433	202	1,087
Orange Walk	Guinea Grass	163,800	396.1	2.39	1	39,131	1,267	2,614	1,219	6,563
Stann Creek	Hope Creek	62,244	150.5	0.91	1	39,131	482	993	463	2,494
Toledo	Indian Creek/Golden Stream	66,318	160.4	0.97	1	39,131	513	1,058	493	2,657
Corozal	Progreso	52,920	128.0	0.77	1	39,131	409	845	394	2,120
Stann Creek	Red Bank	86,478	209.1	1.26	1	39,131	669	1,380	643	3,465
Cayo	San Antonio	209,790	507.3	3.06	1	55,844	1,623	3,348	1,561	8,406
Orange Walk	San Esteban	108,108	261.4	1.58	1	39,131	836	1,725	804	4,332
Toledo	San Jose/Naluum Ca	51,324	124.1	0.75	1	39,131	397	819	382	2,056
Corozal	San Narciso	197,274	477.0	2.88	1	55,844	1,526	3,148	1,468	7,904
Toledo	San Pedro Columbia	97,230	235.1	1.42	1	39,131	752	1,552	723	3,896
Stann Creek	San Roman	84,042	203.2	1.23	1	39,131	650	1,341	625	3,367
Stann Creek	Silk Grass	123,270	298.1	1.80	1	39,131	954	1,967	917	4,939
Total						871,898	15,002	30,942	14,426	77,690

Pilot Metering. As part of the rehabilitation of the supply systems the project will also provide financing to achieve full metering in those systems that have shown efficiency in the management by achieving already more than 55% metering and more than 50% collection (according to the VWB provided information).

The supply and installation of meters will be done in Armenia, Big Falls, Indian Creek, Red Bank, San Esteban, San Pedro Columbia and Silk Grass.

A summary of the proposed investments to reach 100% metering of houses supplied by the network is presented in the following table.

Table 7. Metering proposed Investments

District:	Village Name:	Current Collection (US\$/month)	Current Expenses (US\$/month)	Connected Households not metered	Capex for full metering of connected houses*	Number of meters to install
Cayo	Armenia	3,647.82	3,874.47	69	8,280	69
Orange Walk	August Pine Ridge	1,915.65	2,003.81	410	-	-
Toledo	Big Falls	2,525.80	2,561.08	23	2,760	23
Orange Walk	Carmelita	1,378.75	1,485.84	423	-	-
Cayo	Cristo Rey	1,920.94	1,900.02	482	-	-
Belize	Democracia	393.50	427.95	395	-	-
Cayo	El Progreso (7 Miles)	1,049.11	642.42	188	-	-
Belize	Gales Point	-	-	83	-	-
Orange Walk	Guinea Grass	1,760.45	1,665.63	721	-	-
Stann Creek	Hope Creek	2,799.60	1,781.74	149	-	-
Toledo	Indian Creek/Golden Stream	1,685.76	1,762.96	20	2,400	20
Corozal	Progreso	3,980.97	3,216.76	85	-	-
Stann Creek	Red Bank	2,893.10	2,264.96	34	4,080	34
Cayo	San Antonio	2,895.66	2,000.98	1,057	-	-
Orange Walk	San Esteban	1,826.68	1,847.29	1,057	-	-
Toledo	San Jose/Naluum Ca	1,305.08	1,622.49	82	9,840	82
Corozal	San Narciso	1,431.84	1,450.79	558	-	-
Toledo	San Pedro Columbia	4,056.86	3,827.14	28	3,360	28
Stann Creek	San Roman	1,403.01	1,450.96	268	-	-
Stann Creek	Silk Grass	1,327.83	1,298.82	162	19,440	162
Total		40,198	37,086	6,294	50,160	418

The purpose for the implementation of meters on the distribution networks is to be able to increase VWB's revenue collection capacity through improved meter reading accuracy.

3. Legal and Institutional Framework

This chapter describes the legal, sectoral and institutional framework, considering the environmental, social, safety and occupational health areas directly linked to the interventions to be carried out.

3.1 Belize Legal Framework

This section presents the International Agreements and National regulations related to the Program and projects under analysis. The information is organized by thematic area in order to facilitate the understanding and subsequent reference of each topic.

Environmental Licensing

Table 8 - Environmental Licensing regulations

National Legislation	
Environmental Impact Assessment Regulations S.I. 107/1995 and Amendment - 2020	<p>It establishes that all persons, agencies, institutions (whether public or private), unless exempted pursuant to these Regulations, shall, before embarking on a proposed project or activity, apply to the Department of Environment for a determination whether such project or activity would require an environmental impact assessment (EIA).</p> <p>It also divides the projects into categories that determine, according to their classification, required documentation to be submitted to the DOE:</p> <ul style="list-style-type: none">• Schedule I: It requires an environmental impact assessment. The scope and extent of the environmental impact assessment shall be determined by the DOE.• Schedule II: The DOE shall determine or cause to be determined whether any of the undertakings, projects or activities specified in Schedule II require an environmental impact assessment or a limited level environmental study. <p>In accordance with the classification, this project is classified as Schedule II, (12) Infrastructure projects, (f) A long-distance aqueduct.</p>
Environmental Protection Act Chapter 328 of the Substantive Laws of Belize - Revised Edition 2011	<p>It established the Department of Environment (DOE), and designated it as responsible for monitoring the implementation of the Act and subsequent regulations. The Act provides the DOE with broad regulatory and enforcement authority for the prevention and control of environmental pollution, conservation and management of natural resources, and environmental impact assessment.</p>

National Legislation	
Environmental Protection (Effluent Limitations) Regulations (S.I. 94/1995) and Amendment - 2009	<p>It established a licensing system for effluent discharge under specific conditions. The regulation establishes measures for the treatment of industrial effluents, as well as limitations or standards for physical and chemical effluent parameters.</p> <p>In August 2009, the Effluent Limitation Regulation was amended to include provisions for the treatment of domestic wastewater. This amendment also introduced improvements in effluent standards for both industrial and domestic effluents.</p>
Pollution Regulations (S.I. 56/1996) and Amendment - 2009	<p>These regulations are established to control air, noise, water and soil pollution. It establishes the prohibition to discharge pollutants into the environment, unless it is done with a permit issued by the Department of the Environment and at acceptable levels of pollutants from certain facilities.</p> <p>In June 2002 and August 2009, the regulations were amended to include, among other things, issues related to commitments under the Montreal Protocol on Substances that Deplete the Ozone Layer.</p>
Environmental Protection (Pollution from Plastics) Regulations - 2020	It addresses the importation, manufacture, sale and possession of prohibited and restricted single-use plastics and Styrofoam products in Belize.
Summary Jurisdiction (Littering Offences) Act Chapter 98 - Revised Edition 2003	It deals with the issue of littering, outlines the process for violation tickets and determines the officials authorized to enforce them.
Belize City Council Act Chap. 85 - Revised Edition 2000	<p>The Belize City Council Act provides for the regulation and assessment of building plans, and streets and public open spaces management.</p> <p>The Council has the responsibility of coordinating activities and operations of all utility agencies and property developers within the Belize city with respect to the excavation and restoration of streets, canals, creeks and other public right of way, with the object of preventing damage to the city infrastructure and minimizing the disruption of utility services.</p>
The Belize Building Act (No. 131/2003)	<p>This Act and its 2005 Revision repeals the Belize City Building Act (CAP. 131 Revised Edition 2000).</p> <p>It establishes the Central Building Authority to administer the provisions of the Act. The Act establishes that the Authority shall appoint a professional engineer or architect as the Director of Building Control who shall sign and issue all building permits, notices of execution and other related documents. The Authority may appoint construction inspectors in order to determine compliance with the terms of the building permit.</p>
Customs Regulation (Prohibited and Restricted Goods) (Consolidation) (Amendment) Order - 2006	Regulates the issuance of licenses for the import of used tires and lead-acid batteries and for the export of scrap metal by DOE.

National Legislation	
Mines and Minerals Act Chap. 226 - Revised Edition 2000	It regulates the extraction of all non-renewable resources (except petroleum). The Act also addresses dredging and sand mining. Under Section 36, it requires that any application of a mining (includes dredging) license should be accompanied by a proposal for the prevention of pollution, the treatment of wastes, the safeguarding of natural resources and the minimization of the effects of mining on surface and underground water.
Disaster Preparedness and Response Act, Chapter 145 - Revised Edition 2000	It is often referred to as the NEMO Act. The National Emergency Management Organization (NEMO) is responsible for coordinating national responses to disasters. This regulation deals with the response to any kind of disaster, being natural or man induced.

Water and Water Resources Management

Table 9 - Water Resources management regulations

Multilateral Agreements	
UN Convention on the Law of the Sea and ISPS Code - 1994	Its objective is to regulate law and order in the world's oceans and seas establishing rules regarding all uses of the oceans and their resources.
London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter - 1972	The purpose is to control sea pollution by waste dumping.
National Legislation	
The National Integrated Water Resources Act - 2011	This Act provide for the management, controlled allocation and the sustainable use and protection of the water resources of Belize. It establishes the National Integrated Water Resources Authority with responsibility for the preparation and implementation of a National Water Resources Master Plan, licensing of water abstraction, and responsibility for dealing with issues related to easements required by licensees, control and protection of groundwater and well drilling, and the protection of gathering grounds. It should be noted, however, that this Act has not been fully implemented.
Water Industry Act Chapter 222 - Revised Edition 2020	This Act regulates the provision and control of water and sewerage services in Belize; promotes the conservation and proper use of water resources; provides for the issuance of licenses to water supply companies; provides for the transfer of the assets and liabilities of the Water and Sewerage Authority to the company or companies authorized by the Public Utilities Commission. This Act repeals the Water and Sewerage Act, Chapter 185 of the Laws of Belize.

Multilateral Agreements	
Public Utilities Commission Act Chapter 223 - Revised Edition 2000	Provides for the establishment of a Public Services Commission to regulate the provision of public services in Belize. The function of the Commission will be to ensure that the services provided by a public service provider are satisfactory and that reasonable rates are charged for such services. Public utilities include water supply and sewerage services.

Socio-Economic Legislation

Table 10 - Socio-Economic Legislation

Multilateral Agreements	
International Labour Organization Conventions Act Chapter 304:01 - Revised Edition 2003	These agreements govern the relationship between contractors and their workers. They include, among others, minimum age, right of association, minimum wage, freedom of association and protection of the right to organize, abolition of forced labor, protection against radiation, paid vacations, etc.
Convention for the Protection of Cultural Property in the Event of Armed Conflict UNESCO (Hague Convention) - 1954	It aims to protect cultural property, such as monuments of architecture, art or history, archaeological sites, works of art, manuscripts, books and other objects of artistic, historical or archaeological interest, as well as scientific collections of any kind, regardless of their origin or ownership.
Rotterdam Convention - 2004	The objective of this Convention is to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties.
National Legislation	
Labour Act Chapter 297 - Revised Edition 2011 and Amendment Act 2020	It establishes the conditions for labor relations between contractors and their workers (hiring of employees, conditions of employment, payment of wages, disputes resolution, etc.).

Workmen's Compensation Act Chapter 303 - Revised Edition 2000	The law establishes provisions on the liability of contractors for workers who are involved in accidents at work or while being transported to their workplace (compensation, insurance, insolvency, etc.).
Social Security Act Chapter 44 - Revised Edition 2011	It requires the contractor to pay worker's social security contributions in case of sickness or injury.
National Legislation	
National Occupational Safety and Health Bill	It is a projected National Law that aims to regulate worker's safety and health. Although it is not yet a law, the provisions of this bill serve as an excellent guide for good practices.
Village Councils Act Chapter 88 Revised edition 2020	It addresses issues affecting the villages management through a village council. It deals with legal proceedings, elections, finances, etc.
Town Council Act Chapter 87 Revised Edition 2020	It establishes Town Councils as body corporate with perpetual succession and a common seal. The Council shall consist of a Mayor and six other members duly elected in accordance with this Act and regulations made thereunder. Town Councils have wide powers to manage the affairs of the towns, and operate within declared town limits. They can make subsidiary laws or by laws for the good governance of the towns.
Protection against Sexual Harassment Act Chapter 107 Revised Edition 2000	This Act provides for the prohibition of sexual harassment in the workplace by an employer to his or her co-workers so that both men and women work in a respectful and pleasant environment.
Families and Children Act Chapter 173 Revised Edition 2000	Protects the rights of families and children. Under this legislation, any member of the public who has knowledge of child abuse has a moral duty to report; while anyone whose occupations involve direct contact with children has a legal obligation to do so.
Pesticides Control Act Chapter 216 Revised Edition 2020	The Pesticides Control Board has the responsibility to license persons to import or manufacture pesticides; to authorize pesticide applicators; and to control the use of them.
Customs and Excise Duties Act Chap 48 Rev. 2000	This Act regulates the importation or exportation of any goods which for the time being is subject to any number of conditions or restrictions and applies to the importation of all groups of metals.
Dangerous Goods Act Chapter 134 - Revised Edition 2011	It regulates activities involving the importation, production, transportation, storage and/or distribution of hazardous substances such as explosives, petroleum products, gunpowder, dynamite, nitroglycerin, gun cotton, gunpowder for explosions, mercury or other metal fulminating agents, colored fireworks, etc.

Traffic and Road Safety

Table 11 - Traffic and Road Safety Legislation

National Legislation	
Public Roads Act - Revised Edition 2003	The Public Roads Act charges the Chief Engineer, subject to the Minister's consent, with the construction, alteration, maintenance and supervision of all public roads of Belize.
Motor vehicles and Road Traffic Act Chapter 230 - Revised Edition 2011	This Act establishes conditions for registration and licensing of motor vehicles; driving and other offences and general conditions relating to the use of roads; legal proceedings, suspension, cancellation and endorsement of Driving Licenses; and fees and duties.

Noise

Table 12 – Noise Legislation

National Legislation	
Pollution Regulations S.I. 56 - 1996 and Amendment - 2009	Part XI of the Pollution Regulations sets out the conditions under which certain activities resulting in the emission of noise nuisance are deemed to be violations.

Urban Solid Waste Management

Table 13 - Urban Solid Waste Management Legislation

National Legislation	
The Solid Waste Management Authority Act, Chap. 224 - Revised Edition 2000	It establishes that The Solid Waste Management Authority regulates the management of waste material resulting from new construction or other work. Contractors are required to properly remove and dispose of all waste material.
Environmental Protection (Prohibition of the open-burning of refuse and other regulations) - 2020	It establishes the prohibition of open-burning and other combustible materials for the protection of the environment. During the period of public emergency, no person shall cause, suffer, allow, or permit open-burning of any refuse or combustible matter on any private or public land. A person that contravenes this regulation commits an offence and is liable on summary conviction to a fine not exceeding five thousand dollars or to a term of imprisonment not exceeding two years.

Hazardous Waste Management

Table 14 - Hazardous Waste Management Regulations

Multilateral Agreements	
Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (BASEL) - 1997	The objective is to reduce hazardous waste movements between nations.
National Legislation	
Hazardous Waste Management Regulations -S. I. No. 100/2009	It establishes rules for transport, storage, and disposal of hazardous waste. The regulations do not address hazardous waste contained in domestic waste or waste generated from the use of agrochemicals since these are addressed in other legislations.

Gaseous Emissions Management

Table 15 - Gaseous Emissions Management Legislation

Multilateral Agreements	
United Nations Framework Convention on Climate Change - 1994	The Convention objective is to stabilize greenhouse gas concentrations at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system.
Vienna convention for the Protection of the Ozone Layer - 1978	It establishes that the parties shall cooperate through research and exchange of information in order to better understand and assess the effects of human activities on the ozone layer. The objectives are found in the Montreal Protocol.
Stockholm Convention on Persistent Organic Pollutants - 2004	The Stockholm Convention is a global treaty that aims to protect human health and the environment from the effects of persistent organic pollutants (POPs).
National Legislation	
Nationally Determined Contribution under the United Nations Framework Convention on Climate Change	Belize's Nationally Determined Contribution (NDC) is guided by its commitment to strategically transition to low carbon development while strengthening its resilience to the effects of Climate Change.

Energy

Table 16 – Energy Legislation

National Legislation	
National Energy Policy (Proposal) - 2011	<p>The objective of the policy is to meet the energetic needs of the population through energy efficiency, production, supply, transportation, distribution and end-user systems to contribute to social and economic development in an environmentally sustainable manner.</p> <p>The plan's objectives include: minimize the cost of energy use, minimize the amount of GHG emissions, Maximize the renewability index (percentage of indigenous renewable energy in the total primary energy supply mix), maximize production of energy from indigenous sources, maximize the diversity of the energy supply mix, and maximize the use of electricity in the secondary energy supply mix</p>
Public Utilities Commission Substantive Act Chapter 223 - Revised Edition 2020.	It created the Public Utilities Commission in 2001 incorporating the traditional regulatory agencies, the Electricity Supply Office and the Telecommunications Office, to regulate the electricity, water and telecommunications sectors in Belize.
Electricity Act Chapter 221 - Revised Edition 2020	Provides for the cessation of the functions of the Belize Electricity Board imposed by Part IV of the Belize Electricity Board Act, Cap. 182, R.E. 1980-1990, and sets out the conditions for the Regulation and Provision of Electricity Services and the Licensing of Supply.

Soils

Table 17 – Soils Legislation

Multilateral Agreements	
The United Nations Convention to Combat Desertification (UNCCD) - 1994	The objective of this Convention is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification
National Legislation	
Land Utilization Act Chapter 188 - Revised Edition 2000	It provides the primary authority for land-use planning in Belize. The Act requires that government approval be obtained before any parcel of land can be subdivided and provides general authority to regulate land use in order to protect watersheds, prevent soil erosion, control clearing of forest, and regulate the type of development permitted in designated areas.
Land Tax Act, Chapter 58 - 2000	The Department of Lands and Surveys is responsible for the administration of the Land Tax Act, mainly through its valuation and taxation functions.
National Legislation	
The National Lands Act No. 6 - 1992 and SI 191 - Revised Edition 2000	The Act is designed to establish a framework for the management of national lands, where “national lands” means all lands and seabed, other than reserved forest within the meaning of the Forest Act.

Protected Areas

Table 18 – Protected Areas Legislation

National Legislation	
Convention for Nature Protection and Wildlife Preservation in the Western Hemisphere - 1940	Its purpose is to establish national parks, national reserves, natural monuments and strict wilderness reserves in the territories of the parties.
National Protected Areas System Act No. 17 - 2015	It establishes that in the event that a reclassification of the forest reserve is announced, the Ministry of Agriculture must first conduct a public consultation with the people affected by this decision.
National Park System Act SI 215 - 2000	It establishes four types of protected areas: Natural Monuments, National Parks, Natural Reserves and Wildlife Sanctuaries. It addresses the mandatory nature of management plans and their periodic revision, and the successful evaluation of protected areas.

Flora, Fauna and Native Forest

Table 19 - Flora, Fauna and Native Forest Legislation

Multilateral Agreements	
Convention on Biological Diversity. Rio de Janeiro 1992. - Ratified 1993	Its objective is to conserve biological diversity, promote the sustainable use of its components and encourage the equitable sharing of the benefits derived from the natural resource use.
Convention for the Conservation of Biodiversity and Protection of Priority Areas of Central America - 1992	Its objective is to promote sustainable development in order to conserve the biological diversity and biological resources of the Central American region.
Convention on International Trade in Endangered Species of Wild Fauna and Flora - 1975	It was designed to ensure that international trade of animals and plants does not threaten their survival in the wild.
Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat - 1971	Its main objective is to ensure the conservation and sustainable use of Ramsar sites (wetlands).
National Legislation	
Wildlife Protection Act, Chapter 220 - Revised Edition 2010	The Wildlife Protection Act regulates the hunting of wildlife as game or for other use. This act allows for the establishment of regulations controlling hunting by the declaration of closed hunting areas, determining periods for the prohibition of hunting, the prohibition of hunting of specified animals of specific size limits, etc.
The Forest Act, Chapter 123 - Revised Edition 2000	It regulates the exploitation of forest in nationally held lands. The Forest Act authorizes the Minister to declare forest reserves and to de-reserve forest reserves. The act also authorizes Forest Officers from the Forest Department with wide functions to regulate the forest industry.

Forest Fire Protection Act Chapter 212 - Revised Edition 2020	It provides that the Minister may declare any area of Belize to be a fire protection area. The Chief Forest Officer shall prepare a fire protection plan for any area declared to be a fire protected area.
Forest (Protection of Mangroves) Regulations Chap 213 – Revised Edition 2003	It establishes the prohibition to alter, permit, or cause to be altered any mangrove forest in jurisdictional waters without first obtaining a permit from the Department of Forestry. This prohibition applies to both privately and publicly owned land.

Indigenous People and their Communities

Table 20 - Indigenous Peoples Legislation

Multilateral Agreements	
International Covenant on Civil and Political Rights (Article 27) - 1976	It establishes that in those States in which ethnic, religious, or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practice their own religion, or to use their own language.
Convention on the Elimination of All Forms of Racial Discrimination 1969	It requires states to take measures to eradicate all manifestations of racial discrimination wherever they exist, including with regard to property.
Charter of the Organization of American States – 1951 and Protocol of Managua (Amendment) - 1993	Article XXIII of the American Declaration affirms that the property rights of indigenous peoples are not defined exclusively by entitlements within a state's formal legal regime, but also include that indigenous communal property arises from and is grounded in indigenous custom and tradition.
Charter of the United Nations - 1945	It seeks to create an international order based on respect for fundamental human rights. To realize this objective, the United Nations established the Human Rights Council, which among other activities continues the special procedures of its predecessor, the Commission on Human Rights, to address violations of human rights in specific contexts. Among these special procedures is the United Nations Special Rapporteur on the Situation of Human Rights and Fundamental Freedoms of Indigenous People.

Cultural Heritage, Archaeological and Historical Sites

Table 21 - Cultural Heritage, Archaeological and Historical Sites Legislation

Multilateral Agreements	
Convention Concerning the Protection of World Cultural and Natural Heritage - 1972	The World Heritage Convention aims to promote cooperation among nations to protect heritage around the world that is of such outstanding universal value that its conservation is important for current and future generations.
Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property - 1970	The 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property urges States Parties to take measures to prohibit and prevent the illicit trafficking of cultural property. It provides a common framework for the States Parties on the measures to be taken to prohibit and prevent the import, export and transfer of cultural property.

Convention for the Safeguarding of the Intangible Cultural Heritage - 2003	The main objectives are to safeguard intangible cultural heritage and ensure respect for the intangible cultural heritage of the communities, groups, and individuals concerned to raise local, national and international awareness of the importance of intangible cultural heritage.
The Convention on the Protection and Promotion of the Diversity of Cultural Expressions - 2005	The Convention provides a new framework for informed, transparent and participatory systems of governance for culture.
National Agreements	
National Institute of Culture and History Amendment Act - 2003	This Act empowers the Institute of Archaeology to carry out research, interpretation and the protection of the Archaeological Heritage of Belize. The ownership of all ancient monuments and antiquities shall rest in the Institute of Archaeology, Government of Belize.
Ancient Monuments and Antiquities Act 1972 and Chapter 330 of the - Revised Edition 2000	This Act provides for the protection of declared sites and the protection of archaeological remains discovered during construction sites.
National Cultural Heritage Preservation Act (No. 40) - 2017.	It prohibits the damage, destruction or intentional disturbance of any ancient monument or antiquity, its marking or defacing, or its removal. It further authorizes the Director of Archaeology to take measures for the adequate protection of ancient monuments or antiquities in the event they are threatened by a contractor's operation.

Involuntary Resettlement

Table 22 - Involuntary Resettlement Legislation

National Legislation	
Land Acquisition (Public Purposes) Act Chapter 184 - Revised Edition 2000	It establishes provisions for compulsorily acquiring land for public purposes, assessment and compensation, etc.
Housing and Town Planning Act (HTPA) Chapter 182 - Revised Edition 2000	It deals with Town and Country Planning and also slum clearance and housing.

National Advisory Policies

Table 23 - National Advisory Policies

National Legislation	
Belize 2014-2024 National Environmental Policy and Strategy	The strategy sets out policies, priorities, action plans and expected outcomes for the next ten years (2014-2024) based on a clear assessment of existing environmental challenges and resources and the institutional framework and capacities to address them. This report is intended to be used as an operational/management tool for resource mobilization, capacity building (both institutional and legal), and as guidance for addressing gaps and improvement in the implementation of the Department of Environment (DOE) mandate.

Government of Belize Policy on Adaptation to Global Climate Change	The objectives of Belize's Climate Change Adaptation Policy are to explore and access opportunities being developed through the climate change negotiation process to meet the nation's development objectives; prepare all sectors of Belize to meet the challenges of global climate change; promote the development of economic incentives that encourage investment in adaptation measures; develop Belize's negotiating position on climate change at regional and international levels to promote its economic and environmental interests; and encourage the development of appropriate institutional systems to plan for and respond to global climate change.
Horizon 2030 National Development Framework for Belize 2010-2030.	It is a strategic instrument with a multi-sectoral approach relating to the period 2010-2030. The document embodies the vision for Belize in the year 2030 and the core values that are to guide citizen behavior and inform the strategies to achieve this common vision for the future. The Horizon 2030 Framework covers several thematic areas that are organized under four main pillars: 1) Democratic governance for effective public administration and sustainable development; 2) Education for Development - Education for Life; 3) Economic resilience: Generating resources for long term development; 4) The Bricks and the Mortar - Healthy Citizens and a Healthy Environment.
National Legislation	
National Gender Policy	This policy aims to identify the inequalities experienced by both men and women and suggests actions for the correction of gender disparities. This ensures that every citizen has an equal opportunity to participate fully in all actions that have a positive impact on human development.
National Cultural Policy 2016-2026	The National Cultural Policy provides the policy framework for the safeguarding of Belize's tangible and intangible cultural heritage. It calls upon all stakeholders to fulfil their functions within the mores, laws and customs of a multi-cultural and democratic society. It asks that all cultural actors consider the freedoms which are guaranteed within the Constitution of Belize and to allow the fulfilment of these rights so that persons may properly assert their Belizean cultural identity and exercise creativity for personal growth and national development.
National Sustainable Tourism Master Plan for Belize 2030	The National Sustainable Tourism Master Plan for Belize is the strategic guideline for tourism development in Belize up to 2030. The master plan divides the country into seven unique destinations that all together converge in a cohesive offering that make Belize a distinctive and highly competitive destination.
National Protected Areas System Policy and Plan	This plan establishes protected areas as an important resource base for the development and strengthening of economic activities, and therefore seeks to provide local people and tourists with easy access to adjacent tourism-related protected areas.

3.2 IDB Environmental and Social Policy Framework

This section presents a summary of the Environmental and Social Performance Standards (ESPS) that are part of the IDB's Environmental and Social Policy Framework (ESPF). As this Program will be financed with an IDB Loan Operation (BL-L1045), these E&S Performance Standards must be considered during the preparation and implementation of all projects financed under the Program.

Next, Table 24 details the actions to be implemented in the projects in order to comply with them.

ESPS 1 – Assessment and Management of Environmental and Social Risks and Impacts

This Standard applies to all investment finance projects and provides the basis for all other Standards by providing guidance on how to assess and manage environmental and social risks and impacts. It defines the importance of having an Environmental and Social Management System (ESMS).

The objectives of this Standard are:

- To identify and evaluate environmental and social risks and impacts of the project.
- To adopt a mitigation hierarchy and a precautionary approach to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, project-affected people, and the environment.
- To promote improved environmental and social performance of Borrowers through the effective use of management systems.
- To ensure that grievances from project affected people and external communications from other stakeholders are responded to and managed appropriately.
- To promote and provide means for adequate engagement with project-affected people and other stakeholders throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

The Borrower, in coordination with other government agencies and third parties, as appropriate, will conduct a process of environmental and social assessment and establish and maintain an ESMS appropriate to the nature and scale of the project and commensurate with the level of its environmental and social risks and impacts.

The main characteristics of an EMS are:

- Dynamic and continuous process initiated and led by the executing agency.
- It implies a collaboration between the borrower, its workers, the people affected by the project and, when appropriate, other interested parties.
- Uses the “plan, do, check and act” process to manage environmental and social risks and impacts.

The ESMS will incorporate the following elements:

- i. Project-specific environmental and social framework;
- ii. Identification of risks and impacts;
- iii. Management programs;
- iv. Organizational capacity and competency;

- v. Emergency preparedness and response;
- vi. Stakeholder engagement;
- vii. Monitoring and review.

ESPS 2 - Labor and Working Conditions

Environmental and Social Performance Standard (ESPS) 2 recognizes that pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.

The objectives of this Standard are:

- To respect and protect the fundamental principles and rights of workers.
- To promote the fair treatment, non-discrimination, and equal opportunity of workers.
- To establish, maintain, and improve the worker-employer relationship.
- To ensure compliance with national employment and labor laws.
- To protect workers, including workers in vulnerable situations such as women, people of diverse sexual orientations and gender identities, persons with disabilities, children (of working age, in accordance with this ESPS) and migrant workers, workers engaged by third parties, and primary supply workers.
- To promote safe and healthy working conditions, and the health of workers.
- To prevent the use of child labor and forced labor (as defined by the ILO).
- To support the principles of freedom of association and collective bargaining of project workers.
- To ensure that accessible and effective means to raise and address workplace concerns are available to workers.

The scope of application of this Performance Standard depends on the type of employment relationship between the borrower and the project worker. Applies to project workers hired directly by the borrower (direct workers), those hired through third parties to perform work related to core project functions for a significant period (contract workers), and those hired by the borrower's primary suppliers (workers in the main supply chain).

The borrower shall adopt and apply labor management policies and procedures appropriate to the nature and size of the project and its workforce. In the application of this Performance Standard, the requirements related to gender equality and stakeholder participation must also be considered, in accordance with NDAS 9 and 10.

ESPS 3 - Resource Efficiency and Pollution Prevention

Environmental and Social Performance Standard (ESPS) 3 recognizes that increased economic activity and urbanization often generate increased levels of pollution to air, water, and land and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. This ESPS outlines a project-level approach to resource management and pollution prevention and control, and avoidance and minimization of GHG emissions. It builds on the mitigation hierarchy, and the “polluter pays” principle. It recognizes the disproportionate impact of pollution on women, children, the elderly, and the poor and vulnerable. Appropriate mitigation measures, technologies, and practices should be adopted for efficient and effective resource use, pollution

prevention and control, and avoidance and minimization of GHG emissions, in line with internationally disseminated technologies and practices.

The objectives of this Standard are:

- To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities.
- To promote more sustainable use of resources, including energy and water.
- To avoid or minimize project-related emissions of GHG.
- To avoid or minimize generation of waste.
- To minimize and manage the risks and impacts associated with pesticide use.

The borrower must apply technically and financially viable and effective measures to improve its efficiency in the consumption of energy, water and other important resources and inputs. In addition, during the design and operation of the project, the borrower must consider alternatives to avoid or minimize greenhouse gas emissions, and the prevention of contamination of the air, water and soil components.

ESPS 4 - Community Health, Safety, and Security

Environmental and Social Performance Standard (ESPS) 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts, including those caused by natural hazards and climate change. In addition, communities that are already subjected to adverse impacts from natural hazards and climate change may also experience an acceleration and/or intensification of adverse impacts due to project activities.

The objectives of this Standard are:

- To anticipate and avoid adverse impacts on the health and safety of the
- project-affected people during the project life cycle from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the project-affected people.
- To anticipate and avoid adverse impacts on the project itself from natural hazards and climate change during the project life cycle.

This ESPS addresses potential risks and impacts to the project-affected people from project activities. It also addresses potential risks and impacts to the project itself that may result from natural hazards and climate change.

Occupational health and safety requirements for workers are included in ESPS 2; environmental standards to avoid or minimize impacts on human health and the environment due to pollution are included in ESPS 3; requirements to address sexual and gender-based violence risks in instances of communal conflict and influxes of outside workers are included in ESPS 9; and stakeholder consultation and information disclosure requirements are included in ESPS 10.

ESPS 5 - Land Acquisition and Involuntary Resettlement

Environmental and Social Performance Standard (ESPS) 5 addresses impacts of project-related land acquisition, including restrictions on land use and access to assets and natural resources, which may cause physical displacement (relocation, loss of land or shelter), and/or economic displacement (loss of land, assets, or restrictions on land use, assets, and natural resources leading to loss of income sources or other means of livelihood).

Unless properly managed, involuntary resettlement may result in long-term hardship and impoverishment for the project-affected people, as well as environmental damage and adverse socio-economic impacts in areas to which they have been displaced. For these reasons, involuntary resettlement should be avoided. However, where involuntary resettlement is unavoidable, it should be minimized, and appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented.

The objectives of this Standard are:

- To avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs.
- To avoid forced eviction.
- To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by
 - i. providing compensation for loss of assets at replacement cost and transitional hardships;
 - ii. minimizing disruption to their social networks and other intangible assets;
 - iii. ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected.
- To improve or restore the livelihoods and standards of living of displaced persons.
- To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure, and safety at resettlement sites.

ESPS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources

Environmental and Social Performance Standard (ESPS) 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. The requirements set out in this ESPS have been guided by the Convention on Biological Diversity, which defines biodiversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.”

Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services.

The objectives of this Standard are:

- To protect and conserve terrestrial, freshwater, coastal and marine biodiversity.
- To maintain the ecosystem functions to ensure the benefits from ecosystem services.
- To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

Based on the risks and impacts identification process, the requirements of this ESPS are applied to projects (i) located in modified, natural, and critical habitats; (ii) that potentially impact on or are dependent on ecosystem services over which the Borrower has direct management control or significant influence; or (iii) that include the production of living natural resources (e.g., agriculture, animal husbandry, fisheries, and forestry).

ESPS 7 - Indigenous Peoples

Environmental and Social Performance Standard (ESPS) 7 recognizes that Indigenous Peoples, as distinct social and cultural peoples, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development that is accordance with their worldview.

There is no universally accepted definition of “Indigenous Peoples.” Indigenous Peoples may be referred to in different countries by such terms as “original peoples” (pueblos originarios), “autochthonous peoples” (pueblos autóctonos), residents of indigenous counties (comarcas) or reserves (resguardos), or any other formally recognized indigenous peoples in Latin America and the Caribbean. In the ESPF, the term “Indigenous Peoples” is used in a generic sense to refer to distinct social and cultural peoples possessing some of the following characteristics in varying degrees:

- i. Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others.
- ii. Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories.
- iii. Customary cultural, economic, social, or political laws and institutions that are separate from those of the mainstream society or culture.
- iv. A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.

The objectives of this Standard are:

- To ensure that the development process fosters full respect for the human rights, collective rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples.
- To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts.
- To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner.
- To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) in a culturally appropriate manner with the Indigenous Peoples affected by a project throughout the project’s life cycle.
- To ensure the FPIC of the Project-Affected Communities of Indigenous Peoples when the circumstances described in this ESPS are present.

ESPS 8 - Cultural Heritage

Environmental and Social Performance Standard (ESPS) 8 recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this ESPS aims to ensure that Borrowers protect cultural heritage in the course of their project activities. In addition, the requirements of this ESPS with respect to a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity.

The objectives of this Standard are:

- To protect cultural heritage from the adverse impacts of project activities and support its preservation.
- To promote the equitable sharing of benefits from the use of cultural heritage

For the purposes of this ESPS, cultural heritage refers to (i) tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological, paleontological, historical, cultural, artistic, and religious value; (ii) unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and (iii) certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

ESPS 9 - Gender Equality

This ESPS recognizes, regardless of the cultural or ethnic context, the right to equality among genders as established in applicable international agreements. The pursuit of equality requires actions aimed at equity, which implies providing and distributing benefits and/or resources in a way that narrows existing gaps, recognizing that the existence of these gaps can harm people of all genders.

This ESPS aims at identifying potential gender-based risks and impacts and introducing effective measures to avoid, prevent, or mitigate such risks and impacts, thereby eliminating the possibility of reinforcement of pre-existing inequalities or creating new ones. For purposes of this ESPS, affirmative action specifically aimed at closing existing gender gaps, meeting specific gender-based needs, or ensuring the participation of people of all genders in consultations will not constitute discrimination or exclusion.

The objectives of this Standard are:

- To anticipate and prevent adverse risks and impacts based on gender, sexual orientation, and gender identity, and when avoidance is not possible, to mitigate and compensate for such impacts.
- To establish actions to prevent or mitigate risks and impacts due to gender throughout the project cycle.
- To achieve inclusion from project-derived benefits of people of all genders, sexual orientations, and gender identities.
- To prevent SGBV, including sexual harassment, exploitation and abuse, and when incidents of SGBV occur, to respond promptly.

- To promote safe and equitable participation in consultation and stakeholder engagement processes regardless of gender, sexual orientation, and/or gender identity.
- To meet the requirements of applicable national legislation and international commitments relating to gender equality, including actions to mitigate and prevent gender-related impacts.

ESPS 10 - Stakeholder Engagement and Information Disclosure

This ESPS recognizes the importance of open and transparent engagement between the Borrower and stakeholders, especially project-affected people, as a key element that can improve the environmental and social sustainability of projects, enhance project acceptance, and contribute significantly to the project's successful development and implementation. This ESPS is consistent with the objective of implementing the rights of access to environmental information, public participation in the environmental decision-making process, and access to justice in environmental matters.

For the purpose of this ESPS, "stakeholder" refers to individuals or groups who:

- Are affected or likely to be affected by the project ("project-affected people") and
- May have an interest in the project ("other stakeholders").

The objectives of this Standard are:

- To establish a systematic approach to stakeholder engagement that will help the Borrower identify stakeholders, especially project-affected people, and build and maintain a constructive relationship with them.
- To assess the level of stakeholder interest in and support for the project and to enable stakeholders' views to be considered in project design and environmental and social performance.
- To promote and provide the means for effective and inclusive engagement with project-affected people throughout the project's life cycle on issues that could potentially affect or benefit them from the project.
- To ensure that appropriate information on environmental and social risks.

Summary of Compliance with IDB Environmental and Social Policy Framework

Table 24 details the actions that will be carried out to ensure compliance with the requirements established in the Environmental and Social Performance Standards (ESPS) during the preparation and execution of the projects to be financed under the Program.

Table 24 - Summary of Compliance with the IDB Environmental and Social Policy Framework

IDB Environmental and Social Performance Standards (ESPS)		Applies
ESPS 1 – Assessment and Management of Environmental and Social Risks and Impacts		YES/NO
In compliance with the provisions of the Standard, this Environmental and Social Analysis (ESA) of the projects that make up the representative sample of the BL-L1045 Program was prepared, with its corresponding Environmental and Social Management Plan.		YES

IDB Environmental and Social Performance Standards (ESPS)	Applies
ESPS 2 - Labor and Working Conditions	YES/NO
<p>SIF, the Program's Executing Agency, will adopt and apply labor management policies and procedures appropriate to the nature and size of the projects financed under the Program and their workforce. Those procedures and policies will stipulate the approach for the management of workers in accordance with the requirements of this Performance Standard, and the corresponding national legislation.</p> <p>For these reasons, an Occupational and Community Health and Safety Program is included in the Project's Environmental and Social Management Plan, with guidelines for a Labor Management Procedure (LMP). The objective of the LMP is to define actions and responsibilities of the different employers in relation to the projects (executing agency, contractors, suppliers, etc.). It applies to workers of the Projects hired directly by the Executing Agency (direct workers), to personnel hired through third parties to carry out work related to core functions of the Program for a considerable time (contracted workers) and to those hired by the main suppliers of the implementing agencies (main supply chain workers). Exceptions are public employees subject to the terms and conditions of their labor agreement or arrangement in force in the public sector. The LMP establishes employment relationships based on the principle of equal opportunities and fair treatment.</p> <p>Child or forced labor will not be allowed. The Borrower (or its contractors) will not employ children below the age of 15 (as per IDB's ESPF). The LMP also establishes a specific complaint mechanism for workers (and their organizations, when they exist) so that they can express their concerns about the workplace, and the channeling of complaints about sexual and gender violence.</p>	YES
ESPS 3 - Resource Efficiency and Pollution Prevention	YES/NO
<p>In compliance with this Standard, this ESA establishes the applicable national regulatory framework, considering the environmental, safety, hygiene, and occupational health requirements to be met during the execution of the project, and the Environmental and Social Policy Framework of the IDB. Likewise, it details the guidelines of the Environmental and Social Management Plans (ESMP) to address these aspects in the projects to be financed under the Program.</p> <p>With regard to this Standard, during the construction stage of the sample projects under the Program, the following pollution impacts and risks were identified: (i) water, due to accidental spills or due to incorrect disposal or failures in the effluent or solid waste management systems; (ii) soil, due to erosion or sediment runoff during excavation and stockpiling; and (iii) occupational safety impacts, due to risks inherent in construction and maintenance tasks.</p> <p>In this regard, compliance with the Bank's ESPS and applicable national regulations will be required. In particular, the ESMP guidelines for projects include the following programs (Chapter 6): 1- Program for Monitoring and Control of Compliance with Mitigation Measures; 4 – Waste Management; 5 - Effluent Management; 6 - Chemicals Management; 7 - Occupational and Community Health and Safety Program; 9- Socio-environmental Training for Personnel, and 10- Disaster Management and Emergency Response Plan.</p>	YES

IDB Environmental and Social Performance Standards (ESPS)		Applies
ESPS 4 - Community Health, Safety, and Security		YES/NO
<p>With the purpose of avoiding and mitigating impacts and risks in terms of health, safety and protection of the community, the following Management Programs are included in the ESMP guidelines (Chapter 6): 7 - Occupational and Community Health and Safety, 8 – Pest and Vector Control; 9- Socio-environmental Training for Construction Personnel, 10- Disaster Management and Emergency Response, and 11- Community Information and Participation.</p> <p>Regarding exposure to natural hazards, the works to be executed are not expected to exacerbate the risks to human life, property, the environment, or the projects themselves. The ESA also includes a Natural Disaster Risk Assessment according to the IDB methodology (Chapter 5).</p>		YES
ESPS 5 - Land Acquisition and Involuntary Resettlement		YES/NO
<p>In the works of the representative sample of the Program, no need for involuntary resettlement of people was identified, nor for the acquisition of land. These are works on the public right-of-way / public easement areas. The works in the sample are not expected to generate economic impact or loss of livelihoods.</p>		NO
ESPS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources		YES/NO
<p>The projects to be financed under the representative sample of the Program do not include works that negatively impact critical natural habitats.</p> <p>In the construction phase, mitigation measures included in the guidelines for a Flora and Fauna Management Program will be implemented in the Environmental and Social Management Program at the construction level. In accordance with these guidelines, for reforestation and revegetation works, invasive species will not be used and their use in the compensation of trees and management of green areas is prohibited. The corresponding prevention and mitigation measures are also included in said Program, encouraging the use of native species in reforestation. The Program also establishes the prohibition of hunting of local species. In case of removal of vegetation cover, a compensation program must be included that must guarantee zero net loss of biodiversity, typically using a 3:1 compensation ratio.</p>		YES
ESPS 7 - Indigenous Peoples		YES/NO
<p>In the representative sample, some of the works involve water systems on indigenous communities (Indian Creek / Golden Stream). It is expected that the project's interventions will have significant positive impacts on the lives of the beneficiary indigenous communities. A Socio-Cultural Analysis is under preparation.</p>		YES
ESPS 8 - Cultural Heritage		YES/NO
<p>For the projects of the representative sample of the Program, no impacts on sites of recognized historical, paleontological, archaeological, architectural, religious, aesthetic, or other type of patrimonial significance were identified. Nevertheless, the ESMP guidelines include a Program for the correct management of chance findings that could occur in the construction stage (particularly in the soil movement works).</p>		YES
ESPS 9 - Gender Equality		YES/NO

IDB Environmental and Social Performance Standards (ESPS)	Applies
<p>Projects take a cross-cutting approach to gender and, in compliance with this Standard, identify possible gender risks and impacts and introduce effective measures to avoid, prevent or mitigate them and thus eliminate the possibility of creating inequalities or reinforcing pre-existing ones.</p> <p>Evaluation and management of sexual and gender-based violence related to the Program: within the guidelines of the ESMP for projects under the Program, a Socio-environmental Training Program is incorporated, which includes training on gender issues and the application of a Code of Conduct that includes among other issues, the explicit prohibition of harassing or violent behaviors against women and children in the community, and company employees. Measures are also included to minimize the risk of conflicts between contracted workers and the local population, in order to ensure the creation and maintenance of a positive and free work environment, from: discrimination based on ethnic, racial, gender, gender identity, sexual orientation, or religion; violence, particularly violence against women, girls and adolescents; and child labor.</p> <p>Likewise, in compliance with ESPS 2, the ESA of the representative sample incorporates a "Procedure for Labor Management" (LMP) (as part of Program 8 of the ESMP) that is governed by the principles of equality, opportunity and fair treatment and includes labor laws within its regulatory framework regulations on equality and non-discrimination in the workplace.</p> <p>Equitable participation of people of all genders in consultations: The Stakeholder Engagement Plan (SEP) valid throughout the Program cycle (disclosure of information, meaningful consultation, Grievance Mechanisms and Conflict Resolution and Follow-up and Monitoring) contemplating the equitable and inclusive participation of interested parties with the objective of "ensuring that people of all genders and groups at risk of marginalization (ethnicity, race, age and immigration status, people with disabilities) have interaction and participation effective throughout the project execution cycle.</p>	YES
ESPS 10 - Stakeholder Engagement and Information Disclosure	YES/NO
<p>In compliance with this Standard, a public consultation process was designed for the projects in the representative sample and is included in the Stakeholder Engagement Plan (SEP) included in Annex 1 of this ESA.</p> <p>During the design, construction and operation phases of the works, there will be a Grievance Redress Mechanism (GRM) at the Program level, which will address the concerns of the affected and interested parties throughout the life cycle of the sample projects. Details of the GRM are documented in the Program's Environmental and Social Management Framework.</p>	YES

4. Environmental and Social Baseline

4.1 Introduction

The main objective of this chapter is to characterize the area where the projects under analysis will be developed. The analysis carried out allows to know the location and description of the area of execution and influence of the projects, to determine its current situation and the relevant environmental and social aspects to consider.

This chapter analyzes general aspects and components of the natural and social environment, and specifies the area of influence (AoI) of the specific projects, in order to be able to analyze the potential environmental and social impacts attributable to, or derived from, project activities.

4.2 Definition of Area of Influence

This ESA considers both the construction and operations phase of the Project, and focuses mainly on the relevant existing physical, biological, and socioeconomic environments within the direct footprint of the Project, namely the area surrounding the proposed interventions on the villages' water systems. As such, both a Direct Area influence (DAoI) and an Indirect Area of Influence (IAoI) are defined for the Project as follows below.

Direct Area of Influence

The Direct Area of Influence (DAoI) for the Project is defined as the footprint of the Project, where the majority of the E&S impacts from the Project are expected to occur and/or be experienced most acutely, namely a radius of **100 meters** around the water system facilities to be retrofitted.

Indirect Area of Influence

The Indirect Area of Influence (IAoI) is considered to be the area within which indirect impacts are expected to occur, that is, those impacts that transcend the physical space of the project and its associated infrastructure.

For this ESA, the full extent of each of the 20 villages in the representative were defined as an Indirect Area of Influence. This expanded area of influence is the one that will receive the environmental and social benefits derived from the water system improvement interventions.

4.3 General Context

The projects in the representative sample of the Program will be developed in different villages throughout Belize.

Belize is a country located on the northeast coast of Central America. Situated south of the Yucatán Peninsula, Belize is a land of mountains, swamps, and tropical jungle. It is bounded by Mexico to the

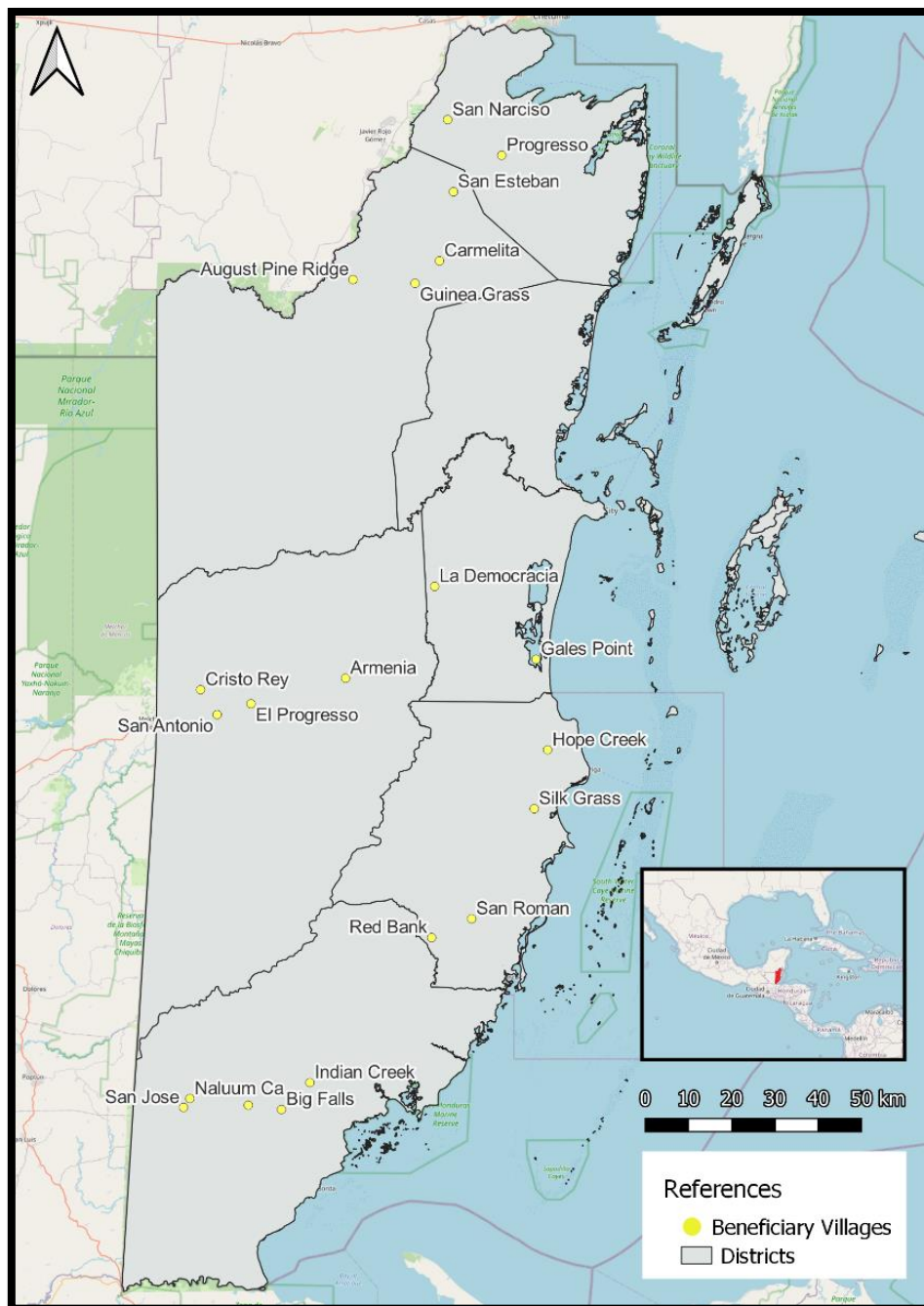
north, Guatemala to the west and south, and the Caribbean Sea to the east. The country has a 174-mile (280-km) coastline.

The country is divided into six districts: Corozal; Orange Walk; Belize; Cayo; Stann Creek y Toledo.

The villages corresponding to the representative sample of the Program and the district to which they belong are listed below:

- **Belize:**
 - Gales Point
 - La Democracia
- **Cayo:**
 - Armenia
 - Cristo Rey
 - El Progreso
 - San Antonio
- **Corozal:**
 - San Narciso
 - Progreso
- **Orange Walk:**
 - August Pine Ridge
 - Carmelita
 - Guinea Grass
 - San Esteban
- **Stann Creek:**
 - Big Falls / Hope Creek
 - Red Bank
 - San Roman
 - Silk Grass
- **Toledo:**
 - Big Falls
 - Indian Creek
 - San Jose/Na Luum Ca
 - San Pedro Columbia

Figure 3 – Belize Districts and Villages map (source: PlanEHS 2023)



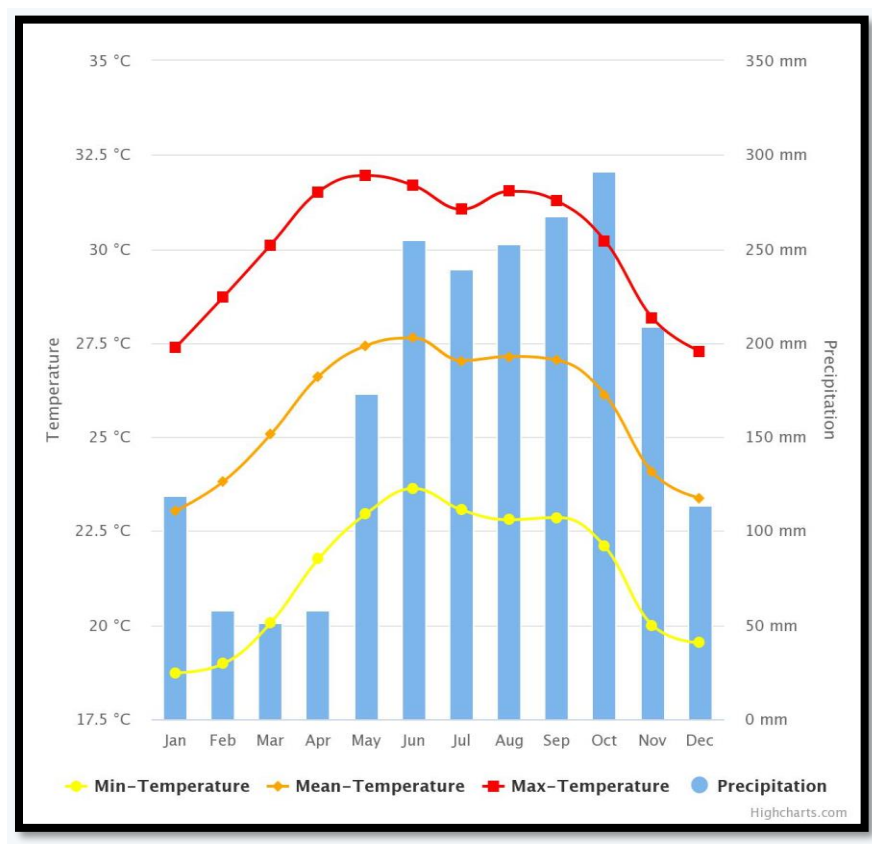
4.3 Physical Environment Baseline of Indirect Area of Influence

Climate

Belize is characterized by a moist tropical climate with two seasons, wet (rainy) and dry. Its wet season occurs during the months of June to November, starting in the south of the country and moving northward. During this season, the average monthly rainfall is 150-400 mm in the south of the country, while the rest of the country receives less than 100 mm of rain per month (World Bank Group, 2021). Its dry season begins in February and lasts until April.

As shown in Figure 1, the average annual temperature oscillates between 23 and 27°C. The country's average maximum temperature varies between 27 and 32°C, while the average minimum temperature varies between 18 and 23°C.

Figure 4 - Monthly Climatology of Belize Temperatures & Precipitation 1991-2020. Source: World Bank Group.



In addition to the dry and wet seasons mentioned above, Belize has a hurricane season that runs from early June to the end of November and results in strong winds, heavy rainfall and flooding.

Climate Change and Vulnerability

Climate change has significant impacts on Belize's territory, population and major economic sectors.

Agricultural yields and ecological resources, such as rainforest, mangroves, wetlands and coral reefs, are highly sensitive to changes in rainfall, temperature and extreme weather events; tourism, which accounts for a large part of the country's income, is affected by sea level rise, coral bleaching and impacts on biodiversity; and Belize's major infrastructure, such as public buildings and health, commercial and transportation facilities located on or near the coast, are extremely susceptible to sea level rise.

However, the country is committed to achieving the ultimate objective of the United Nations Framework Convention on Climate Change and supports the target to limit the increase in global average temperature to 1.5°C, and to developing a long-term strategy aligned with achieving net zero global emissions by 2050.

Geology

Belizean geology consists largely of varieties of limestone, with the notable exception of the Maya Mountains, a large uplifted block of intrusive Paleozoic granite and sediments running northeast to southwest across the south-central part of the country. Much of Belize lies outside the tectonically active zone that underlies most of Central America.

The hilly regions surrounding the Maya Mountains are formed from Cretaceous limestone. These areas are characterized by a karst topography that is typified by numerous sinkholes, caverns, and underground streams. In contrast to the Mountain Pine Ridge, some of the soils in these regions are quite fertile and have been cultivated during at least the past 4,000 years.

Much of the northern half of Belize lies on the Yucatán Platform, a tectonically stable region. Although mostly level, this part of the country also has occasional areas of hilly, karst terrain, such as the Yalbac Hills along the western border with Guatemala and the Manatee Hills between Belize City and Dangriga. Alluvial deposits of varying fertility cover the relatively flat landscapes of the coastal plains.

Topography

Belize topography is broadly divided into two distinct zones, the northern and southern parts of the country.

The backbone of the southern half of the country is formed by the Maya Mountains and the Cockscomb Range. The Maya Mountains is a large, uplifted block of Paleozoic granite intrusive and sediments that extends northeast to southwest through the south-central part of the country, these areas are characterized by karst topography that includes sinkholes, caverns and subway streams. The Cockscomb Range, runs seaward and rises to Doyle's Delight. This range contains the highest peak at 3669 feet, Victoria Peak.

The northern districts, contain considerable areas of low plateau formed by limestone lands and swamps at less than 60 meters above sea level.

Figure 5 – Geographical map of Belize (Adaptation from Worldometer, Dadax)



Hydrology

Belize is divided into 33 watersheds distributed in five main regions, most of which originate in the Maya Mountains and flow into the Caribbean Sea. Some of them share international boundaries such as the largest watershed in Belize (the Belize River), which originates in the Maya Mountains and connects with watersheds in eastern Guatemala and southern Mexico and is the second largest river basin system in Belize.

Table 25 below lists the five main regions and the corresponding watershed areas.

Table 25 - Belize watershed regions and watersheds

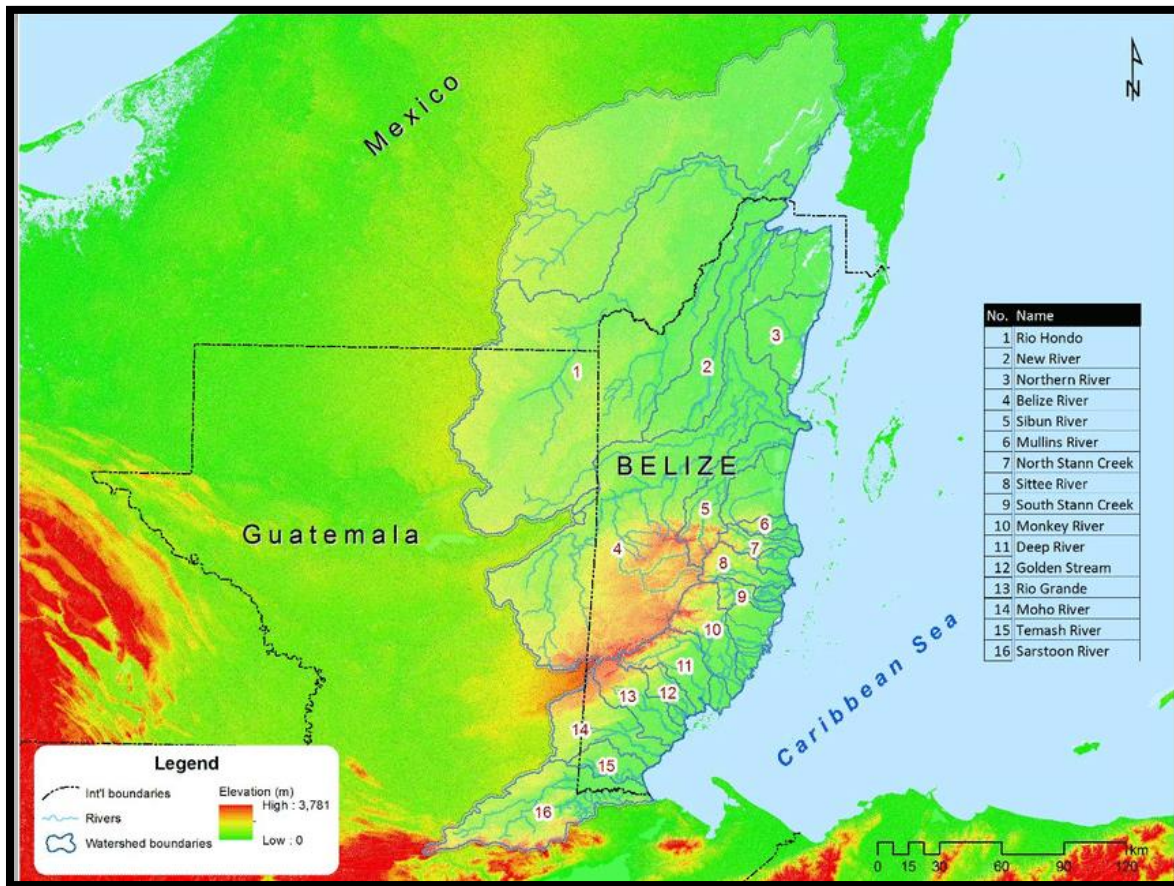
Northern Watersheds	Central Watersheds	Gulf of Mexico Watersheds	Southeastern Watersheds	Southern Watersheds
Baracouta Pond Fresh Water Creek New River Northern River Rio Hondo Shipstern and Progresso Lagoon	Belize River Manatee River Midwinters Lagoon Northern Lagoon Sibun River	Usumacinta	Big Creek North Big Creek South Cabbage Haul Creek Deep River Freshwater Creek Indian Hill Lagoon Mango Creek Monkey River Mullins River North Stann Creek Plantation Creek Sennis River Sittee River South Stann Creek	Golden Stream Middle River Moho River Punta Ycacos Rio Grande Sarstoon River Temash River

Belize's watersheds consist of both surface water, which include springs, streams, rivers, and lagoons and also groundwater resources which are found under our soils and rocks. They are often renewed mostly from rainfall, groundwater and surface storage in the large lagoon systems in the Northern lowlands (Department of the Environment).

Surface hydrology

Belize's surface water resources are supplied by twenty-nine major river basins and many streams, the majority of these streams originate in the Maya Mountains and discharges into the Caribbean Sea. In additions, numerous freshwater and brackish water lakes or lagoons are scattered throughout the central and northern coastal areas and low-lying inland areas. Surface water resources are abundant throughout the country, except on the Vaca Plateau, where streams disappear into the porous limestone. The rivers in the north have meandering channels, while those in the south have smaller basins and flow more rapidly to the sea. The sum of quantified river discharges is 15 km³/year, occupying 59% of the territory (UN Global Compact, n.d.). Figure 4 shows all the rivers that cross the country.

Figure 6 – Belize rivers map. Source: ResearchGate



Recurrent atmospheric/oceanic phenomena such as the El Niño Southern Oscillation (ENSO) and the North Atlantic Oscillation (NAO) generate periods of drought that affect these watercourses, but these are recovered thanks to the tropical rainfall regime that occurs in the northwestern region.

The major watersheds include, but is not limited, to the following:

- **Río Hondo:** It is approximately 150 km long and flows in a northeasterly direction and empties into the Bay of Chetumal in the Caribbean Sea. It is supplied by the confluence of upper tributaries such as Blue Creek, Rio Bravo, Rio Booth, Arroyo Azul, and also other major branches from Mexico and Guatemala through the north central lowlands.
- **Belize River:** also called Old River, rising in northeastern Guatemala as the Río Mopán and flows about 180 mi (290 km) northeast past Benque Viejo, San Ignacio (El Cayo), and Roaring Creek into the Caribbean Sea at Belize City (Encyclopædia Britannica, Inc., 2022). San Ignacio and Belmopan take municipal water from the Belize River.
- **Sarstoon river:** It has an approximate length of 111 km and its basin is shared by Guatemala and Belize. The Belizean part covers approximately 194 km² and is part of the Sarstoon-Temash National Park (Toledo).
- **Monkey River:** This watershed in southern Belize is the most polluted of the watersheds that are part of the Maya Mountains Marine Transect (MMMAT). Multiple factors affecting the ecosystem

include intensive cultivation of bananas, mangoes and citrus, timber extraction and shrimp aquaculture.

Groundwater Hydrology

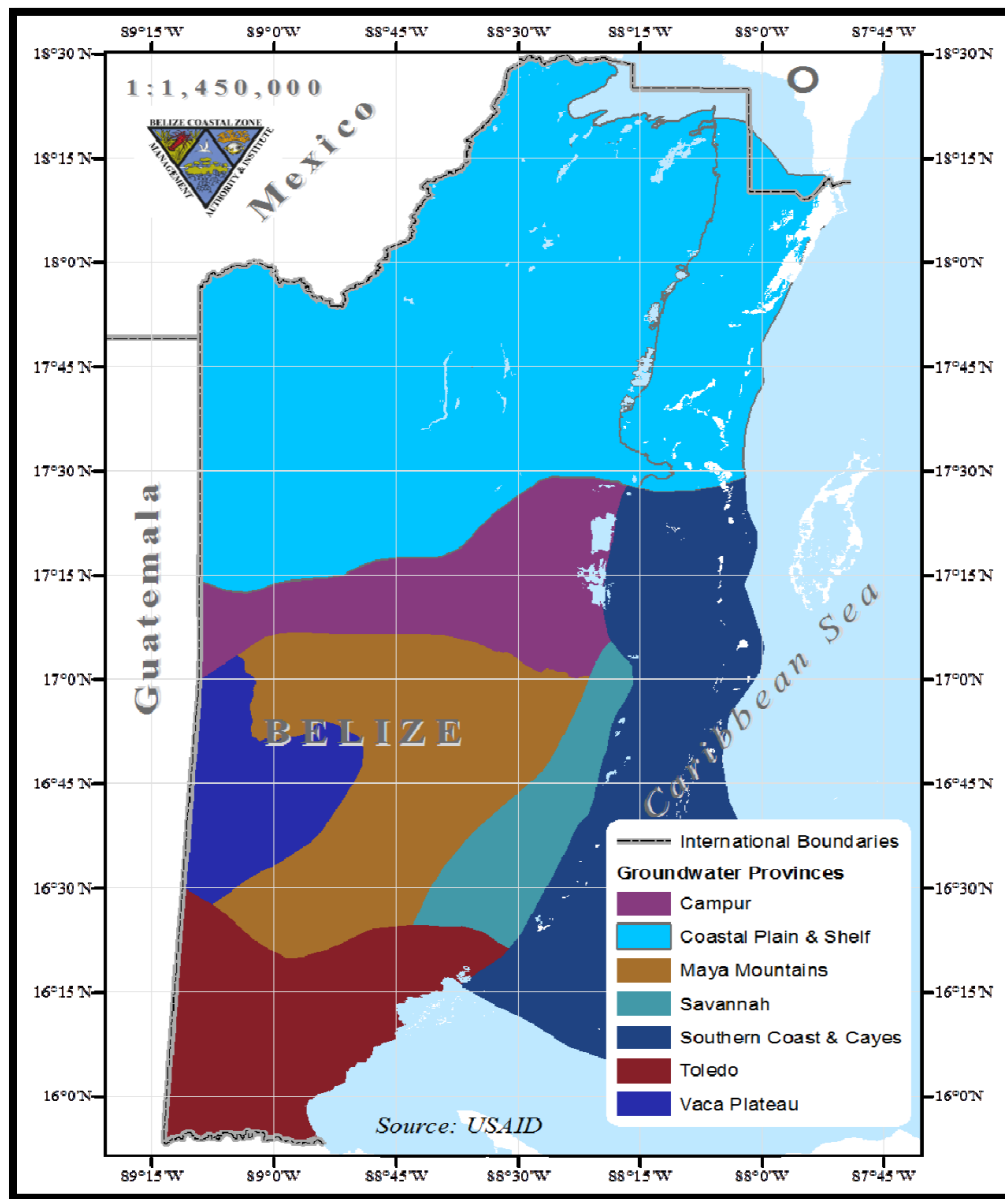
Generally, groundwater is available throughout the less mountainous areas of Belize and favorable yield characteristics can be attributed to geology and climatic conditions. The northern region consists of calcareous sediments that have shown high permeabilities. In the south, where limestones are found, similar groundwater yield conditions are indicated, while the shales and slates are naturally poorly permeable and therefore have low capacity for groundwater extraction (UN Global Compact, n.d.).

In some areas along the coast and in some inland wells in the northern half of the country, water with high concentrations of chloride, hardness and sulfates is found. In addition, during times of drought, water quality is expected to be poorer than usual. Despite this, however, in general the quality of groundwater throughout the country is acceptable.

Belize is divided into seven groundwater areas or provinces, each of which has one or more aquifer:

- Coastal Plain province: the area includes Corozal and Orange Walk Towns, and numerous surrounding villages. The towns of Corozal and Orange Walk are supplied by municipal water systems, while villages have at least one well. The limestone aquifers of the Coastal Plain Groundwater area are one of the most important groundwater resources of Belize (Department of the Environment).
- Southern Coast & Caye province: The Southern Coast and Caye area is a narrow belt along the coast from Belize City, to about 15 km south of Monkey River village, and includes the barrier reef and nearly all of the southern cayes (Department of the Environment). This area does not have major groundwater resources, and sometimes the residents depend on the rainwater collection.
- Campur province: It includes the northern Cayo District and southern Belize district. This area has good quality groundwater, wells dug less than 150m deep often find plenty of water from the limestone. Aquifers in this Province are recharged from direct infiltration and runoff from the Maya Mountains.
- Maya Mountain province: There is no evidence of successful wells tapping this province. Local people obtain water from permanent streams or rainfall.
- Vaca Plateau province: The Vaca area has no town or villages, though there are about 20 small milpa farms nearby. Water is taken from springs or streams in the Chiquibul drainage beds (Department of the Environment).
- Savannah Province: it has not reliable groundwater sources. Only in small individual farm villages were shallow wells drilled. Surface water is generally suitable for irrigation purposes but in some places is used as drinking water source as well.
- Toledo Province: it has an abundant groundwater supply that supplies Punta Gorda and the surrounding towns.

Figure 7 - Belize Groundwater Provinces. Source: Country Environmental Profile, 2006



Groundwater is a vital source for freshwater in rural Belize, where almost 95 per cent of the fresh water supply comes from groundwater (UN Global Compact, n.d.). However, groundwater abstraction, like surface water abstraction, is unregulated and this endangers the availability of the resource, as the unrestricted use of freshwater for banana, rice and citrus cultivation continues to increase.

Water Use and Quality

The freshwater resources demand in Belize comes from three major economic sub-sectors: agricultural, industrial and domestic/residential. In 2005, agricultural, industrial and domestic/residential users required 43.7 per cent, 36.5 per cent and 19.7 per cent respectively of the total demand (UN Global Compact, n.d.).

In Belize, 70% of the water used in urban areas is surface water. Groundwater is also used as a source of drinking water in the towns of Corozal, Orange Walk, Cayo and Toledo districts and in some rural areas of Toledo and Cayo. Per capita domestic water consumption is between 240 and 280 liters per day in urban areas and about 160 liters per day in rural areas (UN Global Compact, n.d.).

The Water and Sewerage Authority (WASA) is responsible for monitoring water in urban areas and ensuring good water quality. In rural areas, however, only 30% of the water is treated in the systems connected to WASA's urban systems.

In general, Belize has abundant good quality water resources. However, it is estimated that much of the surface water in urban areas is polluted due to inadequate disposal of domestic, agricultural and industrial liquid and solid waste. Municipal waste is the most common form of water pollution in Belize, wastewater from homes and businesses often enters rivers and streams.

The challenge for Belize is to improve water quality and sanitation systems, especially in rural areas.

Vulnerability to Natural Disasters

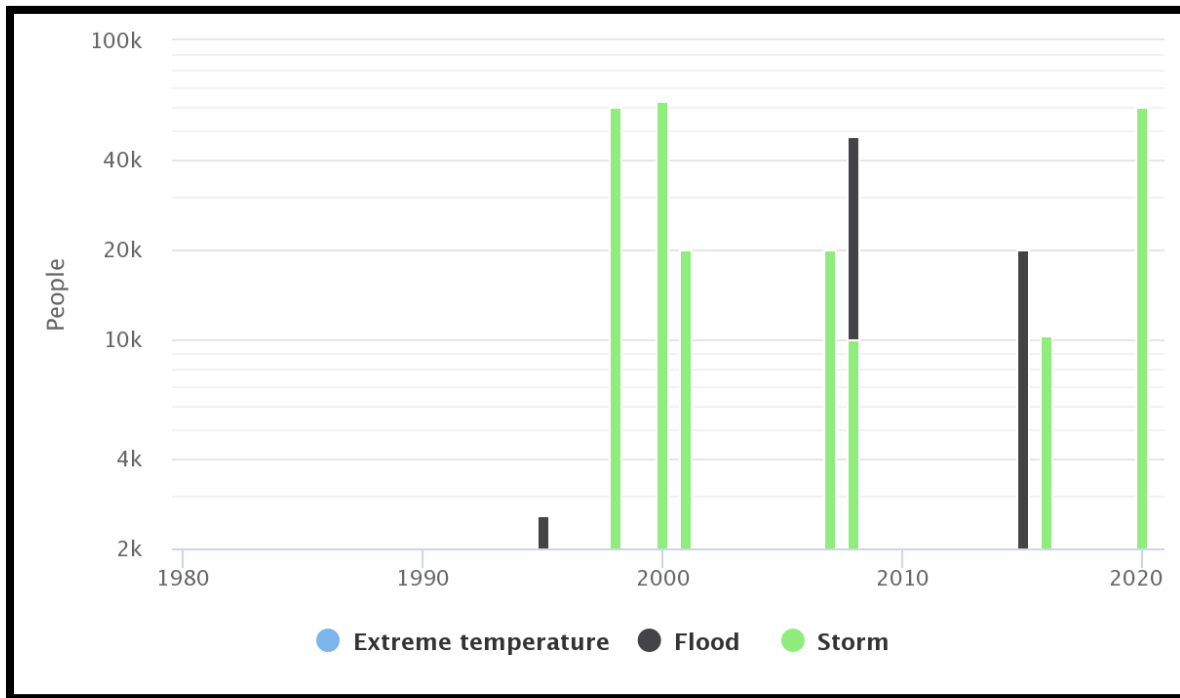
According to a systematic diagnosis conducted by the World Bank Group, Belize is one of the most affected countries in the world by weather events and other natural hazards, ranking 8th out of 167 countries by climate risk.

Based on the Belize Updated Nationally Determined Contribution the key vulnerabilities identified include:

- Hurricanes and tropical storms causing severe losses from wind damage and flooding due to storm surges and heavy rainfall. On average, hurricanes happen about 3 times a year.
- Flood damage due to its low-lying land and exposed positions on the coast; low lying topography makes the country's coastal areas especially vulnerable to sea level rise.
- Extreme temperatures affecting crops and livestock.
- Coral Reef vulnerability due to global warming.

Figure 6 provide an overview of the most frequent natural disaster in Belize and the impacts of those disasters on human populations.

Figure 8 - Key Natural Hazard Statistics for 1980-2020 (number of people affected). Source: World Bank Group



As can be observed in Figure 6, storms and floods, to a lesser extent, have been the greatest source of damage for the Belizean population.

Belize hurricane and storms season officially runs from June 1 until November 30 each calendar year. The most sensitive areas to hurricane damage are the cayes and coastal areas, including popular destinations such as San Pedro on Ambergris Caye, Caye Caulker, and Placencia on the mainland (U.S. Embassy in Belize, n.d.).

The body in charge of prepare for and respond to Hurricanes and Flood in Belize is The National Emergency Management Organization (NEMO). It was established on the 1st of February 1999 after category 5 Hurricane Mitch threatened Belize for five days in October of 1998 (National Emergency Management Organization, n.d.).

In addition to these climatic events that occur by geographical area, Belize, like the rest of the world, is facing the consequences of global warming. Projected climate change impacts for Belize include a rise in temperature of between 2°C and 4°C by 2100, a 7-8% decrease in the length of the rainy season, a 6-8% increase in the length of the dry season and a 20% increase in the intensity of rainfall in very short periods (Belize GOB, 2021).

In April 2016, Belize ratified the Paris Agreement and submitted its first Nationally Determined Contributions (NDCs) to implement the agreement, and it includes actions to mitigate climate change consequences in multiples sectors.

Belize has mainstreamed climate change into its national development planning framework and in addition to NDC, has developed a National Climate Change Policy, Strategy and Action Plan. It sets the guidelines for the strategic transition of Belize's economy towards low carbon development.

4.4 Biological Environment Baseline of Indirect Area of Influence

Flora

Despite being less than 23,000 km², Belize is home to at least 50 different tree species as almost 60% of the country is covered by forest. The forests extend all the way from the Maya Mountains in the west to the Caribbean Sea, forming a key link in the Mesoamerican Biological Corridor and playing a crucial role in watershed protection.

In the north, limestone soils support deciduous forests, predominated by sapodilla and mahogany. In the south, the forest is taller and is evergreen. The rivers are largely bordered by swamp forests. On the southern coastal plain and inland from Belize City, open savanna (grassland) is marked by scattered oaks, pines, and palmetto palms. The coast is fringed with mangrove trees. The highlands are mostly forested and are largely uninhabited (Encyclopædia Britannica, Inc., 2022).

Fauna

Belize has a great variety of both terrestrial and aquatic species. The country's savannahs and lowlands are home to waterfowl and tropical birds, tapirs, pumas, while the mountainous regions are home to jaguars and other felines.

There are an estimated 145 species of mammals, 580 species of birds and 139 species of reptiles and amphibians. The Jaguar (*Pantera onca*) is considered an important indicator species in Belize. The presence or lack thereof of this top predator can reveal the health of Belize's forest ecosystems (Government of Belize, 2010).

However, in urban areas such as Cayo, road construction, timber harvesting, agricultural conversion, and other factors have contributed to the loss of wildlife habitat. As urbanization increases, wildlife has less space and resources to survive.

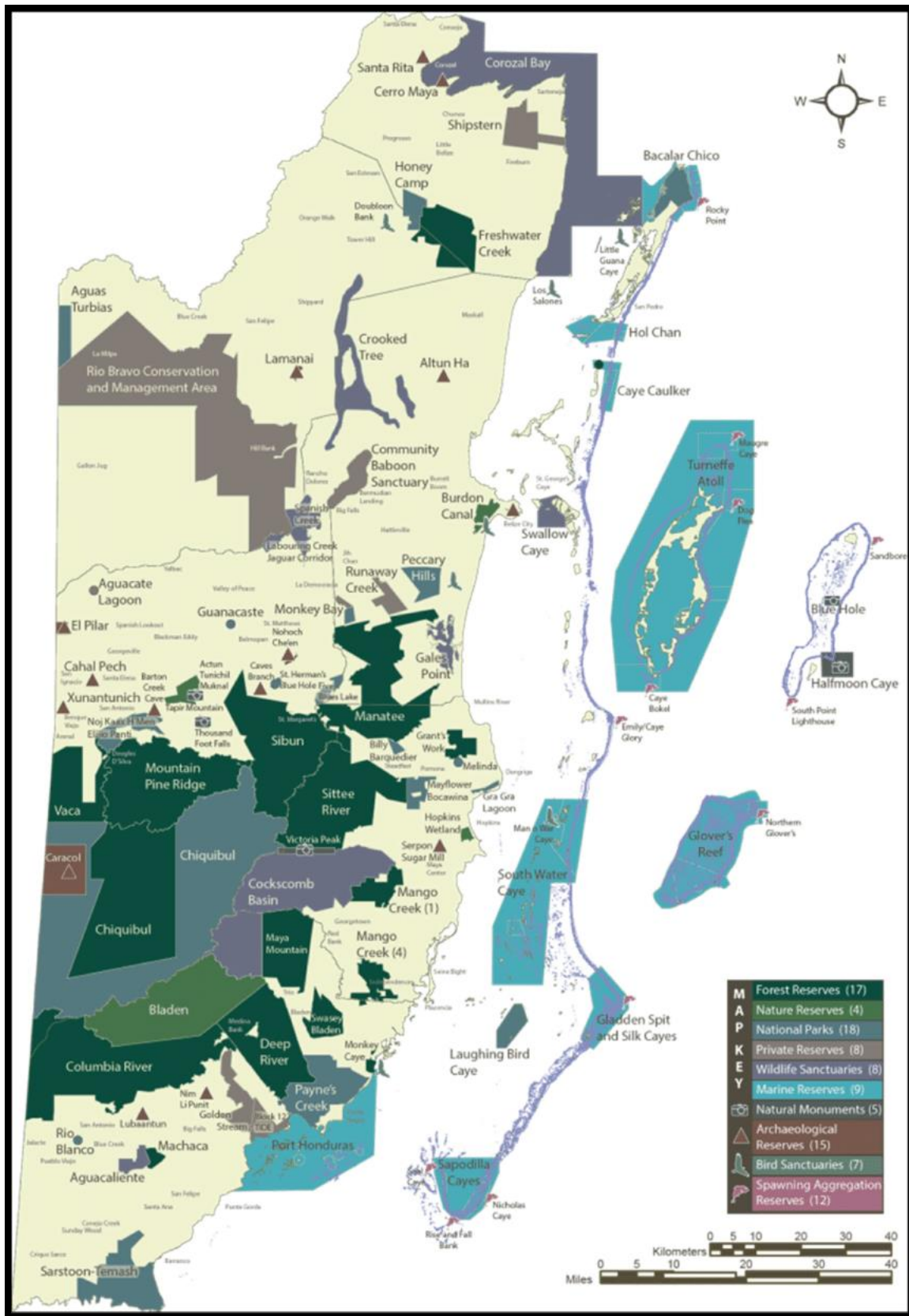
Protected Areas

Belize has a National Protected Areas System plan created with the intention of protecting and preserving the country's biological diversity. The main objective of the plan is to maintain healthy ecosystems and maximize their social, cultural and economic contribution to local and national development.

According to the plan, there are currently one hundred and three protected areas within the NPAS (National Protected Areas System). Of these, fifty-two protected areas are under the administration of the Department of Forestry, while another nine marine reserves and twelve spawning aggregation sites are administered by the Department of Fisheries. In addition, there are seven bird sanctuaries, a single mangrove reserve, four public reserves, sixteen archaeological sites (administered by the Institute of Archaeology), eight private areas (not yet legally integrated into the national framework) and other private lands in the Maya Mountains Marine Corridor.

All these protected areas represented in Figure 8, are representative of most of the ecosystems present in the country as they include two large forest nodes, the Maya Mountains Massif and part of the Selva Maya; two RAMSAR sites, declared for their global importance in protection of wetlands (Crooked Tree Wildlife Sanctuary, and Sarstoon-Temash National Park); and the Belize Barrier Reef, which includes a globally important network of marine protected areas, seven marine protected areas forming Belize's World Heritage Site, and twelve protected spawning aggregation sites, critical for regional fisheries viability.

Figure 9 - Belize Protected Areas. Source: Ministry of Forestry, Fisheries and Sustainable Development, 2015.



The following is a brief description of the protected areas near the villages in the representative sample of the Program.

Billy Barquedier National Park

This National Park is located in the Stann Creek District just north of the Hummingbird Highway through the mountains of the beautiful “Emerald Valley”, about 30 miles from the Silk Grass community. It was legally created in December 2001 to protect the Barquedier watershed. The National Park designation supports watershed protection and allows for low-impact, non-extractive activities such as education, tourism, and research activities.

Cockscomb Basin Wildlife Sanctuary

Cockscomb Basin Wildlife Sanctuary is located near the San Roman, Red Bank and Silk Grass communities, in the Stann Creek District. It encompasses 122,260 acres (49,477 ha) of the Maya Mountains Massif. It is recognized internationally as the world’s first jaguar preserve. It is also known for its waterfalls, mountain views, nature trails, and rich diversity of neotropical birds. It also provides access to Victoria Peak, the highest peak in Belize.

Corozal Bay Wildlife Sanctuary (CBWS)

The CBWS is located in the north east of Belize, near San Narciso and Progreso, approximately 13 miles from both communities. It is the second largest marine protected area in Belize, encompassing approximately 178,000 acres (72,000 hectares) of the Belize portion of the Mesoamerican Reef’s largest estuarine system and much of the northern shelf lagoon behind Ambergris Caye.

Crooked Tree Wildlife Sanctuary

Crooked Tree Wildlife Sanctuary is considered one of the best birding sites in Belize because of its wetland and terrestrial habitats. The sanctuary also protects globally threatened species such as the Central American river turtle (known locally as hickatee), Morelet's crocodile, Mexican black howler monkey and yellow-headed parrot.

The northern zone of the sanctuary is located near the Guinea Grass, August Pine Ridge and Carmelita communities.

Fresh Water Creek Forest Reserve

It is a forest reserve located within the Corozal District, approximately 20 miles from San Esteban and 30 miles from Carmelita (Orange Walk District). It includes several lowland evergreen forests, freshwater lagoons, coastal forests, mangrove forests and wetlands. It is home to over 1000 plant and animal species and is vital in numerous ecological services such as pollution, water storage and delivery, rainfall generation and flood protection for several crop such as sugarcane, rice and beans (APAMO, 2022).

Golden Stream Corridor Preserve

It is located in the Toledo District, approximately 5 miles from Indian Creek. This Preserve forms a strategic biological corridor that stretches from the Maya Mountains to the coastal mangrove forests of Belize’s southern coast; and it is home to and protects an array of biodiversity which includes 17 major

ecosystems. It is also important as an instrument of biological exchange between Belize's terrestrial and marine ecosystems.

Guanacaste National Park

Guanacaste National Park is a non-extractive protected area located at the confluence of the Belize River and Roaring Creek, 7 miles from Armenia, Cayo. The habitat consists of secondary broadleaf forest, which benefits many birds and wildlife, including the "tiger cat" or jaguarundi.

Honey Camp National Park

It is located in the Orange Walk district, near Carmelita and San Esteban villages. Within the Honey Camp National Park is the Honey Camp Lagoon, a freshwater lagoon used by the Maya during the Classic/Early Postclassic period for ceremonial and residential purposes.

Maya Mountain North Forest Reserve

It is located in southern Belize, near Red Bank Village, and encompasses 36,000 hectares of multiple use, home to Belize's first community agroforestry concession. Ya'axché organization took over management of this reserve in 2015 in an effort to reduce illegal incursions, restore degraded areas, and ensure responsible and legal community access for multiple use of the forest reserve.

Mayflower Bocawina National Park

This National Park is located in Stann Creek District, six miles from Silk Grass Village. The majority of the park's forest is tropical evergreen seasonal broad-leaved lowland hill forest. Several threatened species have been recorded in the area, including the endangered Yucatan black howler monkey, spider monkey and Baird's tapir and the sabrinus and Sanderson's rain frogs.

Rio Blanco National Park

It is situated in Toledo district, approximately four miles from San Jose and five miles from Na Luum Ca. The main value of the Park is the preservation of the scenic beauty of the Rio Blanco Waterfall. The National Park is under the administration of the Forest Department, with co-management by the Rio Blanco Mayan Association – established by community members from Santa Cruz and Santa Elena.

Rio Bravo Conservation and Management Area

The Rio Bravo Conservation and Management Area is a reserve located in northwestern Belize. The northern side of the Area is located near the villages of August Pine Ridge and Guinea Grass in Orange Walk District, while the southern side of the area is located near La Democracia, Belize district.

The Management Area focuses on tropical forest conservation. Approximately half of these lands are managed as a reserve for the protection of biodiversity and natural habitats. It conducts research, conservation education and vocational training, and promotes environmental awareness among visitors.

Within the conservation area are 60 Maya sites, including La Milpa, known to be the third largest archaeological site in Belize.

Shipstern Conservation and Management Area

It is located in the Northeast of Belize, in Corozal District, about 27 miles from Progreso.

The reserve protects important aquatic habitats such as the Shipstern Lagoon, the Xo-Pol and the Xacan Chacmol ponds and it is home to numerous rare faunas like the black catbird, and floras such as the Pseudophoenix palm.

Spanish Creek Wildlife Sanctuary

The Wildlife Sanctuary. declared a protected area in June 2002, lies within the Belize River watershed, along Spanish Creek, south of Rancho Dolores. North of the park is near the August Pine Ridge and Guinea Grass villages of the Orange Walk district.

The Area was established for the protection of local biodiversity, and to strengthen corridor connectivity between Rio Bravo, the Community Baboon Sanctuary and Crooked Tree Wildlife Sanctuary.

St. Herman's Blue Hole National Park

It is located at mile 12 miles on the Hummingbird Highway southwest of Belmopan City, about 9 miles from Armenia, Cayo.

It is a popular tourist attraction, with the crystal-clear waters of the karstic sink hole and the accessible cave system, within a tropical rainforest known for its excellent birding. Water flows from the base of the deep, collapsed karst sinkhole, forming the pool that gives the park its name. One of its caves, San Herman Cave, is of archeological importance, as the Maya used it during the Classic period, as evidenced by the ceramic vessels, spears and torches found there. The Blue Hole and San Herman Cave are linked by the water flowing through them.

Tapir Mountain Nature Reserve

This Reserve is a protected area in Belize, located in the Cayo District, approximately 15 miles from El Progreso, 17 miles from San Antonio and 20 miles from Cristo Rey. It falls under the category of the International Union for Conservation of Nature protected areas categories.

International threatened species protected by this conservation area include the Yucatan Black Howler Monkey and Baird's Tapir.

Victoria Peak Natural Monument

Victoria Peak Natural Monument is a non-extractive protected area of the Maya Mountains in which lies a tropical broadleaf evergreen forest. It is the highest mountain in the range at a height of 3,675 feet and the second highest elevation in Belize. The monument is home to a very significant percentage of the species found in Belize. It is also particularly important for the protection of upper elevation species, including threatened amphibians, keel billed mot mots and orchids.

The peak is located near project areas such as San Roman, Silk Grass and Red Bank in the Stan Creek district.

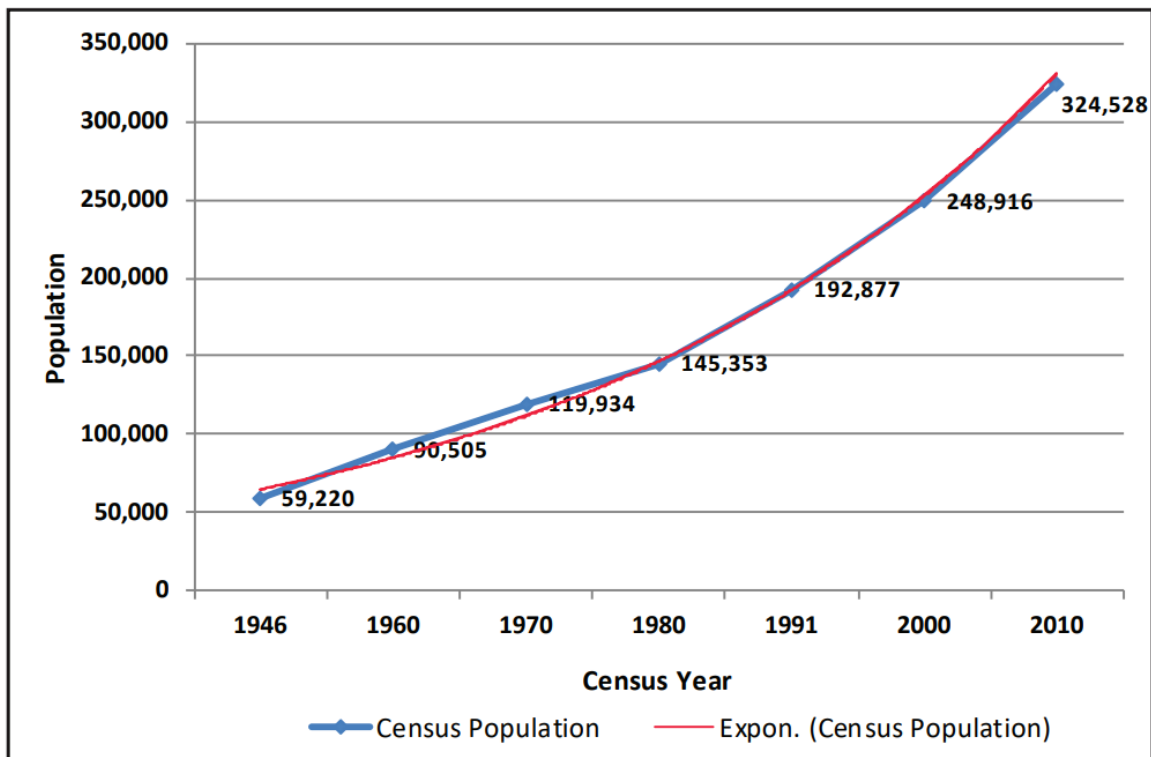
4.5 Socioeconomic Environment Baseline of Indirect Area of Influence

Population and Growth

According to the 2010 Census report, there were a total of 324,528 persons living in the borders of the country of Belize.

As can be noticed in Figure 31, the pattern of population growth in Belize since 1946 closely approximates the exponential curve. As a result, in the last 30 years (1980 to 2010) the population has more than doubled (Statistical Institute of Belize, 2010).

Figure 10 – Belize Total Population at Census Day, 1946 to 2010. Source: Belize Census Report, 2010.



The following table (Table 2) shows total population data, by sex, and number of households for each village under the program according to the 2000 and 2010 census data.

It is important to mention that census data is not available for all the villages involved in the project, therefore, for these cases, the legend "no data available" was added.

From Table 2, the growth in population and number of houses in the different villages can be visualized.

In addition, it can be observed that the number of males and females in each village is similar, with a slight predominance in the number of males in all cases and for both years.

Table 26 – Population and Housing data according to census 2000 and 2010

District	Village Name	2000				2010			
		Total	Male	Female	N° Households	Total	Male	Female	N° Households
Belize	Gales Point	277	156	121	68	No data available			
Belize	La Democracia	56	28	28	13	353	191	162	109
Cayo	Armenia	682	371	311	133	1395	723	672	278
Cayo	Cristo Rey	735	373	362	138	874	441	432	212
Cayo	El Progreso	No data available				No data available			
Cayo	San Antonio	1491	754	737	278	1847	933	914	381
Corozal	San Narciso	2183	1100	1083	429	2423	1198	1224	517
Corozal	Progreso	1211	630	581	230	1356	708	648	274
Orange Walk	August Pine Ridge	1701	893	808	323	1794	914	880	402
Orange Walk	Carmelita	834	436	398	163	1475	727	747	334
Orange Walk	Guinea Grass	2651	1371	1280	474	3218	1606	1612	627
Orange Walk	San Esteban	1566	823	743	323	1661	839	822	385
Stann Creek	Big Falls	No data available				No data available			
Stann Creek	Red Bank					1201	621	580	200
Stann Creek	San Roman					894	446	448	168
Stann Creek	Silk Grass					1092	568	524	240
Toledo	Big Falls	No data available				No data available			
Toledo	Indian Creek								
Toledo	San Jose/Na Luum Ca								
Toledo	San Pedro Columbia								

With the census data available for certain villages, a graph of population growth over time was developed. Although there is no data available to make a real trend curve, a linear trend was assumed, taking into account the overall growth trend of Belize every 10 years (Figure 9), in order to be able to appreciate easily the population growth from 2000 to 2010.

Figure 11 – Villages Population at Census Day, 2000 to 2010.

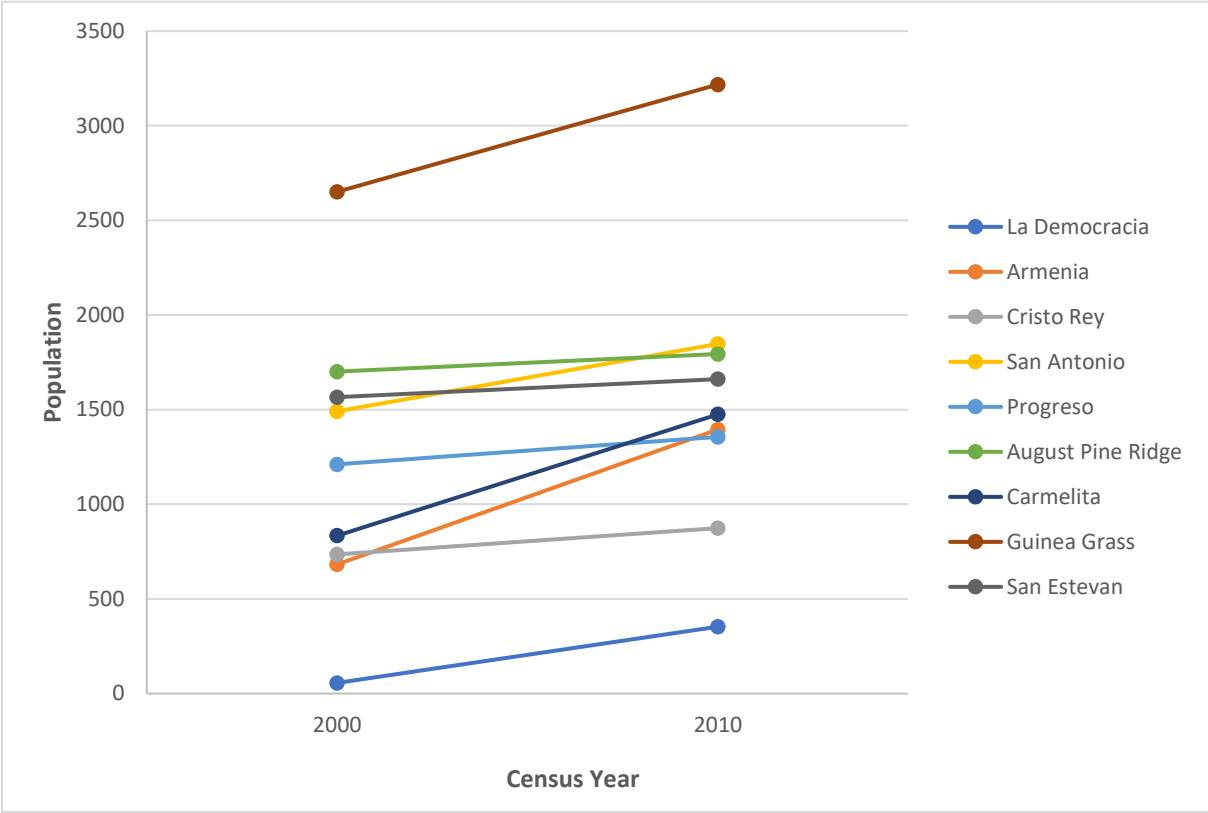


Figure 32 shows a growth for all the villages, although for some of them it is less pronounced and almost negligible in the cases of August Pine Ridge and San Esteban.

Infrastructure and Services

Water and Sanitation

The availability, adequacy and location of sanitary facilities such as toilets, bathing and cooking facilities, as well as ready access to potable water, have implications for the health and well-being of everyone, especially as it relates to the control/elimination of contagious and water-borne diseases (Statistical Institute of Belize, 2010).

- Water source

The following table shows water service data for the different communities affected by the project.

Table 27 - Water service data in the different communities involved in the project.

District	Village Name	Water Source	Daily Water Consumption (Calculated)	Estimated Water Coverage	Estimate Water Connections	Storage tank available (Yes/no)	Storage tank capacity (gals)	Water disinfection system	Type of disinfection	Do you meter your water production?	Are meters installed at the households?	What approximate percentage of household are metered?
Belize	Gales Point	Well, Surface Water	4064,41	79%	103	Yes	13500	No	N/A	No	No	0%
Belize	Democrac ia	Well	2554,05	100%	85	Yes	20000	Yes	Chlorin ation	No	Partial	18%
Cayo	Armenia	Well	31770,83	70%	350	Yes	20000	No	N/A	No	Partial	80%
Cayo	Cristo Rey	Well	8424,00	100%	270	Yes	20000	No	N/A	No	Partial	0%
Cayo	El Progreso	Surface Water	11730,77	100%	200	Yes	20000	No	N/A	No	No	0%
Cayo	San Antonio	Surface Water	47527,04	61%	581	Yes	20000	No	Chlorin ation	No	Yes	61%
Corozal	San Narciso	Well	48921,15	100%	977	Yes	20000	Yes	Chlorin ation	No	No	0%
Corozal	Progreso	Well	13087,94	100%	315	Yes	20000	No	N/A	No	No	0%
Orange Walk	August Pine Ridge	Well	28550,00	72%	430	Yes	20000	No	N/A	No	Partial	0%
Orange Walk	Carmelita	Well	51858,87	80%	600	Yes	20000	Yes	Chlorin ation	No	Partial	2%
Orange Walk	Guinea Grass	Well	46738,65	100%	785	Yes	20000	No	N/A	No	No	0%
Orange Walk	San Esteban	Well	32858,97	94%	518	Yes	20000	No	N/A	No	No	0%
Stann Creek	Big Falls	Well	19757,08	95%	325	Yes	20000	No	N/A	Yes	Partial	40%

District	Village Name	Water Source	Daily Water Consumption (Calculated)	Estimated Water Coverage	Estimate Water Connections	Storage tank available (Yes/no)	Storage tank capacity (gals)	Water disinfection system	Type of disinfection	Do you meter your water production?	Are meters installed at the households?	What approximate percentage of household are metered?
Stann Creek	Red Bank	Well	22620,00	94%	365	Yes	20000	No	N/A	No	Partial	90%
Stann Creek	San Roman	Well	24671,30	89%	325	Yes	20000	No	N/A	No	Partial	50%
Stann Creek	Silk Grass	Well	58356,52	75%	450	Yes	13500	No	N/A	Yes	Partial	60%
Toledo	Big Falls	Well	38412,62	98%	431	Yes	20000	No	N/A	No	Yes	90%
Toledo	Indian Creek	Well	27040,52	77%	228	Yes	20000	No	N/A	Yes	Partial	90%
Toledo	San Jose/Na Luum Ca	Well	12432,00	93%	235	Yes	20000	No	N/A	No	Partial	90%
Toledo	San Pedro Columbia	Well	46081,90	88%	459	Yes	20000	Yes	Chlorination	Yes	Yes	90%

As reflected in Table 3, most of the villages are supplied by well water, except for Gales Point, Belize, which has both well and surface water, and El Progreso and San Antonio, which are supplied by surface water.

Figure 12 – El Progreso water system (surface water)



Figure 13 – La Democracia water system (well)



All communities have a 20000 gallons storage tank available in most cases, except for Silk Grass and Gales Point, for which the tank capacity is 13500 gallons.

Figure 14 - Silk Grass Storage Tank



Figure 15 – Indian Creek Storage Tank



Some villages have flowmeters to measure water production, such as Big Falls, Silk Grass, Indian Creek and San Pedro Columbia.

Figure 16 – Flowmeter of Indian Creek, Toledo



Figure 17 – Flowmeter in San Pedro Columbia, Toledo



Regarding the sanitary state of the water, only five of the twenty villages have a disinfection system that corresponds to chlorination treatment: La Democracia, Belize; San Antonio, Cayo; San Narciso, Corozal; Carmelita, Orange Walk and San Pedro Columbia, Toledo.

Figure 18 - Chlorination system in Carmelita, Orange Walk



Figure 19 - Chlorination system in San Pedro Columbia, Toledo



- Cooking Facility and Fuel

In the absence of data for the villages, census data for each district to which they belong will be used in this case.

Across the country, 78.6 percent of households had their kitchen inside their dwelling, and other six percent had a kitchenette or other cooking space inside. Within the Belize District, 91.3 percent of

households had their cooking space inside the dwelling, followed by Cayo with 84.9 percent, compared to only three-quarters of the households in Toledo. About one-fifth of the households in Toledo and Corozal had their main cooking facility outside the dwelling, but only 2.5 percent of households in the Belize District cooked outside (Statistical Institute of Belize, 2010).

Table 28 - Households by District and Type of Cooking Facility, according 2010 census

District	Number of Households	Total	Type of Cooking Facility				
			Kitchen in Dwelling	Other Cooking Space in Dwelling	Cooking Space Outside Dwelling	No Cooking Space	Not Reported
Country Total	79.492	100,0	78,6	5,8	11,1	4,1	0,4
Corozal	9.258	100,0	74,1	4,8	19,1	1,5	0,6
Orange Walk	10.452	100,0	74,0	5,4	17,8	2,3	0,4
Belize	27.281	100,0	84,2	7,1	2,5	5,9	0,4
Cayo	16.889	100,0	80,4	4,5	13,1	1,5	0,4
Stann Creek	9.074	100,0	77,5	3,6	10,8	7,7	0,4
Toledo	6.538	100,0	65,9	9,4	19,8	4,6	0,2

- Sanitation and Bathing Facilities

In the absence of data for the villages, census data for each district to which they belong will be used in this case.

According to statistical data, in Belize on average two out of three households in usually use a flush toilet. At the district level, the proportion of households using a flush toilet range from a high of 91.5 percent in the Belize District, to a low of 27.8 percent in Toledo. The other main type of toilet used by households is the pit latrine, at 30.6 percent countrywide. However, more than a half (56.8 percent) of Toledo households and about a half of Orange Walk households (49.9 percent) use a pit latrine, compared to a mere five percent of households in the Belize District. Although only about three percent of households in the country reported not having any toilet, about 15 percent of the households in Toledo are without this very important facility.

Bearing in mind that the absence of an adequate method to dispose of human excreta is a key factor in the spread of diseases such as cholera, diarrhea and worm infections, this is an area for immediate intervention by policy makers (Statistical Institute of Belize, 2010).

Table 29 - Households by District and Main Type of Toilet Facility, according 2010 census

District	Number of Households	Total	Type of Toilet				
			Flush Toilet	Pit Latrine	Other	None	Not Reported
Country Total	79.492	100,0	65,8	30,6	0,5	2,9	0,3
Corozal	9.258	100,0	51,6	46,6	0,2	1,2	0,4
Orange Walk	10.452	100,0	47,7	49,9	0,7	1,6	0,1
Belize	27.281	100,0	91,5	4,9	0,7	2,5	0,4
Cayo	16.889	100,0	58,3	40,4	0,1	1,0	0,2
Stann Creek	9.074	100,0	65,0	31,9	0,6	2,3	0,2

District	Number of Households	Total	Type of Toilet				
			Flush Toilet	Pit Latrine	Other	None	Not Reported
Toledo	6.538	100,0	27,8	56,8	0,4	14,8	0,2

Housing

Since data are not available for each particular village, data are taken from the rural sector of each district involved in the project.

Table 6 shows the data of number of households and the average household size for the rural areas of each district involved in the project, according to the 2000 and 2010 census data.

The average household size is the average number of persons who make up a household. This is obtained by dividing the population in a particular area by the number of households in that area.

Table 30 - Number of Households by rural areas, Average Household Size according 2000 and 2010 census.

District (Rural Areas)	Census 2000		Census 2010	
	No. Of Households	Average Household Size	No. Of Households	Average Household Size
Belize	3706	4,1	7351	3,6
Cayo	5978	5,1	7659	4,8
Corozal	5100	5,1	6562	4,7
Orange Walk	5277	5	7077	4,6
Stann Creek	3934	4,2	6502	3,8
Toledo	3653	5,4	5179	4,9
Country (total rural areas)	27648	4,9	40330	4,4

The table above shows that the national average household size in rural areas declined from 4.9 to 4.4 persons per household. The situation is similar in the aforementioned rural sectors.

Household size is a key indicator for examining social issues such as poverty and health, especially as it relates to the risk of exposure to communicable diseases (Statistical Institute of Belize, 2010).

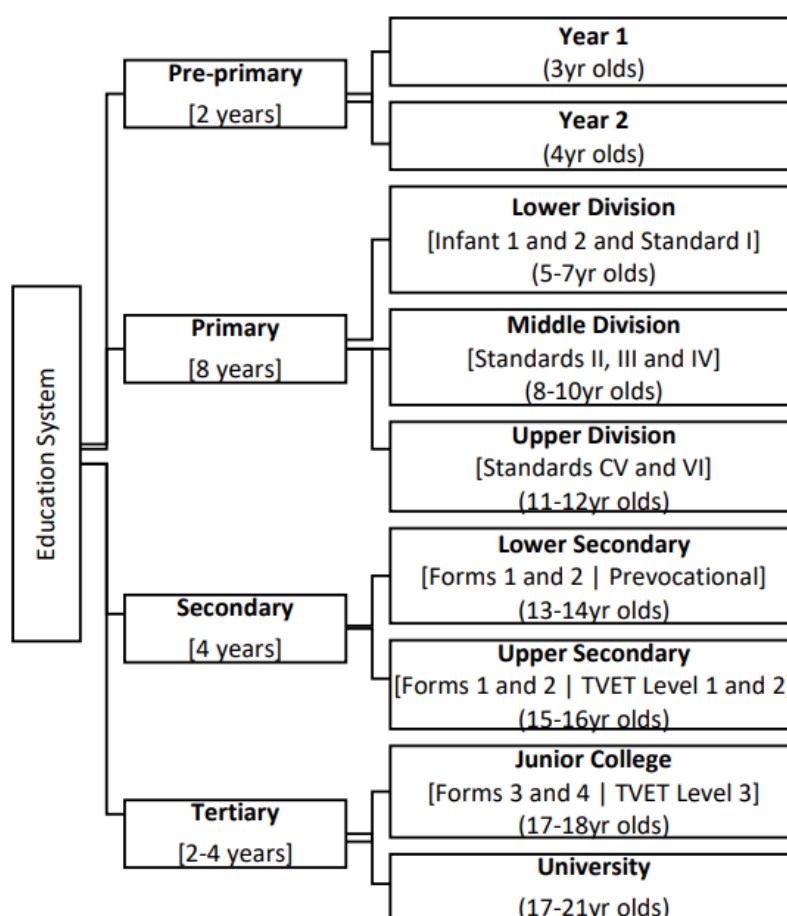
Education

Three types of educational institutions operate in Belize—government, government-aided and private. Government schools are owned and funded by the Government of Belize.

Under the Laws of Belize, the mandatory school age begins at five years, and children are required to be in school as long as they have not attained their fourteenth year or have not completed primary school (Statistical Institute of Belize, 2010). People who have completed at least Standard Five at primary school are considered literate.

Figure 18 illustrates the current structure of the education system, including levels, typical duration and corresponding age groups.

Figure 20 – Belize Education System. Source: Abstract of Education Statistics 2021-2022, Government of Belize



Since no data are available for each village, data are shown for the rural areas of each district involved in the project.

The following table shows the School Enrolment for rural areas in the different districts by level and sex, during the 2020-2021 period.

Table 31 – School Enrolment for rural areas. Source: Abstract of Education Statistics 2021-2022, Government of Belize

District (Rural Area)	Male	Female
Pre-primary level		
Belize	176	193
Cayo	252	267
Corozal	187	210
Orange Walk	176	156
Stann Creek	252	206
Toledo	245	275
Total	1288	1307
Primary level		
Belize	1789	1603
Cayo	4594	4265

Corozal	2883	2576
Orange Walk	3054	2788
Stann Creek	2790	2624
Toledo	3234	3113
Total	18344	16969
Secondary level		
Belize	432	418
Cayo	322	403
Corozal	755	783
Orange Walk	151	133
Stann Creek	772	782
Toledo	755	670
Total	3187	3189

With the data in the table above, two graphs were made to represent the difference in enrollment according to the different levels (Figure 19 and Figure 20).

Figure 21 - Male School Enrolment

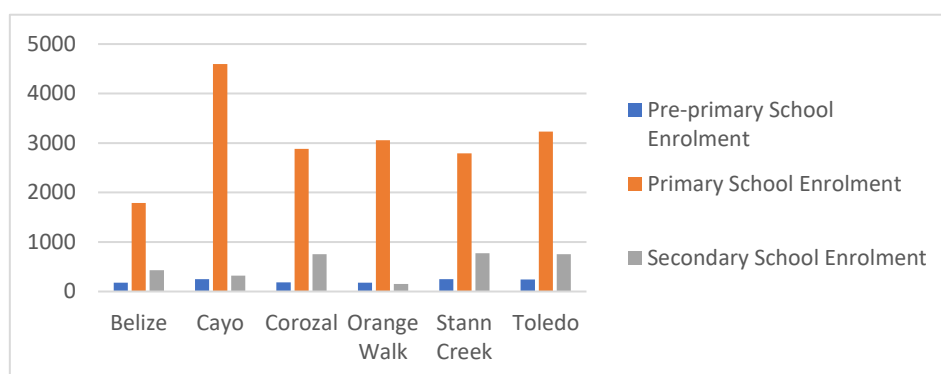
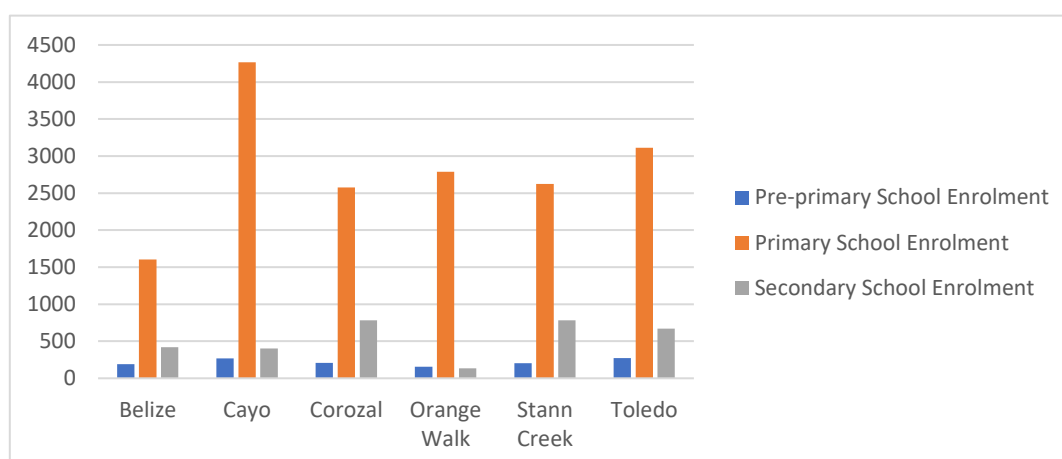


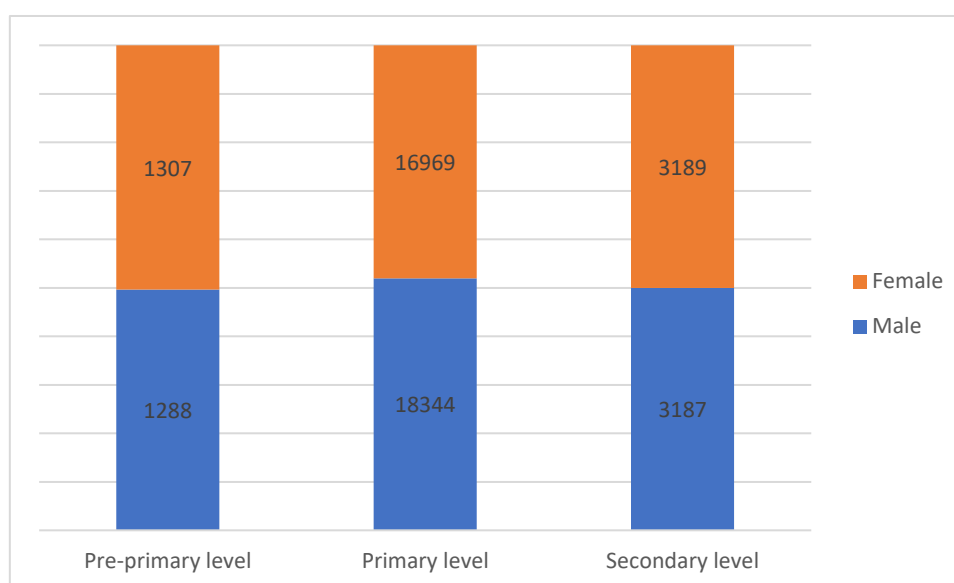
Figure 22 - Female School Enrolment



From both graphs it can be deduced that for both males and females, enrollment at the primary level is much higher than at the pre-primary and secondary levels in all rural areas of the districts mentioned.

In addition to the above, taking into account the sum of all rural areas, it can be observed that the enrollment relationship between males and females is similar for the three educational levels (Figure 21).

Figure 23 – Total School Enrollment in rural areas by sex



Indigenous Peoples and Communities

In a general context, Belize has a population formed by several indigenous communities. According to the Statistics Institute of Belize 2010 Census, 52,9 per cent of population are Mestizo, 26 per cent Creole, 21 per cent are descendants of black Africans and Mulattos (descendants of black Africans and Europeans), 11,3 per cent are indigenous Maya and 6,1 per cent are Garifuna (descendants of black Africans and Caribbeans), and 7,8 per cent are white, of British or Spanish origin. The rest of the population comprises small communities of European, Mexican, Guatemalan, U.S., Honduran, Jamaican, East Indian, Chinese and Far Eastern origins (Centre for Indigenous Peoples' Autonomy and Development, 2017).

Maya are the direct descendants of the original indigenous inhabitants of the Yucatán peninsula. Today there are three Maya groups in Belize, namely Yucatec, Mopan, and Q'eqchi' Maya and they are mainly subsistence farmers. Yucatec reside in the Corozal, Orange Walk, and Cayo Districts; Mopan Maya settlements are in Toledo District and there are also other villages in the Cayo District; and Q'eqchi' Maya settled in the lowland areas along rivers and streams and established small isolated villages throughout Toledo district.

Garifuna are an Afro-indigenous community resulting from the inter-marriage of African maroons (escaped slaves) and indigenous Kalinago (Carib-Arawak) on the Caribbean Island of St Vincent. They have their own language and culture. They are located predominantly in the southern towns of Punta Gorda and Dangriga.

Mennonites are a Dutch/German descent community. They established six communities in the Orange Walk and Cayo Districts and they have their own exclusive schools, churches, and financial institutions in their community. They specialize in agriculture, poultry and furniture production.

The Mestizo population are the mixed descendants of indigenous Maya and Spanish Colonizers. They are found everywhere in the country but mostly live in the northern lowlands of Corozal and Orange Walk and in the western district of Cayo.

Creoles are Afro-European descendants. They live primarily in the coastal region and are the dominant group in most social and political institutions.

The social and economic conditions of indigenous peoples in Belize in general, are characterized by poverty, marginalization and inequality, in addition to a lack of recognition for their rights. The Constitution recognizes the cultural diversity of the country's territories, but has not been amended to provide for government action on multiculturalism. Moreover, it does not recognize customary rights or indigenous jurisdiction. Nevertheless, the Government of Belize has undertaken a commitment to reactivate initiatives promoting respect for the rights of indigenous peoples, in accordance with the provisions of the United Nations Declaration on the Rights of Indigenous Peoples, which the government adopted in 2007 (Centre for Indigenous Peoples' Autonomy and Development, 2017).

Archaeological, Historical and Cultural Heritage

Belize has a unitary system of management in which ownership of all cultural heritage is vested in the people and government of the country.

In 2003, the National Institute of Culture and History (NICH) was created and it is responsible for the management of the country's tangible and intangible heritage. It comprises of four institutions, each with their own mandates and missions but subject to Chapter 331 of the Laws of Belize, called the NICH Act.

The four institutions that comprise the NICH are:

- Institute of Archeology
- Institute of Social & Cultural Research
- Museum of Belize and Houses of Culture
- Institute Creative Arts

Institute of Archeology (IA)

the IA's goals are geared to the research, protection, preservation, and sustainable management of Belize's cultural and archaeological resources. The IA is divided into varying departments, including Parks Management and Research and Education and it manages Belize's seventeen archaeological sites that have been declared reserves.

Institute for Social and Cultural Resource (ISCR)

ISCR's objective is to promote, recover, monitor, document and conduct historical, social, cultural and anthropological research. Among the ISCR's recent initiatives is an increased emphasis on safeguarding intangible cultural heritage (ICH). The ISCR, upon request, conducts presentations and exhibitions at schools and other public events.

Museum of Belize and Houses of Culture (MOB)

The MOB's main focus is education through the exhibition of prehistoric and historic period objects and the promotion of other cultural events. The MOB accomplishes its goals not only via exhibitions at the museum itself, but with exhibits and cultural programs at seven Houses of Culture (HOC) spread across the country (Beardall, 2021).

Institute Creative Arts (ICA)

The ICA, is headquartered at the Bliss Center for Performing Arts in Belize City. It is responsible for managing the Belize Film Commission and the Belize Youth Orchestra and Choir and focuses on artistic expression in all its forms, including dance, theater and visual arts.

Outstanding Heritage Resources

Among some of the heritage resources of Belize, it can be highlighted:

- The Cayo Green Iguana Conservation Project (Belmopan), which aims to conserve and care for Belize's endangered Green Iguana species. The project uses exhibits and interactive programs to help educate visitors and raise awareness among the general public.
- The Belize Barrier Reef, the only UNESCO world Heritage Site in Belize, which consists of seven reserves: Bacalar Chico National Park and Marine Reserve, Blue Hole Natural Monument, Half Moon Caye Natural Monument, South Water Caye Marine Reserve, Glover's Reef Marine Reserve, Laughing Bird Caye National Park and Sapodilla Cayes Marine Reserve. This barrier reef is the largest in the Northern Hemisphere and is an important habitat for some endangered animal species such as sea turtles, manatees and the American crocodile.
- The Xunantunich Archaeological Site in Cayo (Belmopan), a Mayan archaeological site that includes a set of six plazas surrounded by more than twenty-five temples and palaces.
- The Lamanai Maya Archeological Site in Orange Walk, where three large temples can be observed: Temple of Jaguar, the Mask Temple, adorned by a huge stone mask representing an ancient Maya king and the Temple of Alto.
- The Image Factory Art Foundation in Belize, a non-profit contemporary art institution dedicated to the promotion, exhibition and documentation of Belizean art.

5. Environmental and Social Impacts and Risks

This chapter describes the potential environmental and social impacts and risks for the projects of the representative sample of the Belize Water and Sanitation Program for Rural Areas (BL-L1045), on the physical, biological, and socioeconomic environment.

5.1 Impact and Risk Assessment Process

The steps involved in the impact and risk assessment are:

- 1 **Impacts Identification:** determine what could happen in the different environment components, as a consequence of the project and its associated activities and facilities.
- 2 **Impact Assessment:** evaluate the significance of the predicted impacts and risks, considering their magnitude and occurrence probability, and the sensitivity, value and importance of the factor or component of the impacted environment.
- 3 **Mitigation / Improvement:** identify appropriate measures to mitigate negative impacts, and enhance positive impacts.
- 4 **Residual Impact Assessment:** evaluate the significance of impacts assuming the effective implementation of mitigation and improvement measures.

5.2 Analyzed Phases

For the identification of environmental and social impacts and risks, the analysis time horizon was divided into three phases:

- **Construction**
- **Operation and Maintenance**
- Decommissioning or abandonment

The project involves infrastructure that is considered to have a long service life (water and disinfection systems). It is assumed that this infrastructure will be permanently incorporated into the service provider assets. Therefore, the decommissioning or abandonment stage **was not considered for the impact assessment**.

5.3 Project Activities Summary

Project Activities in the Construction Phase

There are several activities in the construction phase that must be considered from the socio-environmental perspective. Activities identified for the project included:

Work Preparation

- A. Transport, movement and stockpiling of materials, equipment, machinery. Preparation of work sites.
- B. Land clearing, dismantling of facilities (where applicable)

Main work

- C. Civil works for improvement in pumping houses, tanks, well protection works.
- D. Installation of new disinfection systems.

Work demobilization

- E. Demobilization of work sites. Removal of surplus materials.

Project Activities in the Operational Phase

For the purposes of the analysis, the operational phase was divided into:

- F. Operation of improved water systems.
- G. Maintenance of improved water systems.

5.4 Physical, Biological and Socioeconomic Environment Components Summary

The components of the physical, biological, and socioeconomic environment likely to be affected by the project include:

Physical Environment

- 1. Air. Gaseous emissions and particulate matter.
- 2. Air. Noise and vibrations.
- 3. Waters. Water table and groundwater. Surface water courses.
- 4. Soil.

Biological Environment

- 5. Flora (vegetation cover, tree, shrub), Wildlife.

Socioeconomic Environment

- 6. Infrastructure and services. Mains services (water).
- 7. Infrastructure and services. Waste Management. Municipal solid waste.
- 8. Infrastructure and services. Waste Management. Special and hazardous waste.
- 9. Infrastructure and services. Waste Management. Construction and demolition waste.
- 10. Occupational and Community Health and Safety. Risk of occupational and community accidents
- 11. Socio-Economic development. Labor employment. Commercial and service activities.
- 12. Cultural and Archaeological Heritage.
- 13. Land Use and Activities in the Area. Residential Use.
- 14. Landscape and Public Space. Visual impact. Landscape perception.

5.5 Impacts Identification and Assessment

For the impact identification, the **interactions between the project actions** (identified above) and **the environmental components** (physical, biological, and socioeconomic environment) were analyzed.

As a representative graphic synthesis of this process, a **matrix** was constructed, which reproduces in a simplified way the conditions of the studied system and allows to visualize with simple symbology the representative interactions. It is a double-entry table in which the columns correspond to actions owned or induced by the project with environmental or social implications, while the rows are the physical, biological, and socioeconomic environment components likely to be affected.

The intersections between Project actions and the environmental components considered, allow us to visualize interaction relationships where differentials were evaluated between the "without project" situation and the "under project" situation, that is, impacts and risks.

The impact assessment to complete the matrix was carried out through: (i) interviews with sector experts and project team staff; (ii) expedited field survey; (iii) literature review – including checklists and impact evaluations for similar projects; and (iv) the consultant's experience.

Details of the impact assessment can be found in the matrix report.

Impact Attributes

In each matrix cell, the impact is rated according to the attributes detailed below:

1. **Impact Sign:** refers to the nature of the impact (whether it is a positive or negative impact)
2. **Impact Magnitude (scale):** qualitatively, it will be indicated if it is an impact of high, medium, or low significance (see Table 1).
3. **Impact Scope:** indicates whether it is a restricted impact (effect restricted to the Operational Area - OA), specific (effect located within the Direct Area of Influence - DAoI), or major (if it impacts neighboring areas, outside the Indirect Area of Influence - IAoI).
4. **Impact Duration (persistence):** it is determined whether it is a transitory or permanent impact.
5. **Impact probability:** it is a measure of the probability of the impact occurrence.
6. **Accumulation:** for the most significant impacts identified, the cumulative impacts of the execution and operation of the works in the sample with respect to existing or potential projects will be analyzed.

Regarding the **magnitude of the impact**, the definitions in Table 1 as a basis for their determination.

Table 1 - Keys to determine the impacts magnitude

Impact Magnitude	Physical and Biological environment	Socio-economic environment
High	It is defined as one that affects the environment or a subcomponent thereof, either in its entirety, or in a high percentage, altering its characteristics in a forceful way, so that it can be presumed that the impact will make it impossible to use it in the current conditions of this environment, in the modality and abundance in which it is currently used.	It is defined as one of long duration (persisting over several generations), or one that affects a definable group of people to such an extent as to cause a significant change in the quality of life or in culturally established and socially valued positive or appropriate patterns of an activity that will not return to pre-project levels for at least several generations.
Medium	It is defined as that which affects the environment or a subcomponent of it,	It is defined as one that affects a definable group of people in a significant

Impact Magnitude	Physical and Biological environment	Socio-economic environment
	partially, in a non-majority fraction, altering its characteristics in an evident manner, but in such a way that it can be presumed that the impact will not significantly impede the use of the resource in the current conditions of this environment, in the modality and abundance in which it is currently used.	magnitude, enough to cause an alteration in the quality of life or in culturally established and socially valued as positive or adequate patterns of an activity.
Low	It is defined as that which affects the environment or a subcomponent of it, partially, in a clearly minority fraction, not significantly altering its characteristics, in such a way that it can be presumed that the impact will not make it impossible to use this environment in the current conditions, in the modality and abundance in which it is currently used.	It is defined as one of short duration or one that affects a reduced group of people in a localized area, but does not imply an evident alteration in the quality of life or in culturally established and socially valued as positive or adequate patterns of an activity.

5.6 Mitigation Measures Identification

Once the impacts have been identified and assessed, mitigation measures are identified to avoid, reduce, correct or compensate for them.

Mitigation Hierarchy

All negative impacts identified in the impacts and risks analysis of this Study require preventive, mitigatory, corrective or compensatory measures, which must be incorporated to minimize environmental impact and ensure the sustainable performance of the project.

Within the mitigation hierarchy, preventive (pre-impact, avoid impact at source) and mitigatory measures (minimize impact, reduce impact at source, or on the receiving body) are preferred over measures involving treatment (post-impact), such as restoration and compensation.

5.7 Residual Impact Determination

Once mitigation measures are identified, the next step in the assessment process is to assign a residual impact value. This step is, in essence, a new impact assessment, considering the effective implementation of the mitigation measures identified.

5.8 Management, Monitoring and Audit

The last stage in the impact assessment process is the definition of monitoring and management measures, to ensure that the identified impacts remain within the ranges of applicable standards, and

that mitigation measures are being effectively implemented, reducing impacts in the manner originally predicted in the analysis.

The summary of these management processes is part of the Environmental and Social Management Plan (ESMP), which is the subject of the next chapter (**Chapter 6**).

5.9 Environmental and Social Impact Matrix

As a first approach to the analysis, a matrix was prepared to identify environmental and social impacts and risks **common to all projects** in the representative sample. The matrix contains the sign and magnitude of the impact. This matrix is presented in Figure 24.

<p>Matrix for the Identification of Environmental and Social Impacts and Risks</p> <p>Belize Water and Sanitation Program for Rural Areas (BL-L1045)</p> <p>Assessment of Representative Sample</p>			PROJECT ACTIVITIES WITH ENVIRONMENTAL AND SOCIAL IMPACT							
ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED BY THE PROJECT			STAGES							
PHYSICAL AND BIOLOGICAL ENV	AIR	Gaseous emissions and particulate matter	1	A	B	C	D	E	F	G
PHYSICAL AND BIOLOGICAL ENV	WATER	Water table and groundwater. Surface water courses	3	A	B	C	D	E	F	G
PHYSICAL AND BIOLOGICAL ENV	SOIL	Soil	4	A	B	C	D	E	F	G
PHYSICAL AND BIOLOGICAL ENV	BIOTA	Flora (vegetation cover, shrubs, trees), Wildlife	5	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	INFRASTRUCTURE AND SERVICES	Mains services (water)	6	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	WASTE MANAGEMENT	Municipal Solid waste	7	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	WASTE MANAGEMENT	Hazardous or special waste	8	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	WASTE MANAGEMENT	Construction waste	9	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	OCCUPATIONAL AND COMMUNITY HEALTH AND SAFETY	Risk of accidents (occupational, community)	10	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	SOCIO-ECONOMIC DEVELOPMENT	Labor employment. Commercial and service activities.	11	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	CULTURAL HERITAGE	Cultural, Archaeological and Paleontological Heritage	12	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	LAND USE	Residential use	13	A	B	C	D	E	F	G
SOCIO-ECONOMIC ENVIRONMENT	LANDSCAPE	Visual impact. Landscape perception	14	A	B	C	D	E	F	G

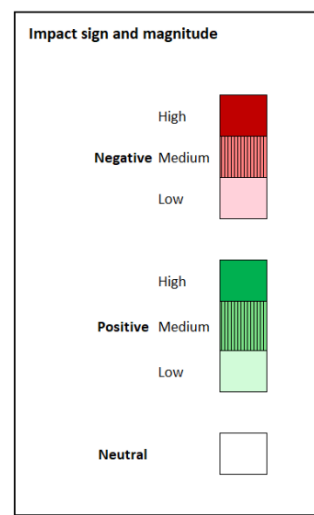


Figure 24 - Project Environmental and Social Impacts and Risks Matrix

5.10 Environmental and Social Risks and Impacts Matrix Report

The following report explains the criteria used in the weighting of the impacts shown graphically in the Impacts and Risks Matrix. It also expands on the valuation of the other attributes identified for the impacts (scope, duration, frequency, and duration). Finally, it identifies mitigation measures to be applied, determining the residual impact resulting from effectively applying these measures.

Impacts - Construction Phase

Air. Gaseous Emissions and Particulate Matter.

Impact Assessment

Impact Description	Air quality impacts of gaseous emissions and particulate matter		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The actions of the construction phase, including storage of materials, movement of machinery and vehicles affected by the work, clearing of the land, civil works for improvements in water systems, are characterized by the emission of particulate matter and gaseous emissions of combustion engines, which can cause air pollution.

These impacts are valued as negative, of low magnitude, of punctual scope (direct influence area) and of a transitory nature (they only occur during the construction phase).

Mitigation Measures

- All materials that could give off dust will be transported in vehicles covered with tarpaulins, with sufficient humidity to minimize their dispersion.
- During the on-site stockpiling period, materials that could generate dust will be periodically wetted. The quantities in stockpiles will be minimized, whenever operationally feasible.
- Periodic watering of roads without asphalt layer to be used on site will be implemented (twice a day).
- Limiting the speed of construction vehicles on access roads without asphalt surface (depending on the case, between 20 and 40 km/h).

Residual Impact

The associated residual impact remains of low magnitude.

Noise and vibration

Impact Assessment

Impact Description	Impacts by noise and vibration generation		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The materials transport and stockpiling, the labor transportation, the operation of equipment, drilling of wells, together with the civil works for improvement of the water systems generate noise and vibrations (noise pollution).

In both cases, these are negative impacts and of a transitory nature (they only occur during the construction phase). No impacts are expected outside the direct influence area. These are temporary exposures. Given that it is a predominantly rural and/or peri-urban environment, the impacts are assessed as low magnitude.

Mitigation Measures

- Implement a **Community Information and Participation Program** in the ESMP, which provides information to neighbors about the works duration and scheduling.
- Maintain construction machinery and equipment in good condition.

Residual Impact

The associated residual impact remains of low magnitude.

Water table and groundwater. Surface water.

Impact Assessment

Impact Description	Impacts on groundwater and surface water resources		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

Construction activities can have a negative impact on the water table due to the risk of accidental spills (hydrocarbons, oils or other chemical substances used on site), or due to poor effluent

management during construction work (for example, sanitary effluents, effluents from hydraulic tests, or *mixer* washing).

Natural site drainage and surface runoff are also affected in works involving soil cleaning and movement, and removal of vegetation cover.

These identified impacts are negative, transitory (they only occur during the work implementation), and of low magnitude.

Mitigation Measures

- Establish an **Effluent Management Program** on the **ESMP**.
- Provide sanitation systems for personnel from the beginning of the project implementation (portable toilets, toilets with connection to the sewer, etc.).

Residual Impact

The magnitude of residual impacts remains low.

Soil

Impact Assessment

Impact Description	Impacts on soil resources from conversion, erosion, sediment runoff, and/or pollution		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The stockpiling and handling of construction materials, and the operation of machinery and equipment in all work activities, can give rise to the risk of soil contamination by oil and hydrocarbon spills, by poor management of sewage effluents or solid waste.

The removal of vegetation and tree cover, soil movement, always generates a negative impact on the composition of the soil, which can lead to erosion, compaction, alteration of the edaphic sequence, etc. The stockpiling of soil during excavations can lead to sediment runoff to nearby water streams and water courses and mangrove areas. This effect can also be exacerbated during flooding events or tropical storms.

In addition, soils movement can cause the dispersion of rodents and other vectors to surrounding areas.

These identified impacts are negative, of low magnitude, of a transitory nature (they only occur during the work implementation phase) and localized (they affect only the direct influence area of the project).

Mitigation Measures

- Establish a **Chemical Management Program** in the ESMP, including storage within the containment area, fuel refill and oil change protocols with spill protection.
- Establish a **Contingency Plan**, which includes spill preparedness and actions (anti-spill kits, training, etc.).
- Establish an **Effluent Management Program** in the ESMP.
- Provide sanitation systems for personnel from the beginning of the project implementation (portable toilets, toilets with connection to the sewer, etc.).
- Prohibit the washing of concrete mixers in the operational area of the project. These activities must be carried out at authorized sites.
- Establish a **Pest and Vector Control Program** in the ESMP.

Residual Impact

The residual impact remains low.

Flora and Fauna

Impact Assessment

Impact Description	Impacts on Flora and Fauna due to construction activities		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

Tasks related to land clearing, stockpiling of materials in preparation for construction, and civil works may involve the removal of vegetation and shrub cover and, in some cases, the removal of trees. This will also affect the fauna associated with this vegetation (including birds). There is also a risk of fauna being run over by vehicles and construction machinery.

These identified impacts are considered negative, of low magnitude and of a permanent nature and affecting the direct influence area of the project.

Mitigation Measures

- Establish a **Flora and Fauna Management Program** in the constructive ESMP, with specific guidelines aimed at preventing impacts on flora and fauna. Likewise, the Program will explain the mitigating and compensatory measures for the removal of trees, communication actions to neighbors, and the prohibition of introducing invasive species.
- Allow the removal of vegetation cover only in designated areas necessary for the works associated with the project.

- Respect the edaphic sequence in soil movements: after cleaning, the upper floor (stored separately) will be used for leveling and reprofiling.

Residual Impact

The residual impact remains low.

Impacts on Water Services

Impact Assessment

Impact Description	Risks of service interruptions during work on water systems		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

During the construction phase, interruptions in the water service may occur during the construction work. The impact is assessed as negative, localized, and is considered of low magnitude, and of a transitory nature (only occurs during the work phase).

Mitigation Measures

- Establish a **Contingency Plan** in the ESMP.
- Implement a **Community Information and Participation Program** in the ESMP, which provides information to neighbors about the works duration, scheduling and mitigation measures of possible risks and impacts produced by the works.

Residual Impact

The residual risk of service outages due to interference remains low.

Waste Management

Impact Assessment

Impact Description	Contamination by improper disposal of solid waste		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

In all construction activities, solid waste assimilable to domestic, surplus construction, demolition waste (replaced components of water systems) and green waste (resulting from land and vegetation cleaning, etc.) are expected.

Due to the characteristics of the activities to be carried out in the works of the project, it is not expected that special or hazardous waste will be generated, except for smaller quantities resulting from the maintenance of machinery and vehicles affected by the work (lubricating oils, etc.) and the washing of concrete mixers. These special waste streams must be disposed of in accordance with current regulations, using authorized transporters and operators, and in compliance with specific regulations.

Improper waste management on site can cause contamination, and risk of proliferation of rodents and other vectors.

The risk of contamination due to poor solid waste management on site is considered a low negative impact, of medium probability and of a transitory nature (occurring during the work execution phase).

Mitigation Measures

- Establish a **Waste Management Program** in the ESMP, which defines the guidelines for proper management of all waste streams to be generated on site, in accordance with current legislation and good practices.
- Establish a **Socio-Environmental Training Program** for Construction Personnel, which includes training in the correct management of construction waste.
- Establish a **Monitoring and Control Program** that includes a protocol for analyzing soil contamination from excavations.
- Establish a **Pest and Vector Control Program** in the ESMP.

Residual Impact

The residual impact of solid waste management is expected to remain low.

Occupational and Community Safety

Impact Assessment

Impact Description	Risk of accidents (occupational - road)		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

It can be anticipated that the execution of the work implies a risk of accidents (both occupational – due to the work tasks – and road – due to the circulation of vehicles and machinery affected by the

work). This is due to the critical activities that are part of the construction process, and that may include: improvements in water storage tanks and pumping stations (including work at heights), electrical work in installation of electromechanical equipment, accidents involving construction machinery, welding and hot working, and ergonomic hazards.

This impact is classified as negative, of medium magnitude for certain work instances, and of a transitory nature (occurring during the work execution phase).

Mitigation Measures

- Establish an **Occupational Health and Safety Program** in the ESMP, which complies with the requirements of current national and local regulations. This Program should pay special attention to high-risk work such as work at heights, electrical work, confined spaces, etc.
- Establish a **Socio-Environmental Training Program** for Site Personnel in the ESMP, which includes training in the use of PPE, risks during works, contingency plan, electrical work, safe handling of chemical substances, etc.
- Establish a **Contingency Plan** in the PGAS, which ensures the response to medical emergencies.

Residual Impact

As a result of the effective implementation of the proposed mitigation measures, the residual impact associated with occupational safety is reduced to low magnitude.

Economic development

Impact Assessment

Impact Description	Impacts on employment, business, and services		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The activities foreseen in the construction phase will require labor – skilled and unskilled – and acquisition of construction materials and services. This will have a positive impact on employment generation, and on the dynamization of the activity of trade in goods and services. In particular, the items that will benefit include those related to the sale of construction inputs and materials, equipment, vehicles, machinery, spare parts and accessories, mechanical services, fuel, logistics, and food, among others.

No risks related to the influx of workers are foreseen, since the developer is committed to using local labor.

These impacts are considered positive, of low magnitude, of a transitory nature, and geographically distributed in the indirect influence area of the project.

Mitigation Measures

- Require the contractor to establish a **Code of Conduct**, which has a transversal gender approach and guarantees respect for the community and harmonious coexistence during the works. The code of conduct shall include commitments to ensure the creation and maintenance of a work environment free from: (i) discrimination based on ethnic, racial, gender, gender identity, sexual orientation, or religion; (ii) violence, in particular violence against women, girls and adolescents; (iii) child labor.
- Establish a **Training Program** that includes training in the Code of Conduct and gender issues for the Company's employees.
- Establish a **Grievance Management Mechanism** for the Project.

Residual Impact

The residual impact of the area revitalization by the action of the Project implementation remains in positive low.

Land Use and Activities in the Area

Impact Assessment

Impact Description	Disruptions to established activities due to the presence of personnel, construction machinery and asset assignment.		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The construction work and the presence of personnel and construction machinery have a disruptive effect on the current uses established in the project sites, for road safety accidents related to the works and for the inconvenience inherent in construction tasks (noise, visual pollution). There is also the risk of conflicts between workers and the population.

The impact on residential use is categorized as low negative for the entire work. These impacts are of a transitory nature.

Mitigation Measures

- Implement a **Community Information and Participation Program** in the ESMP, which provides adequate communication to neighbors about the type and duration of the impact, measures planned to mitigate it, etc.

Residual Impact

The residual impact of land use and activities in the area by Project action remains low.

Cultural and Archaeological Heritage

Impact Assessment

Impact Description	Negative impacts on cultural and archaeological heritage		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

According to the information in the Environmental and Social Baseline, there is no probability of finding evidence of cultural or historical heritage on the operational area of the project. However, the possibility of chance finds must be addressed. The activities of the construction phase could entail a risk of impact on the cultural, historical and archaeological heritage of the area, due to the degradation or loss that could result from improper management of archaeological assets that are in the intervened area.

This risk is assessed as negative, of low magnitude, irreversible (permanent).

Mitigation Measures

- Implement a **Chance Find Procedure** in the ESMP, which ensures the correct management of findings that could have archaeological value.

Residual Impact

The residual risk of negative impacts on the archaeological heritage remains low.

Landscape and Public Space

Impact Assessment

Impact Description	Visual and landscape impact		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The activities of the construction phase and presence of worksites have a negative effect on the perception of the landscape (visual alteration).

This impact is valued as low negative, and transitory.

Mitigation Measures

Mitigation measures are not considered for this impact.

Residual Impact

The residual impact is considered low.

Impacts - Operational Phase

Services by Network (Access to Drinking Water)

Impact Assessment

Impact Description	Impacts of increased quality and reliability of access to potable water		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The main objective of the Program is to implement improvements in the water systems, as well as to install disinfection systems that will improve the quality of drinking water for the population in the beneficiary villages.

Given the benefits derived from the Program's actions on the integral and sustainable improvement of access to potable water, it is considered a positive impact of medium magnitude.

Mitigation Measures

No measures to enhance this impact were identified.

Residual Impact

The residual impact is qualified as positive, of medium magnitude.

Occupational and Community Safety

Impact Assessment

Impact description	Risk of accidents (occupational / road) in operation and maintenance tasks of the water systems		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The operation and maintenance of the built / improved infrastructure gives rise to risks of accidents and occupational diseases. These can arise from exposure to energized equipment, ergonomic hazards, road safety hazards, etc.

These are qualified as a low negative impact, of a permanent nature.

Mitigation Measures

- Establish an Occupational Health and Safety Program in the ESMP for the operational phase, which complies with the requirements of current national and local regulations.
- Establish a Contingency Plan in the operational ESMP, which ensures the response to medical emergencies.

Residual Impact

As a result of the proper implementation of the proposed mitigation measures, the residual impact associated with occupational safety is considered of low magnitude.

Residential use

Impact Assessment

Impact Description	Positive impacts on residential activity due to access to drinking water		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAol)	Local (IAol)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The improvement of access to and quality of drinking water would lead to the reduction of public health problems related to the unsafe water consumption, and therefore a medium positive impact, of a permanent nature, and an indirect benefit are considered.

Mitigation Measures

No mitigation measures are considered for this impact.

Residual Impact

The residual impact is considered medium positive.

5.11 Environmental and Social Residual Impacts Matrix

After applying the mitigation measures identified for Project's environmental and social impacts and risks, the matrix of residual environmental and social impacts is obtained, shown in Figure 1.

Matrix for the Identification of Environmental and Social Impacts and Risks Belize Water and Sanitation Program for Rural Areas (BL-L1045) Assessment of Representative Sample				PROJECT ACTIVITIES WITH ENVIRONMENTAL AND SOCIAL IMPACT		STAGES														
						Work preparation		CONSTRUCTION			OPERATION									
Transportation, movement and stockpiling of materials, equipment and machinery. Labor mobilization.		Land clearing, dismantling of existing facilities (where applicable)		Civil works for improvement in pumping houses, tanks, well protection works		Installation of new disinfection systems		Demobilization of construction sites and workers. Removal of surplus materials. Camps closure		Operation of Improved Water Systems		Maintenance of Improved Water Systems								
ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED BY THE PROJECT														A	B	C	D	E	F	G
PHYSICAL AND BIOLOGICAL ENV	AIR	Gaseous emissions and particulate matter		1																
		Noise and vibrations		2																
	WATER	Water table and groundwater. Surface water courses		3																
	SOIL	Soil		4																
	BIOTA	Flora (vegetation cover, shrubs, trees), Wildlife		5																
SOCIO-ECONOMIC ENVIRONMENT	INFRASTRUCTURE AND SERVICES	Mains services (water)		6																
		WASTE MANAGEMENT	Municipal Solid waste	7																
			Hazardous or special waste	8																
			Construction waste	9																
	OCCUPATIONAL AND COMMUNITY HEALTH AND SAFETY	Risk of accidents (occupational, community)		10																
	SOCIO-ECONOMIC DEVELOPMENT	Labor employment. Commercial and service activities.		11																
	CULTURAL HERITAGE	Cultural, Archaeological and Paleontological Heritage		12																
	LAND USE	Residential use		13																
	LANDSCAPE	Visual impact. Landscape perception		14																

Impact sign and magnitude

High

Negative

Medium

Low

High

Positive

Medium

Low

Neutral

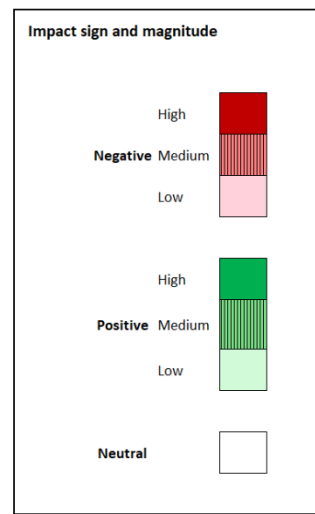


Figure 1 - Project Residual Environmental and Social Impacts and Risks Matrix

5.13 Risk Analysis

The preceding analysis considers the impacts and risks caused by the project implementation on the environment, whether physical, biological, or socioeconomic.

To complement this analysis, an analysis will be made of: (i) Disaster and climate change risks to the project and its feasibility, and (ii) Risks that the project will increase the vulnerability of human populations to existing disaster and climate change risks.

Risk Definition

For the purposes of this Study, a risk is defined as any element or situation of the environment (physical or anthropic) that may represent a threat to the Project, and that is caused by external (not predictable) forces.

Project Risk Identification

The risks in the project areas include:

- **Hurricanes and tropical storms** causing severe losses from wind damage and flooding due to storm surges and heavy rainfall.
- **Flood** damage due to its low-lying land and exposed positions on the coast; low lying topography makes the country's coastal areas especially vulnerable to sea level rise.
- **Extreme temperatures.**

Project Criticality and Vulnerability

The criticality and vulnerability of the Project is defined according to the criteria included in the criticality graph presented below in **Figure 2**.¹⁰

¹⁰ Methodology for Assessing the Risk of Disaster and Climate Change in IDB Projects (Downloadable at <https://publications.iadb.org/es/metodologia-de-evaluacion-del-riesgo-de-desastres-y-cambio-climatico-para-proyectos-del-bid>)

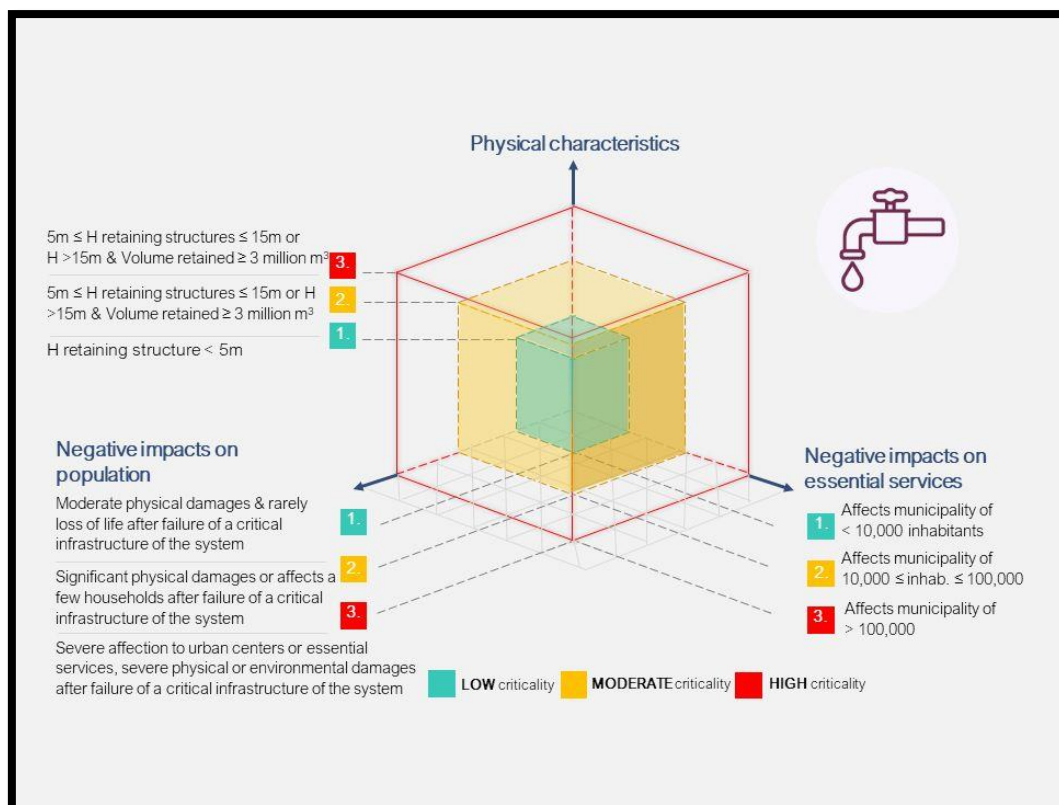


Figure 2 – Criticality graph for drainage, water supply and wastewater management (WSA) infrastructure¹¹

The criticality and vulnerability of the infrastructure component of the project is classified as **Moderate**, following the criteria shown in the criticality chart for roads/water, sanitation or drainage/hydroelectric dams/schools/irrigation/neighborhood improvement/hospitals (see below): (i) For project areas, analyzing the physical characteristics of the infrastructure (water systems) and the magnitude of the works (significantly less than 10,000 served connections), the criticality is classified as low, (ii) the negative impacts on population is low because the infrastructure considered in the project - in case of failure of the works - would not affect a population greater than 10,000 inhabitants, and (iii) level of significant physical damages or affects a few households after the failure of critical infrastructure of the system is moderate. Therefore, the criticality is rated as **Low**.

Considering the hazards levels identified and the hazard context of the country, the criticality and vulnerability estimated for the infrastructure's interventions, and the level of risk exacerbation, a **Moderate** classification is adequate. The Project will contribute to improving the quality of the provision of potable water services to the population.

It is requested as a project preparation criterion that, prior to the start of work, the contractor, as part of the ESMP, develop risk analysis and implementation of mitigation measures, in accordance with the Disaster Management and Emergency Response Program of the ESMP.

To conclude the analysis, considering the identified threats, the estimation of criticality, vulnerability of interventions and levels of risk exacerbation, the risk classification is determined as **Moderate**, not

¹¹ *Ibid.*

requiring a complete qualitative evaluation.

6. Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) is a tool that guides the environmental and social implementation of any development project, providing procedures for environmental and social management.

This Plan will guide the Executing Agency (SIF), to ensure an adequate level of environmental and social management in the construction activities of the projects. The ESMP outlines necessary environmental and social mitigation measures during the constructive stage of the infrastructure included in the Project, and the development phase of management and operational activities.

6.1 Roles and Responsibilities

Design

During the design phase of the interventions, SIF, as the Executing Agency of the Program (EA) will develop the executive project (engineering design) of each project to be financed under the Program.

SIF will prepare the bidding documents for the works, and the environmental and social specialist from the EA will incorporate the necessary environmental, social, and occupational health and safety clauses and requirements, both general and specific to the project, which arise from this ESA and ESMP, and including the needs for reporting and monitoring. These aspects will be included in the Environmental and Social Technical Specifications.

The bidding documents must outline the minimum content of the Environmental and Social Management Program at the constructive level (ESMPc).

The proposals received during the bidding process for the works must contain a budget that includes the cost of implementation and compliance with the environmental, social, and occupational health and safety mitigation measures required by the project, to guarantee compliance with the IDB ESPF and applicable national and local regulations.

Construction

Prior to the start of the works, SIF will conduct the due diligence with the applicable environmental authority (Department of the Environment) to obtain any required environmental permit for the works, for those cases in which it is required, or a written confirmation that an environmental permit is not required.

During the Construction Phase, the Contractor Company will be responsible for preparing and implementing the Construction Environmental and Social Management Plan (ESMPc), as well as obtaining the environmental and occupational health and safety qualifications and insurances required according to the national and local regulatory framework. The Contractor will also need to obtain others applicable permits, which could include tree cutting permits, easements, excavation permits, construction permits, public road occupancy permits, waste disposal permits, etc.

Before the start of the works, the Contractor must submit to the EA, for its approval, a Construction Environmental and Social Management Program (ESMPc). This ESMPc will contain, as a minimum, the

programs and subprograms detailed in the following section of this ESA, together with the specific recommendations that arise from the analysis of the project and as reflected in the Environmental and Social Technical Specifications of the bidding documents.

Once the ESMPc is approved, the Contractor Company will be responsible for its compliance, using the necessary means to implement the Programs that are formulated within its framework. The Contractor Company must have an environmental and social representative and a person responsible for hygiene and safety, who will be responsible for carrying out the implementation of the ESMPc. Likewise, the contractor must comply with and make the operators and subcontractors comply with all the provisions contained in said Plan, national and local environmental legislation, and the IDB Environmental and Social Policy Framework, during all stages of the execution of the works. at your expense.

The Contractor Company will prepare monthly reports to SIF, detailing the actions and results of the ESMPc implementation.

The inspection, control, and monitoring activities of the ESMPc will be carried out by SIF. SIF may carry out inspection visits, prepare reports for internal use for the Project, and determine and impose corrective measures based on the stipulations of the bidding documents.

The environmental authority (DOE) may also carry out control audits of the work.

At the end of the works, the Contractor must submit a Final Environmental and Social Report, which includes the information corresponding to the implementation of ESMPc, including records of implementation of plans and programs, and a report on compliance with all environmental and social indicators considered at different stages of the project cycle.

Operation and Maintenance

During the operational stage, SIF will be responsible for the operation and maintenance of the infrastructure built under the Program, in accordance with its current environmental policies and environmental and social management systems, including the ESMP for the operational and maintenance stage of each work.

Role of IDB

The IDB will be in charge of reviewing and supervising the implementation, by SIF, of the environmental and social management system for all projects under the Program. This includes the review and approval of the semi-annual environmental and social compliance reports submitted by SIF, as well as the performance of environmental and social supervision missions. This follow-up is carried out at all stages of the project cycle.

Table 32 summarizes the environmental and social management responsibilities of the entities involved in the different phases of the projects.

Table 32 - Roles and Responsibilities for E&S Management of the Projects

Project Cycle Phase	Activity	Responsible Party	Monitoring	Supervision
Design	Grievance Redress Mechanism (for the duration of the Program)	SIF		IDB
	Executive Project / Engineering Design	SIF		IDB
	Environmental and Social Assessment	SIF (may use external consultants)		IDB
	Public Consultation	SIF		IDB
	Preparation of E&S Technical Specifications for Bidding Documents	SIF		IDB
	Environmental Permits	SIF		DOE
Construction	ESMPc: Preparation and Implementation	Contractors	SIF	IDB
	Environmental and Social compliance during construction	Contractors	SIF / DOE	IDB
	E&S Progress Reports	Contractors to SIF (monthly)	SIF	
	E&S Progress Reports	SIF to IDB (half-annually)		IDB
	Final E&S Report	Contractors	SIF	
	Final E&S Report	SIF		IDB
Operation	Operation and maintenance of the water infrastructure	VWB	MRD	IDB (for a period of 3 years after commissioning)

6.2 Environmental and Social Management Plans

Mitigation measures were grouped into two different ESMPs, each one targeting different phases of the project:

- **Construction ESMP:** aimed at mitigating the impacts and risks of construction activities (see Section “Impacts of the Infrastructure: Construction Stage”).
- **Operational ESMP:** aimed at mitigating the negative impacts and risks of the operational stage (see Section “Management and Operational Activities in PA and Conservancies”).

Construction Environmental and Social Management Plan

This ESMP presents the minimum environmental and social guidelines that must be implemented during the construction activities of the project's infrastructure.

Based on these guidelines, the Contractor Company must prepare the final version of the construction ESMP, which will contain at least all the programs described below.

Program Number	Program
1	Monitoring and Control of Compliance with Mitigation Measures
2	Construction Sites
3	Flora and Fauna management
4	Waste Management
5	Effluent Management
6	Chemicals Management
7	Occupational and Community Health and Safety
8	Pest and Vector Control
9	Socio-Environmental Training for Site Personnel
10	Disaster Management and Emergency Response
11	Community Information and Participation
12	Chance Find Procedure
13	Works Closure

Below, the guidelines for each of the Construction ESMP programs are presented.

Program 1: Monitoring and Control of Compliance with Mitigation Measures

Program 1: Monitoring and Control of Compliance with Mitigation Measures	
Socio-environmental effects to be prevented or corrected:	Deviations in implementation of mitigation measures
Management Measures	
<p>For the supervision of compliance with the mitigation measures identified, the Contractor will plan and keep updated a "control panel", which will serve to supervise the execution of each Mitigation Measures planned for the Construction Stage. It shall indicate, at least:</p> <ul style="list-style-type: none">• actions to be implemented,• necessary material resources,• responsible staff,• indicators of compliance, goals, and frequency of monitoring.	
Monitoring and Compliance	
Indicators <ul style="list-style-type: none">• Number of ESHS Non-Conformities (environmental, social and safety and hygiene) identified during the inspections.• Number of ESHS Non-Conformities closed on time.	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 2: Construction Sites

Program 2: Construction Sites	
Socio-environmental effects to be prevented or corrected:	Minimize the environmental and social impacts of the preparatory activities of the works
Management Measures	
<p>The works sites must guarantee the minimum impact of the environment and must consider:</p> <ul style="list-style-type: none"> • a materials deposit/collection sector, • a waste collection sector, • provision of water for sanitary use and work use, • appropriate signage, • first aid kit, • electric generator with waterproof base, if necessary, <p>Among the particular recommendations, the following are defined:</p> <ul style="list-style-type: none"> • Work sites will be provided with adequate communication equipment, to able the request of help against emergencies (radios, if necessary). • Work sites will be provided with fire extinguishers or another adequate system against fires. • Personnel must be trained to act in emergency situations, and in the practice of first aid and adequate hygiene practices. • After the finalization of construction activities in each work site, all the remains of materials must be removed. • Raw materials such as: bricks, cement, wood, iron for construction, waterproofing, membrane, additives, wire, nails, sima mesh, etc., will be preferably provided by local businesses and industries. It will be verified that the suppliers comply with the applicable environmental regulations regarding the use or exploitation of natural resources. • The drainage of water surpluses, of the movements and stockpiles of the soil, will be conducted respecting as much as possible its natural course and the levels of runoff of the land, to avoid erosion impacts. <p>Existing Environmental Liabilities.</p> <p>Proper disposal of soil should be exercised for the project in Indian Creek, where visual inspection during the project's due diligence suggests the presence of hydrocarbon spills from the onsite generator.</p>	
Monitoring and Compliance	
Indicators <ul style="list-style-type: none"> • Number of the work sites where the management measures were implemented / number of the current work sites. 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 3: Flora and Fauna Management Program

Program 3: Flora and Fauna Management Program	
Socio-environmental effects to be prevented or corrected:	Impacts on vegetation cover and wildlife
Management measures	
<p>Flora</p> <ul style="list-style-type: none"> Once the construction sites are defined, the net area of loss of natural vegetation shall be calculated. The Contractor must implement a revegetation scheme to achieve zero net loss of vegetation. These activities will be agreed with EA prior to the works starting. The minimum compensation ratio for tree removal is 3:1 (3 new trees for every tree removed) The quantification of the revegetated area will be conducted in the fourth month after planting, counting the surviving vegetation. The removal of the vegetal cover will be conducted immediately prior to the execution of the construction activities. The time on the construction sites shall be reduced to a minimum, in order to reduce the disturbance of the natural habitat. The top layer of excavated soil should be stored separately. This soil will be used for ground levelling activities, respecting the edaphic sequence. The introduction of invasive species in revegetation activities is prohibited. <p>Fauna</p> <ul style="list-style-type: none"> Workers must be trained in the identification and protection of native vegetation and wildlife, and how to proceed when encountering potentially dangerous animals. Establish measures to drive away fauna in areas where the clearing of vegetation will take place. The activity will target animals with greater locomotion capacity, mainly medium and large mammals, birds and large lizards. These animals should be chased away to adjacent areas without the need for capture. In the case of less mobile species, their rescue and relocation to nearby areas should be promoted. It is recommended to establish low circulation speeds Proper planning of activities to minimize the presence of workers in natural environments. Whenever possible, the use of machinery will be limited and/or equipment with low noise levels will be used. Hunting ban in the project area. <p>San Antonio Village Project. Special care should be exercised in the case of the works in the storage tank in San Antonio, which is located adjacent to a natural area.</p>	
Monitoring and Compliance	
<p>Indicators</p> <ul style="list-style-type: none"> Vegetation cover surface removed, Revegetated cover surface surviving after the fourth month. 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 4: Waste Management Program

Program 4: Waste Management Program	
Socio-environmental effects to be prevented or corrected:	Pollution due to improper handling of waste generated on site.
Management measures	
<p>The generation of waste during the construction stage includes similar to household waste (low hazard) and special waste (dangerous). The first category may include packaging waste, plastics, pipe cuttings, wood, cardboard, food scraps, wires, bags of lime and cement, cables, brick, etc. The second category may include items such as rags, wood, filters, gloves, or other solid items contaminated with oils, hydrocarbons, traces of solvents, varnishes, paints; waste from coating and welding electrodes; used oils; containers or packages with remains of the mentioned substances.</p> <ul style="list-style-type: none"> The personnel must be duly trained to differentiate these two groups of waste and maintain their separation between them throughout the entire development of the works, as well as for their correct handling and management. All waste shall be stored separately, according to their nature (reusable or recyclable, household waste, special waste), under suitable conditions to preserve their characteristics and avoid dispersion. The burning or burial of any type of waste generated during the construction period, whether household or special, solid, or liquid, nor the dumping of any type of waste into watercourses or soil will be permitted. Under no circumstances will unattended waste be left on the construction sites, which can be accessed by animals or people. A register of the waste generated in each work site must be carried out, recording the type, volumes, and characterization of waste. whenever possible, the washing of tools and machinery on the construction site will be avoided. When it cannot be avoided, a site will be provided for temporary storage of effluents, which must be removed from the Project Area at the end of each work. <p>Low hazard waste</p> <ul style="list-style-type: none"> If the recycling of some similar-to-household waste is technically and economically feasible, it shall be carried out. If recyclable materials are useful for local residents, they will be delivered to whom request it (after consultation and agreement with the local residents). The waste that was not reused in the Project Area must be safely stored and removed immediately upon completion of each work. <p>Special waste</p> <ul style="list-style-type: none"> Special waste must be stored in suitable containers according to the substance and managed as hazardous waste, in accordance with current legislation. In case of accidental spills, the EA must be notified, and the necessary measures must be taken to contain and eliminate the hydrocarbon or chemical product. The spill must be immediately absorbed with appropriate materials (absorbent cloths, clay, etc.). The soil or vegetation contaminated will be treated as special waste. If any type of pathological waste is generated, due to any personal accident and first aid care, it must be separated and stored properly, and treated in accordance with current legislation. Special waste must be removed daily from construction sites. They can be temporarily stored outside the Project Area in suitable facilities. Its final disposition must be carried out in accordance with current legislation. 	
Monitoring and Compliance	
<p>Indicators</p> <ul style="list-style-type: none"> Volume of waste that can be assimilated to domestic waste managed in accordance with defined standards / Total volume of waste that can be assimilated to urban waste generated by the project. Volumes by type of hazardous waste managed in accordance with defined standards / Total volumes by type of hazardous waste generated by the project. Volume of dry waste and construction surplus managed in accordance with defined standards / Total volume of dry waste and construction surplus generated by the project. <p>Monitoring</p>	

Program 4: Waste Management Program	
<ul style="list-style-type: none"> • Training registration forms for key personnel in the management of different types of waste. • Hazardous waste removal records for final disposal. • Evidence of the certificate of the accredited company to make the final disposal of hazardous waste. 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 5: Effluent Management

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 5: Effluent Management	
Socio-environmental effects to be prevented or corrected:	Pollution due to inadequate management of effluents generated by work activities.
Management Measures	
<p>The drainage of water surpluses, of the movements and stockpiles of the soil, will be conducted respecting as much as possible its natural course and the levels of runoff of the land.</p> <p>Sectors where there is a risk of spills, leaks or leaks of polluting substances must be equipped with an impermeable floor and a perimeter channel connected to an independent channeling system, which will lead the rainwater that flows through them to treatment devices.</p> <p>For the treatment of the sewage effluents that will be generated during the execution of the work, portable toilets or equivalent in sufficient quantity must be installed, both in the camp and in the work fronts, being supervised by the environmental inspection manager in order to avoid an impact on water resources. The effluents accumulated in these toilets must be removed daily and at the same time sanitized, by an authorized operator or by the service provider.</p> <p>Washing of equipment and machinery (including concrete mixers) will not be permitted in the work sites.</p>	
Monitoring and compliance	
<p>Indicators</p> <ul style="list-style-type: none"> Number of effluent types managed according to defined standards / Total number of effluent types generated by the project. <p>Monitoring</p> <ul style="list-style-type: none"> Record sheet of portable toilet withdrawals and inspections by the contractor to other sources of generation. 	
Periodicity of Supervision of the degree of Compliance and Effectiveness of the Measure	Monthly
Head of Audit	Construction Inspection

Program 6: Chemicals Management

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 6: Chemicals Management Program	
Socio-environmental effects to be prevented or corrected:	Pollution due to inadequate management of chemicals used in construction activities
Management Measures	
<p>The person responsible for the work must report and clean up spills of fuels, oils and toxic substances. If there are accidental spills on the ground, they must be removed immediately and notify the Supervision. In the event that this spill exceeds an approximate volume of 5 liters, the affected soil must be removed and treated as special waste. Small spill volumes can be collected with absorbent synthetic materials, rags, sawdust, or sand. The final cleaning of the site can be done with water and detergent.</p> <p>When concrete is produced on <i>site</i>, the application of chemicals that require management measures is sometimes required.</p> <p>An inventory should be made, prior to the commencement of work, of chemical products by classifying them according to the type and degree of physical and health risks of their use.</p> <p>Any flammable substance must be properly protected, safeguarded and stored under safe and restricted conditions according to its use and degree of danger. All chemicals shall be labelled to provide essential information on their classification, the hazards involved and the safety precautions to be observed for workers.</p> <p>The persons in charge of handling the chemical products must ensure that when they are transferred to other containers, their identification and all industrial safety and occupational health precautions that must be taken are maintained, in accordance with the corresponding Plan.</p> <p>It will be mandatory that the work has the technical safety sheets of the chemical products and within the induction training they are made known to their employees. These sheets should contain detailed essential information about your identification, your supplier, your classification, your hazardousness, precautionary measures and emergency procedures. Such records shall constitute a register which shall be accessible to all interested workers and their representatives.</p>	
Monitoring and compliance	
<p>Indicators</p> <ul style="list-style-type: none"> Percentage of compliance in inspections of chemical management facilities and procedures. <p>Monitoring</p> <ul style="list-style-type: none"> Training registration sheets for key personnel in chemical management. Registration sheets for chemical substances stored on site. 	
Periodicity of Supervision of the degree of Compliance and Effectiveness of the Measure	Monthly
Head of Audit	Construction Inspection

Program 7: Occupational and Community Health and Safety

Program 7: Occupational and Community Health and Safety	
Socio-environmental effects to be prevented or corrected:	Accidents and incidents that affect occupational and community health and safety
Management measures	
<p>The contractor will verify, with the appropriate frequency, the compliance with the Requirements and Procedures of the applicable standards according to current legislation, as well as internationally recognized good practices (guidelines of the International Finance Corporation), maintaining a professional or team of professional advisers in the field.</p> <ul style="list-style-type: none"> Workers must be trained in the use of equipment and machinery, as well as in driving vehicles, to comply with all the current regulations in the protected areas. There must be clear identification of all the elements available, in addition to billboards and training notices, as a permanent pedagogical tool. The contractor is responsible for providing the PPE and for conducting an induction to its workers on the types of existing PPE, the appropriate use, the characteristics and the limitations of the PPE. <p>Occupational Health and Safety Subprogram</p> <p>A detailed recognition of the risk factors in each job and the number of workers exposed to each of them must be carried out.</p> <p>The following activities should be considered:</p> <ul style="list-style-type: none"> Conduct 5-minute safety talks each day prior to the start of work. The topics will be programmed based on the risks of the activities carried out according to the progress of the works. Procedures for carrying out activities safely. Check and inspect the proper functioning of equipment and machinery, and risk prevention equipment (fire extinguishers). Application of safety data sheets for dangerous products Provide the appropriate personal protection elements (PPE) necessary for all workers on the construction site. Delimit and use signaling for work areas and storage areas. Develop the Contingency Plan and train workers in its implementation Control the collection, treatment and disposal of residues and waste, applying basic sanitation standards. Ensure that personnel operating equipment are licensed. Train staff in Environment, Health, Hygiene and Occupational Safety. <p>The following are defined as high-risk activities:</p> <ul style="list-style-type: none"> Work at heights and on scaffolding (e.g. water storage tanks) Hot Work (Welding), Machinery maintenance Electrical work (during installation of e.g. pumps) <p>Community Health and Safety Subprogram</p> <p>This subprogram addresses the risks and impacts to the health and safety of communities affected by the project.</p> <p>The Contractor must evaluate the risks and impacts of the project on the health and safety of the affected communities, including those people who, due to their particular circumstances, are vulnerable (children, for instance). Likewise, it must propose mitigation measures in accordance with the mitigation hierarchy.</p> <p>For that, the following aspects will be considered:</p> <ul style="list-style-type: none"> Traffic and road safety. Proper signaling and delimitation of work sites Management and safety of hazardous materials. Ecosystem services: the project's impacts on natural habitats can generate risks and adverse impacts on the health and safety of the affected communities. Emergency preparedness and response (Contingency Plan) 	

Program 7: Occupational and Community Health and Safety	
Labor Management Procedure Subprogram <p>The contractor should develop a Labor Management Procedure (LMP). The objective of the LMP is to define actions and responsibilities of the employer, and it applies to employees working directly for the contractor, as well as to personnel hired through third parties (sub-contractors).</p> <p>The LMP has to establish employment relationships based on the principle of equal opportunities and fair treatment. Child or forced labor will not be allowed. The contractor (or its subcontractors) will not allow employment of children under the minimum age of employment permitted by law, and in no case below the age of 15.</p> <p>The contractor will establish a specific grievance redress mechanism for workers (and their organizations, when they exist) so that they can express their concerns about the workplace, and for directing complaints about sexual and gender violence.</p>	
Monitoring and Compliance	
Indicators <ul style="list-style-type: none"> • Frequency rate (number of accidents x 200,000/man-hours worked in the period). • Severity Index (number of serious accidents x 200,000/ man-hours worked in the period). • Fatal Accident Incidence Rate (Number of fatal accidents x 200,000/Number of exposed workers). • Number of personnel using PPE according to the risk of the activity / Total number of personnel. • Number of workers with Medical and Labour Insurance / Total number of workers in the project Monitoring <ul style="list-style-type: none"> • Work accident registration forms. • PPE delivery record forms. • Record sheets for training in the use of PPE. • Certification forms for the use of specific machinery. • Safety procedures for critical activities. • Risk analysis and checklists for critical activities. 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 8: Pest and Vector Control

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 8: Pest and Vector Control Program	
Socio-environmental effects to be prevented or corrected:	Spread of pests and vectors
Management Measures	
<p>To prevent possible effects on the health of the population, it is recommended that the Contractor hire the services of an authorized and competent company, whose responsibility will be:</p> <ul style="list-style-type: none"> - Perform pest disinfection, prior to the removal of green waste and soil movement. - Coordinate with municipal authorities actions aimed at avoiding the deposit of MSW in adjacent properties without building and in the side streets. <p>Anticipating the use of products with side and residual effects, it is suggested to request and control the protocols of the products used for the elimination of pests.</p> <p>The waste generated by the disinfection actions must also be managed, controlling that the company responsible for the activity proceeds to the removal of the containers used, also requiring proof of disposal of these.</p> <p>No food remains should be left or make fire, as hot food or ash can attract species such as rodents and vipers.</p>	
Monitoring and compliance	
<p>Indicators</p> <ul style="list-style-type: none"> • Number of pest and vector disinfection and control applications carried out / Total number of pest and vector disinfection and control applications provided for in the Program. <p>Monitoring</p> <ul style="list-style-type: none"> • Disinfection certificates, according to scheduled disinfection plan (estimated dates of fumigations, products to be used, safety measures to be implemented, Contingency Plan, etc.). ○ Proof of withdrawal and final disposal of baits. 	
Periodicity of Supervision of the degree of Compliance and Effectiveness of the Measure	Monthly
Head of Audit	Construction Inspection

Program 9: Socio-Environmental training for construction personnel

Program 9: Socio-Environmental training for construction personnel	
Socio-environmental effects to be prevented or corrected:	Lack of knowledge about the role of personnel in the preservation, protection and conservation of the environment and occupational safety in the exercise of their functions.
Management measures	
<p>Socio-Environmental Training</p> <p>To carry out the training, informative meetings will be held prior to the start of the work and, after it has begun, exchange and training meetings with contents adjusted to the requirements of the different works with environmental implications, and drills of acting in situations of emergency.</p> <p>The planning and execution of the training will be carried out under the supervision of the professionals responsible for safety, hygiene, and environment of the Contractor. For the implementation of this Program, the development of at least one informative, exchange and training meeting on each of the following topics will be foreseen:</p> <ul style="list-style-type: none"> • Basic induction in environmental protection. • Evaluation and control of risks. People safety. • Environmental contingencies: spills, fires, etc. • Fire Prevention and Control. • Comprehensive Waste Management. • Protection and management of plant species present in the immediate environment. • Safe handling of chemical substances. • Company Code of Conduct and Gender Issues. <p>Code of Conduct</p> <p>The Contractor shall develop and implement a Code of Conduct for Site Personnel to be included in employment contracts (Contractor and Subcontractors) – in accordance with the guidelines included in the PGL. The Contractor shall take the necessary measures and precautions in order to avoid the generation of gender, social, political, cultural or racial conflicts, and to prevent tumult or disorder on the part of the construction personnel and employees hired by them or by their Subcontractors, as well as for the preservation of order, the protection of the inhabitants and the security of public and private property within the area of influence of the project.</p> <p>This Code prohibits harassment, violence or exploitation, and racism. It must be applied during the working day and outside it, by all the people involved in the project.</p> <p>Sanctions, fines, or dismissals will be applied for non-compliance or infringement of the established rules of conduct, depending on their degree of severity.</p> <p>All construction personnel, regardless of their level of hierarchy, must attend talks and training on the Code. The contractor must implement during the development of the work for all the personnel affected by the work, at least two activities on non-discrimination and gender equity, focused on the following topics: 1) Sexual exploitation of children and adolescents including labor and criminal consequences; and 2) Relationship between men and women at the work level.</p> <p>For the aforementioned activities, an Action Plan must be previously submitted for approval by the Construction Management, which includes in detail those responsible for their implementation, form of work and schedule. At the end of the activities, an evaluation report must be submitted.</p> <p>The contractor must implement, within a period of time to be agreed with the Construction Management, a protocol of sexual harassment at work.</p> <p>In addition, the camp must have hygienic cabinets and changing rooms for people of both sexes, properly installed and signposted. This requirement must be met both for the facilities of the company's personnel and for the premises destined for the Construction Management.</p>	
Monitoring and Compliance	
<p>Indicators</p> <ul style="list-style-type: none"> • Percentage of personnel trained in accordance with the Training Program. • Percentage of training sessions given out of the total training sessions required according to the Training Program. 	
Responsible for the implementation of the measure	Works Director

Program 9: Socio-Environmental training for construction personnel	
Responsible for the control of the measure	Works Inspector

Program 10: Disaster Management and Emergency Response

Program 10: Disaster Management and Emergency Response	
Socio-environmental effects to be prevented or corrected:	Human, economic, and environmental losses associated with an emergency situation and protect areas of social, economic and environmental interest located in the area of influence of the project.
Management measures	
<p>Contingency Prevention and Control Strategies</p> <p>Contractor Responsibilities:</p> <ul style="list-style-type: none"> • Comply with and enforce the general and special regulations, rules, procedures and instructions on health, hygiene, and occupational safety, for which it must: • Prevent and control all risks that may cause accidents at work or professional illnesses. • Identify and correct unsafe conditions in work areas. • Enforce the standards and procedures established in the programs of the environmental management plan. • Develop programs to improve working conditions and procedures aimed at providing greater safety guarantees in the execution of work. • Carry out training and awareness campaigns for workers in relation to the practice of Occupational Health. • Periodically inform each worker about the specific risks of their job, as well as those existing in the work environment in which they work, and indicate the correct way to prevent them. • Ensure that the design, engineering, construction, operation and maintenance of equipment and facilities at the service of the company are based on the norms, procedures and safety standards accepted by the Construction Supervision. • Establish periodic and preventive maintenance programs for machinery, equipment, and locative facilities. • Facilitate the practice of inspections and investigations that, on occupational health conditions, are carried out by the competent authorities. • Provide workers with the necessary and appropriate personal protection elements according to the risk to be protected and in accordance with Industrial Safety recommendations, considering their selection according to use, service, quality, maintenance and replacement. • Define the response plan for emergencies that may occur, with inputs from the National Emergency Management Organization (NEMO) • Have the necessary resources and materials to respond to emergencies. <p>Workers Responsibilities:</p> <ul style="list-style-type: none"> • Carry out their tasks observing the greatest care so that their operations do not result in unsafe acts for themselves or their colleagues, equipment, processes, facilities and the environment, complying with the standards established in this regulation and in the management plan programs environmental. • Carefully monitor the behavior of the machinery and equipment under his charge, in order to detect any risk or danger, which will be communicated in a timely manner to his immediate superior so that he proceeds to correct any human, physical or mechanical failure or environmental risks. that arise in the performance of the work. • Refrain from operating machines or equipment that have not been assigned for the performance of their work, nor allow unauthorized personnel to handle the equipment under their responsibility. • Do not introduce alcoholic beverages or other intoxicating, narcotic or hallucinogenic substances into the workplace, nor appear or remain under the influence of said substances in the workplace. • Workers who operate machines and equipment with moving parts will not wear loose clothing, rings, hoops, bracelets, chains, watches, etc., and if they wear long hair, they will tie it up with a cap or hairnet that completely holds it. • Safely use and maintain work items, safety devices and personal protection equipment supplied by the company and maintain order and cleanliness in workplaces and services. • Collaborate and actively participate in the programs for the prevention of occupational accidents and occupational and community illnesses scheduled by the company, or with its authorization. 	

Program 10: Disaster Management and Emergency Response	
<ul style="list-style-type: none"> • Report in a timely manner the execution of procedures and operations that violate safety regulations and that threaten the integrity of those who execute them, their co-workers and company assets. • The company's vehicle drivers must abide by and comply with the provisions and internal traffic regulations and those of the protected areas, in the execution of their work. • Propose activities that promote Occupational Health in the workplace. • Implement the actions defined in the protocols and strategies for action in emergencies. <p>Fire prevention and control:</p> <p>The Contractor must prevent and/or control fires in its workplace and will use its equipment and fire extinguishers if necessary. The following actions will be implemented:</p> <ul style="list-style-type: none"> • Fight the fire with the closest fire extinguishers to prevent its spread. • Request external support to control the event when necessary, and initiate control procedures with available resources (first response). • Provide the means to maintain permanent communication (radios or telephones). • Evacuate people from the work front and from the camp until the emergency is controlled. • Identify and evaluate the emergency establishing the point of occurrence, the cause, the magnitude, the consequences, the actions to follow and the necessary support for control. <p>Actions in case of floods:</p> <ul style="list-style-type: none"> • If there is any chance of flash flooding, staff should immediately move to higher ground. • Maintain alertness for streams, drainage channels, and other areas that may be flooded suddenly. • Do not drive through flooded areas. <p>Once the emergency is controlled, the emergency coordinator will prepare a final report on it.</p>	
Monitoring and Compliance	
<p>Indicators</p> <ul style="list-style-type: none"> • Number of environmental and health accidents managed in accordance with the defined procedure / Total number of environmental and health accidents that occurred in the project. 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 11: Community Information and Participation

Program 11: Community Information and Participation	
Socio-environmental effects to be prevented or corrected:	Misinformation of the public regarding the progress and tasks of the project.
Management measures	
Responsibilities of the Contractor <ul style="list-style-type: none"> The information regarding the implementation and progress of the project will be kept up to date to provide an immediate response to all types of queries, observations, complaints, and claims, identifying problems and adopting actions for their solution at the request of the Works Inspection. A complaints book will be made available to the population, as well as a 24-hour contact telephone number, an e-mail address, and a web interface through which the community can send their claims, complaints, and suggestions. All comments must be analyzed and must have a quick response. The Community Information and Participation Program must be implemented throughout the cycle of the work and with special consideration of reaching all the people benefited by the Program in a clear, transparent, and timely manner. The Contractor will establish a modality of linkage with the community affected by the development of the Work, to whom it will inform about the schedule and the degree of progress of the works. Access to information will facilitate equal access, promoting gender equity, to all interested social sectors. 	
Monitoring and Compliance	
Indicators <ul style="list-style-type: none"> Percentage of complaints managed properly during the month according to the defined mechanism over the total number of complaints generated. Percentage of public consultations carried out over the total number of public consultations required. 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 12: Chance Find Procedure

Program 12: Chance Find Procedure	
Socio-environmental effects to be prevented or corrected:	Destruction of historical, cultural, archaeological, and paleontological heritage.
Management measures	
<p>This Program will be implemented throughout the period that these tasks are carried out.</p> <ul style="list-style-type: none"> • A permanent monitoring will be carried out, in search of archaeological elements, in the entire area of direct intervention of the project. • In case of finding any property of possible archaeological interest, the builder must immediately order the suspension of activities that could affect the area. Surveillance should be left in the area of the archaeological sites in order to avoid looting. • If necessary, a new alternative regarding the location of the works should be considered. • The competent national authority will be notified, and their instructions will be followed to proceed with the findings. • Salvage work should be applied to cultural remains that appear during ditching, earth removal, excavations, etc. The rescue will be done in the shortest possible time, but respecting the context of the archaeological remains as much as possible. This must be done by a recognized archaeologist and under supervision. The archaeologist will inspect to determine when and where work can resume. Upon completion of the works, a final report will be prepared detailing the amount and type of material recovered, which will be delivered to the competent authority. • The competent authority should be consulted about the delivery of archaeological materials. 	
Monitoring and Compliance	
<p>Indicators</p> <ul style="list-style-type: none"> • Number of archaeological and cultural resources found in the project and managed according to the defined procedures / Number of archaeological and cultural resources found in the project. 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Program 13: Works closure

Program 13: Works closure	
Socio-environmental effects to be prevented or corrected:	Impacts on the environment once the work is finished.
Management measures	
<ul style="list-style-type: none"> • All the installations used in the execution of the works will be removed. • The study of environmental and social liabilities will be carried out and those detected will be remedied. • All waste and solid materials must be transferred to sites approved by environmental and social supervision. • In the places where the vegetation was removed, it must be revegetated with the use of the same species that were previously found. • Leftover reusable or recyclable materials may be donated. The delivery of materials that constitute environmental liabilities will be prohibited. • Burning of waste during the dismantling process is prohibited. • The dismantled sites must be left in perfect condition and integrated into the environment. 	
Monitoring and Compliance	
Indicators <ul style="list-style-type: none"> • Absence of claims by the authorities, the surrounding population, and the community in general. monitoring <ul style="list-style-type: none"> • Photographic record before and after work 	
Responsible for the implementation of the measure	Works Director
Responsible for the control of the measure	Works Inspector

Operational Environmental and Social Management Plan

This ESMP provides mitigation measures for the negative impacts and risks for **the operation and maintenance phase** of the implementation of the projects.

Table 33 outlines the minimum requirements that the Environmental and Social Management Plan must meet for the Operational Phase.

During the Operational Phase, each Village Water Board (and system operators, where applicable) will be in charge of the operation and maintenance of the infrastructure to be built and of the equipment and machinery, according to the guidelines presented below.

Table 33 - Operational Environmental and Social Management Plan

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
Chemicals Management Program	Contamination due to inadequate management of hazardous chemicals used for disinfection	Development and implementation of a Hazardous Chemicals Management Plan (based on the chemicals' MSDSs and recommended handling procedures).	SIF	Environmental Audit of the Site	DOE
Occupational Health and Safety Program	Occupational risks due to the operation and maintenance of water system infrastructure	Compliance with current national regulations. Adopt international best practices	SIF	Frequency Index (number of accidents x 200,000/man-hours worked in the period). Severity Index (number of serious accidents x 200,000/man-hours worked in the period). Fatal Accident Incidence Rate (Number of fatal accidents x 200,000/Number of exposed workers).	Competent authority
Grievance Redress Mechanism	Impacts on local community and workers of the work for the non-attention to the claims and complaints.	There must be an efficient tool for receiving, registering, monitoring and resolving claims.	SIF	Registration of claims and complaints	
Preventive Maintenance Program	Contingencies for failures that may leave water networks out of service	Implement a regular maintenance program of water systems Implementation of a monitoring plan for the detection of leaks or failures	SIF	Maintenance record sheets.	

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
Training Program	Lack of knowledge about the role of personnel in the preservation, protection and conservation of the environment and occupational safety in the exercise of their functions.	Minimum training: - Basic induction in environmental protection and safety. - Labor protection in the task of waste classification. PPE and good practices. - Risk assessment and control. Security of persons, movable and immovable property. - Fire Prevention and Control. - Spill prevention and spill management - Sludge management - Electrical Work -Road safety	SIF	Percentage of operators trained according to Training Program Training Registration Sheets	
Contingency Plan	Poor management of environmental/occupational contingencies	Strategic Plan Define the structure and organization for emergency response, the roles and responsibilities of the people in charge of executing the plan, the necessary resources, and the preventive and operational strategies to be applied in each of the possible scenarios, defined from the evaluation of the risks associated with construction. Action Plan Establish the procedures to be followed in case of emergency.	SIF	Number of environmental and safety accidents managed according to the defined procedure / Total number of environmental and health accidents occurring in the project.	

6.3 Budget for Implementation of the ESMP

Table 34 includes the estimated costs, schedules, and responsible entities for the implementations of the ESMPs.

Table 34. Costs, Schedules, and Responsible Entities for the implementations of the ESMPs.

Measure	Description	Estimated cost	Schedule	Responsible
Implementation of Mitigation Measures and Programs of Construction ESMP	Preparation of the ESMP at the construction level and implementation during the construction of the project; socio-environmental monitoring of the works.	1,5% of the total cost of the Project	From the beginning of the works, until their finalization	Contractor
Implementation of Mitigation Measures of Operational ESMP	Incorporation of mitigation measures for the operational stage within the project activities	[incorporated in VWB operational budget]	Throughout the lifecycle of the infrastructure	VWB

The cost for the implementation of the ESMP mitigation measures and programs is indicative and does not constitute a prescriptive element of contractual obligation. The implementation of the ESMP is monitored exclusively in terms of its performance (results), and not based on the inputs used (resources expended by the contractor).

7. Conclusions

This Environmental and Social Analysis evaluated the environmental and social impacts and risks associated with the Projects of the representative sample of the Belize Water and Sanitation Program for Rural Areas (BL-L1045).

The analysis of impacts and risks focused on the interactions between project activities and the components of the physical, biological, and socioeconomic environment likely to be affected.

As usual in works of these characteristics, there are potential impacts and risks, mainly in the construction phase, such as negative impacts due to the risk of occupational accidents during the works, air pollution due to emissions from vehicles and machinery affected by the work, noise and vibrations, risk of soil contamination due to accidental spills, risk of soil erosion and sediment runoff, and risk of contamination due to poor management of the solid waste generated.

These negative impacts of the construction phase are limited in time, occur during the work period, and affect only the direct area of influence of the projects. For this impacts and risks, the application of adequate mitigation measures detailed in Chapter 5 of this ESA is foreseen, and good construction practices that guarantee compliance with national regulations, and the IDB Environmental and Social Performance Standards.

In the operational phase, the projects will have a positive impact for the beneficiary localities due to improvements in the water supply reliability and quality.

For these reasons, the negative impacts and risks of the construction phase are considered mitigable and acceptable. The positive impacts, in turn, occur throughout the useful life of the works, providing environmental, health and socioeconomic benefits derived from the improvement in access and quality of potable water.

Therefore, the operation is considered feasible, **without significant negative socio-environmental risks or impacts that cannot be mitigated.**

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Annex 1. Stakeholder Engagement Plan

Introduction

As part of the socialization process of the Belize Water and Sanitation Program for Rural Areas (BL-L1045), this Stakeholder Engagement Plan was developed.

This Plan sets out the general principles of participation and a collaborative strategy to identify stakeholders and plan a participatory process in line with Environmental and Social Performance Standard 10: "Stakeholder Engagement and Information Disclosure" along with ESPS 1 "Assessment and Management of Environmental and Social Risks and Impacts" and ESPS 9 "Gender Equality".

Stakeholder engagement is an inclusive, continuous, and iterative process that takes place throughout the project lifecycle (preparation, implementation, and closure). The process must be properly designed and carried out, sustained by the establishment of solid, constructive, and responsive relationships that are important for the satisfactory management of the environmental and social risks and impacts of the Program/Project.

The nature, scope and frequency of stakeholder engagement is commensurate with the nature and scale of each project, its development and implementation schedule, and its potential risks and impacts. SIF will be responsible for defining and evaluating the necessary instances of participation and dissemination of the works.

The entire participation process must be properly documented. SIF shall take steps to maintain confidentiality where required and where necessary to protect personal data.

It is in this context, the following Stakeholder Engagement Plant is proposed, which presents the minimum guidelines and criteria to carry out the consultation process.

Objective

The objective of the consultation process is to present to the affected population and other interested parties the description of the Project, its potential environmental and social impacts and the mitigation measures planned to ensure adequate environmental and social management during the execution of the works, and their subsequent operation.

This instance of participation aims to respond to the doubts and concerns that may arise, and to collect suggestions which will be evaluated in order to determine the possibility of incorporating them into the design of the Project, when appropriate.

Institutional Arrangements for Plan Implementation

SIF as the Executing Agency is responsible for leading and implementing the Project Consultation Plan.

Consultation Process

The programming and dissemination of the consultation should be carried out in such a way as to ensure the participation of stakeholders. Every effort will have to be made to involve groups likely to be affected by the activities of the project, and those groups that have been identified as stakeholders, regardless of whether they do not belong to the affected population.

It is important to recognize the reduced accessibility to these consultation spaces by populations with greater vulnerabilities such as women, aboriginal communities, in situations of immobility, in street situations, LGBTIQ + populations (lesbian, gay, bisexual, trans, intersex, queer), among others. With this, it must be ensured that the call is made considering the obstacles that these populations may face for participation.

The consultation process shall consider at least the following elements:

- **Stakeholder Mapping**
- **Documents to disclose and availability of information**
- **Dissemination of the consultation process through the SIF website, social media and other means**
- **Development of content and documentation to be socialized**
- **Public consultation procedure**
- **Report of the public consultation process**

Below is a brief description of the requirements to be considered at each stage of the consultation process.

Stakeholder Mapping

Stakeholder mapping consists of identifying the directly affected population and organizations relevant to the consultation.

From a preliminary identification, it emerges that, at a minimum, the stakeholders presented Table 35 should be included in the process.

It is important to note that the proposed stakeholder mapping is preliminary, and that the final selection of the stakeholders can be adjusted by SIF and the villages and water boards involved. Therefore, any other stakeholders that the authorities consider appropriate to invite to contribute to guaranteeing a broad, representative and meaningful participatory process may then join.

Table 35 - Stakeholder Map

Guy	Stakeholder	Relationship with the Program/Project
Institutional Stakeholders	SIF	Executing Agency
	Beneficiary Villages (authorities)	Interested party
	DOE representatives	Interested party
	Stakeholders related to other infrastructure in the project areas (E.g., operators of electricity networks, etc.)	Affected party
Civil Society Stakeholders	Beneficiary Population of the Program: area residents	Affected party
	Civil Society Organizations (in particular, those working in environmental and social issues)	Interested Party
Community	Population of the villages reached by the Project and community in general	Interested Party

Documents to Disclose and Availability of Information

Below are the documents to be socialized, which must be published on SIF's website and other means, and available to the public for at least 14 days prior to the consultation events.

- Environmental and Social Assessment, including the Environmental and Social Management Plan (first draft, Fit for Disclosure)
- Summary information on the Project (description, works, etc.)

Once the information is available on the website, the consultation process will be disseminated to interested parties.

Disclosure of the Event

The invitation to the event will be made directly to the interested parties identified in the map of stakeholders, and to the public through publication in relevant information media, such as radio, local TV and / or digital media, important newspapers, and on the institutional website and social network profiles of SIF and the municipalities involved. Also, personal email submissions and brochure handing can be used, to ensure the adequate dissemination of the process.

The following information shall be detailed:

- Project Proponent
- Project/Programme
- Website with the publication of the documentation and as a space for the channeling of queries and concerns about the Project.
- Procedure of the consultation process

- Duration of the consultation process
- Topics to be addressed (Including: Project and main works to be carried out, Benefits associated with the operation of the Project, Parties involved and institutional responsibilities, Outline of the applicable regulatory framework and relevant standards, Main environmental and social impacts identified, Main management measures, and Existing mechanisms to address complaints and resolve conflicts).
- Documentation available.

The **estimated date** for the consultation events is from April 1st through April 15, 2023. To ensure participation, the consultation events will take place during weekends, and will be held at the respective local community centers.

There will be **five** consultation events (clustering villages in the north – one consultation event, center – two consultation events - and south – two consultation events - parts of the country). The stakeholders will mostly consist of institutional representation (village authorities, village water board authorities) and civil society organizations.

These consultation events will be complemented in community information campaigns, to be conducted prior to the start of the works.

Development of the Public Consultation Process

The consultation process will be carried out in person. The coordination of the process will be in charge of SIF with social specialists with experience in consultation instances.

Publication on the website

SIF must publish the ESIA for a minimum of 14 days prior to the event.

It should explain the objective of the consultation, clarifying that, although it is not in itself binding, the questions and proposals arising from the persons participating will be analyzed and answered and, where relevant, the proposed amendments will be incorporated into the Their Article.

Then the context in which the consultation takes place will be explained, and the description of the Project will be made, including its objectives, main characteristics and alternatives considered, the environmental and social impacts both in the work and operation stages, as well as the mitigation measures designed for an adequate environmental and social management of the Project.

It should be ensured that the explanation is clear, and that the language used allows the community to understand the main aspects of the project and its impacts.

The **Grievance Redress Mechanism** the Program and the available channels for making complaints or consultations on the Project will also be disclosed, regardless of those made within the framework of the consultation process.

SIF must disclose the estimated date and how the consultation report will be published so that all stakeholders can see it and make their observations, if any.

Consultation Report

A report will be prepared containing the main concerns raised (both during the consultation process and any prior or subsequent requests that may be received), indicating how they were addressed at the time or, where appropriate, what responses were subsequently prepared and how they were communicated to stakeholders and the public.

Although, as mentioned, the consultation is not binding, the proposals received should be evaluated and the explanation of their relevance or not included in the report. If these are relevant, the consultation report will result in proposals for changes to the Project and/or the ESMP, specifically recommendations for: (i) project design; (i) mitigation measures and (iii) mechanism for dealing with complaints and grievances.

The consultation report will also include the invitation process, the links to the web pages where the project has been published and the corresponding environmental and social documentation, the description of the call mechanism used, the list of participants, photos or screenshots of the process, informative banners, publications made in local media, and other dissemination materials used.

The following is a **minimum content outline of the Consultation Report**:

1. Participation strategy: Description of how the consultation process was developed (prior coordination with authorities, key stakeholders, methodology, selection of topics to be addressed, etc.).
2. Stakeholder mapping (groups, institutions or people who were invited) and selection criteria of the invited stakeholders; Invitation mechanism.
3. Dissemination: Invitations issued and publications of the event on institutional websites and media.
4. Website and term.
5. Analysis of the people who participated compared to the guests.
6. Gender-disaggregated data of participants.
7. Materials submitted and/or published during the consultation process.
8. Queries made and responses (Proposals, claims or questions made by the different stakeholders, and how they were addressed).
9. Indication of how the proposals and/or complaints received were incorporated/or will be incorporated into the design of the project. Any formal agreement reached with the persons consulted.
10. The main conclusions on positive or negative perception of the project by the participants, including the agreements.
11. Elements collected from the consultations and included in the final version of the ESIA and ESGP.
12. ANNEX. Copy of the presentation made (it must be ensured that the impacts and mitigation measures of the specific project have been presented).
13. ANNEX. Sample copy of invitation letters sent.
14. ANNEX. Copy of the acknowledgments of receipt of the sending of the invitation letters.

15. ANNEX. List of invited people.

16. ANNEX. List of participants: interested persons/affected persons, governmental, institutional, and general population participants.

17. ANNEX. Photographs of the activity.

The consultation report must be published on the institutional website of SIF, as communicated to the persons participating in the consultation meeting.

