



Belize Water Supply and Modernization Program (BL-1043)

Environmental and Social Analysis Environmental and Social Management Plan



Document Datasheet


<p><u>Project Proponent</u> Belize Water Services Limited</p>	<p><u>Project</u> Belize Water Supply and Modernization Program (BL-L1043)</p>			
<p>During the preparation of the Belize Water Supply and Modernization Program (BL-L1043), Belize Water Services Limited 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> December 2022</p>			
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<p><u>Authors</u></p> <div style="text-align: center;">  </div> <p>Coordination: Federico Scodelaro, M.S. Environmental and Social Baseline: Magali Kuntz, P.E. Environmental and Social Management Plan: Jorgelina Gossio, P.E. Legal Review: Magali Kuntz, P.E. Social Aspects: Laura Lores, M.S. Cartography and GIS: Valentina Balsari</p>	<p><u>Distribution</u></p> <p><input type="checkbox"/> Internal <input checked="" type="checkbox"/> Public <input type="checkbox"/> Confidential</p>			

Table of Contents

<p>Abbreviations6</p> <p>1. Introduction7</p> <p style="padding-left: 20px;">1.1 Objectives.....7</p> <p style="padding-left: 20px;">1.2 Scope.....7</p> <p>2. Program and Projects Description9</p> <p style="padding-left: 20px;">2.1 Background and Justification9</p> <p style="padding-left: 20px;">2.2 Objectives.....9</p> <p style="padding-left: 20px;">2.3 Components.....10</p> <p style="padding-left: 20px;">2.4 Costs and Financing10</p> <p style="padding-left: 20px;">2.5 Implementation Arrangements10</p> <p style="padding-left: 20px;">2.6 Expected Benefits11</p> <p style="padding-left: 20px;">2.7 Description of Projects in the Representative Sample11</p> <p style="padding-left: 40px;">San Pedro Water Network Expansion...11</p> <p style="padding-left: 40px;">Harmonyville Water Network Expansion15</p> <p style="padding-left: 40px;">Water Disinfection, Energy Efficiency, Smart Metering and other Equipment..17</p> <p style="padding-left: 20px;">2.8 Analysis of Alternatives for Projects in the Representative Sample.....18</p> <p>3. Legal and Institutional Framework19</p> <p style="padding-left: 20px;">3.1 Belize Legal Framework19</p> <p style="padding-left: 40px;">Environmental Licensing19</p> <p style="padding-left: 40px;">Water and Water Resources Management.....21</p> <p style="padding-left: 40px;">Socio-Economic Legislation.....22</p> <p style="padding-left: 40px;">Traffic and Road Safety24</p> <p style="padding-left: 40px;">Noise24</p> <p style="padding-left: 40px;">Urban Solid Waste Management.....24</p> <p style="padding-left: 40px;">Hazardous Waste Management25</p>	<p style="padding-left: 20px;">Gaseous Emissions Management25</p> <p style="padding-left: 20px;">Energy26</p> <p style="padding-left: 20px;">Soils.....26</p> <p style="padding-left: 20px;">Protected Areas27</p> <p style="padding-left: 20px;">Flora, Fauna and Native Forest.....27</p> <p style="padding-left: 20px;">Indigenous People and their Communities28</p> <p style="padding-left: 20px;">Cultural Heritage, Archaeological and Historical Sites28</p> <p style="padding-left: 20px;">Involuntary Resettlement.....29</p> <p style="padding-left: 20px;">National Advisory Policies.....29</p> <p>3.2 IDB Environmental and Social Policy Framework.....31</p> <p style="padding-left: 20px;">ESPS 1 – Assessment and Management of Environmental and Social Risks and Impacts31</p> <p style="padding-left: 20px;">ESPS 2 - Labor and Working Conditions32</p> <p style="padding-left: 20px;">ESPS 3 - Resource Efficiency and Pollution Prevention32</p> <p style="padding-left: 20px;">ESPS 4 - Community Health, Safety, and Security33</p> <p style="padding-left: 20px;">ESPS 5 - Land Acquisition and Involuntary Resettlement34</p> <p style="padding-left: 20px;">ESPS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources.....34</p> <p style="padding-left: 20px;">ESPS 7 - Indigenous Peoples35</p> <p style="padding-left: 20px;">ESPS 8 - Cultural Heritage36</p> <p style="padding-left: 20px;">ESPS 9 - Gender Equality.....36</p> <p style="padding-left: 20px;">ESPS 10 - Stakeholder Engagement and Information Disclosure37</p> <p style="padding-left: 20px;">Summary of Compliance with IDB Environmental and Social Policy Framework.....37</p>
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4. Environmental and Social Baseline	42	5.1 Impact and Risk Assessment Process .	79
4.1 Introduction	42	5.2 Analyzed Phases	79
4.2 Definition of Area of Influence.....	42	5.3 Project Activities Summary.....	79
Direct Area of Influence	42	Project Activities in the Construction	
Indirect Area of Influence	42	Phase.....	79
4.3 Physical Environment Baseline of		Project Activities in the Operational Phase	
Indirect Area of Influence	42	80
Climate	42	5.4 Physical, Biological and Socioeconomic	
Geology	45	Environment Components Summary	80
Topography	45	5.5 Impacts Identification and Assessment	
Hydrology.....	46	81
Oceanography	51	Impact Attributes.....	81
Vulnerability to Natural Disasters.....	51	5.6 Mitigation Measures Identification	82
4.4 Biological Environment Baseline of		Mitigation Hierarchy.....	82
Indirect Area of Influence	53	5.7 Residual Impact Determination.....	82
Flora	53	5.8 Management, Monitoring and Audit..	83
Fauna.....	56	5.9 Environmental and Social Impact Matrix	
Protected Areas	56	83
4.5 Socioeconomic Environment Baseline of		5.10 Environmental and Social Risks and	
Indirect Area of Influence	62	Impacts Matrix Report.....	85
Population and Growth.....	62	Impacts - Construction Phase	85
Infrastructure and Services.....	64	Impacts - Operational Phase.....	97
Education	65	5.11 Environmental and Social Residual	
Indigenous Peoples and Communities..	66	Impacts Matrix.....	100
Archaeological, Historical and Cultural		5.12 Specific Impacts and Risks of the	
Heritage.....	67	Sample Projects	102
4.6 Characterization of the Direct Area of		San Pedro Water Network Expansion.	102
Influence	69	Harmonyville Water Network Expansion	
San Pedro Water Network Expansion...69		102
Harmonyville Water Network Expansion		5.13 Risk Analysis.....	102
.....	75	Risk Definition.....	102
5. Environmental and Social Impacts and Risks		Project Risk Identification.....	102
.....	79	Project Criticality and Vulnerability	103

5.14 Impacts and Risks for Component 2 (Equipment)	104	7. Conclusions	140
6. Environmental and Social Management Plan	106	References	141
6.1 Roles and Responsibilities.....	106	Annex 1. Stakeholder Engagement Plan.....	143
Design.....	106	Introduction	143
Construction.....	106	Objective.....	143
Operation and Maintenance.....	107	Institutional Arrangements for Plan Implementation	143
Role of IDB.....	107	Consultation Process	144
6.2 Environmental and Social Management Plans.....	109	Stakeholder Mapping	144
Construction Environmental and Social Management Plan.....	109	Documents to Disclose and Availability of Information.....	145
Operational Environmental and Social Management Plan.....	133	Disclosure of the Event	145
Environmental and Social Management Plan for Component 2	137	Development of the Public Consultation Process.....	146
6.3 Budget for Implementation of the ESMP	139	Consultation Report.....	147

Abbreviations

Aoi	Area of Influence
BWS or BWSL	Belize Water Services, Limited
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
GRM	Grievance Redress Mechanism
IAoi	Indirect Area of Influence
IDB	Interamerican Development Bank
KBA	Key Biodiversity Area
LMP	Labor Management Procedure
NRW	Non-Revenue Water
OA	Operational Area
OSG	On-site Generation
PM	Particulate Matter
SEP	Stakeholder Engagement Plan
USD	United States Dollars

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 Supply and Modernization Program (BL-L1043), hereinafter "the Program".

The general objective of the Program is to reduce service gaps between urban and peri-urban/rural areas in Belize through the following specific objectives: (i) increase access to safe water in peri-urban and rural areas, with emphasis in vulnerable populations such as migrants; and (ii) improve the operational and financial performance of Belize Water Services Limited (BWSL).

The Program, with a total cost of USD 11 million, will be executed by BWSL, financed with a loan operation with the Inter-American Development Bank (IDB).

As part of the environmental and social evaluation process of the Program, this Environmental and Social Analysis was developed. 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 new 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 course of 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 Supply and Modernization Program, 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

Belize's population is currently growing at a rate of 1.8% a year, driven mostly by immigration from neighboring countries. By 2025, the total population of Belize is expected to reach about 450,000 from today's 405,000 inhabitants, increasing demand for basic services such as water.

Access to water in Belize varies significantly between urban (95%) and rural areas (78%), generating a service gap between these two geographic zones. It also fluctuates significantly between geographic regions. In the two largest districts, Belize and Cayo, more than 80% of households have access to this service; but in smaller and poorer districts, such as Toledo or Stan Creek, only 60% have access to piped water services. In Toledo District, 11% of households still extract water from wells and 10% from open sources, such as rivers, creeks, or springs.

BWSL is the autonomous provider of water and sanitation services in Belize's major urban areas, including Belize City, Belmopan City, San Ignacio, Santa Elena, Benque Viejo Del Carmen, Caye Caulker, San Pedro, Dangriga, Placencia, Punta Gorda Town, Corozal and Orange Walk. As of April 2022, BWSL had an active customer base of 64,000 water connections and 11,654 sewer connections. It provided water services to approximately 70% of Belize's population.

BWSL is one of the best performing water utilities in the Caribbean. Service continuity (the average hours of service per day) is estimated at 23.98 hours. The company reports that 100% of its users have metered water consumption. In FY 2021/2022, BWSL registered non-revenue water levels at 20% on average across the company's 12 major water distribution systems (significantly below the 46% regional average).

Population growth is putting pressure on BWS to attend the new demand and to maintain service quality. To address these challenges, BWS needs to improve its operational and financial performance to be able to finance new capital and operational investments and sustain service coverage. Additional resources for capital investments can help the company attend to these needs and support the country's efforts to reduce service gaps between urban and peri-urban/rural areas. BWS's capital investments are financed by the company's net profits, as it does not receive government subsidies to cover operating expenses or finance capital investments.

2.2 Objectives

The general objective of this program is to reduce service gaps between urban and peri-urban/rural areas through the following specific objectives: (i) increase access to safe water in peri-urban and rural areas, with emphasis in vulnerable populations such as migrants; and (ii) improve the operational and financial performance of BWSL.

2.3 Components

The Program is structured in two components:

Component 1. Increasing Access to Water Services (USD 4.5 million). This component will finance expansion projects aimed at increasing safe access to water in selected BWS' service areas, including peri-urban and rural villages near these areas. It will also finance priority studies such as a Sewer and Wastewater Master Plan, which will include an analysis of different financial strategies for the investments identified in the Plan; a study to identify financing alternatives for future sewer and wastewater investments; and a study to map alternative water sources in the Districts of Cayo and Belize.

Component 2. Innovation for Improved Operational and Financial Performance (USD 6 million). This component will finance different types of innovative equipment aimed at improving the company's operational and financial performance. This component will be structured in four main subcomponents:

- i. **Water Disinfection**, which will finance the deployment of innovative water disinfection technologies based on the on-site production of disinfectants;
- ii. **Energy Efficiency (EE)**, which will finance the repair and replacement of electromechanical equipment in prioritized service areas;
- iii. **Smart metering**, which will finance the piloting of smart metering technologies in selected service areas; and
- iv. **Operational equipment** such as well water rigs.

This component will also finance the implementation of the company's Gender and Diversity Policy.

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 11 million**, to be fully financed by a Loan Operation with the Interamerican Development Bank.

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 Belize Water Services Limited. The Government of Belize will provide the sovereign guarantee.

As EA, BWSL will be responsible for administration of the loan resources and the fulfillment of the operation's objectives.

2.6 Expected Benefits

The Program is expected to benefit at least 1,000 households with no current access to piped water services, as well as about 60 commercial users.

The Program is also expected to reduce BWS' operational expenses, and improve the company's operational and financial performance indicators.

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 water network expansions, and the second one aimed at equipment replacement.

It is expected that most of the environmental and social impacts and risks will materialize during the implementation of **Component 1** (water network expansions). For this component, the representative sample for the Program was selected as **two water network expansion projects**: one in **San Pedro** and one in **Harmonyville**. These two projects amount to about 33% of the total Component 1 cost.

This ESA also analyzes the environmental, social, and occupational safety risks under **Component 2**, using a strategic analysis and applying the criteria of proportionality (in terms of the lower environmental and social impacts expected under this component).

San Pedro Water Network Expansion

Ambergris Caye, the location of the Project, is the largest island of Belize, located northeast of the old capital, Belize City. It is the most popular tourist and expatriate destination in Belize because of its proximity to the coral reef. It is approximately 40 km long and 1.6 km wide.

The largest settlement and the only town is San Pedro, which is located in southern Ambergris Caye, the Project area. The town, with an estimated population of 18,440 (June 2017, Statistical Institute of Belize), is the second largest town in Belize District. BWS currently distributes potable water to 4,338 commercial and residential customers.

Provision of safe potable water to meet growing demand is vital to supporting economic development on Ambergris Caye. The proposed expansion of the system will directly benefit the Caye, providing access to water to support continued development, and will further BWS's continued drive to improve its operational effectiveness and efficiency. Currently, the residents of South San Pedro that are outside of the BWS distribution network rely on bulk water sales, rainwater harvesting and beach wells to meet their water needs.

The scope of works to be implemented by BWS as part of this subcomponent includes the following:

- 9,300 feet of 8-inch distribution water main;
- 2,000 feet of 6-inch distribution water main;
- 5,500 feet of 4-inch distribution water main;
- 72 immediate service smart-metered connections.

Total beneficiaries include:

- 152 households
- 42 businesses
- Expected increase in connections (3 – 5 years): up to 265
- Expected increase in connections (10+ years): up to 311

Figure 1 and Figure 2 show the location of the proposed water main expansions in the south and north of the island, respectively.



Figure 1 – Location of proposed water mains in San Pedro south Water Network Expansion project (Source: PlanEHS with BWS data, 2022)



Figure 2 - Location of proposed water mains in San Pedro north Water Network Expansion project (Source: PlanEHS with BWS data, 2022)

The total cost for the San Pedro Water Network Expansion project is **USD 1.143 million**.

Harmonyville Water Network Expansion

Harmonyville is a small community located about 15 miles east of the capital, Belmopan, nestled between two other villages, Cotton Tree and St Mathew's. As of 2022, the community has a population of about 500 residents.

Provision of safe potable water to the residents of Harmonyville is vital to support the economic development for that community. The proposed expansion to the system will directly benefit current and future residents, providing access to water to support continued development and will further BWS's continued drive to improve its operational effectiveness and efficiency.

Currently, the residents of Harmonyville have no access to a potable water network. They rely mostly on shallow wells and rainwater harvesting to meet their daily water needs. For human consumption, which includes water for drinking and cooking, the residents rely on "purified" bottled water.

The scope of works to be implemented by BWS as part of this project includes the following (see attached Figure 3 where the proposed network expansion is outlined and Table 2 for cost estimates):

- 4,500 feet of 6-inch distribution water main;
- 980 feet of 4-inch distribution water main;
- 8,200 feet of 3-inch distribution water main;
- 75 immediate service metered connections.

Total beneficiaries include:

- 82 households
- 4 businesses
- Expected increase in connections (3 – 5 years): up to 109
- Expected increase in connections (10+ years): up to 134
- Expected increase in consumption (10+ years): up to 16,000 gpd

Figure 3 shows the location of the proposed mains under the Harmonyville Water Network Expansion project.

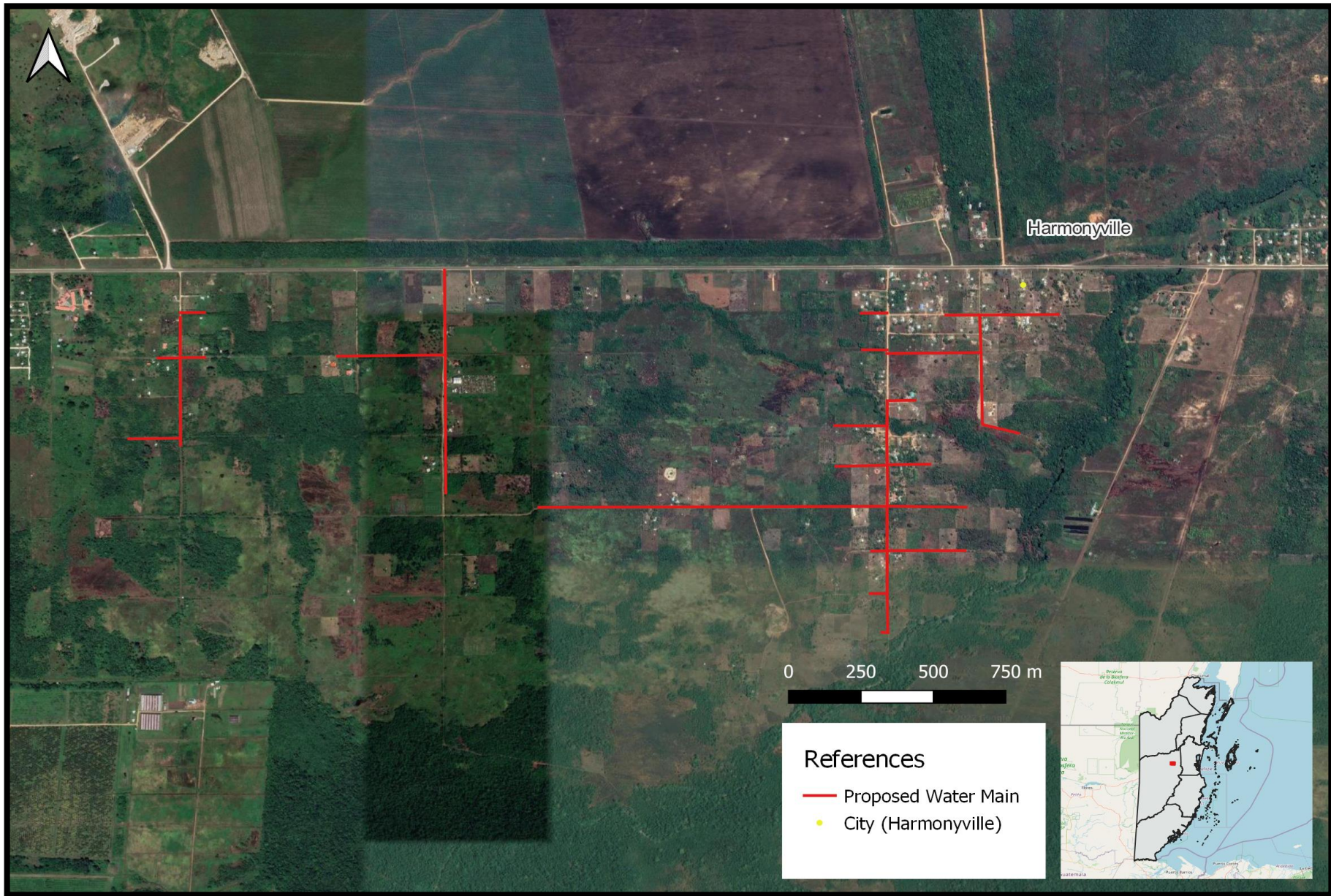


Figure 3 - Location of proposed water mains in Harmonyville Water Network Expansion project (Source: PlanEHS with BWS data, 2022)

The total cost for the Harmonyville Water Network Expansion project is **USD 0.344 million**.

Water Disinfection, Energy Efficiency, Smart Metering and other Equipment

Disinfection Equipment

Based on the results of water treatment and disinfection challenges in Belize's small towns and rural villages, this subcomponent will finance disinfection equipment by on-site generation (OSG) of chemical disinfectants, with two alternatives depending on water supply conditions:

- OSG of sodium hypochlorite (NaClO): the use of this component is recommended when there are no water quality problems, as in the case of systems that use desalinization with reverse osmosis (RO);
- OSG of mixed oxidants (NaClO + H₂O₂): the use of this combination of disinfectants is recommended when water quality problems are detected in raw water, such as the presence of iron, manganese, or organic matter.

The scope of proposed investment includes the supply and installation of the OSG equipment and small piping modifications to install the equipment. As part of supply and installation, training on the use of the equipment, performance evaluation and public information on the advantages of the new disinfection system are also included.

Energy Efficiency

The investments proposed for financing under this subcomponent have been selected on the basis of an Energy Efficiency Assessment and Audit carried out on the main energy intensive elements of BWS' water production and distribution and sewerage networks.

This subcomponents finances replacement of pumping equipment, automation systems (for distribution pumping systems), and interventions to improve water quality and reduce failure in electrical facilities (grounding systems, variable frequency drives, equipment to monitor the need for preventive maintenance of electrical motors, surge protective devices, etc.).

Smart Meters

Under this subcomponent, the pilot installation of smart meters will be done in San Pedro, Ambergris Caye, and Caye Caulker. The purpose for the implementation of smart meters on the distribution networks of Caye Caulker and San Pedro is to be able to increase BWS's revenue collection capacity through improved meter reading accuracy. Other direct and indirect benefits include reduction in overall operational expenses, reduction in meter maintenance, and improved stakeholder relationship.

The scope of works to be implemented under this subcomponent includes the following:

- Procure 900 smart meters for Caye Caulker
- Procure 4,300 smart meters for San Pedro
- Install meters by BWS staff with the technical support of the supplier
- Procure and install receivers for communication with smart meters
- Software subscription and training of BWS staff in the O&M of smart meters

Basic Equipment

The scope of the proposed procurement of basic equipment is: one (1) Well Rig with the capacity to drill boreholes for the installation of 12" PVC casings to a depth of 500 ft; and two (2) Sewer Flushers with trailer and truck for San Pedro and Belmopan.

2.8 Analysis of Alternatives for Projects in the Representative Sample

Alternative Without Project

Under the "without project" alternative, the expansion of the water network in San Pedro and Harmonyville would not be built and operated.

The Project is part of an effort by BWSL to improve the access to potable water, which is an integral part of its mandate. In the "without project" alternative, BWSL's ability to fulfill its mission would be reduced, since the Project is aligned with the fulfillment of that mandate.

Alternative Traces and Locations

The prioritization of intervention areas in San Pedro and Harmonyville was carried out by BWSL's technical team. BWSL's goal is to achieve universal coverage of potable water in its served areas.

Regarding the prioritization criteria, the areas chosen for this project represent the projects where BWSL has a higher readiness (more advanced engineering design), and also match with urban and tourism development plans in Harmonyville and San Pedro.

In terms of project design, the interventions take place on existing streets, avenues and street accesses, with no new road network openings planned under this project.

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 2 - Environmental Licensing regulations

National Legislation	
<p>Environmental Impact Assessment Regulations S.I. 107/1995 and Amendment - 2020</p>	<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>
<p>Environmental Protection Act Chapter 328 of the Substantive Laws of Belize - Revised Edition 2011</p>	<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	<p>It addresses the importation, manufacture, sale and possession of prohibited and restricted single-use plastics and Styrofoam products in Belize.</p>
Summary Jurisdiction (Littering Offences) Act Chapter 98 - Revised Edition 2003	<p>It deals with the issue of littering, outlines the process for violation tickets and determines the officials authorized to enforce them.</p>
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	<p>Regulates the issuance of licenses for the import of used tires and lead-acid batteries and for the export of scrap metal by DOE.</p>

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 3 - 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 4 - 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 5 - 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 6 – 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 7 - 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 8 - 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 9 - 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 10 – 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 11 – 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 12 – 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 13 - 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 14 - 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 15 - 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 16 - 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 17 - 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.

<p>Government of Belize Policy on Adaptation to Global Climate Change</p>	<p>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.</p>
<p>Horizon 2030 National Development Framework for Belize 2010-2030.</p>	<p>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.</p>
<p>National Legislation</p>	
<p>National Gender Policy</p>	<p>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.</p>
<p>National Cultural Policy 2016-2026</p>	<p>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.</p>
<p>National Sustainable Tourism Master Plan for Belize 2030</p>	<p>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.</p>
<p>National Protected Areas System Policy and Plan</p>	<p>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.</p>

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-L1043), these E&S Performance Standards must be considered during the preparation and implementation of all projects financed under the Program.

Next, Table 18 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 ESPPF, 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 18 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 18 - 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-L1043 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>BWSL, 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>	<p>YES</p>

IDB Environmental and Social Performance Standards (ESPS)	Applies
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) air, due to gaseous emissions and particulate matter; (ii) water, due to accidental spills or due to incorrect disposal or failures in the effluent or solid waste management systems; (iii) soil, due to erosion or sediment runoff during excavation and stockpiling; (iv) occupational safety impacts, due to risks inherent in construction and maintenance tasks, and (v) noise and vibrations, due to noise from the operation of equipment and machinery.</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- Air Quality, Noise and Vibration; 5 – Waste Management; 6 - Effluent Management; 7- Chemicals Management; 8- Occupational and Community Health and Safety Program; 12- Socio-environmental Training for Personnel, and 13- Natural Disaster Management and Emergency Response Plan.</p>	YES
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): 8 - Occupational and Community Health and Safety, 9- Road Safety and Traffic Management, 10 – Pest and Vector Control; 11- Coordination with Service Providers; 12- Socio-environmental Training for Construction Personnel, 13- Natural Disaster Management and Emergency Response, 14- Information and Community Participation and 17 - Prevention of Infectious Diseases (with a focus on COVID-19).</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

IDB Environmental and Social Performance Standards (ESPS)	Applies
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 impact critical natural habitats. While the San Pedro project is technically within a Key Biodiversity Area, the nature of the project (small diameter water network mains in right-of-way of existing roads) – both in terms of complexity and its linear typology, no impacts negative direct impacts are identified.</p> <p>In the construction phase, mitigation measures included in the guidelines for a Vegetation 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>The works of the representative sample of the Program have no effects on indigenous communities, nor differentiated negative impacts on indigenous peoples.</p>	NO
ESPS 8 - Cultural Heritage	YES/NO
<p>For the projects of the representative sample of the Program, no sites of recognized historical, paleontological, archaeological, architectural, religious, aesthetic or other type of patrimonial significance were identified in the areas of direct influence (100-meter perimeter). In the case of San Pedro, the <u>entrance</u> to an archeological Mayan reserve is located in the Direct Area of Influence, however the archaeological area is outside the Direct Aol. 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

IDB Environmental and Social Performance Standards (ESPS)	Applies
ESPS 9 - Gender Equality	YES/NO
<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 in order 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 will be implemented for the projects in the representative sample, in accordance with the guidelines of the Stakeholder Engagement Plan (SEP) included in Annex 1 of this ESA. It considers a gender-sensitive approach and methodology, to promote the equitable participation of men, women, the LGTBI+ community and vulnerable groups. The results of the consultation process will be documented in the final version of this ESA.</p> <p>Likewise, 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, in order 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 section of roadway. However, it is understood that in the case of some impacts such as air quality, noise and traffic, impacts may extend beyond the immediate Project footprint. As such, both a Direct Area influence (DAI) and an Indirect Area of Influence (IAI) are defined for the Project as follows below.

Direct Area of Influence

The DAI 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 network expansion networks.

Indirect Area of Influence

Indirect Area of Influence 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 towns of Harmonyville and San Pedro 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 network expansion projects.

4.3 Physical Environment Baseline of Indirect Area of Influence

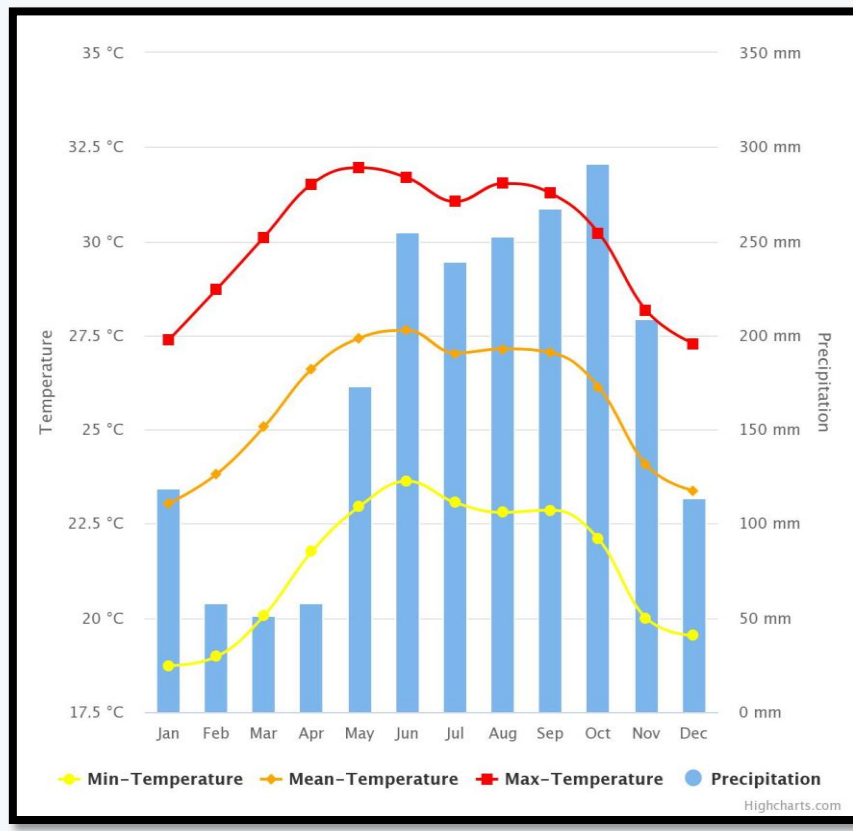
Climate

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.

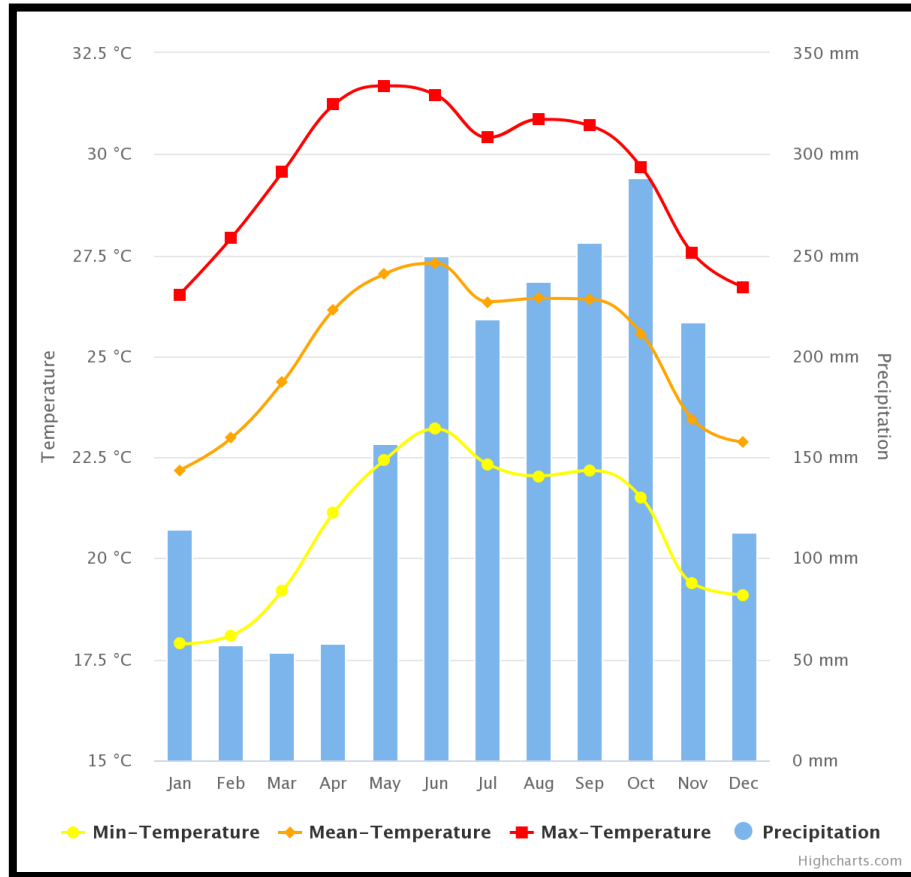
Specifically, Ambergris Caye, the island on which the city of San Pedro is located, has a sub-tropical climate like most of Belize, but it is the driest region of the country getting less than 60 inches of rain a year. The dry season in this region extends from December to May, and the wet season from June to November.

Temperatures at Ambergris Caye varies between 21 and 32°C and the difference between nighttime and daytime at costal locations are moderated by the warm offshore water.

In addition, In Cayo, the district in which Harmonyville is located, rainfall reaches almost 300 mm in months such as September and October, and experiences low rainfall months (below 100 mm per month) such as February, March and April.

The temperature profile is similar to that of the entire Belize region, with average annual temperatures varying between 22.5 and 27.5 °C, average minimum temperature between 18 and 23°C, and average maximum temperature between 27 and 32°C, as shown in Figure 2.

Figure 5 - Monthly Climatology of Cayo District Temperatures & Precipitation 1991-2020. Source: World Bank Group.



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.

The geology of the San Pedro area is typical of that associated with coralline islands. Southern Ambergris Caye is comprised of shallow layer of calcareous sands underlain by limestone bedrock. These soils are very porous and in that area the water table could be found at a depth of 12-18 inches.

Topography

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

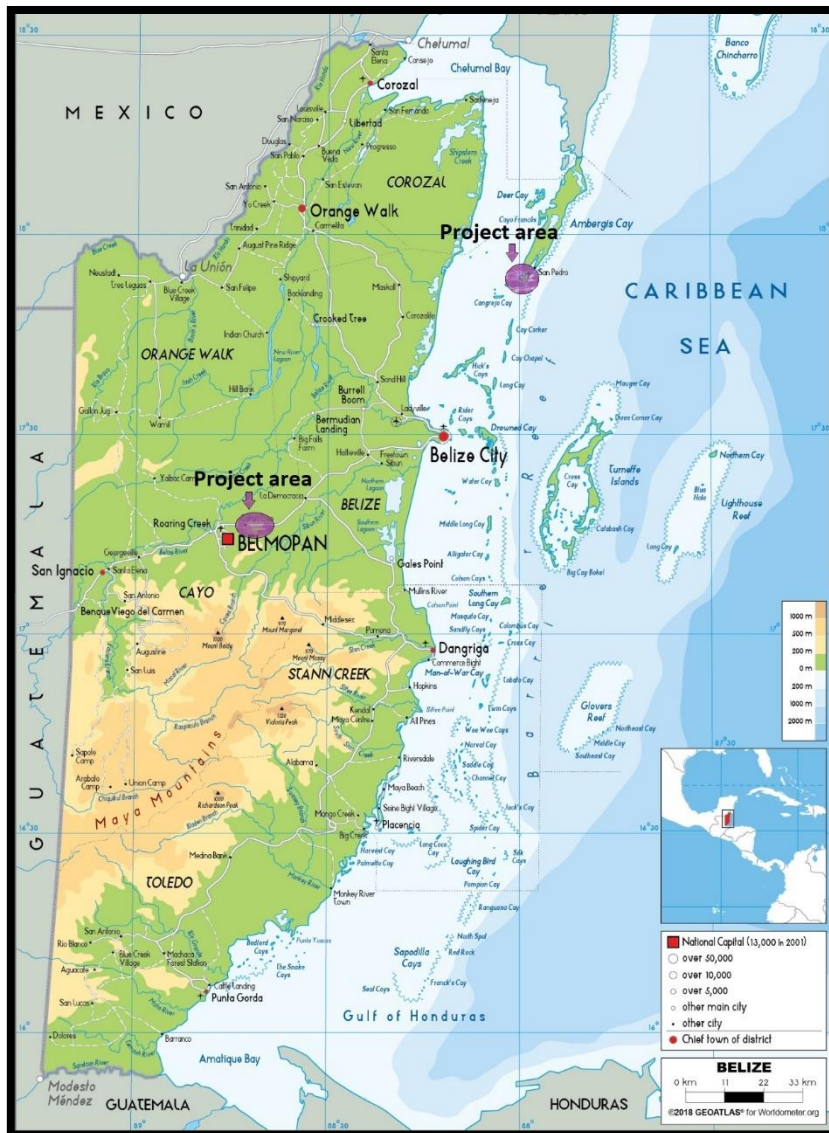
The backbone of the southern half of the country is formed by the Maya Mountains and the Cockscomb Range. The Maya Mountains is a large, uplifted block of Paleozoic granite intrusive and sediments that extends northeast to southwest through the south-central part of the country, these areas are characterized 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.

As can be seen in Figure 3, the Harmonyville project area belongs to the low plateau areas mentioned above.

The topography of Ambergris Caye from the coastline to the inner lagoon to the west ranges from 0 ft at the shoreline to 4 ft, as can be seen on the map in Figure 6. The make-up soil is that coral sand and peat. The island is protected on the east by a living reef that extends 185 miles down the coast of Belize.

Figure 6 - Geographical Belize Map and Project areas (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 19 below lists the five main regions and the corresponding watershed areas.

Table 19 - Belize watershed regions and watersheds

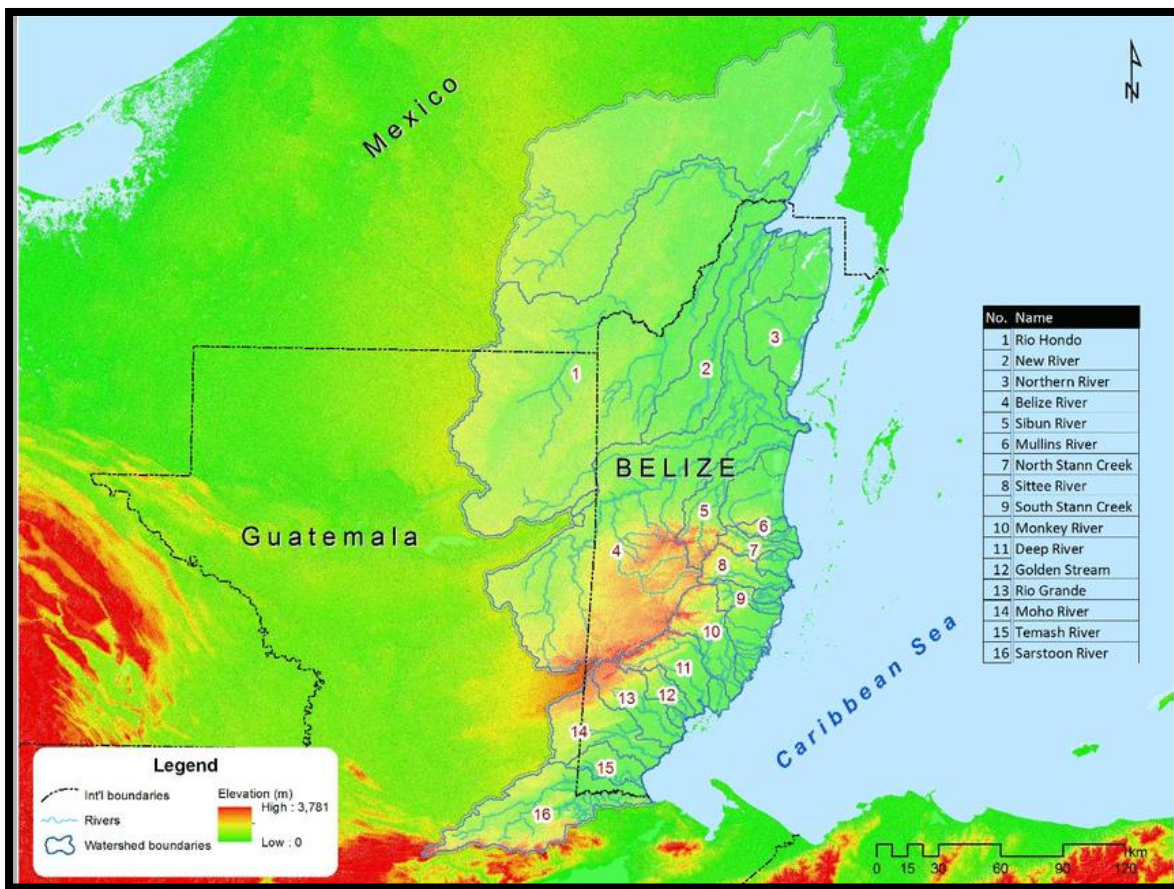
Northern Watersheds	Central Watersheds	Gulf of Mexico Watersheds	Southeastern Watersheds	Southern Watersheds
Baracouta Pond Fresh Water Creek New River Northern River Rio Hondo Shipstern and Progresso Lagoon	Belize River Manatee River Midwinters Lagoon Northern Lagoon Sibun River	Usumacinta	Big Creek 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, ground-water 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 7 – 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

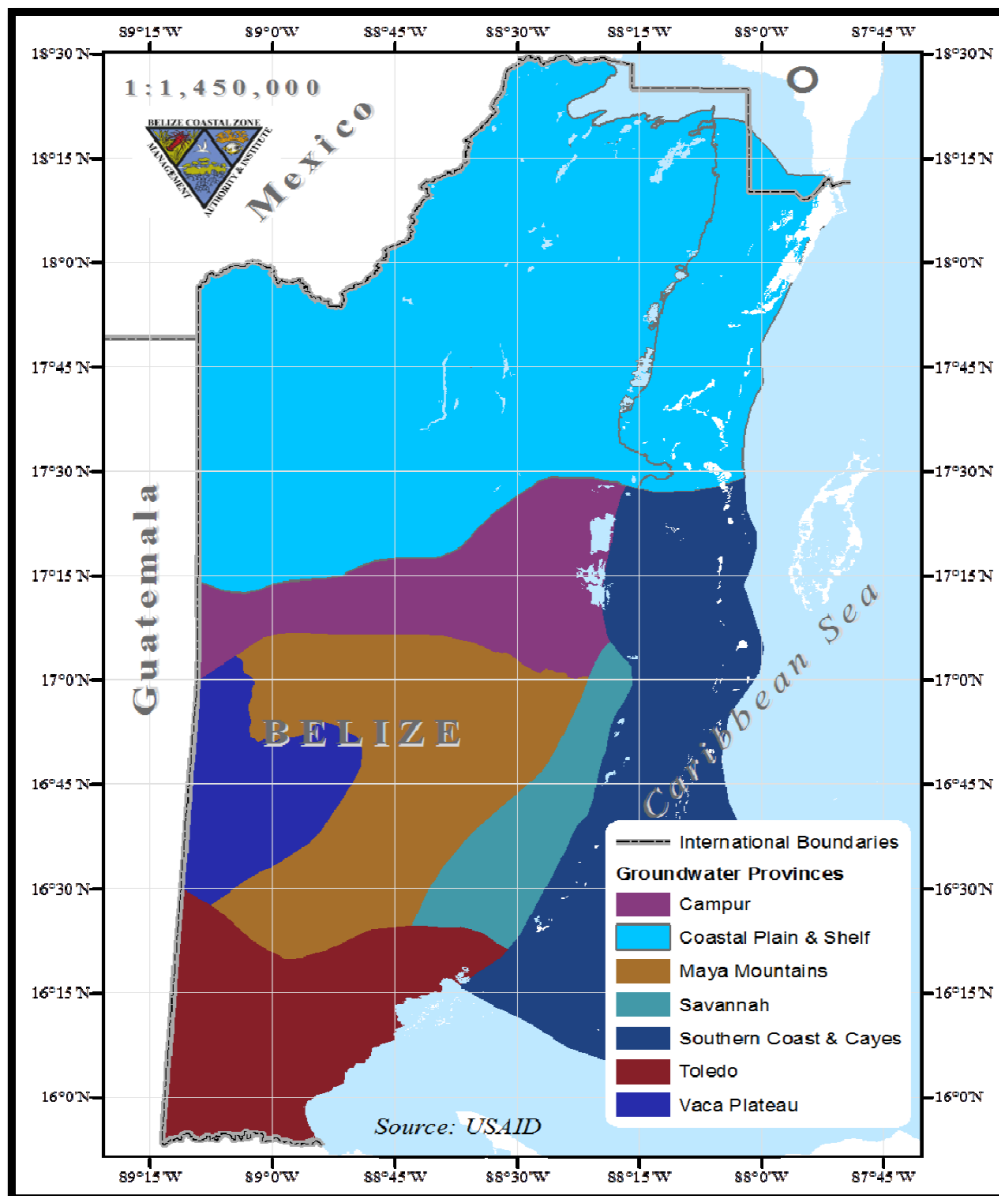
Generally, groundwater is available throughout the less mountainous areas of Belize and favorable yield characteristics can be attributed to geology and climatic conditions. The northern region consists of calcareous sediments that have shown high permeabilities. In the south, where limestones are found, 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 8 - 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.).

In San Pedro, Ambergris Caye, water is abstracted from two shallow wells adjacent to the lagoon and treated at the desalination plant operated by Belize Water Services Limited (BWSL).

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.

Oceanography

The long eastern coast of Belize faces the Caribbean Sea and is protected by the second longest barrier reef in the world; in perspective, it is about 10% the length of Australia's Great Barrier Reef.

Off the northern coast of Belize, from San Pedro northward to the Mexican border, lies a narrow, shallow-water shelf behind a well-developed curvilinear barrier reef. This shelf is generally a half-mile wide or less and contains numerous small patch reefs, biogenic banks, and a variety of generally high- to moderate-energy sands. It is bounded on the west by a long, low-lying peninsula about 60 miles long which varies from less than one mile to about 20 miles in width. Due to high marine energies, there is little lime mud on this shelf. The peninsula is called "Ambergris Caye" because it is broken by a channel at its northern end, which was excavated by the Mayans and is now maintained by tidal exchange flowing through it. The peninsula is underlain by Pleistocene limestone with a thin, discontinuous cover of Holocene sediment, some of which is dolomitic.

Vulnerability to Natural Disasters

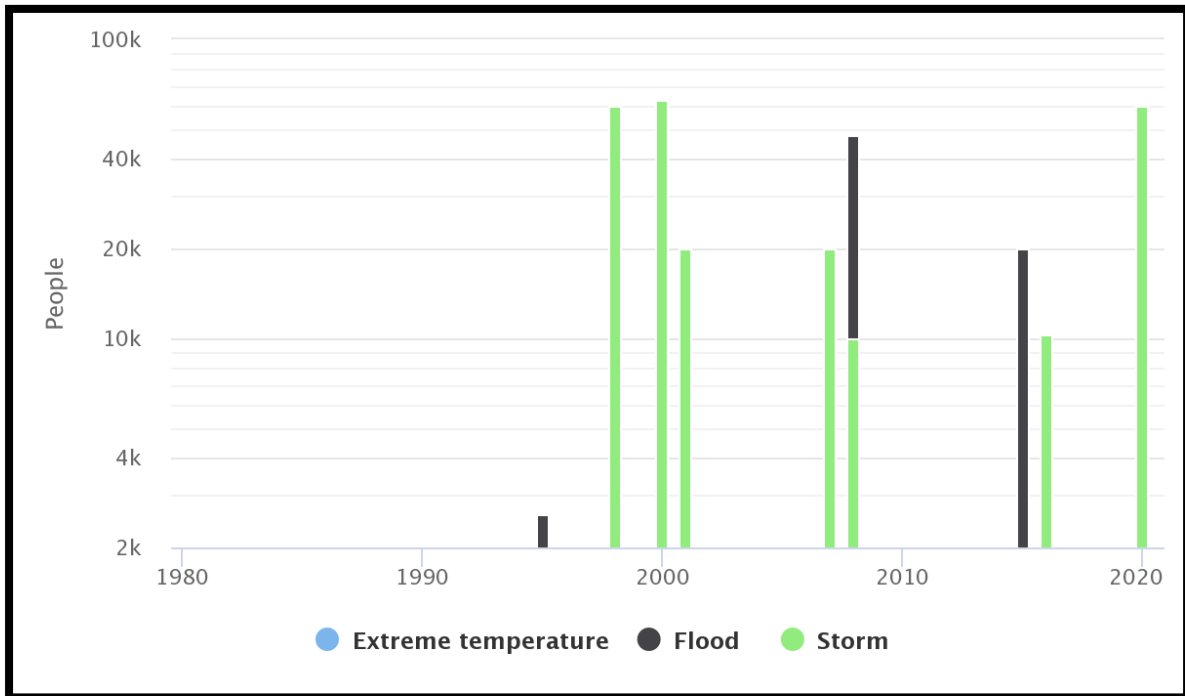
According to a systematic diagnosis conducted by the World Bank Group, Belize is one of the most affected countries in the world by weather events and other natural hazards, ranking 8th out of 167 countries by climate risk.

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 9 - 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.

Belize Water Services, on its part, has a Disaster Risk Mitigation and Recovery Plan¹, defining the emergency response team and chain of command, the preparatory planning, as well as the response protocols for the different phases.

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).

As shown in Figure 7, in the Harmonyville project area, the predominant vegetation is lowland broadleaf forest and, to a lesser extent, portions of the land are used for agricultural purposes.

The lowland broadleaf forests are composed of a substantial number of deciduous tree species. The composition of plant species depends on soil type. On calcareous soils, the characteristic species are wild mammal, cohune, cowfoot, breadnut, gombolimbo, give-and-take tree, wild grape, glass, wood, cabbage bark, sapodilla, black poisonwood, allspice, copal, laurel, mahogany, cushion, fiddlewood, and prickly yellow. On poorer soils nargusta, banak and polewood can be found (Department of Environment, 2019).

On the other hand, the part of the project that covers the San Pedro, Ambergris Caye area consists mainly of mangroves trees and littoral forest, as shown in Figure 10 below.

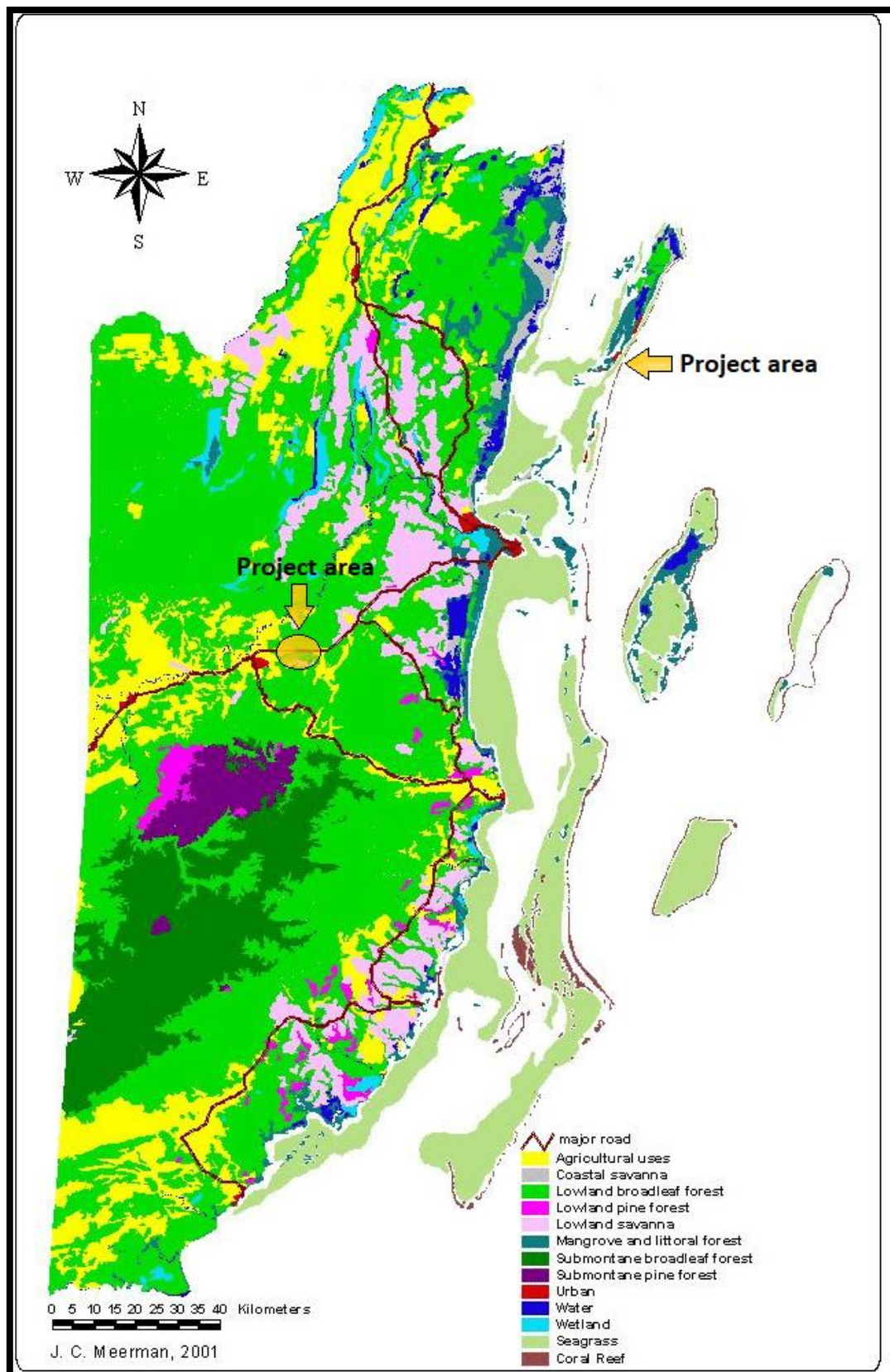
Mangroves are trees adapted to live in wetland areas. There are three species of mangroves that grow on Ambergris Caye and throughout Belize: red, black and white. Each has a different tolerance for the amount of salt and water they can live in. They are particularly important species for Ambergris Caye as they help add land to the island thanks to an extensive root system that helps trap and retain the mud and sand brought ashore by the normal action of waves and currents. They also protect the shoreline, shelter juvenile marine life and are the beginning of a food chain for some marine species.

The littoral forest is characterized by vegetation with high salt tolerance. This forest grows in a thin strip along the coast of Ambergris and is mainly composed of sea grape, cocoplum, potion wood, wild oregano, gumbo limbo and palmetto. Like the mangroves, they are of great importance for the shelter of native fauna.

¹ BWS, Disaster Risk Mitigation and Recovery Plan. June 2022.

Ambergris Caye is also home to part of the Belize Barrier Reef, the second largest in the world known as "the jewel" to Belizeans. More details of this ecosystem are presented in the "protected areas" section.

Figure 10 - Generalized ecosystems map of Belize. Adaptation from J.C. Meerman, 2001.



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.

On the coast of Ambergris Caye it is common to encounter several kinds of sea turtles. Around the island you can see other species such as the iguana, the wishi-willy and small saltwater crocodiles in the lagoons. In addition, more than 250 species of birds can be sighted, among the most common, frigate birds and brown pelicans.

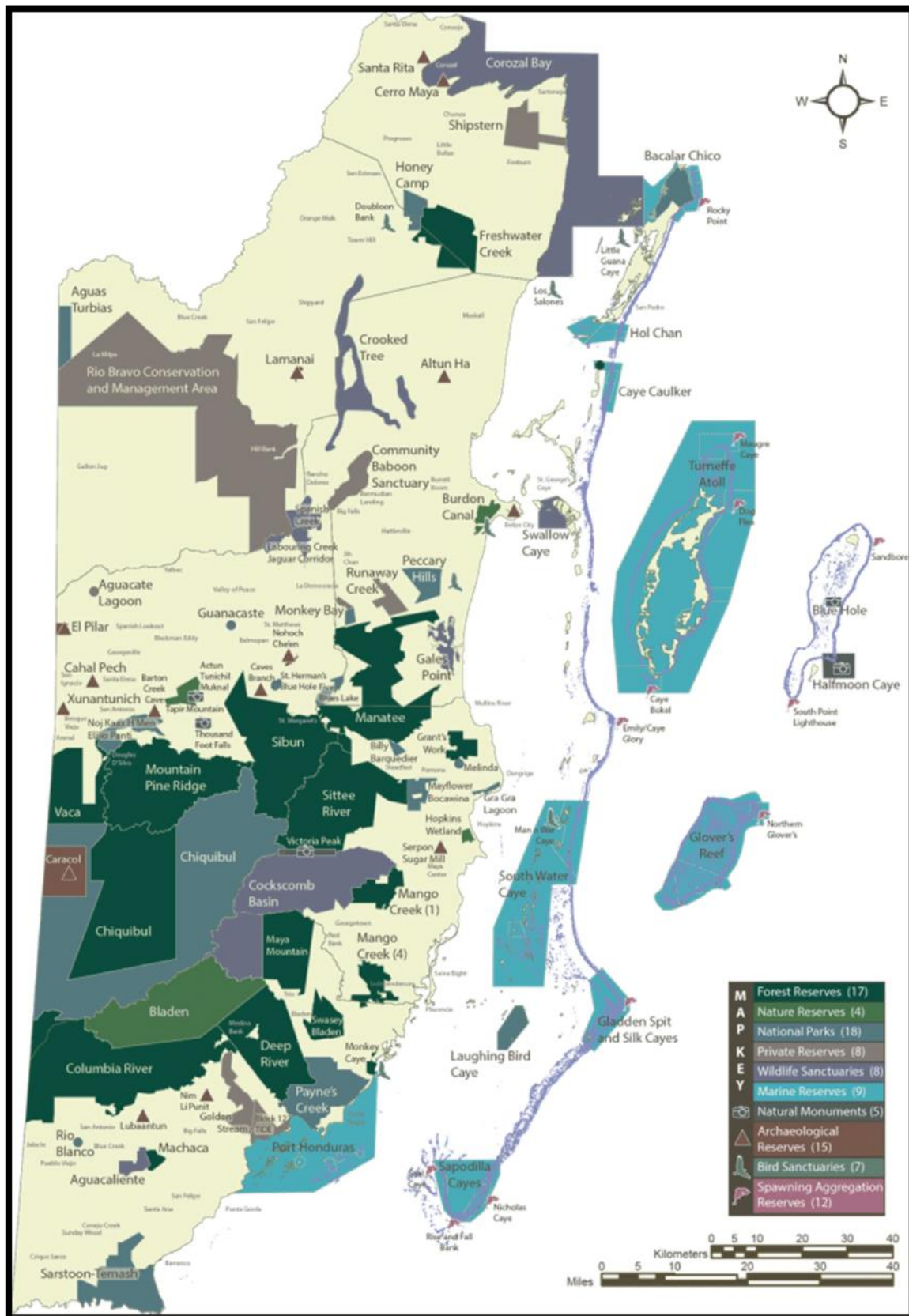
Protected Areas

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



In the Harmonyville project area, none of these previously mentioned areas are located in the vicinity.

In contrast, the San Pedro project area is close to the Belize Barrier Reef Reserve System (BBRRS). This reserve comprises 12% of the entire Reef Complex and it was inscribed as a UNESCO World Heritage Site in 1996. The reef is unique in the world for the variety of reef types it contains in a relatively small area, and is the longest in the northern and western hemispheres. The property provides important habitat for a number of threatened marine species, harboring a number of species of conservation concern including the West Indian manatee (*Trichechus manatus*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), and the American crocodile (*Crocodylus acutus*) as well as endemic and migratory birds which reproduce in the littoral forests of cayes, atolls and coastal areas (UNESCO, 2022). It is located in the Belize Coastal and Near Shore Islands Key Biodiversity Area (KBA).

The three maps below show the overlays of project areas with identified protected areas. This area is comprised of 3 Marine Reserves namely Hol Chan, Caye Caulker and Port Honduras; and seven Forest Reserves: Grants Works, Mango Creek, Swasey-Bladen, Machaca, Caye Caulker, Deep River and Manatee.



Figure 12 - Overlay of Project Areas in San Pedro south and Protected Areas (Source: PlanEHS)



Figure 13 - Overlay of Project Areas in San Pedro north and Protected Areas (Source: PlanEHS)



Figure 14 - Overlay of Project Areas in Harmonyville and Protected Areas (Source: PlanEHS)

4.5 Socioeconomic Environment Baseline of Indirect Area of Influence

Population and Growth

Harmonyville is a small village situated nearby to Beaver Dam and St. Matthew's, in Cayo District. There is no demographic data for this town since the 2000 and 2010 censuses do not record this particular place. In these statistics, there is general information on the total number of inhabitants and by gender for urban areas and the entire rural area of the district, without differentiating these small settlements. As a result, demographic data are presented at the district level.

Cayo District is the largest district in Belize and within it are the national capital of Belmopan. This region is primarily an agricultural zone and according to the 2010 census, about 49,4% of population live in rural areas.

The 2010 census recorded a population of 75046 people, of which 49.9% were female and 50.1% were male. Compared to the 2000 census, the population increase in the 2000-2010 period was 38.5%. In addition, the 2010 population density was recorded at 37 persons per square mile, making the district the third most densely populated after Belize and Corozal (both 57 persons per square mile).

Table 20 - Cayo district population according to census data

Area	Census 2000			Census 2010			Percentage Change
	Total	Male	Females	Total	Male	Females	
Cayo District	54197	27114	27083	75046	37445	37601	38,5

Figure 9 shows the population structure of Cayo by Five-Year Age Group and Sex in 2010. As can be observed, the district has a young population, since the largest number of people are in the age groups between 1 and 25 years old, with the highest peak in the 5 to 9 age group (1074 people). In addition, the sum of people between 55 and 85+ years of age represent 8% of the total population, a percentage that also corresponds approximately to the age range of 1 to 4 years.

Figure 15 – Cayo Population by Five-Year Age Group and Sex, 2010. Source: Belize Census Report, 2010.

Age Group	Total	Males	Females
Total	75,046	37,445	37,601
Under 1	1,765	902	863
1 - 4	6,948	3,566	3,382
5 - 9	10,074	5,124	4,950
10 - 14	9,820	4,884	4,936
15 - 19	8,624	4,336	4,288
20 - 24	6,954	3,401	3,553
25 - 29	5,863	2,762	3,101
30 - 34	4,897	2,346	2,551
35 - 39	4,608	2,178	2,430
40 - 44	3,768	1,858	1,910
45 - 49	3,141	1,576	1,565
50 - 54	2,532	1,280	1,252
55 - 59	1,855	984	871
60 - 64	1,319	702	617
65 - 69	971	523	448
70 - 74	714	408	306
75 - 79	530	285	245
80 - 84	365	183	182
85 +	298	147	151

San Pedro Town is the only island municipality in the country, located on Ambergris Caye. According to census results, between 2000 and 2010, San Pedro Town experienced a population growth of more than 17% annually.

The community of San Pedro is predominantly mestizo, with Spanish as its most widely spoken language, although 74% of the population also speaks English, indicating that the majority of the population is bilingual.

This city is the only urban area with more men than women (according to table 3, 6051 males vs. 5714 females in 2010 census), which is believed to be a result of the immigration of male workers to the island in search of employment in the tourism industry (UNICEF, 2017).

Table 21 - San Pedro population according to census data

Area	Census 2000			Census 2010			Percentage Change
	Total	Male	Females	Total	Male	Females	
San Pedro Town	4267	2186	2081	11765	6051	5714	175,7

Infrastructure and Services

Housing

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).

According to census data, of all the urban areas, San Pedro Town has the smallest average household size at 3,15 persons per household (a decrease from 3,4 persons at Census 2000), despite the fact that the number of households has tripled (from 1,248 to 3,769 households) in the last ten years. This could be associated with the fact that, as indicated in Table 3, the population has also approximately tripled.

Regarding Cayo District, the number of households has increased by 46,6 percent. Together with the Belize District, they represent more than half of the number of households in the country.

Average household size for Cayo decreased from 4,7 to 4,4 from 2000 to 2010. However, it still represents a high percentage with respect to other districts and the total for the country (4,1). In general, in rural areas, the average household size is higher and, particularly in the Cayo rural it is 4,8.

Household Services

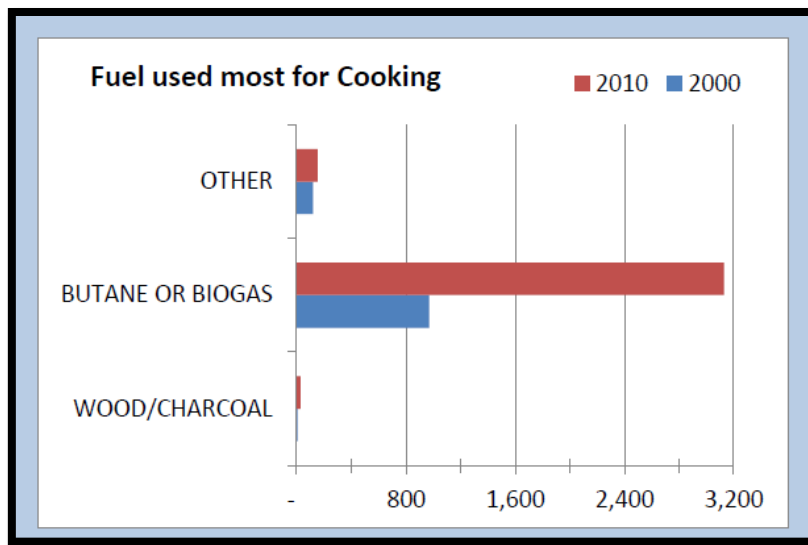
In the case of San Pedro City, the main source of energy for lighting is electricity from public source. It is estimated that about 96% of households have this service available. The same is true in the Cayo district, where 80% of the domestic lighting is supplied by the public power company as well.

The source of drinking water in San Pedro is mainly bottled water. According to 2010 statistics, 90% of households purchase bottled water for consumption. In the Cayo district, 45,4% of the water consumed is bottled water, followed by 36% of public water consumption.

San Pedro Town is one of only three municipalities in the country with an established sewer system for wastewater disposal and treatment (UNICEF, 2017). Almost 34% of households have flush toilets connected to the sewer, while the rest are connected to a septic tank and are the main type of sanitary facility for most households. In Cayo, 58.3% of households have a flush toilet, followed by 40.4% of households that have a pit latrine.

One of the indicators used to measure progress in MDG 7, "Ensure environmental sustainability", is the proportion of the population using solid fuels for cooking (Statistical Institute of Belize, 2010). The 2010 census data indicate that in San Pedro Town, most fuel used for cooking is butane or biogas. About 3128 households use this service, and the percentage change from 2000 to 2010 was 222.8%.

Figure 16 – Fuel used most for Cooking in San Pedro Town. Source: Statistics Institute of Belize.



In the Cayo district, 84.9% of households have a kitchen in their dwellings and, the same as San Pedro, 83.4% of the fuel used for cooking is butane/biogas.

Road Connectivity, Routes and Highways

The proposed Project area in Harmonyville is adjacent to the George Price Highway (GPH) (originally known as Western Highway).

This highway is of vital importance to the social and economic country infrastructure, as it links three western cities (San Ignacio, Santa Elena and Benque Viejo) and surrounding villages to the administrative capital in Belmopan and to the country's commercial center in Belize City.

Regarding San Pedro, there are two ways to get there from Belize: by ferry or flight. There are frequent daily trips from the Belize City water cab port to San Pedro and they last approximately 75 min. The second option is the flight from Belize City airport to San Pedro airport, with an approximate duration of 20 minutes. Once on the island, the most common way to get around is by golf carts on unpaved roads.

Education

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.

San Pedro City has 7 primary schools, 1 high school and 1 sixth form. According to the census data, the primary school enrollment rate has declined significantly, from 102% in 2004 to 89% in 2010. This decline may be largely due to the 205% increase in the population of children aged 5 to 14 years over the intercensal period. The secondary school gross enrollment rate increased from 53% in 2000 to 68% in 2010 for males, and from 64% in 2000 to 76% in 2010 for females.

The youth literacy rate (15 to 24 years) increased from 86% in 2000 to 93% in 2010 for male youth, and from 85% in 2000 to 95% in 2010 for females.

Technical and vocational training also experienced strong growth, with the number of students increasing by more than 600% between 2000 and 2010.

In Cayo District, the net primary school enrollment ratio in the 2010 Census report was 92,2% for males and 91,9% for females, but the net secondary enrollment ratio decreases significantly, with a percentage of 37,9 for males and 45,5 for females. The adult literacy rate was 73,7 and the youth literacy rate 86,8.

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 percent 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).

The main groups settled in the Cayo district are the Maya, Garifuna, Mennonites and Mestizos; and the main groups settled in San Pedro Town are Mestizos, Creoles, Garifuna, and Maya.

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.

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.

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 area. 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.

In terms of the Project areas:

- **Harmonyville** presents no indications of archaeological, historical or cultural heritage sites
- **San Pedro** south section is adjacent to the Marco Gonzalez Archaeological Reserve, a 2000-year-old Mayan site (house sites, no temples).



Figure 17 - Access sign at the Marco Gonzalez Archaeological Reserve (Photo: PlanEHS, Nov. 2022)

4.6 Characterization of the Direct Area of Influence

This section describes the Direct Area of Influence for the San Pedro Water Network Expansion and Harmonyville Water Network Expansion projects.

San Pedro Water Network Expansion

In order to understand the characteristics of the environmental, social and territorial context of the project, a field visit was conducted in November 2022. The photographic record detailing the key features of the areas is presented below. The field visit allowed to visualize the general characteristics of the project context, and identify early problems or situations that are useful for its evaluation and environmental and social management.



Figure 18 - Initial point of south San Pedro main (Photo: PlanEHS, Nov. 2022)

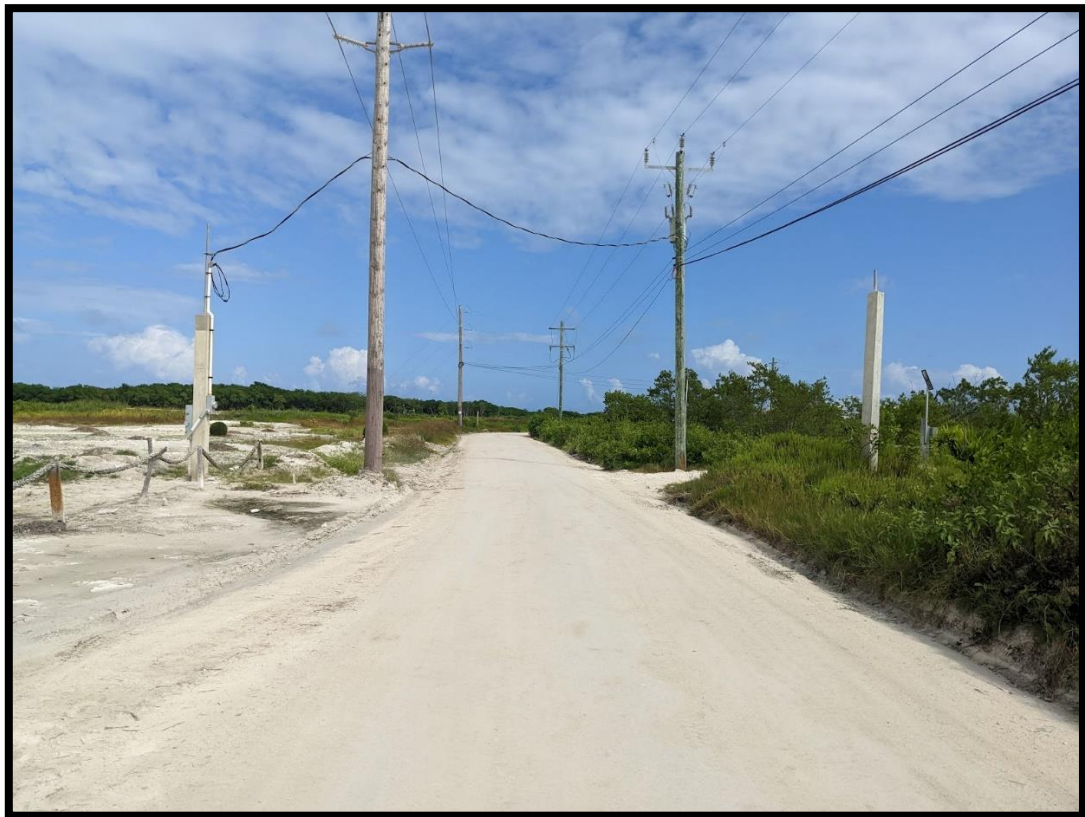


Figure 19 - Suburban characteristics of south San Pedro proposed main (Photo: PlanEHS, Nov. 2022)



Figure 20 - Lodge / beach resort (Photo: PlanEHS, Nov. 2022)



Figure 21 - Final point of south main. Residential complex under construction (Photo: PlanEHS, Nov. 2022)



Figure 22 - San Pedro north main to Port Authority. Initial point (Photo: PlanEHS, Nov. 2022)



Figure 23 - Ramification on proposed main to Port Authority (Photo: PlanEHS, Nov. 2022)



Figure 24 - Street narrowing on side ramification from north San Pedro main (Photo: PlanEHS, Nov. 2022)



Figure 25 - Micro-dumpsite (front back) on ramification from north San Pedro main (Photo: PlanEHS, Nov. 2022)



Figure 26 - Signs of inadequate waste disposal on streets in small shipyard. North San Pedro (Photo: PlanEHS, Nov. 2022)



Figure 27 - Proposed water main location in north San Pedro, urban profile (Photo: PlanEHS, Nov. 2022)

Harmonyville Water Network Expansion

In order to understand the characteristics of the environmental, social and territorial context of the project, a field visit was conducted in November 2022. The photographic record detailing the key features of the areas is presented below. The field visit allowed to visualize the general characteristics of the project context, and identify early problems or situations that are useful for its evaluation and environmental and social management.



Figure 28 - Easternmost proposed main in Harmonyville. Suburban profile. (Photo: PlanEHS, Nov. 2022)



Figure 29 - Drainage canal crossing in easternmost proposed main in Harmonyville (Photo: PlanEHS, Nov. 2022)



Figure 30 -Side ramification from easternmost Harmonyville proposed main (Photo: PlanEHS, Nov. 2022)



Figure 31 - Vegetation on partially open side road with proposed ramification of main (Photo: PlanEHS, Nov. 2022)



Figure 32 - Suburban profile in central proposed main in Harmonyville (Photo: PlanEHS, Nov. 2022)



Figure 33 - Vegetation on both sides of the road in central proposed main in Harmonyville (Photo: PlanEHS, Nov. 2022)

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 Supply and Modernization Program (BL-L1043), 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 distribution network). 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. Labor transportation.
- B. Worker camps installation and operation. Fencing in camps and construction fronts.
- C. Land clearing, dismantling of facilities and road breakage (where applicable)

Main work

- D. Aqueduct laying. Excavation, trenching, soil movement
- E. Aqueduct laying. Pipeline laying.
- F. Aqueduct laying. Installation of instrumentation, valves, measuring chambers, etc. Hydraulic testing

Work demobilization

- G. Demobilization of construction sites and workers. Removal of surplus materials. Camps closure.

Project Activities in the Operational Phase

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

- H. Operation of water network.
- I. Maintenance of water network.

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. Road network and traffic.
- 7. Infrastructure and services. Mains services (water, sewage, energy, gas).
- 8. Infrastructure and services. Waste Management. Municipal solid waste.
- 9. Infrastructure and services. Waste Management. Special and hazardous waste.
- 10. Infrastructure and services. Waste Management. Surplus work, aggregate construction and demolition waste.
- 11. Infrastructure and services. Waste Management. Excavation surpluses.
- 12. Occupational Health and Safety. Risk of occupational and road accidents. Health impact.
- 13. Socio-Economic development. Labor employment. Commercial and service activities.
- 14. Cultural and Archaeological Heritage.
- 15. Land Use and Activities in the Area. Residential Use.
- 16. 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	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-

Impact Magnitude	Physical and Biological environment	Socio-economic environment
	environment, in the modality and abundance in which it is currently used.	project levels for at least several generations.
Medium	It is defined as that which affects the environment or a subcomponent of it, 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.	It is defined as one that affects a definable group of people in a significant 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 both projects** (Harmonyville and San Pedro Water Network Expansions). The matrix contains the sign and magnitude of the impact. This matrix is presented in Figure 34.

<p style="text-align: center;">Matrix for the Identification of Environmental and Social Impacts and Risks</p> <p style="text-align: center;">Belize Water Supply and Modernization Program (BL-L1043)</p> <p style="text-align: center;">Water Network Expansions in San Pedro and Harmonyville Projects</p>			PROJECT ACTIVITIES WITH ENVIRONMENTAL AND SOCIAL IMPACT									STAGES		
												CONSTRUCTION		
			ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED BY THE PROJECT			Work preparation			Main Works			Work demobilization		
						Operation and Maintenance								
			Transportation, movement and stockpiling of materials, equipment and machinery. Labor mobilization.	Camps installation and movement. Fencing.	Land clearing, roadway breakage.	Excavation, trenching and soil movement	Pipeline laying	Aqueduct Laying	Installation of instrumentation, valves measuring chambers, etc.	Demobilization of construction sites and workers. Removal of surplus materials. Camps closure	Water Network Operation.	Water Network Maintenance		
			A	B	C	D	E	F	G	H	I			
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	Road network and traffic	6											
		Mains services (water, sewage, energy, gas)	7											
	WASTE MANAGEMENT	Municipal Solid waste	8											
		Hazardous or special waste	9											
		Construction waste	10											
		Excavation waste	11											
	OCCUPATIONAL AND COMMUNITY HEALTH AND SAFETY	Risk of accidents (occupational, road, health impact)	12											
	SOCIO-ECONOMIC DEVELOPMENT	Labor employment. Commercial and service activities.	13											
	CULTURAL HERITAGE	Cultural, Archaeological and Paleontological Heritage	14											
	LAND USE	Residential use	15											
	LANDSCAPE	Visual impact. Landscape perception	16											

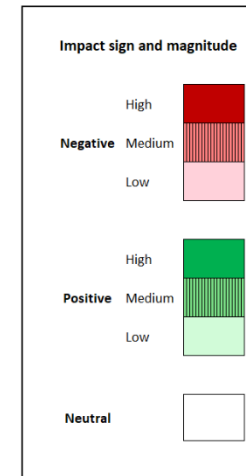


Figure 34 - Project Environmental and Social Impacts and Risks Matrix

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 worker camps installation, material storage, movement of machinery and vehicles affected by the work, cleaning of the land, drilling of wells, excavations, movement of demolition soils, civil works for construction of storage tanks and pumping stations, and electromechanical works, 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).
- When extracting earth during excavation and soil movement, dust emissions will be mitigated by spraying the material.
- Maintenance of construction machinery in good condition (technical verification).

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 demolition and excavation machinery, drilling of wells, together with the civil works for construction of storage tanks and pumping stations, and electromechanical works, are activities that 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 an **Information and Community Participation Program** in the ESMP, which provides information to neighbors about the works duration and scheduling.
- In the vicinity of population settlements, high noise generation activities will be scheduled with the community in order to avoid impacts at sensitive hours.
- Maintain construction machinery and equipment in good condition.
- Implement IFC Guidelines noise guidance levels – 55 dBA during the day, and 45 dBA at night for equivalent continuous noise levels in residential, institutional and educational settings; and/or compliance with specific legislation at national and local level. (Corporación Financiera Internacional, 2007)

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.).
- Identify and properly manage non-domestic effluents (including *mixer* washing effluents).

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 washing concrete mixers, or by poor management of sewage effluents or solid construction waste.

The removal of vegetation and tree cover, soil movement, drilling and excavations, demolition and breakage of road, and post-excavation filling always mean 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 protection measures to avoid sediment runoff, including: limiting the extent of open trenches to minimize stockpiling volumes; close out trenches as works schedule permits in anticipation of strong storms / tropical storms; cover soil stockpiles with tarpaulin sheets, etc.
- Establish an Effluent Management Program at 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 in 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, installation of the camp and work fronts, stockpiling of materials in preparation for construction, and excavations for civil works for the construction of new storage tanks and laying of pipelines, will 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 medium magnitude for the critical activities of the project (land clearing, excavations, civil works for the construction of new tanks and pumping stations) and of a permanent nature and affecting the direct influence area of the project.

Mitigation Measures

- Establish a Vegetation 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.
- Land used for temporary construction facilities (e.g., campground) must be restored to its original condition.

Residual Impact

Effective implementation of detailed mitigation measures is expected to result in low negative residual impact.

Road and Traffic Impacts

Impact Assessment

Impact Description	Competitive impacts on the use of the road network		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAoI)	Local (IAoI)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

During the entire construction phase, impacts will be generated by increased traffic, competition in the use of the road network (by the transport of materials, equipment and machinery for all well drilling works, laying of aqueducts, civil and electromechanical works of the project), and by the

reduction of effective road areas (by the presence of camps and fencing of the front of work, pavement breakage due to excavation works, and machinery parked or in operation).

In general, since the majority of the impact is on rural roads, secondary roads and/or tracks, this impact is not significant. Impacts are classified as negative, low magnitude, localized in the direct influence area, and transitory in nature (only occurring during construction), for preparation and closure activities.

Mitigation Measures

- Implement an Information and Community Participation Program in the PGAS, which provides information to neighbors about the works duration, scheduling and mitigation measures of possible risks and impacts produced by the works.
- Establish a Road Safety and Traffic Management Program in the PGAS.

Residual Impact

The residual impact remains low.

Impacts on Public Services

Impact Assessment

Impact Description	Risks of ruptures and service cuts due to interference during excavation and laying of aqueducts		
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, in the excavation actions, soil movement and laying of pipes, and in the construction of new infrastructure such as storage tanks and pumping stations, installation of valve instrumentation, measuring chambers, among others, interference with the existing service network may occur, which could result in accidental breaks and service interruptions to users.

However, given the rural and/or peri-urban nature of the area where the main works are developed, it is not expected to find a significant number of interferences. 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 Coordination Program with Service Providers in the ESMP, which allows a correct identification of interferences.
- Establish a Contingency Plan, which includes preparation and actions before water, sewer or gas service pipes ruptures.

- Implement an Information and Community 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 breakages and 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

The operation of the camp and the construction front involve the generation of solid waste assimilable to domestic.

In all construction activities, surplus construction, demolition waste (iron cuttings, cables, remains of plastic pipes, wood, aggregates from pavement breaks, dismantling/demolition of facilities, etc.) and green waste (resulting from weeding, land cleaning, etc.) are also 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.

Surplus excavation soils (if any) must be properly disposed of (e.g., used as backfill at other approved sites – quarries).

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 – including surplus excavations, 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 (DAoI)	Local (IAoI)
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: excavations (with the consequent risk of collapses and burial of people during the execution of the activity), construction of tanks and pumping stations, electrical work in installation of electromechanical equipment, accidents involving construction machinery, temporary or permanent hearing loss due to the operation of noise-generating equipment and machinery, welding and hot working, and ergonomic hazards.

This impact is classified as negative, of high magnitude for certain work instances of the (including the trenching and laying of pipes, construction of new storage tanks and pumping stations, dismantling/demolition of facilities and electrical work), 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, and is nourished by elements of internationally recognized occupational health and safety management systems (ISO 45001: 2018). This Program should pay special attention to high-risk work such as excavations and trenching, 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 Road Safety and Traffic Management Program in the PGAS, which seeks to prevent road accidents involving personnel or construction vehicles, through driving measures, correct road signage of work fronts and detours, etc.
- Establish a Works Installation and Camp Set-up Program in the PGAS, which ensures the installation of fencing, access control and adequate signage in the camp, work fronts, ditches, 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 (DAoI)	Local (IAoI)
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 project is framed in an area with available labor supply, and 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 (DAoI)	Local (IAoI)
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 (mainly residential dispersed in some sectors where the works will be developed mainly of laying of aqueduct, civil works of construction of new tanks and pumping stations, and electromechanical works), for road safety accidents related to the works and for the inconvenience inherent in construction tasks in more urban areas (noise, visual pollution). There is also the risk of conflicts between workers and the population.

During the construction phase, the work activities may temporarily affect both residential and commercial uses in populated areas. Although the contractor is contractually obliged to limit the duration of these impacts, due to the nature of the works, they may cause temporary difficulties in accessing housing or productive establishments. The exact time for which each home, business or equipment for community use will be affected will be determined once the executive project and the adjusted work schedule are available. In all cases, the corresponding measures will be implemented to minimize the impacts and compensate those whose will be affected as a consequence of the extension of the interruption of access to their premises or productive establishment. In the case of mobile posts or seasonal posts in public domain areas, if any, the necessary accompanying measures will be implemented so that those affected can continue to develop their activity in nearby areas with similar influx of public. It should be noted that in some cases commercial activities may also have positive impacts derived from the presence of workers linked to the work.

Regarding potential effects on community uses, from the existing information at the moment it does not emerge that this type of impact will be generated. However, in the event that the executive design of the project affects common uses in public domain properties, it must be ensured that the impact on the use of the property is minimized, and the uses that would have been affected by the construction are restored (both those temporary ones that derive from the activities of the work and the permanent ones, such as the impacts on equipment).

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

Mitigation Measures

- Follow up on the procedure for the constitution of an aqueduct easement in all existing aqueduct replacement works.
- Implement an Information and Community Participation Program in the ESMP, which provides adequate communication to neighbors about the type and duration of the impact, measures planned to mitigate it, hours of traffic and services cuts, if applicable, as provided in the corresponding section of the PGAS, and expected date for the restoration of the existing conditions before the work on the road and sidewalks.
- Implement prevention and mitigation measures during the construction phase, including work programming and coordination with roadside owners, forecasts of pedestrian and vehicular access, opening and closing of ditches on the day, etc. These measures may include compensation for those affected by the interruption of access to their premises for extended periods. In the case of mobile posts, the necessary accompanying measures will be implemented so that those affected can continue to develop their activity in nearby areas with similar influx of public. It should be noted that in some cases the activity of the shops may also have positive impacts derived from the presence of workers linked to the work.
- As the project progresses, a survey of the homes, productive establishments and establishments for community use whose accesses will be affected by the works will be carried out to determine the temporal scope of the impacts in each case and, in the case of businesses and other productive establishments, identification of those whose income could be affected by the presence of the work. On the other hand, definitive survey must also indicate if there are among the roadside owners, people who require some specific measure or accompaniment to consider during the work (for example, people with disabilities).
- Definition of specific measures to minimize and compensate for these impacts when it is not possible to avoid them. Specific measures shall include, among others:
 - In all cases, adequate communication to the neighbors about the type and duration of the impact, measures planned to mitigate it in the ESMP, and the expected date for the restoration of the existing conditions before the work in front of their houses.
 - Calculation and payment of corresponding compensations when the works generate an impact on the shop's income.
 - Specific complementary measures for particular cases (for example, if the survey arises from the fact that in any of the front homes there are people with disabilities or elderly people who require specific measures to ensure accessibility while the works are carried out in front of their home).
 - 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.
- Entering into use agreements with the jurisdictions to which the land belongs.
- Conduct surveys, based on the final designs of the project, to determine if there is any impact on common use facilities. In the event that the survey identifies any impact on equipment or facilities (street furniture, sports or play areas, etc.), a plan will be designed and implemented to reestablish uses (e.g., relocation of equipment within the same site or other improvements agreed upon with local or national authorities, as appropriate, and in consultation with the neighbors using the site) to ensure that activities can continue to be carried out normally on the area of the site not affected by the work.

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 – soil movement and excavations for laying aqueducts, civil works for the construction of new tanks and pumping stations – 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 Procedure of Fortuitous Discoveries 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 camps, fences, construction machinery, excavation, etc. 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

Groundwater

Impact Assessment

Impact Description	Impacts on groundwater from aquifer exploitation		
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 foreseen in the project will involve the increased use of existing aquifers to ensure adequate supply of potable water to the new connections (water network expansion). In the case of water obtained by reverse osmosis, increased production also induces increased disposal of brine (which is injected back in disposal aquifers).

The increased induced exploitation of aquifers is valued as a negative impact, of low magnitude (given the relatively small number of new connections in comparison to the current supply), and of a

permanent nature. This impact is cumulative since other current or future uses of this aquifer will be enhanced.

Mitigation Measures

- Establish a Physical Loss Detection Program in the operational phase EMP, in order to avoid superfluous consumption of the resource (NRW).

Residual Impact

The assessment of the magnitude of the residual impact remains negative low.

Services by Network (Access to Drinking Water)

Impact Assessment

Impact Description	Impacts of increased coverage of access to drinking water		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted (OA)	Punctual (DAoI)	Local (IAoI)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The main objective of the Program is to implement actions in the potable water supply system to ensure the availability of potable water for the population and beneficiary towns.

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 aqueduct		
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 infrastructure (tanks and pumping stations, laying of aqueducts, electromechanical works) 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

- Reinforce signage and occupational health and safety measures in the intervened facilities.
- 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, and is nourished by elements of internationally recognized occupational health and safety management systems (ISO 45001: 2018).
- Establish a Contingency Plan in the operational ESMP, which ensures the response to medical emergencies.
- Establish a Socio-Environmental Training Program for Plant Personnel in the operational ESMP, which includes training in the use of PPE, risks during maintenance tasks, contingency plan, etc.

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 integral and sustainable improvement of access to drinking water would lead to the reduction of public health problems related to the unsafe water consumption and the probable reduction in the future availability of the resource, and therefore a medium positive impact, of a permanent nature, and an indirect benefit are considered.

In addition, through the comprehensive improvement of the health infrastructure for the population, it will result in an increase in property prices. This real estate valuation is qualified as a low positive impact, of a permanent nature and medium probability.

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.

<p style="text-align: center;">Matrix for the Identification of Environmental and Social Impacts and Risks</p> <p style="text-align: center;">Belize Water Supply and Modernization Program (BL-L1043)</p> <p style="text-align: center;">Water Network Expansions in San Pedro and Harmonyville Projects</p>			PROJECT ACTIVITIES WITH ENVIRONMENTAL AND SOCIAL IMPACT										STAGES													
													CONSTRUCTION			OPERATION										
			Work preparation			Main Works			Work demobilization			Operation and Maintenance														
			Transportation, movement and stockpiling of materials, equipment and machinery. Labor mobilization.			Camps installation and movement. Fencing.			Land clearing, roadway breakage.			Excavation, trenching and soil movement			Aqueduct Laying			Installation of instrumentation, valves measuring chambers, etc.			Demobilization of construction sites and workers. Removal of surplus materials. Camps closure.			Water Network Operation.		
ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED BY THE PROJECT												A	B	C	D	E	F	G	H	I						
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	Road network and traffic	6																							
		Mains services (water, sewage, energy, gas)	7																							
	WASTE MANAGEMENT	Municipal Solid waste	8																							
		Hazardous or special waste	9																							
		Construction waste	10																							
		Excavation waste	11																							
	OCCUPATIONAL AND COMMUNITY HEALTH AND SAFETY	Risk of accidents (occupational, road, health impact)	12																							
	SOCIO-ECONOMIC DEVELOPMENT	Labor employment. Commercial and service activities.	13																							
	CULTURAL HERITAGE	Cultural, Archaeological and Paleontological Heritage	14																							
	LAND USE	Residential use	15																							
	LANDSCAPE	Visual impact. Landscape perception	16																							

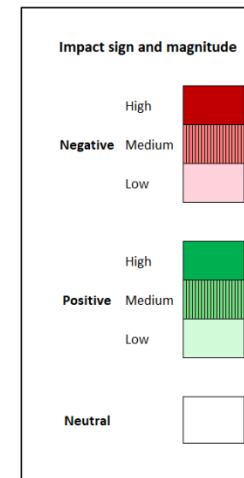


Figure 1 - Project Residual Environmental and Social Impacts and Risks Matrix

5.12 Specific Impacts and Risks of the Sample Projects

The matrix and analysis above list the general impacts and risks that will apply to both sample projects. Below is an analysis of the specific risks and impacts for each of the sample projects.

San Pedro Water Network Expansion

In terms of construction-phase impacts, the field visits highlight the presence of small open dumps and solid waste collection issues in general, which could be further exacerbated by the fact that San Pedro exports its solid waste to the continent landfill (Mile 24) through a transfer station and barge operation. The contractor for the works should ensure, through its Solid Waste Management Program in the ESMP, adequate collection and disposal for all waste generated during the construction. Additionally, the presence of small open dumps poses a risks of increase vectors and pests. The contractor should reinforce the Pest and Vector Control Program of the ESMP accordingly.

In terms of operational-phase impacts, the provision of water services, particularly for the south part of San Pedro, could induce further urban development in that area (indirect impact), which could lead to degradation of natural habitats such as mangroves and shoreline.

Harmonyville Water Network Expansion

In terms of operational-phase impacts, the provision of water services in the Harmonyville area will most induce further urban development in that area (indirect impact), which could lead to degradation of existing natural habitats.

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 ²Figure 2.

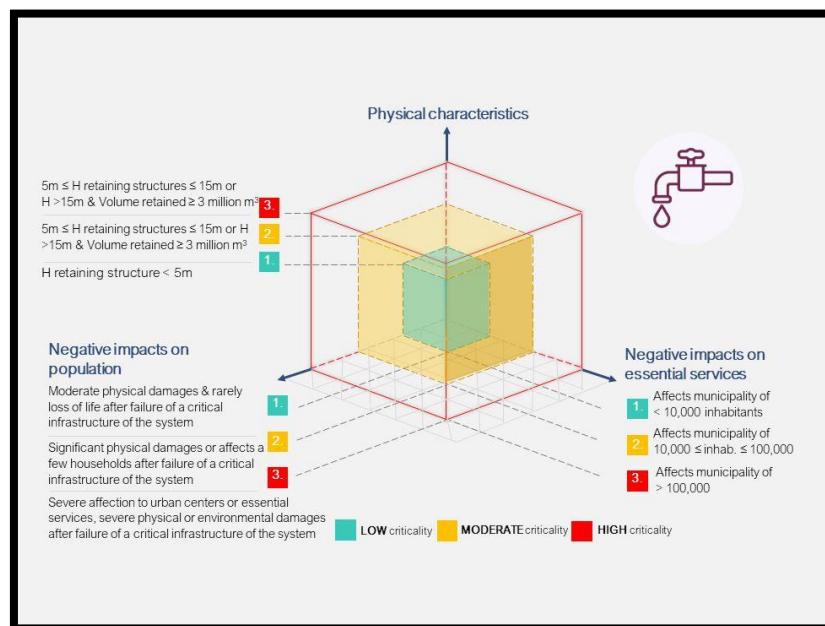


Figure 2 – Criticality graph for drainage, water supply and wastewater management (WSA) infrastructure³

Analyzing the **physical characteristics** of the infrastructure (water networks – underground piping) and the magnitude of the works (significantly less than 10,000 served connections), the criticality is classified as **low**. The infrastructure considered in the project - in case of failure of the works - would not affect a population greater than 10,000 inhabitants.

The Project will contribute to improving the quality of the provision of potable water services to the population.

The project also seeks to strengthen the infrastructure to make it more resilient and to contribute to national efforts by incorporating equipment and infrastructure with characteristics of resilience to climate change and climate risks present in the country's territory (e.g., energy efficiency equipment

² 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>)

³ Methodology for Disaster Risk Assessment and Climate Change. Technical Note N° IDB-TN-01771.

under Component 2).

In this sense, 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 Natural 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 **Low**, not requiring a complete qualitative evaluation.

For the purposes of responding to extreme events, BWS has a Disaster Risk Mitigation and Recovery Plan⁴, defining the emergency response team and chain of command, the preparatory planning, as well as the response protocols for the different phases.

5.14 Impacts and Risks for Component 2 (Equipment)

Table 22 below summarizes the impacts and risks identified for Component 2 (Equipment replacement).

Table 22 - Impacts and Risks for Component 2

Stage	Identified Impacts		
	Physical Environment	Biological Environment	Socioeconomic Environment
Construction	<ul style="list-style-type: none"> • Generation of emissions, particulate matter, noise and vibrations for minor works, transport of equipment, etc. • Generation of waste during installation of equipment 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Operation and Maintenance	<ul style="list-style-type: none"> • Generation of bulky waste (end of cycle equipment) 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Occupational risks during operation and maintenance of equipment (disinfection equipment, electromechanical equipment, etc.) • Occupational risks derived by the transport, storage, handling and use of chemical substances used by the new equipment (particularly, disinfection equipment) • (+) Improvement of the energy efficiency and overall, of the operations

⁴ BWS, Disaster Risk Mitigation and Recovery Plan. June 2022.

These impacts and risks are mitigated with the corresponding Environmental and Social Management Plan for Component 2 (see **Chapter 6**).

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

BWSL 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, BWSL 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 BWSL, detailing the actions and results of the ESMPc implementation.

The inspection, control and monitoring activities of the ESMPc will be carried out by BWSL. BWSL 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, BWSL 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 BWSL, 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 BWSL, 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 23 summarizes the environmental and social management responsibilities of the entities involved in the different phases of the projects.

Table 23 - 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)	BWSL		IDB
	Executive Project / Engineering Design	BWSL		IDB
	Environmental and Social Assessment	BWSL (may use external consultants)		IDB
	Public Consultation	BWSL		IDB
	Preparation of E&S Technical Specifications for Bidding Documents	BWSL		IDB
	Environmental Permits	BWSL		DOE
Construction	ESMPc: Preparation and Implementation	Contractors	BWSL	IDB
	Environmental and Social compliance during construction	Contractors	BWSL / DOE	IDB
	E&S Progress Reports	Contractors to BWSL (monthly)	BWSL	
	E&S Progress Reports	BWSL to IDB (half-annually)		IDB
	Final E&S Report	Contractors	BWSL	
	Final E&S Report	BWSL		IDB
Operation	Operation and maintenance of the water network infrastructure	BWSL	DOE	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.

Number of the Program	Program
1	Monitoring and Control of Compliance with Mitigation Measures
2	Installation of works camps
3	Vegetation and Fauna Management Program
4	Air Quality, Noise and Vibration
5	Waste Management Program
6	Effluent Management
7	Chemicals Management
8	Occupational and Community Health and Safety
9	Road Safety and Traffic Management
10	Pest and Vector Control
11	Coordination with Service Providers
12	Socio-environmental training for construction personnel
13	Natural Disaster Management and Emergency Response
14	Information and Community Participation
15	Archaeological, Historical, Cultural and Paleontological Heritage Management
16	Works closure
17	Prevention of Infectious Diseases in the Workplace and Community

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	
<p>Indicators</p> <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: Installation of works camps

Program 2: Installation of works camps	
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 camps will be provided with adequate communication equipment, to able the request of help against emergencies (radios, if necessary). • Work camps 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. 	
Monitoring and Compliance	
<p>Indicators</p> <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: Vegetation and Fauna Management Program

Program 3: Vegetation 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"> Whenever possible, the Contractor shall select the most degraded or anthropized sites for the construction of the facilities (avoid well-vegetated areas, especially when native species and trees are present). 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. These activities will be agreed with PMU 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 carried out in the fourth month after planting, counting the surviving vegetation. The removal of the vegetal cover will be carried out 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. 	
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: Air Quality, Noise and Vibration

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 4: Air Quality, Noise and Vibration Program	
Socio-environmental effects to be prevented or corrected:	Air and noise pollution due to inadequate management of construction activities
Management Measures	
<p>Particulate matter:</p> <ul style="list-style-type: none"> • All materials that could give off dust will be transported in vehicles covered with tarpaulins, with sufficient moisture content to minimize their dispersion. It must be controlled that the volume of cargo transported by truck in the operational and influence area, ensuring that it is flush with the level of the transport box, in order to avoid dispersion or fall of the material. • During the period of collection on site, periodic wetting (only with water) of materials that could generate dust will be carried out. The quantities in stockpiling will be minimized, whenever it is operationally feasible. The greatest possible distance will be maintained between the collection of materials and the area residents. • Periodic watering of vials without asphalt folder to be used on site will be implemented - once a day, or as often as determined necessary for local conditions. <p>Emissions:</p> <ul style="list-style-type: none"> • Maintenance of construction machinery in good condition (technical verification). • Verification of exhaust emissions by the use of portable opacimeters <p>Noise and vibration</p> <ul style="list-style-type: none"> • Avoid the installation of fixed equipment such as generators, compressors or similar noise sources, in proximity to sensitive areas. In case it is necessary to use it in acoustically sensitive areas, privilege equipment with soundproofing cabinets or implement acoustic shielding designed for this purpose. • Speed limitation of construction vehicles on access roads without bearing folder (define according to case between 20 and 40 km / h). • Maintenance of construction machinery in good condition (technical verification). • The activities of high generation of noise will be programmed with the community to avoid impacts in sensitive schedules. • Implement the strictest value for noise guide levels between local legislation, and IFC Guidelines – 55 dBA during the day, and 45 dBA at night for equivalent continuous noise levels in residential, institutional and educational settings. Daytime schedules will be established for those tasks that involve the generation of relevant noise. • Implement training sessions for construction personnel in order to promote awareness of noise and vibration pollution, and good practices to reduce air pollution as a result of the work. • On windy days or in places highly exposed to wind action, the effectiveness of the mitigation measures applied should be verified in order to prevent the generation of dust and/or dispersion of aggregates (e.g., in the urbanized environment of the camp and construction fronts). • The preservation of vegetation throughout the construction area contributes to reducing the dispersion of particulate matter. 	

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Program 4: Air Quality, Noise and Vibration Program

- Although in principle it is not foreseen necessary to develop activities during the night period, if this situation changes, authorization must be requested from the Enforcement Authority.
- Implement acoustic shielding in fixed equipment or machinery (e.g., water table depression pumps) in case their need is evaluated by characterizing the level of noise generation.
- The location of the work equipment with the highest noise emission will be chosen as far as possible considering avoiding sensitive receivers. When they are near sensitive receivers, construction sites will be scheduled and provided with the necessary resources to make the exposure time as short as possible.
- Avoid the installation of fixed equipment such as generators, compressors or similar noise sources, in proximity to house facades. In case it is necessary to use it in acoustically sensitive areas, privilege equipment with soundproofing cabinets or implement acoustic shielding designed for this purpose.
- Install specially equipped and acoustically insulated enclosures for the performance of particularly noisy tasks.
- Avoid obstruction in the circulation of vehicular flow in the area of the work to reduce the noise generated by situations of traffic congestion, through the correct signaling of alternate roads, the deployment of personnel to direct traffic, and the programming of entry and exit sequentially of heavy vehicles affected to the work.

Monitoring and compliance

Indicators

- The local residents concerned are informed, as far as possible, of the planned work and the vibration and noise levels, as well as the periods during which it will occur.
- All staff is professionally trained on good practices to reduce air pollution as a result of the work.
- The recorded values, corresponding to the emission of noise, vibrations, particles and polluting gases do not exceed in any of the parameters, the threshold allowed by current legislation.
- There is no record of impacts (nor claims or complaints) of the local community, nor of the personnel of the work, of the inhabitants of the houses closest to the trace due to a possible decrease in air quality.
- The installation of fixed equipment such as generators, compressors or similar noise sources has been avoided, in proximity to house facades. If it has been necessary to use it in sensitive acoustic areas, the use of equipment with soundproofing cabinets has been privileged or acoustic shielding designed for this purpose has been implemented.

Periodicity of Supervision of the degree of Compliance and Effectiveness of the Measure

Monthly

Head of Audit

Construction Inspection

Program 5: Waste Management Program

Program 5: 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 supervising body 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 5: 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 6: Effluent Management

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 6: 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 liquid effluents generated in the camp must be properly managed through the installation of collection and treatment systems, complying with the permissible tipping limits of local regulations, in order to avoid deterioration in the water quality of surface runoff.</p> <p>A drainage system must be designed at the construction site and camp that allows a controlled evacuation of rainwater, thus minimizing the dragging of materials and losses that reach the ground towards the rainwater collectors. The need for flow disposal from actions of water table depression that were required by the works should be considered.</p> <p>The liquid effluents generated from the washing of equipment and machinery (including concrete mixers) must be collected, with the aim of preventing any remaining components from accumulating on any of the existing trenches or ditches, and treated to remove suspended solids (sedimentation), the residues of fats and oils they may contain, as well as by pH correction, prior to discharge into the sewer or rainwater system as appropriate or authorized. Alternatively, the contractor may prohibit subcontractors from washing concrete mixer trucks on the construction site.</p> <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>	
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 7: Chemicals Management

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 7: 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>In the event that the contractor performs the refueling of heavy machinery in the vicinity of the construction site, tank trucks must be used and the following procedure must be taken into account during refueling:</p> <ul style="list-style-type: none"> • Park the vehicle where it does not cause interference, so that it is in a quick exit position • Ensure the presence of extinguishers near the site where the supply is carried out (distance not exceeding 3 m) • Check that there are no sources that could cause fire in the vicinity • Check hose coupling • Use anti-spill trays • In case of spill or fire, follow the procedures of the Contingency Plan • Immediately report any spillage or contamination of the product to the environmental controller. <p>For this there must be a report form and authorization of fuel filling.</p> <p>Polyethylene material should be placed to cover the area where some corrective maintenance is to be carried out on heavy machinery (greasing and checking of oil levels). In this case, the delegated Work Supervision must be notified of the day and place where it took place and the causes that motivated it.</p> <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 Construction 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>The minimum daily storage allowed in the camp must be agreed with the competent authority. Tanks containing fuels or lubricants will be stored removed from any building – ideally, more than 6 meters away. The storage of fuels or lubricants shall be carried out in metal containers with spring-loaded lids, or in plastic tanks. They must be properly identified with the substance it contains and carry preventive signs of "flammable" and "no smoking".</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>	

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 7: Chemicals Management Program	
Monitoring and compliance	
Indicators	<ul style="list-style-type: none"> Percentage of compliance in inspections of chemical management facilities and procedures.
Monitoring	<ul style="list-style-type: none"> Training registration sheets for key personnel in chemical management. Registration sheets for chemical substances stored on site. Report forms and authorization of fuel filling.
Periodicity of Supervision of the degree of Compliance and Effectiveness of the Measure	Monthly
Head of Audit	Construction Inspection

Program 8: Occupational and Community Health and Safety

Program 8: 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 periodicity, 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, and Risk Management System of the ISO 45001 standard: 2018), 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>Preventive Occupational Medicine Subprogram</p> <p>The main objective of this subprogram is the promotion, prevention, and control of the health of working people, protecting them from occupational risk factors.</p> <ul style="list-style-type: none"> The main activities in the Preventive Occupational Medicine Subprogram are: Develop epidemiological surveillance activities, together with the industrial hygiene and safety subprogram, which will include at least: <ul style="list-style-type: none"> accidents at work. professional illnesses. Risk scenario. Develop activities for the prevention of occupational diseases, work accidents and health education for project workers, in coordination with the Industrial Hygiene and Safety subprogram. Investigate and analyze the diseases that have occurred, determine their causes, and establish the necessary preventive and corrective measures. Organize and implement a timely and efficient first aid service. Prepare and keep up-to-date statistics on morbidity and mortality of workers and investigate possible relationships with their activities. Coordinate and facilitate the rehabilitation and relocation of people with temporary and partial permanent disability. <p>Industrial Hygiene 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 demarcate work areas and storage areas. Carry out and publicize the Contingency Plan. 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, 	

Program 8: Occupational and Community Health and Safety

- Hot Work (Welding),
- Machinery maintenance

Community Health and Safety Subprogram

This subprogram addresses the risks and impacts to the health and safety of communities affected by the project.

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.

For that, the following aspects will be considered:

- Design and safety of infrastructure and equipment: consider the safety risks for third parties and for the communities where the works are carried out.
- Traffic and road safety.
- Ecosystem services: the project's impacts on natural habitats can generate risks and adverse impacts on the health and safety of the affected communities.
- Community exposure to disease.
- Management and safety of hazardous materials.
- Emergency preparedness and response (Contingency Plan)
- Mechanism for handling workers' complaints and claims. The contractor must formulate and implement a mechanism for receiving and responding to complaints and claims from direct workers and ensure that subcontractors have a similar one.

Labor Management Procedure Subprogram

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).

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.

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.

Monitoring and Compliance

Indicators

- 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

- 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 9: Road Safety and Traffic Management Plan

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 9: Road Safety and Traffic Management Plan	
Socio-environmental effects to be prevented or corrected:	Road accidents, deterioration of road infrastructure and congestion.
Management Measures	
<p>The Contractor must prepare the Road Safety and Traffic Management Plan. It must be prepared prior to the start of the tasks, and executed throughout the construction phase of the project. The Plan will require the approval of the Construction Supervision, in consultation with the competent Transit and Transport authority.</p> <p>The Program will incorporate the corresponding road safety and signaling plan provided for by current national and local regulations. It will also consider implementing the warnings of the alternative routes with sufficient geographical anticipation, adequately indicating the users of the Passenger Motor Transport lines whose routes must be modified the transitory location of the stops, ensuring that it is maintained throughout the period of work. Likewise, the routes must be drawn and the most convenient schedules established for the circulation of cargo vehicles linked to the work, in order to minimize the effects on traffic and avoid impacts in surrounding areas.</p> <p>The Plan must integrate, both in vehicular and pedestrian traffic, universal accessibility, signage and control devices (in accordance with current regulations), to facilitate and guarantee orderly, safe and predictable movement, guiding and warning all school users during the construction period.</p>	
Monitoring and compliance	
<p>Indicators</p> <ul style="list-style-type: none"> • Number of works fronts marked in accordance with the approved Road Safety and Traffic Management Plan/Number of work fronts that require signaling in accordance with the Road Safety and Traffic Management Plan. • Number of road accidents. <p>Monitoring</p> <ul style="list-style-type: none"> • Road safety accident records. 	
Periodicity of Supervision of the degree of Compliance and Effectiveness of the Measure	Monthly
Head of Audit	Construction Inspection

Program 10: Pest and Vector Control

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	
Program 10: 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 11: Coordination with Service Providers

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN						
Program 11: Coordination with Service Providers						
Socio-environmental effects to be prevented or corrected:			Impacts on services due to breakages during work activities.			
Management Measures						
<p>The Contractor will establish coordination with the companies providing network services to resolve the interferences that the execution of the Work will produce with the existing infrastructure. For the fulfillment of this, with the agreement of the Work Inspection, it will plan and propose the solution that is considered most appropriate and will agree with the corresponding company, which will be responsible for executing it, minimizing the inconvenience to users. Likewise, the action will be programmed so that the Contractor resolves quickly in the event that a possible situation of unscheduled interference puts the provision of the service in crisis.</p> <p>The Contractor will work from the beginning of the work in the management of the appropriate permits, coordinating with the technical teams of the service providers.</p> <p>An inventory shall be made by the contractor of existing utility networks in accordance with contract specifications and drawings to identify and locate lines that may be affected.</p> <p>Before starting the activities, the Contractor will locate the axes of the different lines of public services that are in the area to be intervened, this in accordance with what is indicated in the design plans of the project and the information obtained from the utility company. At the same time, the plans must be approved by the respective utilities.</p>						
Monitoring and compliance						
Indicators						
<ul style="list-style-type: none"> Number of service outages per network generated by interfering work activities / Number of service outages per network generated by construction activities with coordinated interference with network service providers. 						
Stage of the Project in which it is applied:	Preparation	X	Estimated cost	To be indicated by the contractor in his offer	Expected effectiveness	Loud
	Construction	X				
	Abandonment	X				
Indicators of success				Number of service outages per network generated by interfering work activities / Number of service outages per network generated by construction activities with coordinated interference with network service providers.		
Responsible for the Implementation of the Measure				Project Manager		
Periodicity of Supervision of the degree of Compliance and Effectiveness of the Measure				Monthly		
Head of Audit				Construction Inspection		

Program 12: Socio-environmental training for construction personnel

Program 12: 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>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 the 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. • Control of potential environmental contamination of the natural environment: air, soil, groundwater. • Evaluation and control of risks. People safety. • Environmental contingencies: spills, landslides, explosions, 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.</p> <p>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	

Program 12: Socio-environmental training for construction personnel	
Indicators	
<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
Responsible for the control of the measure	Works Inspector

Program 13: Natural Disaster Management and Emergency Response

Program 13: Natural 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. • 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. • 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. 	

Program 13: Natural Disaster Management and Emergency Response

- 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.

Fire prevention and control:

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:

- 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.

Actions in case of floods:

- 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.

Once the emergency is controlled, the emergency coordinator will prepare a final report on it.

Monitoring and Compliance

Indicators

- 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 14: Information and Community Participation

Program 14: Information and Community 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 15: Archaeological, Historical, Cultural and Paleontological Heritage Management

Program 15: Archaeological, Historical, Cultural and Paleontological Heritage Management	
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 16: Works closure

Program 16: 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

Program 17: Prevention of Infectious Diseases in the Workplace and Community

Program 17: Prevention of Infectious Diseases in the Workplace and Community	
Socio-environmental effects to be prevented or corrected:	Impact on the health of the workers and the communities of the Project Area due to infectious diseases, especially COVID-19 and HIV.
Management measures	
<p>Challenges due to infections could be addressed through:</p> <ul style="list-style-type: none"> • enhancing education and sensitization of workers and the local communities on the dangers and prevalence of diseases, • regular sensitization campaigns and monitoring of the spread diseases, • development of brochures and other materials that will convey information about diseases and infections, • regular provision of adequate prevention measures such as hygiene elements and condoms, • provision of drugs such as anti-retroviral drugs (ARVs). • implementing covid prevention protocols. 	
Monitoring and Compliance	
<p>Indicators</p> <ul style="list-style-type: none"> • Number of workers positive for COVID-19. <p>Monitoring</p> <ul style="list-style-type: none"> • PPE delivery forms. • Workers positive for COVID-19 follow-up forms. 	
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 24 outlines the minimum requirements that the Environmental and Social Management Plan must meet for the Operational Phase.

During the Operational Phase, BWSL will be in charge of the operation and maintenance of the infrastructure to be built and of the equipment and machinery, and will be responsible for the preparation and implementation of an operational ESMP, in accordance with its environmental policy and system. environmental and social management, and with the guidelines below.

Table 24 - Operational Environmental and Social Management Plan

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
Solid Waste Management Program	Contamination due to inadequate solid waste management in the operation and maintenance of water networks or equipment replacement.	Definition of optimal frequencies for the removal of special waste resulting from the maintenance of equipment with authorized operators.	BWSL	Environmental Audit of the Site Special waste removal registers and manifests.	DOE
Hazardous Chemicals Management Program	Contamination due to inadequate management of hazardous chemicals used during disinfection and other processes	Development and implementation of a Hazardous Chemicals Management Plan.	BWSL	Environmental Audit of the Site	DOE
Occupational Health and Safety Program	Occupational risks due to the operation and maintenance of PPAs and aqueducts.	Compliance with current national regulations. Adopt international best practices (including ISO 45001:2018) for the occupational health and safety risk management system	BWSL	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.	BWSL	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 electromechanical equipment in networks	BWSL	Maintenance record sheets.	

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
		Implementation of a monitoring plan for the detection of leaks or failures in aqueducts.			
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.	<p>Minimum training:</p> <ul style="list-style-type: none"> - 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 	BWSL	<p>Percentage of operators trained according to Training Program</p> <p>Training Registration Sheets</p>	
Contingency Plan	Poor management of environmental/occupational contingencies	<p>Strategic Plan</p> <p>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</p>	BWSL	<p>Number of environmental and safety accidents managed according to the defined procedure / Total number of environmental and health accidents occurring in the project.</p>	

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
		from the evaluation of the risks associated with construction. Action Plan Establish the procedures to be followed in case of emergency.			

Environmental and Social Management Plan for Component 2

This ESMP provides mitigation measures for the negative impacts and risks for implementation of Component 2 of the Project.

Table 25 outlines the minimum requirements that the Environmental and Social Management Plan for Component 2 must meet. BWSL will be in charge of developing and implementing this ESMP, in accordance with its environmental policy and system. environmental and social management, and with the guidelines below.

Table 25 - Environmental and Social Management Plan for Component 2 (Equipment)

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
Waste Management Program	Contamination due to inadequate waste management in the equipment replacement.	Adequate final disposal of equipment replaced, and other waste generated.	BWSL	Environmental Audit of the Site Special waste removal registers and manifests.	DOE
Hazardous Chemicals Management Program	Contamination due to inadequate management of hazardous chemicals used during disinfection and other processes	Development and implementation of a Chemicals Management Plan for every new disinfection facility installation.	BWSL	Environmental Audit of the Site	DOE
Occupational Health and Safety Program	Occupational risks during the replacement of equipment (e.g., electrical risks, ergonomic risks, etc.)	Compliance with current national regulations. Adopt international best practices (including ISO 45001:2018) for the occupational health and safety risk management system	BWSL	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
Preventive Maintenance Program	Contingencies for failures that may leave equipment out of service	Implement a regular maintenance program of electromechanical and other equipment.	BWSL	Maintenance record sheets.	

6.3 Budget for Implementation of the ESMP

Table 26 includes the estimated costs, schedules, and responsible entities for the implementations of the ESMPs.

Table 26. 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 BWSL operational budget]	Throughout the lifecycle of the infrastructure	BWSL
Implementation of Mitigation Measures of Component 2 ESMP	Incorporation of mitigation measures for Component 2 implementation	[incorporated in BWSL operational budget]	Throughout the lifecycle of equipment	BWSL

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 Supply and Modernization Program (BL-L1043).

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 network and access to potable water.

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 San Pedro and Harmonyville Water Expansion Projects, to be financed within the framework of the Belize Water Supply and Modernization Program (BL-L1043), 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. BWSL 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. BWSL shall take steps to maintain confidentiality where required and where necessary to protect personal data.

It is in this context, the following Stakeholder Engagement Plan 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

BWSL 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 BWSL 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 27 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 BWSL and the municipalities 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 27 - Stakeholder Map

Guy	Stakeholder	Relationship with the Program/Project
Institutional Stakeholders	BWSL	Executing Agency
	Municipalities located within the <u>area of direct influence of the Program</u> (municipal authorities and in particular areas of environment and public works of each beneficiary municipality).	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
	Affected population (potential store owners in public space, productive activities – owners of fields affected by the traces of water mains -, recreational, service and otherwise, area residents with direct access to the works) located within the area of influence of the Program.	Affected party
	Civil Society Organizations (in particular, those working in environmental and social issues)	Interested Party
Community	Population of the towns 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 the BWSL 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 BWSL 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 in San Pedro and Harmonyville is the week of September 12-16, 2022.

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 BWSL with social specialists with experience in consultation instances.

Publication on the website

BWSL 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.

BWSL 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 BWSL, as communicated to the persons participating in the consultation meeting.

