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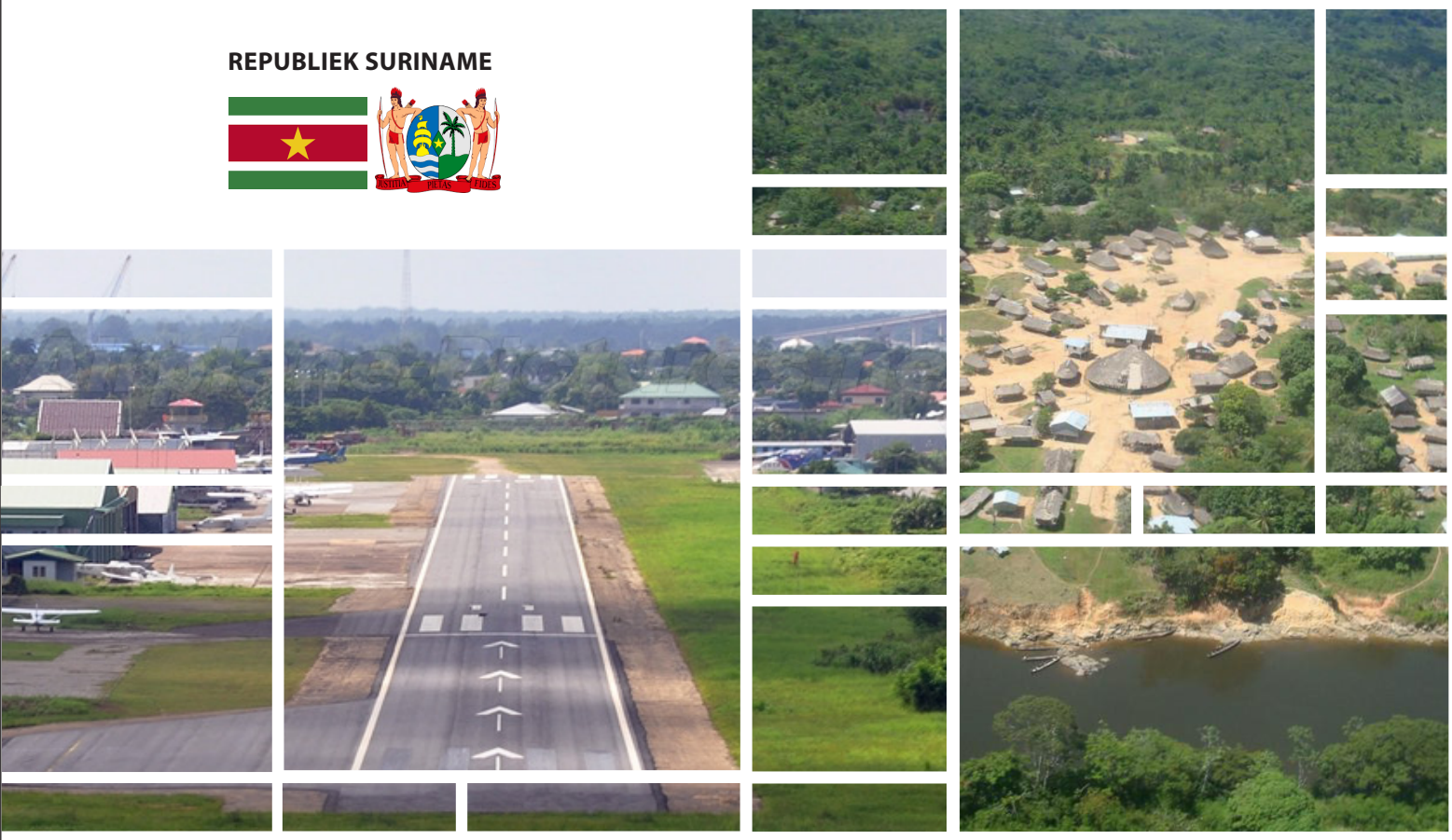

Essential Air Transport Service for Remote Communities in Suriname (SU-L1071)

Environmental and Social Assessment
Environmental and Social Management Plan

PlanEHS

Final Version
October 2024

Document Datasheet

Project Proponent **Ministry of Transport, Communication and Tourism, Suriname**	**Project** **Essential Air Transport Service for Remote Communities in Suriname Program (SU-L1071)**
During the preparation of the Essential Air Transport Service for Remote Communities in Suriname Program (SU-L1071), Suriname's Ministry of Transport, Communication and Tourism commissioned, with technical cooperation resources from the Interamerican Development Bank, the preparation of an Environmental and Social Assessment for the works under the Program. The purpose of this document is to provide an environmental and social assessment of the works under the Program against IDB's Social and Environmental Policy Framework.	**Client** Interamerican Development Bank **Contract Date** June 2024

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Executive Summary

Introduction

The objective of this Environmental and Social Assessment (ESA) is to evaluate the Infrastructure Projects of the **Essential Air Transport Service for remote communities in Suriname Program** (SU-L1071), in accordance with the Interamerican Development Bank's Environmental and Social Policy Framework (ESPF).

The specific objectives of the ESA were the following:

1. Conduct a comprehensive diagnostic evaluation of the Environmental and Social Baseline of the Projects Intervention Area. This includes a synthesis of the pertinent legal and institutional regulatory framework.
2. Identify and evaluate the environmental and social impacts and risks associated with the Projects, spanning all the phases from construction to operation and eventual closure. These evaluations encompass the physical, biological, and socioeconomic aspects of the environment.
3. Establish effective mitigation measures and implement robust management procedures to minimize the assessed impacts and risks. This will culminate in the formulation of the Project's Environmental and Social Management Plan, which will serve as a guiding document.

Program and Project Description

The Program's main objective is to contribute to a safe, secure, and self-sustaining air transport sector for Suriname.

The Projects included in the infrastructure improvements are the following:

1. Kwamalasamutu aerodrome rehabilitation in Kwamalasamutu.
2. Zorg En Hoop rehabilitation in Paramaribo.
3. Johan Adolf Pengel International Airport

Legal and Institutional Framework

Chapter 3 of this ESA outlines the legal, sectoral, and institutional framework of the Projects, taking into account environmental, social, occupational health, and safety areas.

The legal framework is described based on international agreements and national environmental laws.

Considering the funding source is the Inter-American Development Bank, it is necessary to guarantee compliance with the ten Environmental and Social Performance Standards stipulated within the recently revised IDB Environmental and Social Policy Framework.

Environmental and Social Baseline

Chapter 4 of this ESA presents the Environmental and Social Baseline of the Projects, where the analysis carried out allows to know the location and description of the area of execution and influence of the project, to determine its current situation and the

critical aspects to consider during the projects' implementation.

In this section of the Study, the baselines for the physical, biological, and socioeconomic environments are described.

Likewise, an analysis of biodiversity and protected areas, vulnerability to natural disasters, and cultural heritage is carried out.

The analysis then focuses on the Area of Direct Influence of the interventions, providing a description based on a photographic register.

Environmental and Social Impacts and Risks

The Environmental and Social (E&S) Risk and Impact Assessment Process is developed in Chapter 5.

For the impact identification, the interactions between the project actions (identified above) and the environmental components (physical, biological, and socioeconomic environment) were analyzed. The analysis is comprised of two distinct phases: on the one hand, an assessment for the **environmental and social impacts and risks common across all projects**; on the other, individualized assessments for each project, focusing on the **distinct environmental and social impacts and risks of each project**.

Common E&S Impacts and Risks

This analysis was carried out through an impact **matrix**, which exposed the interactions between the project's actions and environmental and social factors.

In each box of the matrix, an impact rating was presented, according to its sign and magnitude.

A matrix memory describing the evaluation of other impact attributes (scope, duration, probability of occurrence, and accumulation) was presented.

During the Construction Phase, the primary concerns and risks identified related to all projects were related to occupational hazards and accidents, land use and activities in the area, and impacts on wildlife (in Kwamalasamutu), whereas for the Operational Phase, no significant adverse effects were identified.

Specific E&S Impacts and Risks

Individualized assessments were conducted for each project. These specific analyses focused on their distinct environmental and social effects.

During this stage of the assessment, the findings of the analysis were articulated and presented in a narrative structure, providing a specific section for each Project.

The main impacts and risks identified for the Projects were the following:

Kwamalasamutu Airstrip: in the area were identified 15 IUCN Red List species. Additionally, Kwamalasamutu is a major Trio settlement. Construction activities could result in negative impacts in the community and the wildlife. Moreover, this presents a significant risk to airport workers due to the potential for dangerous animal interactions, which could result in serious injury or health hazards.

Zorg En Hoop Airport: The activities will be developed in a densely populated area. Additionally, the presence of the Lokono indigenous community was identified in the project area. Construction activities may generate noise and traffic disruptions due to the presence of construction machinery and material transportation.

Johan Adolf Pengel International Airport: The activities will be developed in a middle to low densely populated area, given Para district is considered a rural region. However, the presence of a sensitive receptor 500m away from the project may lead to construction activities generating noise and traffic disruptions.

The 'Specific E&S Impacts and Risks' section in Chapter 5 outlines mitigation measures for the project-specific impacts.

Environmental and Social Management Plan

The ESMP for the construction stage includes the following Programs:

1. Monitoring and Control of Compliance with Mitigation Measures
2. Construction Sites Management
3. Air Quality, Noise and Vibrations Management
4. Erosion Control
5. Flora and Fauna Management
6. Energy and Resource Efficiency
7. Waste Management
8. Effluent Management
9. Occupational and Community Health and Safety
10. Traffic and Pedestrian Management
11. Pest and Vector Control
12. Socio-Environmental Training for Site Personnel
13. Disaster Management and Emergency Response
14. Community Information and Participation
15. Chance Find Procedure
16. Chemical Substances Management
17. Works Closure
18. Gender Action Plan

The ESMP for the Construction Phase of the projects will be developed by the Contractor Company.

Chapter 6 outlines the essential requirements for ESMP programs for construction stage and provides general guidelines for programs to be implemented during the operational stage (Operational ESPM).

Conclusions

During the construction phase, potential impacts include occupational accident risks, air pollution from vehicle and machinery emissions, noise and vibrations, soil and water contamination from spills, soil erosion and sediment runoff, and poor solid waste management. Additionally, specific vulnerabilities were identified: Kwamalasamutu, Para and Paramaribo host indigenous communities, necessitating special measures in the Stakeholder Engagement Plan to prevent conflicts. In Kwamalasamutu, species listed on the IUCN Red List were found, prompting the inclusion of a flora and fauna management plan in the ESMP. Zorg En Hoop airport, located in a densely populated area with sensitive receptors like schools and sports centers adjacent to it, has mitigation measures in the ESMP to address potential impacts. Johan Adolf Pengel International Airport is surrounded by the Wit Santie and Hollandse Kamp communities and the town of Zanderij, in a low-density populated area, however, O.S Zanderij school is located 500m away and it might be subject to noise impacts during construction and operation that have been address by the mitigation measures in the ESMP.

These impacts are temporary, occurring only during construction and affecting the projects' direct influence areas. Mitigation measures are detailed in Chapters 5 and 6, ensuring compliance with national regulations and IDB Environmental and Social Performance Standards, thereby mitigating all identified impacts and risks.

In the operational phase, the projects are expected to provide long-term positive impacts by optimizing air transport services, enhancing safety, and efficiency.

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

Abbreviations

AIA	Accident Investigation Authority
AoI	Area of Influence
AML	Airport Management Ltd.
ANSP	Air Navigation Service Provider
ATN	Aeronautical Telecommunication Network
CADSUR	Civil Aviation Department of Suriname
CAMP	Civil Aviation Master Plan
CASAS	Civil Aviation Safety Authority Suriname
CNS	Communications, Navigation and Surveillance
CoC	Code of Conduct
DAoI	Direct Area of Influence
EA	Executing Agency
E&S	Environmental and Social
EHSS	Environmental, Health, Safety and Social
ESA	Environmental and Social Assessment
ESMP	Environmental and Social Management Plan
ESMPc	Environmental and Social Management Plan at the Construction Stage (ESMPc)
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
ICAO	International Civil Aviation Organization
ICAP	Institutional Capacity Assessment Platform (IDB)
IDB	Interamerican Development Bank
IPP	Indigenous People Plan
KBA	Key Biodiversity Area
LHB	N.V. Luchthavenbeheer
LMP	Labor Management Procedure
LVT	Aerodrome Department
MSPE	Ministry of Spatial Planning and Environment
MTCT	Ministry of Transport, Communication and Tourism
NIMOS	National Institute for Environment and Development in Suriname
OA	Operational Area
PBM	Johan Adolf Pengel International Airport
PEU	Project Executing Unit
PPE	Personal Protective Equipment
PwD	People with Disabilities
SAR	Search and Rescue Software
SCA	Socio-Cultural Analysis
SEP	Stakeholder Engagement Plan
SMSM	Kwamalasamutu Airstrip
SMZO	Zorg en Hoop Airport
USD	United States Dollars

1. Introduction

1.1. Background

The objective of this Environmental and Social Analysis (ESA) is to **evaluate the environmental and social risks and impacts** of the infrastructure projects of the Essential Air Transport Service for remote communities in Suriname Program (SU-L1071), hereinafter "the Program".

The overarching goal of the Program is to contribute to a safe, secure, and self-sustaining air transport sector for Suriname. To realize these aims, the Program is divided into three key components.

The Program, with a total cost of **USD 20 million**, will be executed by the Ministry of Transport, Communication and Tourism (MTCT) through the N.V. Luchthavenbeheer [1] and financed by the Inter-American Development Bank (IDB).

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

By the Bank's Environmental and Social Policy Framework (ESPF) and based on existing information on the program, it has been classified as category “B” since negative environmental and social impacts are expected to be moderate in the short-term duration, which can be managed through specific management plans. According to the type of interventions, the negative environmental and social impacts are moderate during the period of execution of the works, and there are appropriate mitigation measures for the sector to manage said effects and risks.

1.2. Objectives

The specific objectives of the Environmental and Social Assessment 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.

[1] Parastatal organization of the MTCT whose purpose is to maintain and operate Suriname’s international airport.

1.3. Scope

This document summarizes the process of environmental and social evaluation of the works 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 Assessment (ESA).

Chapter number	Content title	Description
Executive Summary		This chapter provides a summary of the Strategic Environmental and Social Assessment.
1	**Introduction**	This chapter delineates the formulation and composition of the SESA Report, encompassing its contextual framework and overarching objectives.
2	**Program and Projects Description**	This chapter offers an overview of the program, delineating the various interventions envisioned across the distinct projects and delineating their respective scopes.
3	**Legal and Institutional Framework**	This chapter describes the legal and institutional framework applicable to the environmental and social impact evaluation procedure of the program projects, covering the policies on environmental and social safeguards established by the Inter-American Development Bank (IDB).
4	**Environmental and Social Baseline**	This chapter summarizes the basic information available about the physical, biological and socioeconomic environment within the Program intervention area.
5	**Environmental and Social Impacts and Risks**	This chapter provides an overview of the methodology employed for assessing the project's effects on the physical, biological, and socioeconomic environment, along with a detailed presentation of the ensuing analysis results. Additionally, both general and specific mitigation measures are identified and expounded upon with the aim of averting, eliminating, diminishing, or compensating for adverse effects on environmental and social receptors, while simultaneously augmenting positive impacts.
6	**Environmental and Social Management Plan**	The Environmental and Social Management Plan (ESMP) comprehensively addresses the identified mitigation measures, organizing them into structured programs for deployment across all project phases. Additionally, it establishes the framework delineating institutional roles and responsibilities for effective implementation.
7	**Conclusions**	This chapter summarizes the conclusions and environmental and social viability of the Program.
References		This chapter provides an exhaustive account of all the references cited in the report and the documentation employed throughout the evaluation process.
Annexes		The technical annexes encompass specific studies and plans, which include: i) Stakeholder Engagement Plan ii) Labor Management Procedure iii) Affidavit Template for the Acquisition of Solar Pannels

2. Program and Projects Description

This chapter presents a description of the **Essential Air Transport Service for Remote Communities in Suriname Program (SU-L1071)**, including objectives, components, and costs, as well as the projects that are part of the Program.

2.1. Background and Justification

Suriname, situated in the Amazon, is characterized by its small, open, commodity-based economy, and is highly susceptible to external shocks and natural disasters. Despite its vast territory of 164,000 square kilometers, most of its population and infrastructure are concentrated in the Great Paramaribo and Coastal regions. This concentration leaves the interior regions, which are primarily accessible only by boat or aircraft, largely isolated with limited access to essential services like healthcare and education.

According to the 2022 Suriname Survey of Living Conditions, the interior regions, heavily populated by Maroon and Amerindian communities, face significant socio-economic challenges. These areas show higher rates of multidimensional and consumption-poverty, affecting 59% and 38% of the population respectively[2]. Educational attainment is also significantly lower, with an average of 4.1 years of schooling compared to 8.4 years in the coastal regions. Secondary school attendance in the interior is only 46%, compared to 72% in other parts of the country.

Employment opportunities in the interior are scarce, with high unemployment rates and wages that are 75% lower than those in the coastal regions. Health disparities are pronounced, with only 25% of interior residents having had a medical check-up in the past year, compared to 51% in coastal areas.

Air transport is critical for connecting these remote regions. The Ministry of Transport, Communication, and Tourism oversees 53 domestic aerodromes, which facilitate the transportation of about 55,000 passengers and 3,500 tons of cargo annually[3]. However, these aerodromes are often underdeveloped, with unpaved runways and inadequate facilities, making them unusable during the rainy season and limiting the delivery of essential services and economic opportunities.

The Suriname General Aviation Legislation (SGAL) of 1935, which currently governs aviation, is outdated and does not address modern regulatory needs. Attempts to update the framework, such as the Civil Aviation Safety and Security Act of 2002, have been inadequate, and significant gaps in safety and operational standards remain, as highlighted by the International Civil Aviation Organization's audit[4].

[2] Key drivers of multidimensional poverty are chronic illnesses, disability, low education, and ICT skills as well as lack of medical insurance.

[3] Feasibility Study for Upgrading of Interior Airports, Suriname Air Transport Support Project, IOS Partners. 2012

[4] Safety Audit Results: USOAP interactive viewer.

Suriname does not have an independent Air Accident Investigation Authority, which is crucial for the safety of air transport. These deficiencies impair the efficacy and independence of the accident investigation structure and stem from outdated regulations, inadequate training, financial constraints and the absence of well-defines procedures[5]. A technical assistance mission held by ICAO in April 2022 highlighted deficiencies within Suriname's Accident Investigation (AIG) framework[6]. According to ICAO, states shall "investigate or delegate to other organizations, such as dedicated accident/incident investigation bodies or aviation service provider organizations, the investigation of accidents which have occurred in their territory". The purposes of accident investigation include: (i) preventing future accidents and incidents; (ii) providing fair and impartial inquiry; and (iii) granting inquiries with immediate and unfettered access to all evidence[7].

Financial sustainability is another critical issue. Although aeronautical services generate significant revenue, approximately US$12 million annually, these funds are not reinvested into the sector, limiting improvements in infrastructure and services. Furthermore, the Civil Aviation Safety Authority Suriname (CASAS) lacks mechanisms to sustainably collect fees, hindering its regulatory functions.

Climate change poses additional threats, with Suriname being highly vulnerable to changes in rainfall, temperature, and sea level rise. Projections indicate significant economic losses unless robust flood management and climate adaptation strategies are implemented.

Gender and diversity issues also persist. Women in Suriname have higher educational attainment than men but lower labor force participation and earnings. They are underrepresented in sectors like transport and logistics, and people with disabilities face significant barriers to labor market participation, with limited regulatory support for their inclusion.

Addressing these challenges involves improving oversight of the air transport sector, enhancing connectivity and access to services for vulnerable populations, integrating national infrastructure more effectively, and ensuring the sustainability of airstrip maintenance.

The main problem the program will address is the lack of a safe, connected, and resilient air transport sector. The primary factors that contribute to the basic determinants of the problem are as follows: (i) an outdated air transport legislative framework that is not adapted to the civil aviation international standards in institutional governance, the country's current development objectives, safety, and security, and fee collection and reinvestment system; and (ii) the absence of resilient, high-quality air transport infrastructure compounded by a lack of investment and maintenance.

2.2. Objectives

The general objective of this program is to contribute to a safe, secure, and self-sustaining air transport sector for Suriname.

[5] Thorough and transparent investigations help maintain public confidence in the aviation industry by demonstrating a commitment to safety and accountability. Air accident and incident investigations (ECAC).

[6] The Accident Investigation Section (AIG) of ICAO is responsible for developing and updating Standards and Recommended Practices (SARPs) for inclusion in Annex 13 — Aircraft Accident and Incident Investigation.

[7] ICAO's Annex 13.

The specific objectives are to: (i) improve compliance with civil aviation safety and security standards; (ii) improve quality and resilience of air transport infrastructure.

2.3. Components

The Program is structured in four components:

Component I. Improvements in the Institutional and Legal Framework. (US$ 4,000,000). This component will finance the following activities:

a. *Restructuration of Suriname's civil aviation system and institutional capacity strengthening, through:* (i) developing a new aviation legal framework that will establish clear roles and responsibilities for CASAS, CADSUR, and the future accident investigation unit, and by addressing air transport policies to improve the financial sustainability of the civil aviation system, while incorporating climate mitigation and resilience measures under diverse climate scenarios and shared economic pathways (SPP); (ii) developing and supporting the organizational structure and establishing a Civil Aviation Master Plan (CAMP) for CASAS that incorporates climate change adaptation and resilience, as well as climate mitigation strategies for the sector , implementing a human resource development plan with recruitment, training, and retention strategies for inspectors in all critical areas, as well as restructuring CADSUR's workforce, focusing on meteorological personnel, ATC specialists and auxiliary services; and (iii) developing an economic plan/strategy to support CASAS and CADSUR, including a comprehensive economic study of the current air transport system, a study of the potential growth of aviation in Suriname including an initial financial, operational and regulatory risk scenario analysis, a review of the financial status of CASAS and CADSUR, a digital readiness assessment outlining their digital infrastructure needs and roadmap with an emphasis on addressing climate impacts in the aviation sector, a look at the revenue generated from overflight fees and a comprehensive economic analysis for ensuring a financially viable aviation system.

b. *Strengthening of CASAS regulatory capacity, by:* (i)) developing regulatory documentation and guidance material, conducting a gap analysis of existing regulations and procedures followed, and developing updated frameworks for AIG, PEL, AIR, OPS, ANS, AGA, Environmental Protection and Safety Management Systems (SMS) misaligned with ICAO Annexes; and (ii) implementing comprehensive training programs: one oriented for managers to equip them with skills to develop sustainable plans for Suriname's civil aviation industry and another for inspectors to equip them with the necessary skills to conduct regulatory and oversight tasks effectively.

c. *Strengthening sustainability policies and contributing to decarbonizing the sector,* by developing a State Action Plan for Sustainable Aviation Fuel (SAF) that encourages sustainable production, distribution and use.

d. *Gender and diversity actions:* (i) Elaboration of a diagnosis, policy, and gender action plan to reduce gender gaps and encourage women's labor participation in the air transport sector, and (b) job internships program for women and PwD in non-traditional jobs at the SMZO.

Component II. Improvements in the air transport control and operations (US$ 5,000,000). This component will finance:

a. *Enhancement of air navigation capacity and efficiency,* by assisting in reviewing and updating the national air navigation plan, with cost-benefit analysis and key performance indicators to address

the implementation and maintenance of CNS infrastructure at optimal levels, prioritizing the national segment of the ATN (Aeronautical Telecommunication Network) and improving communication and surveillance coverage for air traffic control, as well as human resource development for ATM and CNS.

b. *Establishment of an independent air Accident Investigation Authority (AIA),* operating autonomously and complying with international standards set by the International Civil Aviation Organization (ICAO). This includes: (i) capacity building and procedure development, with definition of procedures and protocols as well as staff training; (ii) implementation of infrastructure and resources; and (iii) acquisition of Search and Rescue (SAR) software and systems.

c. *Definition of a new international standard-based fee structure and collection mechanism* using new digital tools that will allow to better identify, quantify, and monitor the collection of the appropriate fees, resulting mainly from air navigation services provided to airlines, and that will be efficiently used to cover operations and maintenance of all airstrips nationwide.

d. *Other improvements in air navigation surveillance* such as the development of updated flight manifests for domestic passengers and cargo for security and fee collection.

Component III. Enhancement and maintenance of Suriname's air transport infrastructure (US$10,000,000). This component will finance:

a. *PBM international airport interventions.* Activities will include: (i) acquisition and installation of a new energy-efficient communication antenna, to improve air transport operations and fly-over revenues collection; (ii) a detailed digital assessment for the Airport Management Ltd.; and (ii) training and capacity building.

b. *SMZO domestic hub improvements.* Activities will include: (i) rehabilitation/upgrading of existing land-side facilities considering mitigation and adaptation measures to ensure resilient, safe, and secure air transport operations; (ii) implementation of care facilities such as child-friendly bathrooms and lactation rooms; (iii) acquisition and installation of energy-efficient aeronautical equipment to ensure secure operation of the airport; and (iv) inclusion of people with disabilities and women at Zorg en Hoop aerodrome through labor and internships.

a. *Pilot for all weather aerodrome modernization serving Amerindian communities.* Activities will include: (i) works for the rehabilitation of Kwamalasamutu Aerodrome (SMSM) to optimize operations for safe and efficient transport services including school supplies, and health services, using climate-smart materials that are lightweight and that have proven their worth providing an all-weather surface for landing in similar contexts; (ii) acquisition and installation of energy-efficient aeronautical equipment to ensure secure operation of the aerodrome; and (iii) training and capacity building, including local communities (in particular Amerindians) for disaster and resilience planning, response, and maintenance of the airstrip.

Administration and monitoring. (US$1,000,000). This component will finance management costs, including supervision and technical support for the Project Execution Unit (PEU), as well as audits and project evaluation.

2.4. Beneficiaries

Beneficiaries of the Program include air transport users, estimated at 465,000 per year, including Amerindian communities (3% of Suriname's total population) to a greater extent, by ensuring sustainable accessibility to very isolated regions of the country, improving safety conditions for

operations and reducing the time and cost of transporting people and goods, which currently must be done by other modes of transport. Expected results from the construction of the airstrips include narrowing gaps in essential services such as education and healthcare in remote areas by facilitating the efficient delivery of medical and food supplies, as well as enabling the transportation of teachers to schools or medical staff and patients to hospitals. Additionally, employment opportunities may be increased for women, People with Disabilities (PwD), and Trio populations through internships and capacity building for maintenance roles.

2.5. Costs and Financing

The total cost of the Project is **USD$ 20 million**. This financing will be provided entirely by the Inter-American Development Bank (IDB).

The project is structured as a **Specific Investment Loan**, to be financed with resources from the Bank's Ordinary Capital (OC). The execution activities along with the timeline and costs to be supported by the operation are in the Program Operations Manual (POM). The execution plan projects for civil works, technology systems, and institutional strengthening activities will take 72 months to complete, it is expected that the loan will be disbursed in six years.

2.6. Implementation Arrangements

The borrower will be the Republic of Suriname, and the Executing Agency will be the Ministry of Transport, Communication, and Tourism. The program will be implemented through a new dedicated PEU who will be responsible for general and technical coordination; planning, monitoring, and evaluation; financial management; procurement administration; environmental, health, and safety management; and communication activities. This PEU will be financed by the loan and should be comprised of at least: a project manager, an air transport infrastructure specialist, a legal advisor, an environmental and social specialist, a procurement specialist, and a financial specialist. The PEU staff will have exclusive dedication to the program, and any changes in its key personnel will require the Bank's written approval.

Given the weaknesses identified during the Institutional Capacity Assessment and the lack of the necessary resources or expertise, including inadequate staffing and skilled personnel in the aeronautical sector, the PEU will be assisted in the implementation of the loan by a specialized consulting firm. This firm will be responsible for supporting the implementation of identified institutional measures and regulatory aspects, providing technical specifications for the equipment and systems needed that will be financed by the loan, and providing project implementation and coordinating tasks among stakeholders. The firm will also ensure compliance with aviation regulations and safety standards.

Labor Conditions for MTCT

During preparation of the program, an institutional capacity assessment (ICAP) was performed to evaluate the MTCT's capacity for managing the project and recommend measures or steps that can be undertaken to strengthen MTCT's capacity to manage the intended project and the financial resources assigned.

Findings on Human Resources Management from MTCT show that the ministry does not have a **Personnel and Functions Manual** (although it does provide job descriptions and salary ranges for the

main positions of the project) nor a **Code of Conduct, Ethics and Integrity** with mechanisms that guarantee its application.

The assessment also concluded that MTCT has formal staff recruitment procedures for hiring of permanent and temporary staff and the publication of job opportunities is not mandatory. However, MTCT does not have legal autonomy to manage human resources of the project.

The country of Suriname has not placed regulatory framework and requirements on hiring temporary staff. It has generally taken the MTCT 1-3 months for the process of hiring temporary staff and more than 3 months for permanent staff. The average turnover rate among all temporary and permanent staff over the last 2 years is between 11 and 20%. For temporary and permanent staff, the technical department has a higher-than-average turnover. There are no expected changes on temporary staff composition, however there are changes expected on the **number of permanent staff,** since nowadays the institution does not have sufficient skilled staff to undertake human resource management responsibilities for the project.

MTCT does not have formal procedures for managing performance of temporary and permanent staff, it does not require the staff to prepare annual work plans, and the ministry does not have a staff training program for temporary and permanent staff.

As conclusions, the ICAP indicates that the office of the Directorate of Transport will be responsible for the human resource management functions for the project and proposes that existing staff assigned part-time to the project will perform the tasks relating to the HR processes. As indicated above, **additional staff will need to be employed, as well as the implementation of a Code of Conduct** (a model of a Code of Conduct can be found in Appendix A) **and training programs for personnel** (training sessions are included into the programs of the ESMP)**.**

2.7. Description of Infrastructure Projects

For the environmental and social impact assessment of the Program, the infrastructure projects were defined.

It is worth noting that the projects involved in the program are expected to produce minor greenhouse gas emissions (GHG). The bank has calculated estimated gross GHG emissions for both the construction and operation phases, resulting in 3.127tnCO_2 and 280tnCO_2/year, respectively.

Figure 1 shows the beneficiary airstrips from which stem the representative projects to be considered: Kwamalasamutu Airstrip (Kwamalasamutu), Zorg En Hoop Airport (Paramaribo) and Johan Adolf Pengel International Airport (Zanderij).

Figure 1. Beneficiary Municipalities of BL-1046 Program. Source: Prepared by the author.

Projects will be described below.

2.7.1. Kwamalasamutu Airstrip

Figure 2. Kwamalasamutu Airstrip. Source: Google Earth, 2024.

Located in the southwestern part of the country in the district of Sipaliwini, Kwamalasamutu is accessible solely by airplane. Despite the limited production activities in the region, aside from tourism, there is a significant amount of flight traffic. According to previous studies conducted by ILACO, the airstrip in Kwamalasamutu has been assigned a high priority score. The condition of this

airstrips ranges from fair to poor, experiencing flooding twice over the past 15 years. This has rendered it unsuitable for operations for a total of 36 days from January 2023 to the present.

According to the information documented in the daily Baanberichten reports from the Radiokamer at Zorg en Hoop airport (which provide detailed updates on the conditions of various airports), the primary issue causing this disruption is the swampy nature of the runway, which has prevented planes from landing or taking off during these periods.

Additionally, as evidenced by the following figures, there are several deficiencies in terms of equipment and facilities, especially in the Station building and the warehouse.

Figure 3. Current Station building from the outside. Source: Google, 2024.

Figure 4. Office Condition (inside and outside). Source: Google, 2024.

Figure 5. Fuel warehouse (outside and inside). Source: Google, 2024.

According to information provided by aerodrome personnel, the priority equipment and facilities needing repair or complementary equipment include: a Rider Mower, Solar panel, Brushcutter, radio communication equipment, batteries for the solar panel and radio communication, new office space, a fuel warehouse, a wind direction indicator, fuel, a scale, and garden tools such as a hack and shovel.

The planned interventions for the rehabilitation of the Kwamalasamutu aerodrome, aim to optimize operations for safe and efficient air transport services. This includes the acquisition and installation of

energy-efficient aeronautical equipment to ensure the secure operation of the aerodrome and training and capacity-building initiatives, including local communities on disaster and resilience planning, response and maintenance of the airstrip.

The project also includes the rehabilitation of Kwamalasamutu Aerodrome (SMSM) using climate-smart materials to allow for all-weather landing conditions. Preliminary designs include lightweight and easy to transport technologies such as a Geoweb base with a reinforced top layer to improve the current conditions of runways.

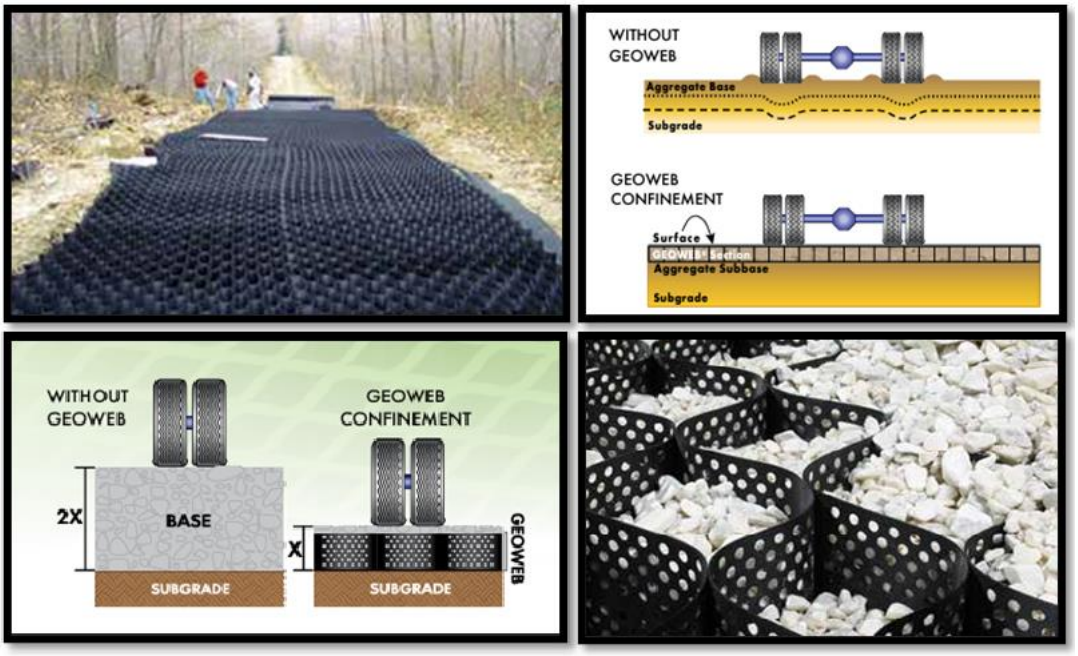


Figure 6. General view of use of Geoweb. Source: PRESTO Geosystems.

The Geoweb technology has been used for airstrips upgrading in similar contexts and present the following advantages:

(i) easier maintenance: low risk of rutting, erosion, or deformation, due to the distribution of pressures from dynamic and static loadings throughout the system, reducing lateral and vertical displacement of the infill and surface rutting[8].
(ii) cost effectiveness: stabilize local soil material instead of transport material from elsewhere and reduces by 50% or less the amount of base material to achieve the same load support requirements.
(iii) installation equipment: less heavy equipment than conventional asphalt pavement; and
(iv) versatility: can be customized to accommodate various soil conditions and site-specific requirements.
(v) Stormwater management: with the use of aggregate infill, the geoweb technology performs double duty as an on-site water detention/retention storage “basin”, it may eliminate requirements and costs for on-site stormwater containment systems[9].

[8] PRESTO Geosystems. https://www.prestogeo.com/products/soil-stabilization/geoweb-load-support/

[9] PRESTO Geosystems. https://www.prestogeo.com/products/soil-stabilization/geoweb-load-support/

Lastly, the program includes the procurement of a **solar system** consisting of a panel and a battery for the airstrip, needed to power the **new radio and navigation equipment** that will also be installed.

2.7.2. Zorg En Hoop

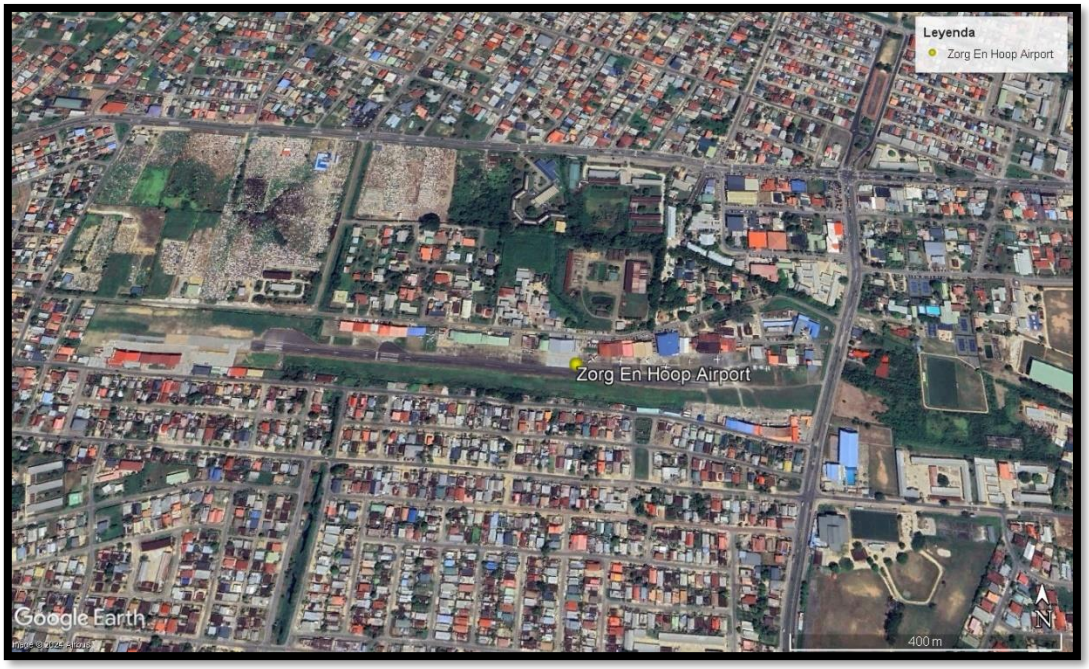


Figure 7 - Zorh En Hoop Airport. Prepared by the author (Google Earth image).

The Zorg en Hoop airport in Paramaribo serves as the primary origin point for most connections to the interior of the country. It accommodates both scheduled and chartered flights operated by various private companies and NGOs. Additionally, several other privately-owned companies provide air travel services to the interior using both fixed-wing and rotor aircraft. Zorg en Hoop also facilitates international charter flights, primarily to Guyana and French Guiana, with dedicated operators servicing specific needs, such as those of an oil and gas company.

To enhance the operational capabilities of Zorg en Hoop airport, the planned activities will include the acquisition and installation of energy-efficient aeronautical equipment, rehabilitation of existing land-side facilities considering mitigation and adaptation measures to ensure resilient, safe and secure air transport operations and the implementation of care facilities such as child-friendly bathrooms and lactation rooms. Moreover, the program also entails the inclusion of people with disabilities and women at Zorg en Hoop aerodrome through labor and internships.

2.7.3. Johan Adolf Pengel International Airport

Figure 8. Johan Adolf Pengel International Airport. Source: Google Earth, 2024.

The Johan Adolf Pengel International Airport (PBM), also known as Paramaribo-Zanderij International Airport, is the main international gateway of Suriname. Located near Zanderij town in Para District, about 45 km south of the capital Paramaribo, it connects Suriname to international destinations. The airport is managed by Airport Management, Ltd., and is a key infrastructure for both passenger travel and cargo transportation.

The activities include acquiring and installing of a new energy-efficient communication antenna to improve air transport operations and fly-over revenues collection and a detailed digital assessment for the Airport Management Ltd - AML (N.V. Luchthavenbeheer - LHB). Moreover, the program will also finance training and capacity building initiatives.

3. Legal and Institutional Framework

This chapter outlines the legal, sectoral, and institutional framework of the Essential Air Transport Service for remote communities in Suriname Program (SU-L1071), considering environmental, social, and occupational health and safety areas.

The first section of the chapter describes the national legal framework applicable to the Program. As this operation is proposed to be financed by a loan operation from the Interamerican Development Bank, the second section describes the Environmental and Social Performance Standards included in IDB's Environmental and Social Policy Framework, which are also applicable to the Program.

3.1 National Legal Framework

Environmental licensing

The Environmental Framework Act and associated regulations provide the legal framework for environmental licensing in Suriname. These laws mandate that certain projects and activities undergo an Environmental Impact Assessment (EIA), known locally as the "Miliey Effecten Analyse" (MEA) to evaluate their potential environmental impacts and to identify mitigation measures.

The National Institute for Environment and Development in Suriname (NIMOS) is the institution responsible for overseeing the MEA process. NIMOS evaluates project proposals, conducts reviews and ensures compliance with environmental regulations.

Project proponents must submit an initial project proposal to NIMOS, including a brief description of the project, its location, and potential environmental impacts. NIMO reviews the project proposal to categorize it in the screening phase to determine the level of assessment required. Projects may fall into different categories, ranging from those requiring a full MEA to those exempts from detailed assessment.

After conducting, if required, detailed studies to assess the potential environmental impacts of the project, the findings are compiled into an Environmental Impact Statement (EIS) which outlines predicted impacts and proposed mitigation measures. NIMOS reviews the EIS and decides on whether to approve the project and communicates the decision to the project proponent and relevant stakeholders. After approval, NIMOS monitors the implementation of the project to ensure compliance with the conditions of approval and the effectiveness of the mitigation measures.

Public participation is an essential component of the MEA process. Stakeholders, including local communities, NGOs, and other interested parties, are given opportunities to provide input during the scoping, impact assessment, and review phases. Public consultations and hearings are conducted to gather feedback and address concerns.

Table 2. Environmental licensing and ESIA regulations

National Regulations	
Nature Conservation Act (No. 26 of 1954)	This Act provides for nature conservation in Suriname, including the procedure for declaring natural reserves. The Nature Conservation Commission may provide advice on the management of natural reserves. Criminal provisions are also included.
Environmental Framework Act (No. 97 of 2020)	This Act is about the protection and sustainable management of the environment in Suriname and the implementation and

National Regulations	
	carrying into effect of obligations deriving from the membership of Suriname to international agreements, notably the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity, the Paris Agreement and the Stockholm and Rotterdam (Conventions on POPs and PIC respectively). Another important matter is the investigation, prosecution and trial of offences defined in this Act as environmental offences. The Act is composed of 77 articles divided into 11 Chapters: General provisions (I); The National Environment Authority (II); Duty of Care (III); Environmental Strategy (IV); Activities and Environmental Consequences (V); Control of Pollution - Environmental Pollution and Standards (VI); Waste and Hazardous Substances (VII); Legal Protection Mechanisms (VIII); Environmental offences and Sanctions (IX); Provisions on Enforcement and further provisions (X); Transitional and Final Provisions (XI).
Hindrance Act (G.B 1930 no 64 amended by S.B.2001 no. 63)	Article 1 state that it is prohibited to establish an enterprise which can cause danger, damage or hindrance without a permit from the District Commissioner (DC).
Act laying down rules for Businesses and professions subject to a license (Business and Professions Act) (No. 40 of 2017)	This Act aims at improving the business environment in Suriname by introducing a new modern system of business authorizations. It lays down rules for carrying out business and undertake various professions. The Act requires businesses and professions to be classified based on the International Standard Industrial Classification of All Economic Activities Code (ISIC Code). One category is prohibited businesses and professions, and another requires businesses and professions to be subject of certain conditions and authorizations. Authorizations are granted by the Director of the Ministry of Economic Affairs to natural or legal entities. Interested parties may object against the granting of an authorization on grounds of danger of public health or the environment. The Minister may indicate zones where economic operations or professions are restricted. The Act is also about enforcement and rehabilitation measures, offences and sanctions.
Decision of the Minister of Trade, Industry and Tourism of 20 March 2019 no. 630, laying down general conditions for companies and professions subject to a license	This Decisions lays down rules for the carrying out of activities by businesses and professions that are subject to authorization in accordance with the Act laying down rules for Businesses and professions subject to a license. Rules are specified for, among other things, food producers, sellers of agricultural chemicals, butchers, fish producers and processors, timber processing plants, pet shops (where veterinary products may be sold). The rules concern, among other things, hygienic conditions for manufacturing and sale, waste disposal and management (also of wastewater and chemicals), inspections, and enforcement. The

National Regulations	
	Decisions mentioned norms that shall be observed, notably the conditions of the National Institute for Environment and Development in Suriname (NIMOS), the environmental hygiene conditions and safety regulations of respectively the Bureau for Public Health (B.O.G.) and the Labor Inspectorate, and the directives from the Ministry of Agriculture, Livestock and Fisheries.
Mining Act ((S.B. 1986 no. 28, as most recently amended by S.B. 1997 no. 44)	This decree governs Suriname's mining sector. It states that minerals in and on the ground are property of the state and separated from ownership of land. There are five types of mining permits that can be obtained from the Ministry of Natural Resources: reconnaissance, exploration, exploitation, small-scale mining and **quarrying building materials**. In the case of the latter, the permits have a 5-year duration, renewable for periods of up to 5 years and the maximum size of the operation is 400ha.

Air Transport Service

Table 3. Air Transport Service Regulations

International Regulations	
Convention for the Unification of Certain Rules Relating to International Carriage by Air	This Convention applies to all international carriage of persons, luggage or goods performed by aircraft for reward. It applies equally to gratuitous carriage by aircraft performed by an air transport undertaking.
Convention on International Civil Aviation	The Convention on International Civil Aviation, also known as the Chicago Convention, was intended to update aviation regulations. It is the most important normative treaty in relation to International Public Aviation Law.
International Air Services Transit Agreement	The purpose of the International Air Services Transit Agreement is to grant aircraft the right to fly over a country's territory and to make technical stops without obtaining prior permission. This facilitates international air travel by simplifying the process for overflight and landing for non-commercial reasons.
Protocol Relating to an Amendment to the Convention on International Civil Aviation (Article 93 bis)	The Protocol Relating to an Amendment to the Convention on International Civil Aviation aims to update environmental standards, modernize aviation regulations, promote global cooperation, and harmonize procedures among member states of the International Civil Aviation Organization (ICAO).
Convention on the International Recognition of Rights in Aircraft	The purpose of the Convention on the International Recognition of Rights in Aircraft is to provide a standardized legal framework for recognizing and protecting ownership, leasing, and other interests in aircraft across international borders.
Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface	The purpose of the Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface is to establish rules for

	liability and compensation when foreign aircraft cause damage to people or property on the ground in another country.
Convention for the Suppression of Unlawful Seizure of Aircraft	The purpose of the Convention for the Suppression of Unlawful Seizure of Aircraft is to prevent and suppress the unlawful seizure of civil aircraft and ensure the safe and orderly conduct of international air travel.
Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation	The purpose of the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation is to prevent and punish unlawful acts that jeopardize the safety of civil aviation, including hijacking and other acts of violence against aircraft and airports.
Protocol for the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation, Supplementary to the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation	The purpose of the Protocol for the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation is to address and suppress unlawful acts of violence specifically targeting airports that serve international civil aviation, complementing the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation.
Convention on the Marking of Plastic Explosives for the Purpose of Detection	The purpose of the Convention on the Marking of Plastic Explosives for the Purpose of Detection is to ensure that plastic explosives used in commercial applications are detectable through specified marking requirements, thereby enhancing aviation security worldwide.
Convention on Offences and Certain Other Acts Committed on Board Aircraft (Tokyo Convention)	This convention addresses unlawful acts aboard aircraft. Suriname ratified this convention on October 20, 1978.
Convention for the Unification of Certain Rules for International Carriage by Air (Montreal Convention)	This modernizes and harmonizes rules governing liability in international air travel. Suriname ratified this convention on March 18, 2013.
National Regulations	
Civil Aviation Safety and Security Act (SB 2002, nr 24)	This act promotes the civil aviation and its development inclusive the safety, security, economic development and environment. The act also promotes the implementation of bilateral and multilateral agreements.
Act regulating Exploitation Permits of Approved Aerodromes (SB 2006 nr 92)	This act regulates the issuance, revocation, modification, suspension or approval for transfer of an operating permit for a designated aerodrome.
Civil Aviation Regulations	CARS 001 General Policies, Procedures and Definitions CARS 002 Personnel Licensing CARS 003 Approved Training Organizations CARS 004 Aircraft Registration and Marking CARS 005 Airworthiness CARS 006 Approved Maintenance Organization

	CARS 007 Instruments and Equipment CARS 008 Operations CARS 009 Air Operator Certification and Administration CARS 010 Commercial Air Transport by Foreign Air Carriers within Suriname CARS 011 Aerial Work CARS 012 Aerodromes CARS 013 Aviation Security CARS 014 Aircraft Accident and Incident Investigation CARS 015 Aeronautical Charts CARS 016 Units of Measurements CARS 017 Aeronautical Telecommunications CARS 018 Air Traffic Services CARS 019 Meteorological Services CARS 020 Aeronautical Information Services CARS 022 Search and Rescue CARS 023 Safety Management
Civil Aviation Safety Authority Suriname (CASAS) Advisory Pamphlet Certification of an air operator	This CASAS Advisory Pamphlet (CAP) describes the process of applying for and obtaining an Air Operator Certificate (AOC) to conduct commercial air transport operations under CASAS Advisory Pamphlet Civil Aviation Regulations SURINAME (CARS). The certification process may appear to be a complex undertaking, particularly to a "first-time" operator. This CAP provides basic information applicable to the certification process. This CAP does not describe the process for obtaining an AOC when the AOC applicant proposes to conduct maintenance under the equivalent system of maintenance referenced in Part 9 of the CARS.
CASAS Advisory Pamphlet Quality system Program	This CASAS Advisory Pamphlet (CAP) provides information and guidance material that may be used by air operator certificate (AOC) holders to design or develop a Quality System Program acceptable to the Civil Aviation Safety Authority Suriname (CASAS). The procedures and practices outlined in this CAP can be applied to the maintenance, flight operations, and security aspects of an AOC holder's organization.
CASAS Advisory Pamphlet Aircraft Mass and Balance Control	This CASAS Advisory Pamphlet (CAP) provides one means, but not the only means, for obtaining approval of a mass and balance data control system.
CASAS Advisory Pamphlet Aircraft Ground Handling and Servicing	This CASAS Advisory Pamphlet (CAP) contains information and guidance for the servicing and ground handling of aircraft.
CASAS Advisory Pamphlet Aircraft Fuel Control	This CASAS Advisory Pamphlet (CAP) alerts the aviation community to the potential hazards of inadvertent mixing or contamination of turbine and piston fuels and provides recommended fuel control and servicing procedures.
CASAS Advisory Pamphlet	This CASAS Advisory Pamphlet (CAP) provides information regarding the items that are required to be, or should be, covered

Passenger Safety Information Briefing and Briefing Cards	in oral passenger briefings and on passenger briefing cards. The CAP provides specific information about Commercial Air Transport Operators engaged in passenger carrying operations conducted under Part 8 of the Civil Aviation Regulations Suriname (CARS). It also provides suggestions about making this information interesting and meaningful.
CASAS Advisory Pamphlet Certification of an Approved Maintenance Organization	This CASAS ADVISORY PAMPHLET describes the process of applying for and obtaining an Approved Maintenance Organization Certificate to conduct maintenance operations under the Civil Aviation Regulations of Suriname. The certification process may appear to be a complex undertaking, particularly to a first-time applicant. This CASAS ADVISORY PAMPHLET provides basic information applicable to the certification process.
CASAS Advisory Pamphlet Certification of an Approved Maintenance Organization / Establishment of a Maintenance Training Curriculum	This CASAS ADVISORY PAMPHLET describes the process of applying for and obtaining an Approved Maintenance Organization Certificate to conduct maintenance operations under the Civil Aviation Regulations of Suriname. The certification process may appear to be a complex undertaking, particularly to a first-time applicant. This CASAS ADVISORY PAMPHLET provides basic information applicable to the certification process.
CASAS Advisory Pamphlet Standard Passenger Weights	This CASAS Advisory Pamphlet (CAP) has been prepared by the Civil Aviation Safety Authority Suriname to provide advice to those operators that are required to have an approved Mass & Balance Data Control program i.e. CARS 9.3.1.16. These guidelines suggest standard passenger weights which, considering the range of capacities found in different aircraft, provide a common standard of accuracy for aircraft seating. capacities ranging from seven to above 500. The use of the suggested standard weights will, in most cases, ensure that the gross weight of the aircraft does not exceed the maximum take-off. weight or the maximum landing weight of the aircraft.
CASAS Advisory Pamphlet Obtaining Approval for Conduct of Flights in RVSM Designated Airspace	This Advisory Pamphlet is intended to provide the prospective operator who intends to operate in RVSM designated airspace with the procedures to be followed to obtain CASAS approval for such operations. It contains information on airworthiness, continuing airworthiness, and operations programs for RVSM operations. RVSM airspace is any airspace or route between FL 290 and FL 410 inclusive where aircraft are separated vertically by 1,000 ft (300 m).
CASAS Advisory Pamphlet EUR RVSM Height Monitoring Requirements	This Advisory Pamphlet provides important information regarding the height monitoring requirements in the context of EUR RVSM.
CASAS Advisory Pamphlet Reduced vertical separation minimum operations – Flight	This Advisory pamphlet has been produced to provide guidance for operators and flight crew because of operations in reduced vertical separation minimum (RVSM) airspace.

Crew Training and Operational considerations	
CASAS Advisory Pamphlet List of Prohibited Items – revision 5 (NEW)	This Advisory pamphlet has been produced to provide guidance for operators and flight crew because of operations in reduced vertical separation minimum (RVSM) airspace.
CASAS Advisory Pamphlet Check Airman, Instructor, and Supervisor Classifications and Qualifications Programs	This CASAS Advisory Pamphlet (CAP) contains guidance concerning check airman and air transportation instructor programs for Civil Aviation Regulations Suriname public transport operators. It addresses the roles and purposes of check airmen, air transportation flight instructors and air transportation ground instructors.
CASAS Advisory Pamphlet Guidance on the Approval of Surinamese Operators and Aircraft to Operate under Instrument Flight Rules in European Airspace	The purpose of this CASAS Advisory Pamphlet (CAP) is to provide operational approval and airworthiness guidance material regarding Area Navigation (RNAV) requirements for operators of Suriname registered civil aircraft, operating in a Basic Area Navigation (B-RNAV) or Precision Area Navigation (P-RNAV) environment in European RNAV airspace.
CASAS Advisory Pamphlet Foreign Air Operators	The purpose of this CASAS Advisory Pamphlet (CAP) is to provide information to Foreign Carriers who wish to operate to and from Suriname.
CASAS Advisory Pamphlet Certification of an Approved Training Organization	This Advisory Pamphlet (CAP) describes the process of applying for and obtaining an Approved Training Organization (ATO) certificate to conduct training under Civil Aviation Regulations Suriname (CARS) Part 3. The certification process may appear to be a complex undertaking, particularly to a “first-time” applicant. This CAP provides basic information applicable to the ATO certification process.
CASAS Advisory Pamphlet Approved Training Organization Quality System	This Advisory Pamphlet (CAP) provides information and guidance. It is to be used by applicants for, or holders of an Approved Training Organization (ATO) certificate for developing a quality system acceptable to the Civil Aviation Authority Suriname (CASAS). Training organizations should use appropriate sections of Civil Aviation Regulations Suriname (CARS) Parts 2 and 3 as well as the information in this CAP for Quality System development guidance. An ATOs quality system should be documented in a Quality Manual.
CASAS Advisory Pamphlet Developing ATO Training and Procedures Manual	The Training and Procedures Manual describes the way an Approved Training Organization (ATO) conducts its activities. As such it is a document that is essential for the ATO. The provision of a Training and Procedures Manual for the use and guidance of personnel concerned is required by Annex 1 To the Convention on International Civil Aviation (Annex 1) and by Civil Aviation Regulations (CARS) § 3.2.9 (a) and § 3.3.8
CASAS Advisory Pamphlet Extended Operations (ETOPS and Polar Operations)	This CASAS advisory Pamphlet (CAP) provides AOC holders with guidance for obtaining operational approval to conduct Extended Operations (ETOPS) under the Civil Aviation Regulations of Suriname (CARS) Part 8.6.2.10. The Civil Aviation Safety Authority

	Suriname (CASAS) may authorize ETOPS with two-engine airplanes over a route that contains a point farther than 60 minutes flying time from an adequate airport at an approved one-engine inoperative cruise speed under standard conditions in still air (adequate airport is defined in Part 1 and Appendix 1 of this CAP). The CASAS may also authorize ETOPS with passenger-carrying airplanes with more than two engines over a route that contains a point farther than 180 minutes flying time from an adequate airport at an approved one-engine inoperative cruise speed under standard conditions in still air. This CAP provides guidance for obtaining authorization to conduct operations under Part 8 and 9 in Polar Areas as well.
CASAS Advisory Pamphlet Aerial Work	This advisory pamphlet explains and clarifies the application requirements for an Aerial Work Certificate in accordance with the Civil Aviation Regulations of Suriname (CARS) Part 11 Aerial Work
CASAS Advisory Pamphlet Flight deck automation	This Advisory Pamphlet is issued to alert air operators to the importance that air crews are aware of the automation mode under which the aircraft is operating. It provides a sample automation policy to support the use of aircraft automation.
CASAS Advisory Pamphlet Aircraft Maintenance Reliability Programs	A reliability program is a set of procedures aimed at collecting data related to the failure (i.e. not able to perform the function they are designed for, when it is required) of the aircraft, its systems, sub-systems, components and parts. Further analysis of the data thus collected and making meaningful inferences using engineering judgment also forms part of the program. The actions based on those inferences should lead to an improved maintenance program tailored to those conditions specific to the aircraft fleet and those specific to the operator.
CASAS Advisory Pamphlet Laser Lights Operations & Reporting Illumination of Aircraft	The hazards posed by laser attacks against civil aircraft, specifically the deliberate targeting of flight crew with laser illumination to disrupt the safe operation of the aircraft, is a matter of increasing concern. Available data indicate that the frequency of laser attacks on civil aircraft has risen significantly worldwide.
CASAS Advisory Pamphlet Aviation Safety Reporting System	The key objective of the voluntary and confidential reporting system, is to enhance aviation safety through the collection of reports on actual or potential safety deficiencies that would otherwise not be reported.
CASAS Advisory Pamphlet Traffic Information Broadcasts by Aircraft (Tiba) and related Operating Procedures	Traffic information broadcasts by aircraft are intended to permit reports and relevant supplementary information of an advisory nature to be transmitted by pilots on a designated VHF radiotelephone (RTF) frequency for the information of pilots of other aircraft in the vicinity.
CASAS Advisory Pamphlet Material relating to Contingency Planning	The purpose of the guidelines is to assist in providing for the safe and orderly flow of international air traffic in the event of disruptions of air traffic services and related supporting services

	and in preserving the availability of major world air routes within the air transportation system in such circumstances.
CASAS Advisory Pamphlet Exemption Application	CARS Part 1 Sub Part 1.4 “Exemptions” sets out the framework governing the issuance of exemptions from the CARS requirements. The purpose of this CASAS Advisory Pamphlet (CAP) is to provide information and guidance to those seeking an exemption from the CARS.
Decision Director CASAS	2003 No. 5- Flight Operations – Flight Crew Testing No. 7- Air Transportation Ground Instructor 2006 No. 2 – Learning Statements No. 4 – Test Aids and Materials No. 6- Private Pilot License No. 7 – Commercial Pilot License No. 8 – Airline Transport Pilot License No. 9 – Designated Pilot Examiner No. 10 - Instrument Rating No. 11 - Ground and Flight Instructor No. 12 - Private Pilot No. 13- Commercial Pilot No. 14 – Airline Transport Pilot and Aircraft Type Rating No. 15 – Instrument Rating with Helicopter No. 16 – Flight Instructor No. 17 – Designated Pilot Examiner 2008 No. 2 – PEL 2009 No. 2 - Airline Transport Pilot for Helicopter No. 3 – Commercial Pilot for Helicopter No. 4 – Private Pilot for Helicopter No. 5 – Flight Engineer No. 6 – Flight Instructor for Helicopter 2012 No. 01 – Special Requirements for the Import Aviation Products 2016 Decision Director CASAS – DDC.001 – AVSEC – Registration of Regulated Agents and Known Consigners Decision Director CASAS – DDC.002 – AVSEC – Cargo

	Decision Director CASAS – DDC.003 – AVSEC – Screener Certification (cancelled, revision included in 2019 DDC.002) Decision Director CASAS – DDC.004 – ANS – Instrument Flight Procedure Design Standards Decision Director CASAS – DDC.005 – AVSEC – Security Service Providers Decision Director CASAS – DDC.006 – AVSEC – Emergency Restriction Samsung Galaxy Note 7 2017 Decision Director CASAS – DDC.001- AIR/OPS – Light Sport Aircraft (LSA) 2018 Decision Director CASAS – DDC.001 – ANS – Quality Assurance Decision Director CASAS – DDC.002 – PEL – Examenreglement 2019 Decision Director CASAS – DDC.001 – OPS/AIR/AVSEC – Unmanned Aircraft Decision Director CASAS – DDC.002 – AVSEC – ASC/Instructor certification 2020 Decision Director CASAS – DDC.001 – AVSEC – Extension Screener Certification

Solid Waste Management

Table 4. Solid Waste Management regulations

National Regulations	
Environmental Framework Act (No. 97 of 2020)	This Act is about the protection and sustainable management of the environment in Suriname and the implementation and carrying into effect of obligations deriving from the membership of Suriname to international agreements, notably the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity, the Paris Agreement and the Stockholm and Rotterdam (Conventions on POPs and PIC respectively). Another important matter is the investigation, prosecution and trial of offences defined in this Act as environmental offences. The Act is composed of 77 articles divided into 11 Chapters: General provisions (I); The National Environment Authority (II); Duty of Care (III); Environmental Strategy (IV); Activities and Environmental Consequences (V); Control of Pollution - Environmental Pollution and Standards (VI); Waste and Hazardous Substances (VII); Legal Protection Mechanisms (VIII); Environmental offences and Sanctions (IX); Provisions on

National Regulations	
	Enforcement and further provisions (X); Transitional and Final Provisions (XI).
Decision of the Minister of Trade, Industry and Tourism of 20 March 2019 no. 630, laying down general conditions for companies and professions subject to a license	This Decisions lays down rules for the carrying out of activities by businesses and professions that are subject to authorization in accordance with the Act laying down rules for Businesses and professions subject to a license. Rules are specified for, among other things, food producers, sellers of agricultural chemicals, butchers, fish producers and processors, timber processing plants, pet shops (where veterinary products may be sold). The rules concern, among other things, hygienic conditions for manufacturing and sale, waste disposal and management (also of wastewater and chemicals), inspections, and enforcement. The Decisions mentioned norms that shall be observed, notably the conditions of the National Institute for Environment and Development in Suriname (NIMOS), the environmental hygiene conditions and safety regulations of respectively the Bureau for Public Health (B.O.G.) and the Labor Inspectorate, and the directives from the Ministry of Agriculture, Livestock and Fisheries.
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and reduction of long-term climate risks in the country at the national and sectoral level.
Police Criminal Law (G.B. 1915 no 77 amended by S.B. 1990 no. 24)	Article 39a states that it penalizes the disposal of waste in public places.

Indigenous Peoples Rights

International Regulations	
United Nations Declaration on Human Rights of Indigenous Peoples	The UNDRP outlines the rights of Indigenous peoples in areas like culture, education, health, and self-determination. It emphasizes collective rights, ensuring that Indigenous peoples can maintain their cultural traditions, control their lands, and participate in decisions affecting them. The declaration promotes equality and prohibits discrimination, aiming for harmonious relationships between Indigenous peoples and states. Suriname voted in favor of this international instrument in 2007.
International Labor Organization's (ILO) Convention N°169:	A legally binding instrument specifically addressing the rights of Indigenous and tribal peoples. It guarantees their rights to self-governance, cultural preservation, and land ownership, while ensuring their inclusion in national policies. ILO 169 also mandates that governments consult Indigenous peoples on policies and projects that directly affect their lives and land. This instrument was not ratified by Suriname.

Hazardous Waste Management

Table 5. Hazardous Waste Management Regulations

International Regulations	
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as "hazardous wastes" based on their origin and/or composition and their characteristics, as well as two types of wastes defined as "other wastes" - household waste and incinerator ash.
Stockholm Convention on Persistent Organic Pollutants (POPs)	As set out in Article 1, the objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants. While primarily focused on chemicals, this convention includes provisions related to the disposal and management of POPs waste.
Minamata Convention on Mercury	The Minamata Convention on Mercury is a global treaty to protect human health and the environment from the adverse effects of mercury.
National Regulations	
Decision of the Minister of Trade, Industry and Tourism of 20 March 2019 no. 630, laying down general conditions for companies and professions subject to a license	This Decisions lays down rules for the carrying out of activities by businesses and professions that are subject to authorization in accordance with the Act laying down rules for Businesses and professions subject to a license. Rules are specified for, among other things, food producers, sellers of agricultural chemicals, butchers, fish producers and processors, timber processing plants, pet shops (where veterinary products may be sold). The rules concern, among other things, hygienic conditions for manufacturing and sale, waste disposal and management (also of wastewater and chemicals), inspections, and enforcement. The Decisions mentioned norms that shall be observed, notably the conditions of the National Institute for Environment and Development in Suriname (NIMOS), the environmental hygiene conditions and safety regulations of respectively the Bureau for Public Health (B.O.G.) and the Labor Inspectorate, and the directives from the Ministry of Agriculture, Livestock and Fisheries.

Occupational Health, Hygiene and Safety

Table 6. Occupational Health, Hygiene and Safety regulations

International Regulations	
Rotterdam Convention	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

International Regulations	
	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.
Stockholm Convention	As set out in Article 1, the objective of the Stockholm Convention is to protect human health and the environment from persistent organic pollutants. While primarily focused on chemicals, this convention includes provisions related to the disposal and management of POPs waste.
National Regulations	
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and reduction of long-term climate risks in the country at the national and sectoral level.
Safety Regulation no. 1 G.B. 1972 no. 95	The Occupational Safety Act (Article 3) defines safety standards such that regulations can be established in the areas of: - Avoidance or limitation of accidents and fires, provision of help during accidents and possibilities of escape during fires. - Promotion of cleanliness. - Promotion of acceptable working temperature limits. - Prevention of detrimental or unpleasant fumes of gases or dust. - Prevention of damage to health due to labor activities. - Setting acceptable limits for heights of workrooms and ensuring free airspace for all. - Daylight and artificial light. - Electrical installations. - Locker rooms, break rooms and sleeping accommodation; and - Toilets and washrooms.
The Labor Act 1963 of Suriname and the Occupational Safety and Health Act of 1947	The main Acts containing provisions in relation to occupation safety and health, and more details can be found in the nine Safety Regulations pursuant to the Occupational Safety and Health Administration (OSHA), the Industrial Accident Act, the Pesticides Act, and the Labor Inspection Decree.

Potable Water, Quality, Supply

Table 7. Water Quality Regulations

National Regulations	
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and

National Regulations	
	reduction of long-term climate risks in the country at the national and sectoral level.
Water Supply Act No. 33/1938	Royal Decree that establishes prohibitions on water collection points and mandates connection to the water supply system in Paramaribo to ensure public health and proper water management.

Effluent Discharge

Table 8. Effluent discharge regulations

National Regulations	
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and reduction of long-term climate risks in the country at the national and sectoral level.

Labor legislation

Table 9. Labor Legislation Regulations

International Regulations	
Forced Labor Convention, 1930 (No. 29)	It prohibits the use of forced or compulsory labor in all its forms, considering that the term "forced or compulsory labor" shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.
Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87)	It states workers and employers, without distinction whatsoever, shall have the right to establish and, subject only to the rules of the organization concerned, to join organizations of their own choosing without previous authorization.
Right to Organize and Collective Bargaining Convention, 1949 (No. 98)	It states workers shall enjoy adequate protection against acts of anti-union discrimination in respect of their employment.
C100 - Equal Remuneration Convention, 1951 (No. 100)	It states men and women workers shall be equally remunerated for work of equal value. It refers to rates of remuneration established without discrimination based on sex.
Abolition of Forced Labor Convention, 1957 (No. 105)	It states the obligation to suppress and not to make use of any form of forced or compulsory labor-- (a) as a means of political coercion or education or as a punishment for holding or expressing political views or views ideologically opposed to the established political, social or economic system; (b) as a method of mobilizing and using labor for purposes of economic development; (c) as a means of labor discipline; (d) as a punishment for having participated in strikes; (e) as a means of racial, social, national or religious discrimination.
Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	It states the obligation to declare and pursue a national policy designed to promote equality of opportunity and treatment in respect of employment and occupation, with a view to eliminating any discrimination in respect thereof. The term

International Regulations	
	discrimination includes (a) any distinction, exclusion or preference made on the basis of race, color, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation.
Minimum Age Convention, 1973 (No. 138)	It states the obligation to pursue a national policy designed to ensure the effective abolition of child labor and to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons.
Worst Forms of Child Labor Convention, 1999	It states the obligation to take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labor as a matter of urgency. For the purposes of this Convention, the term child shall apply to all persons under the age of 18, and the term the worst forms of child labor comprises: (a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labor, including forced or compulsory recruitment of children for use in armed conflict; (b) the use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances; (c) the use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties; (d) work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children.
Protection of Wages Convention, 1949 (No. 95)	The purpose of the Protection of Wages Convention, 1949 (No. 95), adopted by the International Labor Organization (ILO), is to ensure that workers receive fair and timely payment for their labor.
Equality of Treatment (Social Security) Convention, 1962 (No. 118)	The purpose of the Equality of Treatment (Social Security) Convention, 1962 (No. 118), adopted by the International Labor Organization (ILO), is to ensure that all workers, regardless of their nationality or other factors, receive equal treatment in terms of social security benefits.

National Regulations	
Constitution of Suriname	Article 15: No one shall be obliged to do forced or compulsory labor.
Labor Act 1963 (No. 163 of 1963)	Protects workers from exploitation and discrimination. Sets minimum standards for wages, working hours, and working conditions. Facilitates fair treatment and dispute resolution in the workplace. Regulates employment practices to ensure stability. Promotes collective bargaining for improved conditions. Establishes health and safety guidelines for workplaces. It provides a legal framework to safeguard workers' rights, promote fairness, and support economic development.

National Regulations	
Law on Minimum Wages 2019 (2019, No. 101)	The Minimum Wages Act determines the minimum hourly wage that an employee is entitled to as of 10 July 2019, the minimum hourly wage for an employee of 21 years or older is SRD 8,40. The minimum hourly wage is subject to annual change by the government of Suriname. The employer is required to pay employees a salary which at least corresponds with the minimum wage. Aside from the minimum wages, salaries do not have to be adjusted periodically, unless this has been agreed upon between parties.
Civil Code	The Civil Code (CC) contains provisions in Book III, title 7a, regulating the relationship between workers and employers in an employment contract. According to the contract law, all private persons, including workers and employers, are free to conclude agreements, including employment contracts which take legal restrictions and requirements into account. Minors (persons under 21 years, who have never been married) are only qualified to enter into an employment contract if they have either oral or written authorization from their statutory representative (article 1613g, paragraph 1). Authorization is given if the minor performs duties without opposition or objection of the statutory representative during six weeks after conclusion of the employment contract (article 1613h). An employment contract between spouses is null and void (article 1613i). Book III, title 7a contains special provisions to promote good industrial relations between workers and employers in an employment contract. The most relevant duty is to act as befits a good worker or employer (articles 1614y and 1615d).
Labor Code	The Labor Code of Suriname aims to protect workers' rights, ensure fair treatment, regulate employment relationships, promote workplace safety, and provide mechanisms for resolving labor disputes.
Child Labor Act	The Child Labor Act in Suriname aims to protect children from exploitation, ensuring they are not engaged in hazardous work and have access to education. It promotes their well-being and supports social development by prohibiting harmful labor practices and encouraging their educational opportunities.

National Regulations	
Hazardous Labor Decree	The Hazardous Labor Decree of Suriname aims to protect children by prohibiting them from working in dangerous conditions, ensuring their safety and promoting their education. It sets standards to prevent exploitation and promote the well-being of children.
Freedom of Associations Act	The Freedom of Association Act28 (WVV) is a clustering of freedom of association provisions in Decrees and a further implementation of international labor standards (ILO Conventions Nos. 87, 98 and 125) and segments of the CARICOM Model Harmonization Act regarding Registration, Status and Recognition of Trade Unions and Employers' Organizations. Conclusions of the ILO Committee of Experts on the implementation of ILO Conventions Nos. 87, 98 and 125 and statements of the Committee on the Freedom of Association (CFA) have been considered in formulating the WVV.
Industrial Accidents Act	The Industrial Accidents Act30 (SOR) aims to indemnify the worker against financial consequences of industrial accidents. These are accidents related to or in the course of employment including fatal injuries (article 4). The employer is obliged to pay compensation except for workers engaged with the main activity in agriculture, horticulture, forestry and cattle breeding (article 5). In order to fulfill this obligation, employers have to take out industrial injury insurance (article 10).
Maternity Protection Act	The Maternity Protection Act ensures a safe workplace for pregnant workers and new mothers. Protects their jobs during maternity leave and ensure they can return without discrimination. Provides maternity leave with pay or benefits. Supports breastfeeding with breaks and facilities. Prohibits discrimination based on maternity status. Promotes family well-being and work-life balance.
General Pension Act	The pension rights based on the General Pension Act 2014 (WAP) are awarded in addition to the monthly AOV general old age benefit.33 The purpose of the WAP34, which came into effect on 9 December 2014, is to introduce a mandatory general pension scheme, which entitles the holder to a pension upon reaching retirement age (article 2). The pension rights are accrued from the entry into force of the law and have no retroactive effect to a time prior to the date of entry into force (article 2, paragraph 2). Introduction of the WAP means that the accrual of pension rights will take effect from that date, and entitlement to pension rights can only be made by employees who accrue these rights under this scheme.

National Regulations	
National Basic Care Act	The National Basic Care Act (WNB) came into effect on 9 October 2014. The law is intended to introduce basic health insurance for all residents in Suriname, also for foreigners living in Suriname. The WNB obliges every employer to take out basic health insurance for his/her employee. In this Act, in addition to the children from the marriage and the married partners, account is also taken of long-term unmarried partners (see article 1, §e) and the children who belong to their household. Not only the married partner is co-insured, but also those with whom the employee maintains a long-term joint household (see article 1, sub j).
Occupational Safety and Health Act	The Occupational Safety and Health Act (OSHA) is a framework act on safety and hygiene in enterprises. Detailed rules are or should be laid down in subsidiary legislation. At present there are nine Safety Regulations pursuant to the OSHA. The OSHA and the nine Safety Regulations aim to decrease the chances of employment injuries and occupational diseases. The paragraphs list some provisions in the OSHA and the subjects to be laid down in Safety Regulations.
Holidays Act	The purpose of the Holidays Act (HA) is to guarantee annual holidays with pay for every worker engaged in an employment contract. Every employee is entitled to an annual holiday with pay (articles 2 and 7, paragraph 2).
Labor Mediation Act	The Labor Mediation Act of 1946 (LMA) is the key standard for collective labor dispute settlement in Suriname. The LMA establishes within labor administration, the National Labor Mediation Council (BR) to deal with the settlement of labor disputes. The BR has the task to promote the peaceful settlement and the prevention of labor disputes, which means any dispute between workers and one or more employers regarding labor matters.
Labor Exchange Act	The Labor Exchange Act 2017 (LEA) is the modern version of the Labor Exchange Act of 1965. The LEA gives a new dimension to the task of the Government to bring jobseekers and employers together and to improve employment. According to the State Decree on the Terms of References of Departments 38 Act of 26 September 1946 (GB 1946 No. 104) as amended by GB 1948 No. 8. Labor Exchange Act 2017 (SB 2017 No. 67). 97 of Government40, the Ministry of Labor is entrusted with the task to supervise the legal regulations on employment placement (labor exchange) and to formulate the labor market policy and increase employment. Historically the Government has played an active role in the field of labor exchange and the tackling of unemployment. The Government had, however, no monopoly on labor exchange, because private institutions had the opportunity to render their services to jobseekers under certain conditions. The LEA reshapes the legal basis of labor exchange fundamentally with the introduction of regulated freedom for intermediating

National Regulations	
	institutions, ethical codes for intermediaries and employers and rights for jobseekers. The ratification on 12 April 2006 of the ILO Private Employment Agencies Convention (No. 181) and the guidelines in the ILO Private Employment Agencies Recommendation (No. 188) required the elimination of gaps with the existing legislation.
Private Employment Agencies Act	The Private Employment Agencies Act (WTBAI) is a new law in Suriname governing the functioning of temporary work agencies uitzendbureaus. The primary objective of the WTBAI is to establish the relationship between the Government and the temporary work agencies with the main focus to prevent the exploitation of workers. The Government of Suriname ratified the relatively new ILO Employment Agencies Convention, 1997, No. 181 in April 2006 (ILO Convention No. 181). The Employment Agencies Recommendation, 1997, No. 188 is linked to this Convention.
Dismissal Act 2018	The purpose of the dismissal legislation is to protect employees, promote job security and prevent unjustified layoffs. The Dismissal Permit Act was repealed with the entry into force of the Dismissal Act 201842 (DA). The DA still maintains the licensing system, broadens dismissal protection based on international standards and introduces a review procedure outside the administration. The Dismissal Act 2018 does not apply to the employment relationship of civil servants as referred to in article 1 of the Personnel Act (GB 1962 No. 95) (article 1, paragraph 2). This law applies to the employment contract that is exclusively governed by the CC.
Work Permits Act	The aim of the Work Permits Act (WPA) is to regulate the number of foreign workers on the Surinamese labor market. The WPA prohibits employers from employing foreigners without a work permit that is granted by the Permanent Secretary (article 3).
The Free Movement of CARICOM Skilled Nationals Act	The Free Movement of CARICOM Skilled Nationals Act (CSNA) implements articles 45 and 46 of the Revised Treaty of Chaguaramas regarding the free movement of CARICOM skilled nationals. According to the CSNA, all CARICOM nationals can apply for recognition of the status of CARICOM skilled national to the Minister of Labor (article 4, paragraph 1)
Penal Code	Legal representatives can be punished if they offer a child under 12 years of age, who is placed under their supervision, to another person knowing that they will be subjected to work harmful to their health or otherwise (article 311). The Criminal Code was amended in 2006, adding a number of provisions regarding the worst forms of child labor. The ages to

National Regulations	
	determine the limit with regard to the above are variously set at 12, 16, 17 and 18 years.
Commercial Code	The employment between crew members and shipowners is regulated by the Commercial Code (Book II, title IV, paragraph 2). According to the Commercial Code "crew members" are only those who have concluded an employment contract with shipowners (article 490). All rules of the CC are applicable on the employment relationship between crew members and ship-owners if not stipulated otherwise in the Commercial Code (article 491). The employment contract should be in writing in order to be valid (article 492).

Gender

Table 10. Gender regulations

International Regulations	
Inter-American Convention on the Prevention, Punishment, and Eradication of Violence against Women (Belém do Pará Convention) (1994)	International Human Rights instrument adopted by the Inter-American Commission of Women (CIM) of the Organization of American States (OAS) at a conference held in Belém do Pará, Brazil. It is the first legally binding international treaty that criminalizes all forms of violence against women, especially sexual violence.

National Regulations	
Law against Stalking (2012)	The instrument creates the offence of stalking and enables public prosecutor to protect a potential victim by applying for preventative measures. The law punishes the stalker with a maximum of 4 years of prison and the maximum of SRD 50,000 maximum.
Domestic Violence Prevention Act (2009)	This is the principal law governing domestic violence in Suriname. The law includes protections against physical, sexual, psychological and economic violence perpetuated against a partner or child or any other member of the family. Further, the law adopts gender-neutral standards.

Protected Areas

Table 11. Protected Area Regulations

International Regulations	
Convention Concerning the Protection of the World Cultural and Natural Heritage, UNESCO, 1972	It creates the World Heritage Sites, with the primary goals of nature conservation and the preservation of cultural properties. It guides the work of the World Heritage Committee and defines which sites which can be considered for inscription on the World

International Regulations	
	Heritage List. It sets out the duties of each country's governments to identify potential sites and to protect and preserve them. Signatory countries pledge to conserve the World Heritage sites situated on their territory, and report regularly on the state of their conservation.

National Regulations	
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and reduction of long-term climate risks in the country at the national and sectoral level.
Nature Protection Law. G.B. 1954 no. 26, z.l.g. bij S.B. 1992 no. 80.	This law regulates the protection and conservation of natural monuments; prohibiting the infliction of damage to a nature reserve.

Flora, Fauna and Native Forest

Table 12. Flora, Fauna and Native Forest legislation

International agreements	
The Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973 (CITES) Suriname ratified in 1980	It is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat, 1971	It provides the framework for the conservation and wise use of wetlands and their resources. The Convention has three main pillars: work towards the wise use of all their wetlands; designate suitable wetlands for the list of wetlands international importance and ensure their effective management; cooperate internationally on transboundary wetlands, shared wetland systems and shared species.
Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, 1940	Provides for the establishment of protected areas, research co-operation between governments, listing of species for special protection and control of trade in protected fauna and flora.
Convention on Biological Diversity, United Nations, 1993	It recognizes the conservation of biodiversity is "a common concern of humankind" and is an integral part of the development process. It recognizes that ecosystems, species and genes must be used for the benefit of humans in a way and at a rate that does not lead to the long-term decline of biological diversity. Some of the many issues dealt with under the convention include: measures the incentives for the conservation and sustainable use of biological diversity; access to and transfer of technology; technical and scientific cooperation; impact assessment; education and public awareness; national reporting on efforts to implement treaty commitments.

International agreements	
The Cartagena Protocol on Biosafety to the Convention on Biological Diversity	The Cartagena Protocol, in force since September 2003, was adopted as a complementary agreement to the Convention on Biological Diversity.
United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa	The United Nations Convention to Combat Desertification entered into force in 1996 and has been ratified by the 33 countries of Latin America and the Caribbean. It is the only binding international agreement linking environment and development to sustainable soil management.

National Regulations	
National REDD+ Strategy (2019)	The Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) Strategy establishes long-term partnerships through planning, scientific research, effective management of protected areas and sustainable forest management resulting in efficient use of natural resources, including the forest, ecosystems and biodiversity.
Plant Protection Act (No. 7 of 2020)	This act contains rules for the prevention of spreading of diseases and pests affecting plants and control of Living Modified Organism. The act carries into effect obligations under the Agreement on the Application of Sanitary and Phytosanitary Measures and the IPCC. The Plant Protection and Quality Inspection Service of the Ministry responsible for agriculture shall be the NPPO and shall issue phytosanitary certificates.
Animal Welfare Order (No. 14 of 2018)	This Order lays down rules for purposes of carrying into effect articles 2,3,5,6,7,8,9,11,13,15,21,24 and 24a of the Animal Welfare Law. These rules concern the conditions of keeping of domestic, livestock and wild animals, and treatment or killing of animals. They also provide with respect to proper conditions for livestock farming and transportation of animals, the trade in animals, animal competitions and zoos, animal asylums, etc. The persons of the Livestock Breeding Sub-directorate appointed by the Minister are charged with carrying out inspections and supervising compliance with the Animal Welfare Act and the rules laid down in this State Order. The head of the Veterinary Service is charged with issuing, revoking, renewing and amending the veterinary licenses. This Decree also provides for the issuing of veterinary licenses.
Decree concerning measurement, marking and registration of timber (No. 6 of 2020)	This Decree of the Minister of Physical Planning and Land and Forestry Management carries into effect Article 44, paragraph 1 to 3 of the Forestry Management Act rand amends the legal regime about measuring, marking and registration of timber that is felled and transported from its place of origin. Those that have to right to fell trees as defined in Article 1 shall immediately mark those trees with a as indicated by the Director of Forestry Management or the Director of the Foundation for Forestry Management and Supervision. A unique number shall be placed on each timber log after it is moved from the place of felling (special registration mark). Timber logs shall be provided with a mother label (ML) and shall be registered after measurement in

National Regulations	
	the register. After control by the authorized officer, logs shall be provided with a hammer mark. Pieces of timber logs shall be provided with a Child Label. The Decree further provides rules for the use and protection of marks and the registration of logs and related control procedures.
Nationally Determined Contribution 2020	This second Nationally Determined Contribution has been developed by the Government of Suriname under the Paris Agreement and in line with the priorities outlined in the Policy Development Plan 2017-2021 that emphasizes the need for the national economy diversification. The present NDC includes sectoral policies and measures covering an estimated 70% of emissions from the following sectors (i) forests; (ii) energy, with a considerable reduction of emissions together with an incremented use of renewable energy resources; (iii) agriculture; and (iv) transport by introducing vehicle emissions controls and tighten import to vehicles less than five years old. Sectoral sub-targets, complemented by a portfolio of projects that contribute significantly to meeting the contributions of the NDC objectives are also included.
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and reduction of long-term climate risks in the country at the national and sectoral level.
Intended Nationally Determined Contribution Under UNFCCC	By virtue of this document the Republic of Suriname submits its Intended Nationally Determined Contribution (INDC) under the United Nations Framework Convention on Climate Change (UNFCCC). The period covered by Suriname's INDC, as proposed, is up to 2025. The document has a national-scale coverage. The GHGs to be accounted for are carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). As regards mitigation, the sectors covered in this INDC are Forests and Renewable Energy. Unconditional and conditional contributions are outlined for both sectors. They include measures for sustainable forestry management to promote multiple use of its forest resources while at the same time exploring options for the payment of forest climate services that its forest provides. Also, estimation of national carbon stocks and the development of a Monitoring, Reporting and Verification (MRV) System are underway. Regarding adaptation, Suriname has outlined climate resilience measures as part of the 2012-2016 National Development Plan and is currently undertaking projects and actions as a direct response to climate change.
National Plan for Forest Cover Monitoring	This National Plan for Forest Cover Monitoring (FCM) is a sectoral policy document. The overall goal of the FCM plan is: "To contribute to the strengthening of the National Forest Monitoring

National Regulations	
	System (NFMS) by generating information about changes in forest cover for Suriname that is reliable, up-to-date, accessible, understandable and transparent, serving multiple purposes amongst others optimized policy, policy implementation (e.g. national land use planning, sustainable management of the forest, REDD+) and law enforcement in the field (e.g. gold mining, mangrove forest)."
Forest Management Act (1992)	This act provides for the management and conservation of forest resources, and to regulate forest exploitation and the primary forest processing industry in order to increase the economic, social and ecological functions of forests as national resource and to enhance a responsible development of the forestry industry. The Minister of Natural Resources is responsible for forest management, adopting a forest inventory program and a forest management plan.
Hunting Act 1954 (G.B. 1954 no. 25,z.l.g. bij S. B. 1997 no. 73).	This act regulates the protection of fauna and the regulation of hunting.
Nature Conservation Act 1954, G.B. 1954 no. 26 as amended by S.B. 1992 no. 80	Regulates the designation, protection and maintenance of Nature Reserves.

Gaseous Emissions Management

Table 13. Gaseous Emissions Management Regulations

International Regulations	
Vienna Convention for the Protection of the Ozone Layer, 1985 Suriname acceded in 1997	Protection of the ozone layer, it is a framework convention that aims to promote international cooperation through exchange of information on the impact of human activity on the ozone layer. Came into force in 1988.
Montreal Protocol on Substances that Deplete the Ozone Layer, 1987	It was designed to stop the production and import of ozone depleting substances and reduce their concentration in the atmosphere to help protect the earth's ozone layer. It regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone depleting substances.
Kyoto Protocol, 1992	It commits state parties to reduce greenhouse gas emissions, based on the scientific consensus that global warming is occurring and that human-made CO2 emissions are driving it.
The Paris Agreement, 2015	One of the primary goals of the Agreement is to pursue a development trajectory characterized by low greenhouse gas emissions, ensuring that food production remains uncompromised. The Agreement aims to contain the global average temperature increase well below 2°C relative to pre-industrial levels, with continued efforts to further limit this increase to 1.5°C. To achieve this, the signatories intend to peak global greenhouse gas emissions as soon as possible. It is acknowledged that developing nations will require more time to reach this zenith, and once achieved, there will be a swift decline in emissions.

International Regulations	
	Developing nations are expected to augment their mitigation measures. Over time, they are encouraged to adopt comprehensive emission reduction or limitation objectives, considering their distinct national circumstances. Least developed countries and small island developing states have the provision to devise and convey strategies, plans, and actions for low greenhouse gas emission development, reflecting their unique situations.
United Nations Framework Convention on Climate Change (UNFCCC)	The United Nations Framework Convention on Climate Change (UNFCCC) established an international environmental treaty to combat "dangerous human interference with the climate system". All parties should promote and support the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all sectors, including energy, transport, industry, agriculture, forestry and waste management. In addition, they should promote sustainable management and cooperatively support the conservation and enhancement of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans, as well as other terrestrial, coastal and marine ecosystems. Each party should submit to the Conference of the Parties a national inventory, within its capabilities, of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be promoted and approved by the Conference of the Parties.

National Regulations	
Nationally Determined Contribution 2020	This second Nationally Determined Contribution has been developed by the Government of Suriname under the Paris Agreement and in line with the priorities outlined in the Policy Development Plan 2017-2021 that emphasizes the need for the national economy diversification. The present NDC includes sectoral policies and measures covering an estimated 70% of emissions from the following sectors (i) forests; (ii) energy, with a considerable reduction of emissions together with an incremented use of renewable energy resources; (iii) agriculture; and (iv) transport by introducing vehicle emissions controls and tighten import to vehicles less than five years old. Sectoral sub-targets, complemented by a portfolio of projects that contribute significantly to meeting the contributions of the NDC objectives are also included.
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and

National Regulations	
	reduction of long-term climate risks in the country at the national and sectoral level.
National Plan for Forest Cover Monitoring	This National Plan for Forest Cover Monitoring (FCM) is a sectoral policy document. The overall goal of the FCM plan is: "To contribute to the strengthening of the National Forest Monitoring System (NFMS) by generating information about changes in forest cover for Suriname that is reliable, up-to-date, accessible, understandable and transparent, serving multiple purposes amongst others optimized policy, policy implementation (e.g. national land use planning, sustainable management of the forest, REDD+) and law enforcement in the field (e.g. gold mining, mangrove forest)."

Energy

Table 14. Energy Regulations

International Regulations	
International Renewable Energy Agency (IRENA)	While not a convention, Suriname is a member of IRENA, an intergovernmental organization that promotes the adoption and sustainable use of renewable energy worldwide.
Sustainable Development Goals (SDGs)	Suriname has committed to achieving the SDGs, including Goal 7 (Affordable and Clean Energy), which aims to ensure access to affordable, reliable, sustainable, and modern energy for all.
National Regulations	
Nationally Determined Contribution 2020	This second Nationally Determined Contribution has been developed by the Government of Suriname under the Paris Agreement and in line with the priorities outlined in the Policy Development Plan 2017-2021 that emphasizes the need for the national economy diversification. The present NDC includes sectoral policies and measures covering an estimated 70% of emissions from the following sectors (i) forests; (ii) energy, with a considerable reduction of emissions together with an incremented use of renewable energy resources; (iii) agriculture; and (iv) transport by introducing vehicle emissions controls and tighten import to vehicles less than five years old. Sectoral sub-targets, complemented by a portfolio of projects that contribute significantly to meeting the contributions of the NDC objectives are also included.
Suriname National Adaptation Plan 2019-2029	The National Adaptation Plan is a national policy with a multi-sectoral approach. The timeframe of the policy is 10 years between 2019 and 2029. This Adaptation Plan lays down medium- and long-term adaptation strategies for management and reduction of long-term climate risks in the country at the national and sectoral level.
Intended Nationally Determined Contribution Under UNFCCC	By virtue of this document the Republic of Suriname submits its Intended Nationally Determined Contribution (INDC) under the United Nations Framework Convention on Climate Change

International Regulations	
	(UNFCCC). The period covered by Suriname's INDC, as proposed, is up to 2025. The document has a national-scale coverage. The GHGs to be accounted for are carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O).

Right to Environmental Information

Table 15. Regulations on access to environmental information

National Regulations	
Constitution of the Republic of Suriname	The Constitution of the Republic of Suriname's highlights citizen participation and the construction of a just society. The State shall create the conditions for citizens to participate in a democratic and effective manner in the development process of the nation. The central authority shall organize the regular dissemination of information on government policy and state administration, in order to allow the people to participate optimally in the administrative structures. The lower administration shall have the obligation to create a process of communication with the people, for the purpose of making government answerable to the public and to ensure the participation of the people in policymaking. Article 19: Everyone has the right to make public his thoughts or feelings and to express his opinion through the printed press or other means of communication, subject to the responsibility of all as set forth in the law.
Environmental Framework Act (No. 97 of 2020)	The Environmental Framework Act contains rules for sustainable environmental management in Suriname. It aims to develop a national environmental strategy and planning for sustainable development under a coordinated approach. The Act provides for the generation and access to environmental information, the participation of different stakeholders in environmental policies and environmental justice, such as the detection, prosecution and trial of environmental offenses. It recognizes that everyone in Suriname must take sufficient care of the environment.

Expropriations

Table 16. Expropriations Legislation

National Regulations	
Constitution of the Republic of Suriname	Article 34 1. Property, both of the community and of private persons, shall fulfil a social function. Everyone has the right to the undisturbed enjoyment of his property, subject to the limitations which originate in the law.

National Regulations	
	2. Expropriation shall take place only in the general interest, pursuant to rules to be laid down by law and against compensation guaranteed in advance. 3. Compensation need not be previously assured if, in case of an emergency, immediate expropriation is required. 4. In cases determined by or pursuant to the law, the right to compensation shall exist if, in the public interest, the competent authority destroys or renders property unusable or restricts the exercise of property rights.
Expropriation Act (Onteigeningswet) G.B. 1904 no. 37, amended by G.B. 1911 no. 19, G.B. 1924 no. 47, G.B. 1935 no. 80.	Under expropriation is understood: depriving someone from his property, by the Government, in favor of a work for the public interest. The deprived party is entitled to compensation. This Act contains regulations, procedures and timelines regarding expropriation and related compensation.
Act on Expropriation in the interest of Urban Development and housing (Wet Onteigening Stedebouwkundige ontwikkeling en Woningvoorziening). G.B. 1948 no. 4 as last amended by G.B. 1972 no. 96	Art. 1 stipulates that without preceding declaration by law that public interest requires expropriation, expropriation against compensation can take place to have the possession of non-built and built properties, necessary for: – The implementation or enforcement of the actual condition in accordance with a Zoning Plan; – Surfaces in the interest of housing; – The execution of a building plan.
L-Decrees, specifically Decree Principles of Land Policy (Decreet Beginselen Grondbeleid). S.B. 1982 no. 10, S.B. 1983 no. 103, as last amended by S.B. 2003 no. 8.	Art. 1 presents a founding principle of Suriname land policy, namely that All land to which others have not proven their right of ownership is domain of the State. Since the introduction of the L-Decrees, the only title that can be obtained on state land is that of land lease (grondhuur), which is valid for a period between 15 and 40 years with the option to renewal
Decree L2: Decree Issuance Domain Land (Decreet uitgifte domeingrond) S.B. 1982 no. 11, S.B. 1990, last no. 3, S.B. 2003 no. 7	Regulates the issuance of domain land. Article 7: A request for domain land can be refused if the allocated land is contrary to regional development plans or zoning plans.
Decree Origins Land Policy (Decreet Beginselen Grondbeleid), S.B. 1982 no. 10, as last amended by S.B. 2003 no. 8	The Memorandum of Understanding for Art. 3, lid 2 defines unlawful occupation as “to occupy or work the land of an entitled party, without his permission”.
Civil Code	Art 625-626 deal with ownership of property in general (Art 625) and land specifically (626). Expropriation of property for the common good is possible against prior agreed to compensation. Land ownership entails everything that is on and in the ground, with specified limitation (i.e. mining). Art 411a-244 penalizes the person who settles on land belonging to someone else, without adequate tenure title (Lid.1). In addition to the legal sanctions, the judge will also order eviction (Lid. 2)

Cultural Heritage, Archaeological and Historical Sites

Table 17. Cultural Heritage, Archaeological and Historical Sites Regulations

National Regulations	
Constitution of the Republic of Suriname	Article 47 The State shall save and protect the cultural heritage of Suriname, shall promote its preservation and promote the use of science and technology in the context of the national development aims.
The Monuments Act 2002 SB 2002 no. 72	The Act provides protection to archaeological sites, but only after Suriname's Minister of Education has declared the site to be a monument, based on the advice of the Monuments Committee.

Noise

Table 18. Noise regulations

International Regulations	
Environmental, Health, and Safety General Guidelines (IFC, 2007)	Recommended noise level thresholds for residential/institutional/educational areas of 55 weighted decibels [dBA] equivalent sound level (Leq) for daytime and 45 dBA Leq for nighttime.

National Regulations	
Environmental Framework Act	This Act is about the protection and sustainable management of the environment in Suriname and the implementation and carrying into effect of obligations deriving from the membership of Suriname to international agreements, notably the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity, the Paris Agreement and the Stockholm and Rotterdam (Conventions on POPs and PIC respectively). Another important matter is the investigation, prosecution and trial of offences defined in this Act as environmental offences. The Act is composed of 77 articles divided into 11 Chapters: General provisions (I); The National Environment Authority (II); Duty of Care (III); Environmental Strategy (IV); Activities and Environmental Consequences (V); Control of Pollution - Environmental Pollution and Standards (VI); Waste and Hazardous Substances (VII); Legal Protection Mechanisms (VIII); Environmental offences and Sanctions (IX); Provisions on Enforcement and further provisions (X); Transitional and Final Provisions (XI).
Safety Regulation No. 7 (Working Environment Decree)	Articles 21-27 on Chapter IV regulate the prevention or limitation of harmful or bothersome noises and vibrations from machines, tools, and equipment during operation, requiring effective measures to minimize impacts on employees' living spaces and physical health.

Disaster Risk Management

Table 19. Disaster Risk Management regulations

International Regulations	
Sendai Framework for Disaster Risk Reduction (2015-2030)	Aims to achieve substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities and countries over the next 15 years. It outlines seven clear targets and four priorities for action to prevent new and reduce existing disaster risks: (i) Understanding disaster risk; (ii) Strengthening disaster risk governance to manage disaster risk; (iii) Investing in disaster reduction for resilience and (iv) Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction.

National Regulations	
National Strategy for Disaster Reduction (in process)	Suriname is currently working on developing a National Strategy for Disaster Risk Reduction, aligning it with the Multi-Annual Development Plan (2022-2026), the National Adaptation Plan (2019-2029), the Updated Nationally Determined Contribution (2020), the National Climate Change Policy Strategy and Action Plan (2013), the Paris Agreement, the Regional Comprehensive Disaster Management (CDM) Strategy and the Sendai Framework for Disaster Risk Reduction.

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 is proposed to be financed with an IDB Loan Operation (BH-L1061), these E&S Performance Standards must be considered during the preparation and implementation of all projects financed under the Program.

After description of the 10 Environmental and Social Performance Standards, **Table 19** details the actions to be implemented in the projects 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", "autochthonous peoples" or any other formally recognized indigenous peoples in Latin America and the Caribbean. In the ESPF, the

term “Indigenous Peoples” is used in a generic sense to refer to distinct social and cultural peoples possessing some of the following characteristics in varying degrees:

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

The objectives of this Standard are:

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

ESPS 8 - Cultural Heritage

Environmental and Social Performance Standard (ESPS) 8 recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this ESPS aims to ensure that Borrowers protect cultural heritage during 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 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 19 below details the actions that will be conducted 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 20 - 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**
The operation will be executed by the Ministry of Transport, Communication and Tourism (MTCT) through a dedicated PEU who will be responsible for general and technical coordination, planning, monitoring and evaluation, financial management, procurement administration, environmental, health and safety management and communication activities. To meet the requirements of ESPS 1, this Environmental and Social Assessment (ESA) includes the identification and control of the potential environmental and social impacts and risks of the types of projects to be financed under the Program a**nd** incorporates an Environmental and Social Management Plan (ESMP) to address these impacts and risks in accordance with the requirements established in the ESPF, and applicable ESPS.	**YES**
ESPS 2 - Labor and Working Conditions	**YES/NO**
The works and activities that result in interventions include construction processes, movement of materials and mobilization of personnel, which bring with it risks and impacts associated with labor and working conditions, including the health and safety of workers. A Labor Management Procedure has been included in this ESA/ESMP (**Annex 2**), with a Code of Conduct and Grievance Redress Mechanism (GRM) for workers. The ESMS of the Program will incorporate requirements for ensuring compliance with ESPS 2 related to worker health and safety and working conditions. This ESA also includes an Affidavit template to be filled out by solar panel suppliers to screen out forced labor risk in the supply chain.	**YES**
ESPS 3 - Resource Efficiency and Pollution Prevention	**YES/NO**
The projects will be developed in Kwamalasamutu Airstrip, Adolf Johan Pengel International Airport and Zorg En Hoop Airport. During the **construction phase**, localized and temporary negative impacts are expected, such as: nuisances due to noise, vibrations, dust, emissions, traffic, presence of heavy machinery, businesses and/or public infrastructure, risk of accidents, risk of disease transmission like waterborne and water-related diseases, and contagious diseases, and possible conflicts	**YES**

IDB Environmental and Social Performance Standards (ESPS)	Applies
between construction personnel and the communities due to disturbance or interference with regular operating conditions of the airstrips. During the **operational phase**, negative impacts can be expected such as exposure to accidents, including disabling or fatal accidents, due to unsafe acts or conditions during maintenance of the new infrastructure and equipment. This ESA identified impacts and risks of environmental contamination and management measures aimed at their proper management were established, using the mitigation hierarchy.	
ESPS 4 - Community Health, Safety, and Security	**YES/NO**
The impacts and risks on the people affected by the projects in the Program were assessed in this ESA. The use of hazardous materials, exposure to diseases were analyzed. The corresponding management plans were proposed in the ESMP. During the execution of the works there are risks for the security of the community related to the circulation of vehicles and machinery; exposure to hazardous materials; and presence of security personnel, among others. The overall disaster risk of the Program has been identified as **moderate** because the projects present a moderate level of criticality in case of Kwamalasamutu, a Moderate level of criticality for the Johan Adolf Pengel and moderate level of criticality in case of Zorg En Hoop, but the potential impacts caused by the hazards do not entail emergency situations that would immediately endanger community health or cause irreparable damage to biodiversity if properly managed. The ESA included a simplified qualitative risk analysis for the works in the Program.	**YES**
ESPS 5 - Land Acquisition and Involuntary Resettlement	**YES/NO**
The operation does not anticipate impacts from the physical displacement of people. Also, given the scale of the works, no potential impacts on livelihood resulting from the works were identified.	**NO**
ESPS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources	**YES/NO**
Even though the airports where the program will be developed are not located within protected areas or Key Biodiversity Areas (KBAs), a survey conducted in 2010 in Kwamalasamutu identified 15 species listed on the IUCN Red List of Threatened Species. Additionally, minimal to no deforestation is expected. The ESA identified impacts and risks on biodiversity on these areas. Management measures aimed at its proper management have been included, using the mitigation hierarchy. The use of exotic invasive species will be forbidden in revegetation activities, which will be designed to achieve a net zero loss of vegetation in intervened areas. A brief analysis on the possible ecosystem services impacted by the project was performed and no significant impacts to the identified services were found, however measures to avoid impacts on water provisioning and regulating services were included into the ESMP.	**YES**
ESPS 7 - Indigenous Peoples	**YES/NO**
The presence of indigenous communities has been identified in and around the airports. The Lokono community in Paramaribo, Kalina community around the K.A. Pangel airport and the Trio community in Kwamalasamutu. However, the activities will be carried out on previously intervened airport lands. An Indigenous Peoples Plan (IPP) is presented as a complementary document for the ESA.	**YES**

IDB Environmental and Social Performance Standards (ESPS)	Applies
ESPS 8 - Cultural Heritage	**YES/NO**
Suriname has three UNESCO World Heritage Sites: the Central Suriname Nature Reserve, the Historic Inner City of Paramaribo, and the Jodensavanne Archaeological Site. However, none are within the project area. In addition, there are sites of cultural and archaeological significance in Suriname, although they are not located in the areas of the projects. The closest site is the Historic Inner City of Paramaribo, about 4 kilometers from Zorg En Hoop airport. The nearest archaeological site to Kwamalasamutu is the Werephai Cave, located 12.2 kilometers northeast along the Maripa River, with petroglyphs dating back to 3000 B.C. Nevertheless, a Chance Find Procedure to prevent the destruction of historical, cultural, archaeological, and paleontological heritage is incorporated into the Environmental and Social Management Plan (ESMP).	**YES**
ESPS 9 - Gender Equality	**YES/NO**
The presence of contractors in the communities during the execution of the projects can increase the risk of sexual and gender violence against women, girls, boys, LGBTIQ+ people in the community and project workers. To mitigate this possible risk, the ESMP includes a Gender Action Plan with the following measures: (i) adoption by contractors of a Code of Conduct that prohibits acts of sexual harassment, sexual or gender violence, as well as establishing the corresponding measures in in case of non-compliance, (ii) training for workers on respectful relations with the communities, how to avoid gender violence and the Code of Conduct of the Program, (iii) information to the communities regarding the standards of conduct for project personnel , (iv) considerations to be integrated into the project's complaints mechanism to receive, register and address claims related to sexual harassment or gender violence and (v) definition of referral protocols for victims who require it to care services of gender violence or competent authorities.	**YES**
ESPS 10 - Stakeholder Engagement and Information Disclosure	**YES/NO**
This ESA/ESMP includes a Stakeholder Engagement Plan, which includes the mapping of stakeholders, community relations processes, the complaints, and claims response mechanism, as well as what is pertinent to the consultation process. During due diligence, a consultation process will be developed to present to affected and interested groups: the project, the environmental and social impacts, the mitigation measures, and the grievance response mechanism. The consultations must be conducted by the MTCT, and their results will be considered in the preparation of the final environmental and social documents of the operation.	YES

4. Environmental and Social Baseline

4.1. Introduction

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

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

4.2. Definition of Area of Influence

This ESA considers both the construction and operations phase of the Project, and focuses mainly on the relevant existing physical, biological, and socioeconomic environments within the direct footprint of the Project, namely the area surrounding the proposed interventions on Johan Adolf Pengel International Airport in the Para District, Zorg en Hoop Airport in Paramaribo and Kwamalasamutu Airstrip in Sipaliwini District. As such, both a Direct Area influence (DAoI) and an Indirect Area of Influence (IAoI) are defined for the Project as follows below.

4.2.1. Direct Area of Influence

The Direct Area of Influence (DAoI) for the Project is defined as the footprint of the Project, where the majority of the E&S impacts from the Project are expected to occur and/or be experienced most acutely, namely a radius of 100 meters around the designated project sites, including construction camps and any other additional facilities.

4.2.2. Indirect Area of Influence

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

For this ESA, the full extent of each of the 3 cities in the representative projects, Paramaribo City, Zerandij and Kwamalasamutu Village 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 project's interventions.

4.3. General Context

Suriname is a country on the northern coast of South America and is one of the smallest on the continent but has one of the most ethnically diverse populations. The economy heavily relies on natural resources, particularly bauxite, making it a leading global producer.

Approximately two-thirds of Suriname's population lives in urban areas, with about 40% residing in the capital, Paramaribo. The interior is predominantly inhabited by Maroon and Indigenous communities, with some Indigenous villages along the coast and nomadic groups near the Brazilian border in the south.

Paramaribo is the largest city, capital, and main port of Suriname, situated on the Suriname River, 9 miles (15 km) from the Atlantic Ocean. The administrative center of Paramaribo is Independence Square, surrounded by the Presidential Palace and the Ministry of Finance.

Para is a rural district, known for its lush forests and a hub for eco-tourism and recreation. Zanderij is a town connected to Paramaribo City by the Kennedy Highway, 45km away. The district is also home to indigenous communities such as Hollandse Kamp and Wit Santie.

On the other hand, Kwamalasamutu is a small Trio indigenous village in the Sipaliwini district. According to a 2024 United Nations publication, the population is estimated to be approximately 1,300 people.

4.4. Physical Environment Baseline of Indirect Area of Influence

4.4.1. Climate

The climate of Suriname is tropical with abundant rainfall, uniform temperature, and high humidity, influenced by the periodical northward and southward shift of the Inter-Tropical Convergence Zone (ITCZ) and experiences two rainy (Mid-April to mid-august and December to January) and two dry seasons (mid-august to early December and early February to mid-April)[10].

Between May and July, most of the country receives 250-400mm per month and during the minor rainy season, from November to January, around 150-200mm per month. Rainfall is highest in the central and south-eastern parts of the country. The 2021 average yearly precipitation was **2.109mm** and mean average rainfall from 1971-2015 data shows similar values of **2246,7mm**[11]. Average annual temperatures in 2021 ranged between a minimum of **24,2** and a maximum of **30,9°C**. The range in average temperatures between the warmest and the coldest month is only 2,4°C.

There are measuring stations located in **Zorg en Hoop** (23,6°C; 27,5°C; 31,6°C) and **Zanderij** (24,4°C; 28,1°C; 31,6°C) that show similar minimum, medium and maximum temperatures for the year 2021.

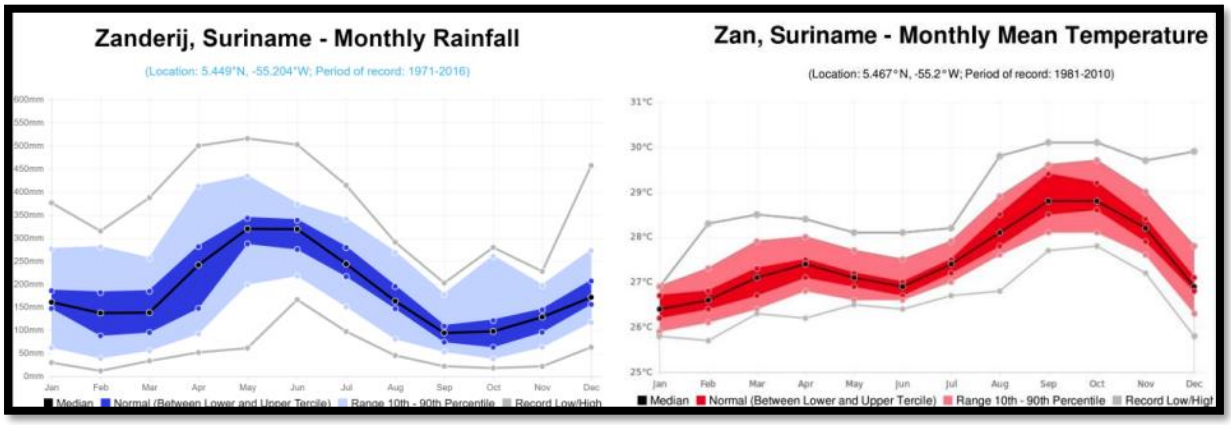


Figure 9. 1975-2015 climatology of monthly rainfal totals (left) and 1981-2010 monthly mean near-surface air temperature (right) at the Zanderij station. Source: NDC, 2020.

[10] Republic of Suriname. (2020). Nationally Determined Contribution, in fulfillment under the Paris Agreement on climate change.
https://unfccc.int/sites/default/files/NDC/2022-06/Suriname%20Second%20NDC.pdf

[11] Republic of Suriname (2022). 10th Environment Statistics.

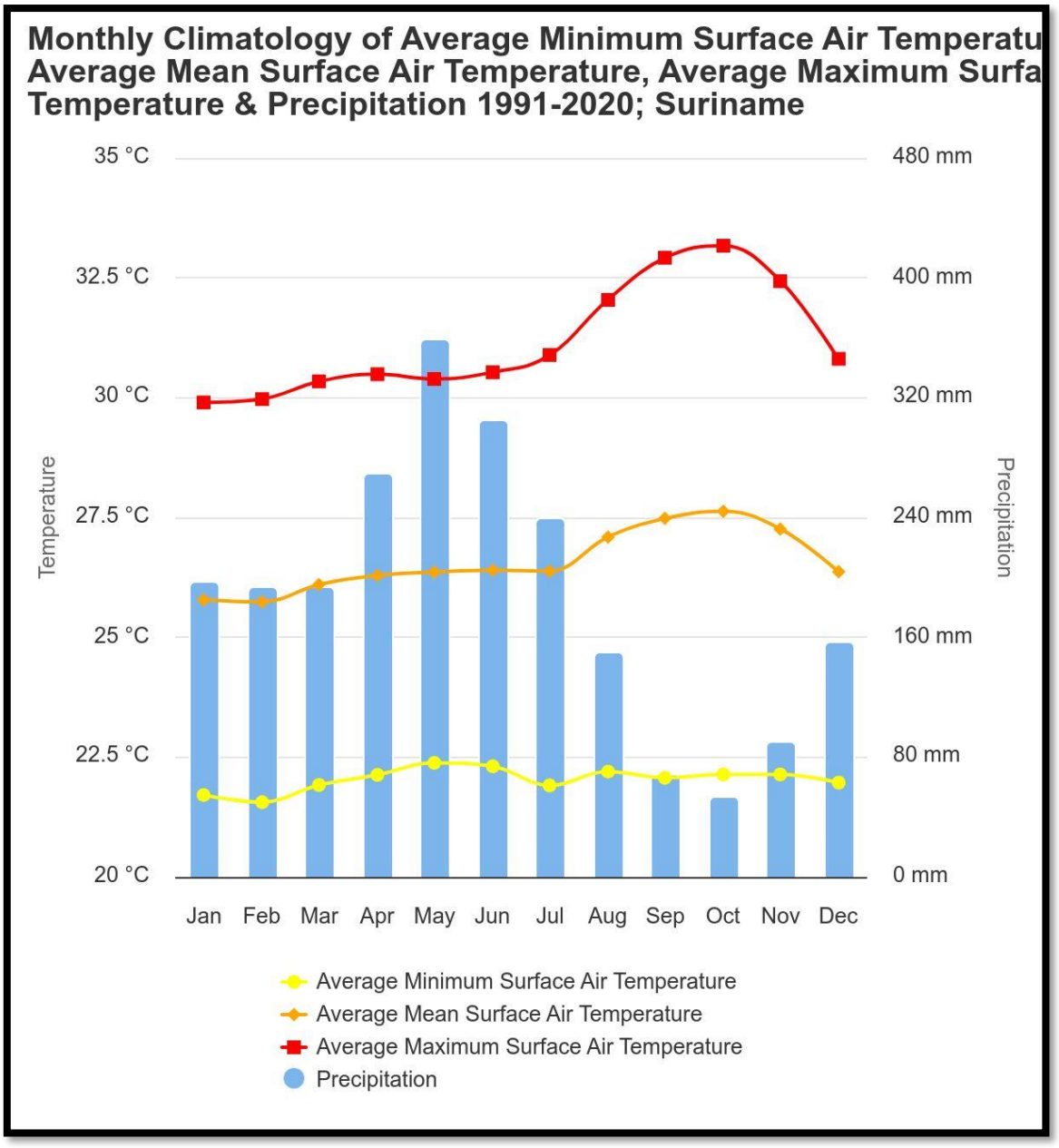


Figure 10. Monthly Climatology of Suriname Temperatures and Precipitation from 1991-2020. Source: World Bank Group

Rainfall is typically the highest in the central and eastern parts of the country, as it can be seen in Figure 5. The coastal area, however, experienced more rainfall in January 2022 than the interior, while the interior recorded more rainfall totals in February and March 2022.

Suriname is typically subject to north-easterly winds with an average speed of **1.3 Beaufort**, reaching a maximum of 1.6 Beaufort during dry seasons in February and again in September and October. Wind speeds along the coast are relatively higher than in the interior as well as higher during the day, with speeds of 3 to 4 Beaufort, and dropping significantly at night. The average daily air **humidity** ranges from **80-90%** in coastal regions while in central and southern regions of the country, it is on average

75%[12]. The penetration of sun radiation, among other factors, impacts the air humidity levels in forested areas resulting in humidity ranging between 70-100% versus 50-100% in open areas. The **Inter Tropical Convergence Zone (ITCZ)** is the main determinant for the rainfall in Suriname and it migrates twice a year above Suriname, being a convergence area of the northeast and southeast trades and located near the equator. Additionally, the El Niño-Southern Oscillation (ENSO) occurs every 2-7 years and impacts Suriname's climate as it can cause rainfall to be below or above normal levels. Typically, **during El Niño** years when there is above average rainfall on the Western coast of South America, **Suriname receives less rainfall**. El Niño episodes bring dry conditions throughout the year, and bring warmer temperatures between June and August, while **La Niña episodes bring wetter conditions** throughout the year and cooler temperatures between June and August. This was the case for the year 2022, with extreme amounts of precipitation due to the presence of La Niña.

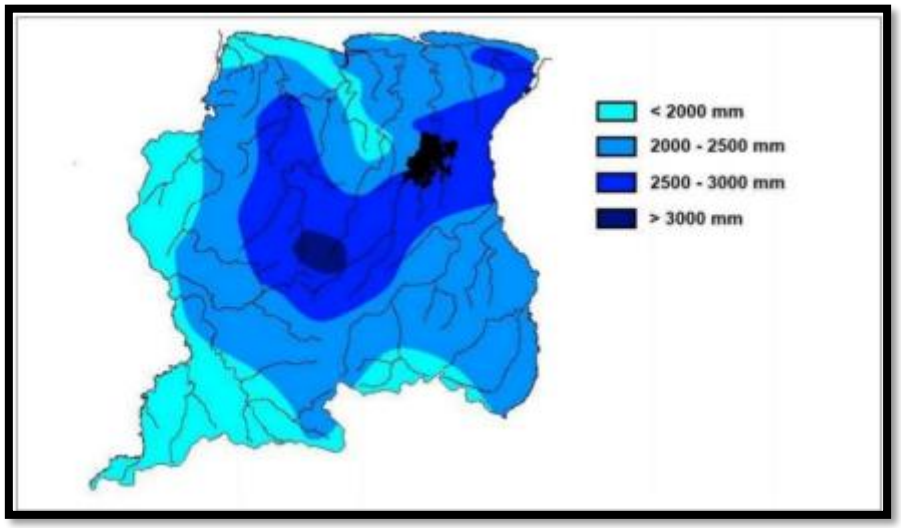


Figure 11. Average annual rainfall in Suriname accross the Country. Source: NC2, 2016.

While Suriname is located outside of the hurricane belt, it is still affected by the tails of hurricanes as well as local gales which typically occur before storms at the end of the rainy season. These gales can impact the entire country and may destroy trees as well as houses and other infrastructure. During these gales, wind speeds have been recorded as reaching up to 20-30m/s. *Sibibusies* (very strong winds) can also occur during thunderstorms and heavy rains that can achieve windspeeds of between 70 to 100km/h[13].

Climate Change and Vulnerability

Climate change has significant impacts on Suriname's territory, population and major economic sectors. Amongst them, hurricanes have been increasingly observed in the coastal region, as well as Storm surge and intense rainfall, causing severe flooding of roads and brought water-borne and vector-borne diseases in urban areas of **Paramaribo. Paramaribo** district has experienced flooding and associated blocked drainage channels, impacting recreation resorts, Para district has experienced heavy rainfall and strong winds that have torn off roofs in 2021, and **Sipaliwini** has seen intense

[12] Republic of Suriname. (2022). First Biennial Update Report (BUR1) to the United Nations Framework Convention on Climate Change.

[13] UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

floodings in the interior in 2006 resulting in evacuation, deaths and health impacts, including an outbreak of malaria, diarrhea and vomiting[14].

In certain districts like Brokopondo, drought recorded in 2004-2005 and 2009 caused lake levels to drop so low that EBS was forced to rent diesel generators and buy diesel fuel from abroad for 3 months at a cost of US$ 16 million to avoid power outages[15]. Similar situation occurred in **Sipaliwini**, where river levels dropped so low in 2009 that boats, the main form of transportation, could not be used. Nickerie has had important food security issues related to droughts and decreased precipitation that led to saltwater intrusion in rice fields. This similar issue is also occurring in Saramacca, where saltwater intrusion has led to ruined crops and incomes for farmers, as well as a threat to **Paramaribo** food security.

Climate modelling projections using a General Circulation Model (GCM) ensemble of 15 models and PRECIS, a Regional Climate Model (RCM) based on HadAM3 GCM, project changes in Suriname's climate are shown in Table 20.

Annual air and **sea surface temperature and sea level** are projected to **increase over time**. Most models also project that the proportion of **rainfall** that falls in **heavy events will increase** while average annual rainfall will decrease. The coastal plain is vulnerable to sea level rise, Paramaribo is approx. between 0 to 3m above sea level. According to statistics, Suriname is on the list of the ten vulnerable countries with **low-lying coastal plains which are threatened by sea level rise** in this century. There is however uncertainty about the extent of changes, as well as the direction of change in the case of rainfall and wind speed.

Table 21. Climate Change Scenarios for Suriname. Source: National Climate Change Policy Strategy and Action Plan, 2015.

Climate Parameter	Scenarios for the 2020s, 2050s, 2080s and 2100			
	2020s	**2050s**	**2080s**	**2100s**
Temperature (annual)	GCM: +0,3 to 1,3°C	GCM: +0,8 to 2,6°C	GCM: +1,2 to 3,8°C RCM: +4,8°C	SNC (2013): +2 to 3°C
Precipitation (annual rainfall)	GCM: -10 to +10mm/month	GCM: -22 to +14mm/month	GCM: -39 to +10mm/month RCM: -38mm/month	SNC (2013): -10%

[14] Republic of Suriname. (2015). Final National Climate Change Policy, Strategy and Action Plan for Suriname. https://cdn.climatepolicyradar.org/navigator/SUR/2015/national-climate-change-policy-strategy-and-action-plan_c9ada1a3f34fedf38f5803132d02b323.pdf

[15] Approximately 53% of Suriname's electricity is generated by hydropower and over the past decade, climate factors have had a clear impact on the functioning of Suriname's electricity generation and transmission and EBS operation.

Rainfall Extremes (% of total rainfall falling in Heavy Events, R95pct)	N/A	GCM: -1 to +8%	GCM: -1 to +11%	SNC (2013): "increased frequency of extreme weather events"
Wind Speed (annual average)	GCM: -0,1 to 0,1ms^{-1}	GCM: -0,1 to 0,3ms^{-1}	GCM: -0,1 to 0,7ms^{-1}	SNC (2013): "increased frequency of high winds"
Sea level rise	N/A	N/A	N/A	IPCC AR4, including adjustment for Caribbean: +0,13 to 1,45m SNC (2013): 1m rise

As to vulnerabilities identified for Suriname, coastal and urban infrastructure is more exposed to **flooding as the sea level rises**, this susceptibility also increases due to poor drainage infrastructure. As it was stated previously, the dependence on existing hydropower facilities increases vulnerability to climate impacts such as **drought** and **increased temperatures**, which affect the amount of water available and the functioning of Suriname's electricity generation, transmission and distribution systems. Changes in precipitation can also decrease freshwater availability, as well as an increase in the risk of contamination of water reservoirs due to water-borne diseases. Increased frequency and intensity of extreme events, combined with the concentration of population in exposed coastal zones and lack of defense infrastructure, may lead to more climate-related disasters. These may result in physical and socio-economic damage and loss of life.

4.4.2. Geology

Suriname is subdivided into a crystalline basement which forms part of the Guiana Shield and consists largely of granitoids and associated metavolcanics (80%) and coastal plain with narrow bridges (20%). The crystalline basement forms part of the Guiana Shield, one of the oldest geological formations in the world which stretches between the Orinoco and the Amazon rivers and includes eastern Venezuela, Guyana, Suriname, French Guiana, and northern Brazil. The predominant rock types in Suriname are primarily of Precambrian origin, formed approx. 2 billion years ago during the Trans-Amazonian Orogeny. This mountain building event shaped the region's geology, resulting in a variety of metamorphic and igneous rocks across the country[16].

[16] Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

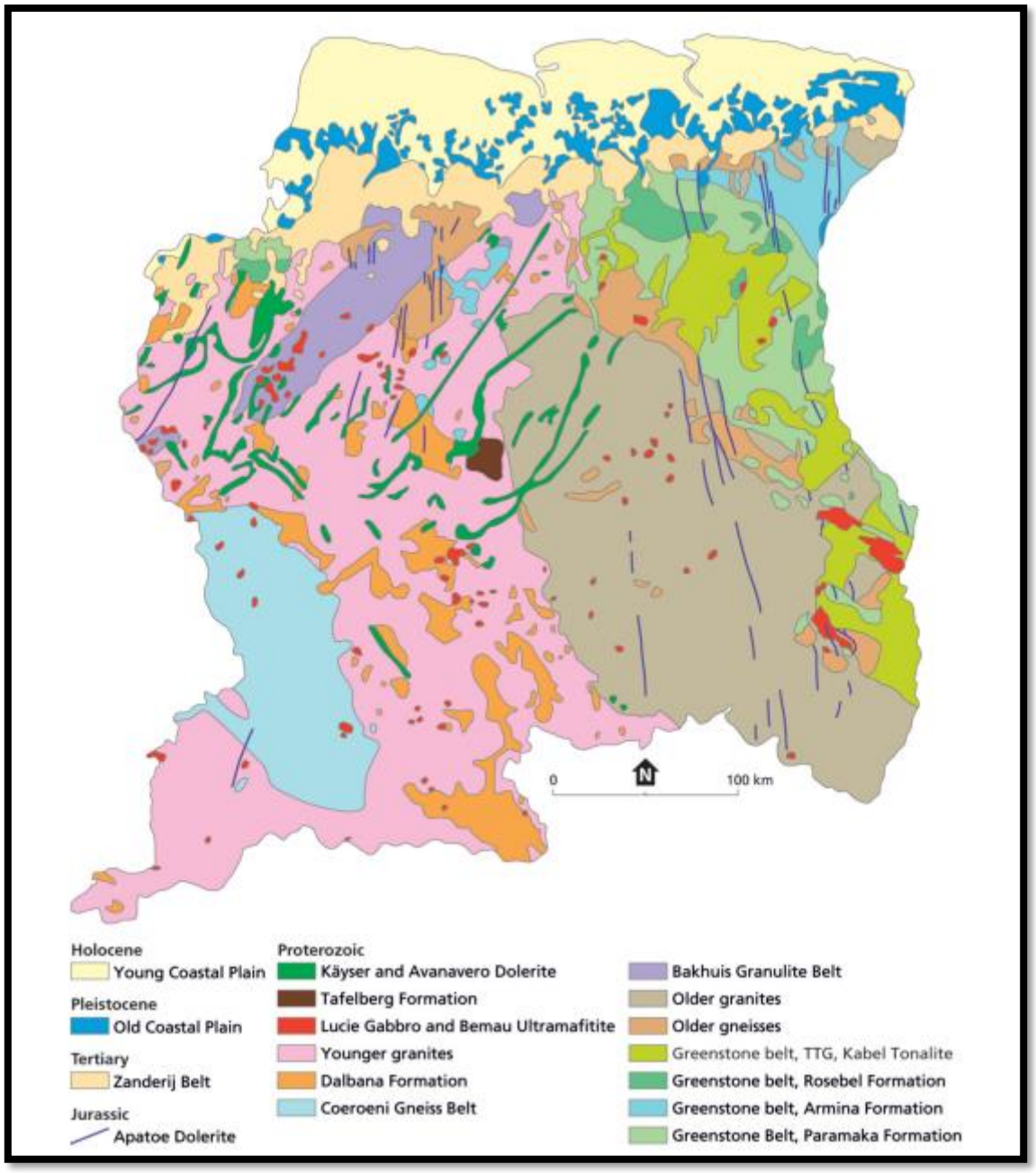


Figure 12. Geological sketch map of Suriname, simplified after Kroonenberg et al. 2016. Source: Natural History and Ecology Suriname, Salomon Kroonenberg.

Suriname's geological landscape is diverse, with significant features such as the Marowijne Greenstone Belt in the northeast, which is rich in volcanic and sedimentary rocks that have been metamorphosed. This belt is notable for its gold mineralization and large TTG (tonalite-trondhjemite-granodiorite) bodies. The Bakhuis Granulite Belt in the northwest contains high-pressure granulite's, charnockites, and anorthosites formed during the Trans-Amazonian Orogeny, indicative of the deep crustal processes that shaped the region[17].

[17] Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

In central Suriname, the Wilhelmina Mountains and the Corantijn and Sipaliwini drainage basins contain fine-grained volcanic rocks and granite bodies from the Dalbana Formation, deposited by pyroclastic flows and slightly recrystallized upon contact with intruding magma. The region also features gabbroic intrusions like the Lucie Gabbro, widespread throughout the basement rocks[18].

Paramaribo, the capital of Suriname, lies in the coastal lowland region where the geology is characterized by younger sedimentary deposits. The area's elevation ranges from 10 to 50 meters, and the landscape is dominated by white sands of the Zanderij Formation, deposited in the Pliocene epoch by braided river systems under arid climatic conditions. These sediments consist of well-layered sands with local occurrences of gravelly beds and kaolinitic clay layers in deeper parts. This formation underpins much of the northern coastal area, influencing the soil composition and landforms around Paramaribo.

The **Para** District, where **Zanderij** is located, is underlain by the Pliocene-aged Zanderij Formation as well, consisting predominantly of well-sorted sands deposited during a period of arid climate. This formation, typical of the Savannah Belt, stretches across northern Suriname and is characterized by coarse sand layers interspersed with loams and fine sands. The sands can reach a thickness of up to 20 meters, with local occurrences of gravel beds at the base, pointing to the formation's fluvial origins during drier periods.

As for **Kwamalasamutu**, located in the southwestern part of Suriname, the town sits in a different geological context. This region is part of the Coeroeni Gneiss Belt, characterized by gneisses and other high-grade metamorphic rocks. These rocks have undergone intense pressure and high-temperature conditions, leading to the development of distinct landforms. The area is marked by lowland terrain with varying types of gneisses contributing to different landforms. The geological processes have resulted in significant topographical features that include rolling hills and occasional residual hills protruding from the lowlands.

4.4.3. Topography

Suriname's topography is largely influenced by its location within the Precambrian Guiana Shield, a vast and ancient geological formation. The country’s land surface generally lies at a low elevation between 200-600 meters above sea level, with the highest point reaching 1,230 meters at Juliana Peak. Approximately 93% of Suriname is covered in dense forest, with 80% of its area consisting of the Guiana Shield. This region extends east and south towards the Amazon River in Brazil and west to the Orinoco River in Venezuela, while the remaining 20% comprises the northern young and old coastal plain.[19]

The Guiana Shield's landscape is predominantly made up of an endless mosaic of low hills with flat tops and steeply cut creek valleys. The topography includes distinct features such as mountain tops up to 1,280 meters high, inselbergs rising above 700 meters, duricrust planation levels over 500 meters, and river terraces at approximately 20 meters, 15 meters, and 5 meters above the mean water level. These terraces are the only morphological units aligned with the current drainage pattern. The

[18] Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

[19] Republic of Suriname. (2022). First Biennial Update Report to the United Nations Framework Convention on Climate Change.

direction of river drainage is controlled by structures in the bedrock, including faults and fractures, resulting in the rectangular patterns of larger rivers[20].

In contrast, the coastal plain is divided into three regions: the Savannah Belt, the Old Coastal Plain, and the Young Coastal Plain. The Savannah Belt, which lies between 10 to 50 meters above sea level, features a gently sloping, north-facing hilly landscape. It is underlain by the Pliocene Zanderij Formation, consisting of horizontally layered deposits of coarse sands with small amounts of loams and fine sands. These deposits can be up to 20 meters thick, with local gravel deposits up to 2 meters at the base. This formation was created under dry climatic conditions, contributing to the area's distinctive topographical features[21].

The Old Coastal Plain, ranging from 4 to 11 meters above sea level, is a dissected Pleistocene marine terrace characterized by numerous small plateaus, known as the "schollenlandschap." This landscape varies in width from 20 km in the east to 70 km in the west and includes notable features like the Old Ridge Landscape and the Old Clay Landscape, formed by westward sediment transport influenced by the Guiana Current. The Old Coastal Plain consists of the Coropina Formation's sands and clays, subdivided into the lower clayey Para member and the upper sandy Lelydorp member. The Young Coastal Plain features Holocene deposits forming a flat, clay-prone surface, interrupted by east-west oriented sandy cheniers, marking former coastlines.

[20] Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

[21] Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

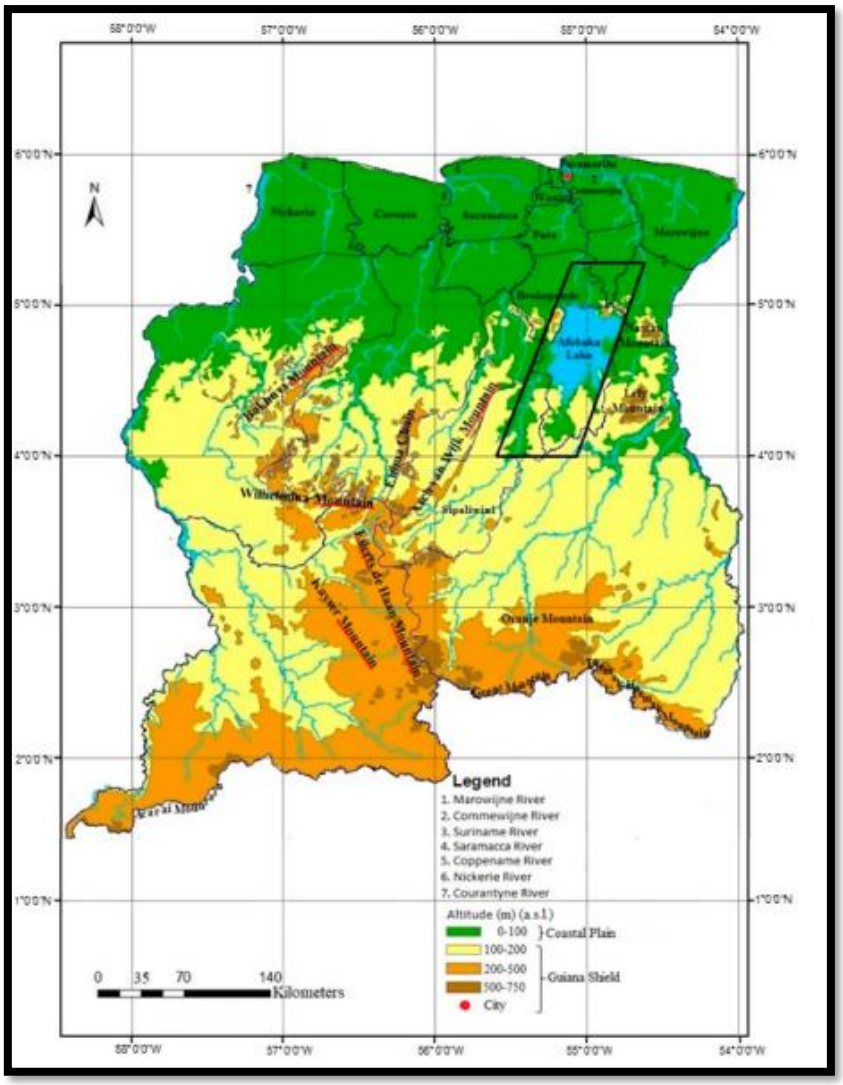


Figure 13. Simplified topographic map and hydrographic network of Suriname. Source: Gersie, K. 2021.

Paramaribo, located in the northern coastal plain, is influenced by the region's varied topography. The city lies within the Savannah Belt, featuring gently sloping landscapes underlain by the Zanderij Formation. This formation's coarse sands and occasional loams and fine sands, reaching thicknesses up to 20 meters, shape the area's topography. Additionally, the flat clay-prone surfaces of the Young Coastal Plain, interrupted by sandy cheniers, contribute to the city's distinctive landscape. The Old Coastal Plain's dissected marine terraces further add to the topographical diversity surrounding Paramaribo[22].

The region around **Zanderij,** in the **Para District** features a gently sloping landscape with elevations between 10 and 50 meters above sea level, transitioning into flat savannah plains interspersed with seasonal wetlands and small streams. These plains are key features of the Savannah Belt, contributing to the distinct ecological conditions of the area. Unlike the densely forested interiors of

[22] Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

Suriname, the Para District presents a more open savannah ecosystem, with lateritic soils formed through intense tropical weathering processes. These soils, rich in iron and aluminum oxides, contribute to the area's distinct reddish-brown color and are typical of tropical regions with prolonged wet and dry seasons.

Kwamalasamutu, in the southwestern part of Suriname, is situated within the Guiana Shield's rugged terrain. The area is characterized by low hills with flat tops, steeply cut creek valleys, and various elevations ranging from inselbergs over 700 meters to duricrust planation levels above 500 meters. River terraces at 20, 15, and 5 meters above mean water level align with the current drainage pattern, controlled by bedrock structures like faults and fractures. The region is entirely forested, with few permanent human settlements[23].

4.4.4. Hydrology

Surface Hydrology

Suriname is abundant in hydrological resources. The annual average rainfall in the country is 2,200mm, amounting to approximately 355km³ per year. This rainfall is distributed unevenly throughout the year, with about 50% occurring during the four months of the long-wet season and around 20% during the long dry season. Despite high levels of precipitation, nearly half of this water is lost through evapotranspiration and evaporation. The internal renewable water resources are estimated at about 88km³ per year, with Suriname's major rivers flowing northward into the Atlantic Ocean[24].

[23] Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

[24] UN WaterActionHUB. (2006). Suriname Country Profile. https://wateractionhubfrontdoor-d6dwaqhbgwebcfg2.z01.azurefd.net/media/files/2020/08/25/Country_Profile_-_2020-08-25T133124.451.pdf

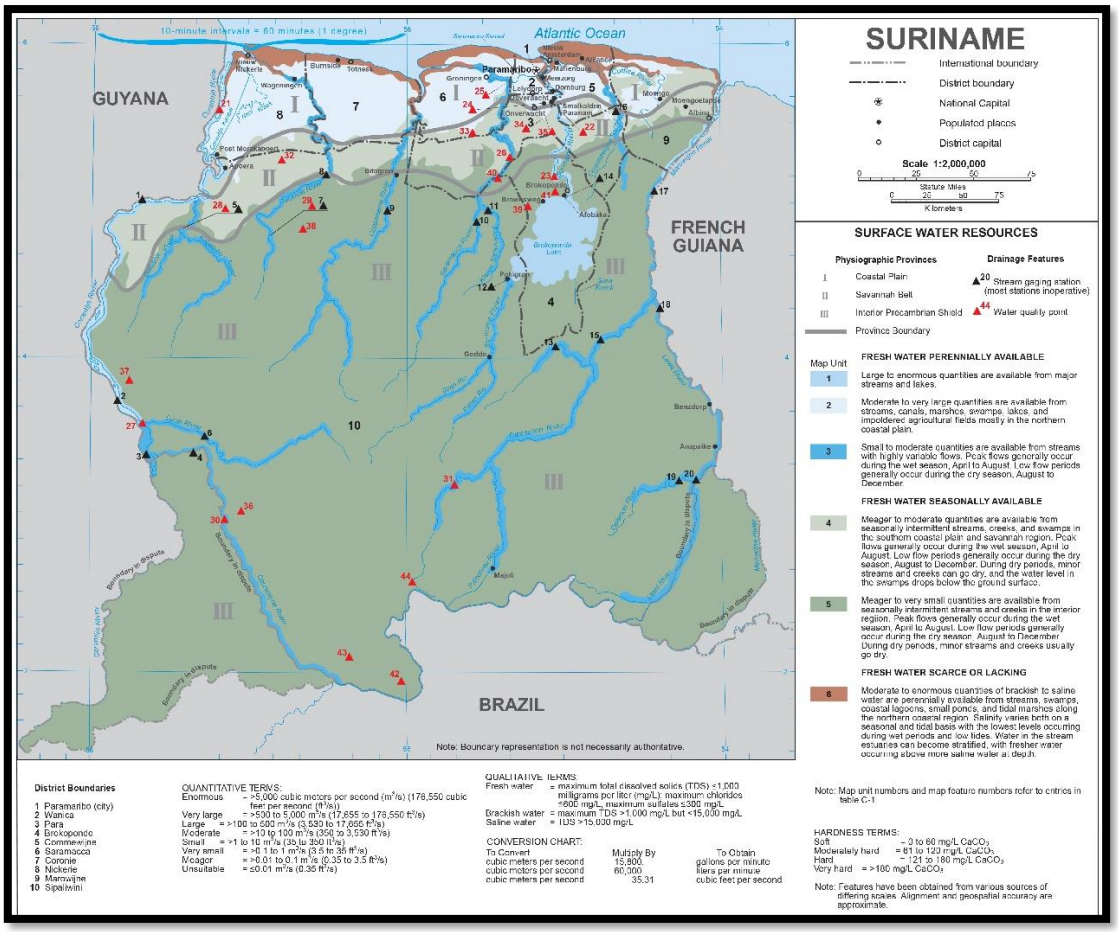


Figure 14. Map of Rivers and Reservoirs of Suriname. Source: LACGEO, 2024.

Suriname's seven major rivers (Figure 7), including the **Marowijne** and **Corantijn rivers**, drain northward into the Atlantic Ocean, accounting for significant portions of the country's hydrological output (4.800m^3/s). These rivers form the borders in the east and west and collectively drain around 58% of the country. Other notable rivers, such as the **Coppename** and **Suriname rivers**, drain an additional 24% of the country. The smaller rivers, including the **Nickerie**, **Saramacca**, and **Commewijne** rivers, drain the remaining 16%. The coastal areas, which make up the final 2%, have direct drainage into the Atlantic. This extensive river network contributes to the country's rich hydrological landscape, influencing both surface and groundwater resources[25].

The country is also equipped with Coastal lagoons, estuaries, and wetlands that dot the shoreline, offering a haven for migratory birds, marine life, and indigenous flora. **Brokopondo Reservoir** is one of Suriname's most prominent water bodies, it was created by damming the Suriname River. It covers a vast area, and it is in the central part of the country. Its primary purpose is to generate hydroelectric power for the country, as well as fishing and recreational activities. **Bigi Pan** is also an important coastal lagoon and wetland area near the Nickerie River, it is an essential habitat for birds and other wildlife, and it is known for its biodiversity. Whether facilitating transportation and trade, supporting agriculture, or nurturing fragile ecosystems, they are integral to the country's identity and

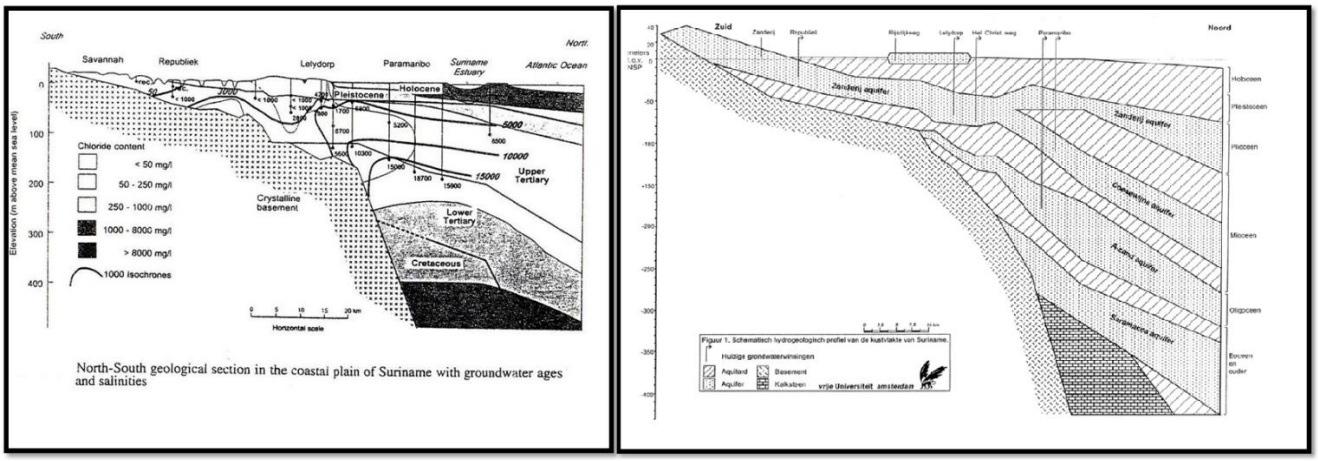
[25] Suriname Water Resources Information System: https://www.swris.sr/

development[26]. Other important water bodies are freshwater swamps, namely Surnau, Coesewijne, Coronie and Nani swamp[27].

Groundwater Hydrology

95% of the country's total supply of potable water comes from groundwater. The country's hydrology is significantly influenced by its two distinct hydrological provinces: the Interior Precambrian Shield, which consists of crystalline rocks and covers 80% of the country, and the coastal plain basin, which makes up the remaining 20%[28].

The Interior Precambrian Shield has unfavorable groundwater conditions due to its low primary permeability, whereas the coastal basin contains abundant, high-quality groundwater. The south which is an active system is recharged directly from rainfall and coincides with the savanna and old coastal plain. Generally, the salinity increases towards the coast. The water in the **Zanderij** aquifer is fresh throughout the old coastal plain, and brackish in the young coastal plain, particularly adjacent to the rivers. The change is abrupt. In the **Coesewijne** aquifers freshwater continues farthest north. Higher salinity extends farthest inland along concealed lines in the **A-Sand**[29].



North-South geological section in the coastal plain of Suriname with groundwater ages and salinities

[26] LACGEO. Latin America & Caribbean Geographic. Water Bodies of Suriname. https://lacgeo.com/water-bodies-suriname

[27] UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

[28] UN WaterActionHUB. (2006). Suriname Country Profile. https://wateractionhubfrontdoor-d6dwaqhbgwebcfg2.z01.azurefd.net/media/files/2020/08/25/Country_Profile_-_2020-08-25T133124.451.pdf

[29] Suriname Water Resources Information System: https://www.swris.sr/

Figure 15. Groundwater geolollical sections and salinities. Source: SWRIS.

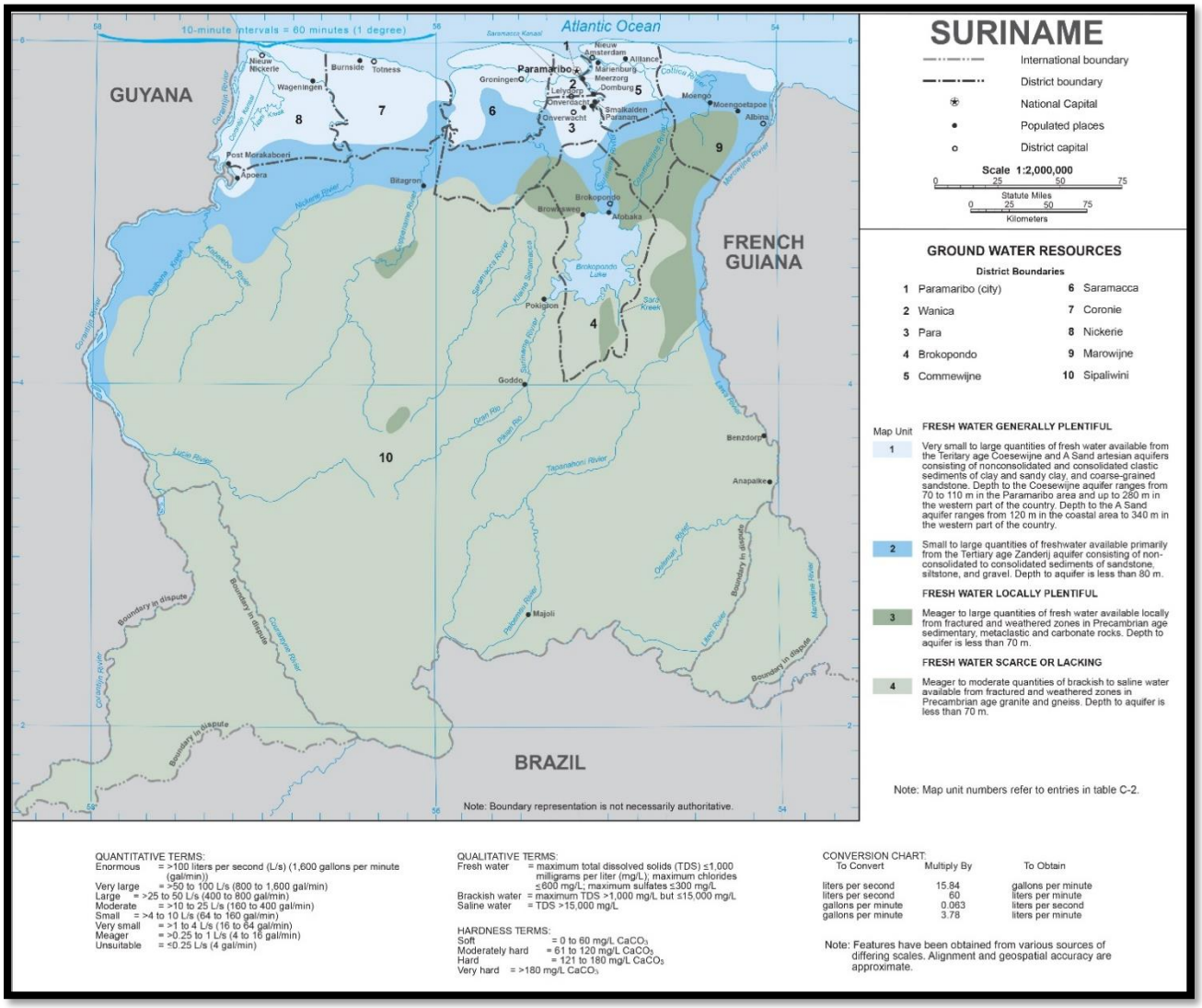


Figure 16. Groundwater Resources in Suriname. Source: SWRIS

The coastal basin high quality groundwater, found in aquifers built up of unconsolidated sediments, is primarily used for public supply and, to a lesser extent, industry. Key aquifers in the coastal basin include the **Nickerie**, **Onverwacht**, **A-sand**, **Coesewijne**, **Zanderij**, **Coropina** and **Demerara** aquifers, with the most important being the A-sand (no recharge aquifer, depth 130-190m), Coesewijne (no recharge aquifer, depth 70-110m), and Zanderij (recharge from Savannah area, depth 15-60) aquifers[30].

In **Paramaribo**, the capital city situated in the coastal plain, the hydrology is characterized by the interaction between surface water and groundwater. The city lies within the influence of the **Suriname River**, which plays a vital role in its water supply. The **Zanderij** aquifer, which is recharged from the savannah area, is a crucial source of fresh groundwater, particularly in the old coastal plain where the water remains fresh. However, towards the coast and in the young coastal plain, the groundwater can become brackish, particularly near the rivers. This change in water quality is abrupt and significantly affects the city's water resources management. The 2011 Suriname Water Supply Master Plan

[30] Suriname Water Resources Information System: https://www.swris.sr/

identified clear signs of saline intrusion in the northern stations of the Greater Paramaribo area (A-Sand and Coesewijne aquifers). The assessment revealed that the available groundwater yield in the Greater Paramaribo area is conservatively estimated at 12.500m3/h for the next 15 years. However, after the length of time, this yield will have to be drastically reduced because of a salinity increase due to heavily exploitation of the A-Sand and Coesewijne aquifers, which are not recharged with new freshwater as they are confined aquifers[31].

The hydrology of the **Zanderij region** in the **Para District** is defined by the abundance of fresh water sourced from the tertiary age Coesewijne and A-sand artesian aquifers. These aquifers are composed of both nonconsolidated and consolidated clastic sediments, including clay, sandy clay, and coarse-grained sandstone, which contribute to the area's significant groundwater reserves. The Coesewijne and A-sand aquifers play a critical role in providing a reliable supply of fresh water, supporting both the local communities and agricultural activities. Seasonal rainfall patterns influence the recharge of these aquifers, ensuring that fresh water remains plentiful and accessible in this region[32].

Kwamalasamutu, located in the southwestern part of Suriname, experiences a different hydrological regime. This area, part of the Interior Precambrian Shield, relies more on surface water and direct rainfall for its water supply due to the unfavorable groundwater conditions. The region is characterized by numerous small streams and rivers, (predominantly Curuni and Sipaliwini rivers and associated streams) which are vital for the local water supply. The area's hydrology is less influenced by the large rivers that dominate the northern part of the country, and more by the smaller, locally significant water bodies. These water resources are essential for the indigenous communities living in Kwamalasamutu, who depend on them for daily use and agricultural activities[33].

Water Use and Quality

In 2019, water consumption was circa 28,3 million m3 and water production was 50,1million m3[34]. Water consumption is dominated by House connections, with approx. 71,7% of the total consumption[35].

In urban areas, approximately 95% of the population has access to running water (90 per cent by house connections) but only some 3 per cent of the population has sewerage connections. In rural areas about 70% of the population has running water in the house.

The source of drinking water for the population varies by district. In Paramaribo, 88% of the population uses drinking water that is piped into their dwelling or into their yard or plot. For Nickerie this is 81% and for Wanica and **Para** this is 72%. The households in the districts of Commewijne (27%), Brokopondo (33%) and **Sipaliwini** (6%) have the lowest access to piped water into their dwelling[36].

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[31] IADB. (2014). SU-T1070: Assessment of Aquifer Potential and Groundwater Level.

[32] Suriname Water Resources Information System: https://www.swris.sr/

[33] Suriname Water Resources Information System: https://www.swris.sr/

[34] UN WaterActionHUB. (2006). Suriname Country Profile. https://wateractionhubfrontdoor-d6dwaqhbgwebcfg2.z01.azurefd.net/media/files/2020/08/25/Country_Profile_-_2020-08-25T133124.451.pdf

[35] UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

[36] UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

The second most important source of drinking water is rainwater collection. In **Sipaliwini** 73% of the households use rainwater. In Brokopondo and **Sipaliwini**, 8% of the households use surface water (rivers and ponds) as source of drinking water, which is generally considered an unsafe source

Typically, the sewage from individual houses in the **Paramaribo** area is treated by septic tanks, causing pollution problems during heavy rainfalls. The groundwater resources of Suriname are used for public supply and to a lesser extent for industry.

The Surinamese Water Supply Company (SWM) has currently 15 production stations. The number of groundwater wells is about 78, production rounds 38.106m3/year and 32% of the drinking water supply is withdrawn from the A-sand aquifer[37].

Surface water quality in urban, as well as rural areas, is under severe stress due to poor sanitary practices, and industrial and mining activities. Saltwater intrusion in the groundwater is also becoming more of a problem in the coastal areas and in the water, supply wells for Paramaribo. To counteract this, some well fields that have higher chlorides are mixed with water of lower chlorides.

A Conservation International's Rapid Assessment Program (RAP) carried out a survey in 2010 in **Kwamalasamutu** region to supply baseline data of biodiversity and water quality. The parameters measured in the field revealed undisturbed river ecosystems with few negative human impacts. However, mercury levels were found in both sediment and piscivorous fishes from all sites, consistent with small scale mining operations that have become an issue in the Guianas.

4.4.5. Vulnerability to Natural Disasters

Suriname is one of the most vulnerable countries to **river and coastal floods**. Almost 30% of the country is within a few meters above sea level, making it susceptible to coastal flooding. Additionally, as nearly 90% of Suriname's population (two thirds of whom live in the capital, Paramaribo) and most of the country's fertile land and economic activity are in the 384 km long coastal plain, **sea level rise** represents a very significant development challenge. By estimates, a one-meter rise would impact over 6.4% of Gross Domestic Product (GDP), 7% of the population, and 5.6% of agricultural land. The impact to agriculture is of particular concern as the sector is critical to Suriname's economy[38].

Heavy rainfall, in May 2008, flooded villages and crops in Suriname's eastern coastal and inland areas (Marowijne, Lawa, and Tapanahony). In the southern region, an estimated 30% of the livestock, 65 percent of crops, and 90% of the fishing industry were impacted. Greater rainfall variability due to climate change is expected to lead to an increased occurrence of droughts also.

[37] Suriname Water Resources Information System: https://www.swris.sr/

[38] GFDRR. 2022. Suriname Natural Hazard Risk. https://www.gfdrr.org/en/suriname

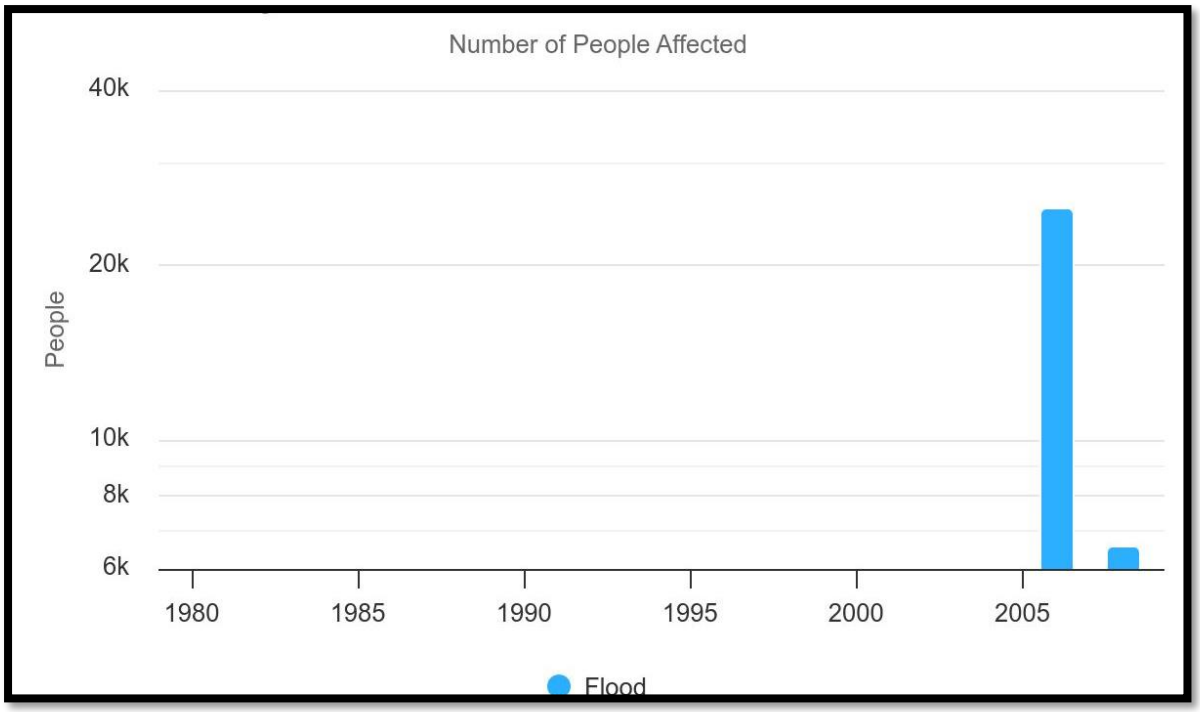


Figure 17. Key Natural Hazard Statistics of Number of Affected People by Natural Hazard Occurrences for 1980-2020. Source: World Bank Group

As can be observed in **Figure 10** and **Table 21**, floods have been the greatest source of damage for the Suriname population, with the year 2015 being particularly affected by floods and strong winds and causing over 567.000 people to be affected by the extreme weather conditions (139,96 per 100.000 were affected by the extreme events, highest percentage of affected population recorded in the latest years).

Table 22. Population affected by a Disaster due to Extreme Weather events 2015-2019. Source: UNDP, 2019 and RoS, 2022.

Year	Type Disaster	Dead (A2)	Injured (A3)	Affected (B1)	A2+A3+B1	Estimated Population	Ratio per 100.000 people
2015	Floods and storm with heavy winds	1	3	790	794	567.291	139,96
2016	Floods and storm with heavy winds	-	2	36	38	575.700	6,6
2017	Floods and storm with heavy winds	-	-	109	109	583.400	18,68
2018	Floods and storm with heavy winds	-	-	22	22	590.100	3,73
2019	Floods and storm with heavy winds	-	-	74	74	598.000	12,37

2020	Floods and storm with heavy winds	-	-	3	3	608.900	0,5
2021	Floods and storm with heavy winds	-	-	75	75	616.500	12,2

Based on the Suriname's 10th Environment Statistics Publication 2015-2022, the estimated damage caused by extreme weather in 2020 (last complete data set) was SRD 205.395. When looking at the latest data available from the Suriname Government in terms of flooding due to extreme weather based on the area affected (Table 23), **Paramaribo** district shows the highest affected households for all years analyzed. The **Para** district shows only 6 affected households for the 2021 period.

As for Sipaliwini district, even though the detailed data by area affected from 2017 to 2021 show no affected households from extreme weather events, the latest statistics from January to September of 2022 show that **Kwamalasamutu** had one of the highest numbers of people affected with 640 out of 5.253 people affected in the entire Sipaliwini District[39] .

Table 23. Types of Disasters due to Extreme Weather by Population Affected and Area Mostly Affected, 2017-2021. Source: RoS, 2022.

Year	Type of Natural Disaster	District	People injured/dead	Affected households
2017	Severe Flooding	Sipaliwini		
2017	Heavy rainfall with heavy winds	Paramaribo, Wanica and Commewijne		69
2017	Heavy rainfall with heavy winds	Paramaribo, Wanica and Commewijne		10
2017	Tail of a heavy tropical storm	Paramaribo, Wanica, Commewijne and Coronie		30
			Total	**109**
2018	Heavy rainfall with heavy winds	Paramaribo (Tamenga)		5
2018	Heavy rainfall with heavy winds	Paramaribo (Kwatta)		1
2018	Heavy rainfall with heavy winds	Paramaribo (Noord) Commewijne, Marowijne and Saramacca		
2018	Heavy rainfall with heavy winds	Paramaribo (Latour and Centrum)		5
2018	Heavy rainfall and flooding	East of Suriname (Galibi and Goninikrikimofo)		

[39] Republic of Suriname. (2022). 10th Environment Statistics Publication 2017-2021.

2018	Heavy rainfall with heavy winds	Paramaribo (Blauwgrond)		10
2018	Heavy rainfall with heavy winds	Paramaribo		1
			Total	**22**
2019	Heavy rainfall with heavy winds	Paramaribo (Tamenga)		2
2019	Heavy rainfall with heavy winds	Paramaribo (Rainvile) and Commewijne (Meerzorg)		4
2019	Heavy rainfall with heavy winds	Paramaribo (Paramaribo-Noord, Centrum, Kwatta and Abrabroki)		
2019	Heavy rainfall with heavy winds	Nickerie		3
2019	Heavy rainfall with heavy winds	Paramaribo (Centrum) and Wanica (Leiding)		19
2019	Heavy rainfall with heavy winds	Paramaribo (Centrum and Munder)		3
2019	Heavy rainfall	Paramaribo, Wanica and Commewijne		2
2019	Heavy rainfall with heavy winds	Paramaribo (Morgenstond, Charlesburg, Tourtonne, Geyersvlijt) and Commewijne)		1
2019	Heavy rainfall with heavy winds	Marowijne (Moengo)		4
2019	Heavy rainfall with heavy winds	Paramaribo (Centrum)		5
2019	Heavy rainfall with heavy winds	Paramaribo (Rainville and Centrum)		31
			Total	**74**
2020	Heavy rainfall with heavy winds	Paramaribo and Nickerie		
2020	Heavy rainfall with heavy winds	Wanica (Leidingen)		3
2020	Heavy rainfall with heavy winds	Para (Para-Noord)		
			Total	**3**
2021	Heavy rainfall with heavy winds	Paramaribo, Welgelegen		4

2021	Heavy rainfall with heavy winds	Paramaribo, Centrum		2
2021	Heavy rainfall with heavy winds	Paramaribo, Centrum		4
2021	Heavy rainfall with heavy winds	Paramaribo, Pontbuiten		9
2021	Heavy rainfall with heavy winds	Wanica, Houttuin		17
2021	Heavy rainfall with heavy winds	Wanica, Nieuwe grond		12
2021	Heavy rainfall with heavy winds	Para, Osembo		5
2021	Heavy rainfall with heavy winds	Paramaribo, Blauwgrond		4
2021	Heavy rainfall with heavy winds	Wanica, Nieuwe grond		12
2021	Heavy rainfall with heavy winds	Para, Para Oost		1
2021	Heavy rainfall with heavy winds	Para, Para Oost		5
			Total	**75**

Fires have shown a decrease in numbers in the latest years analyzed (from 2015-2022 data), especially from the year 2020 to 2021, showing an almost 50% decrease in fire occurrences which reaches over a 60% decrease for grass fires.

Table 24. Number of Fires by Type and Casualties in Suriname, 2015-2021. Source: RoS, 2022.

Fire Fighting	2015	2016	2017	2018	2019	2020	2021	Total
Building fires	200	156	147	170	230	155	185	1243
Other building fires	14	18	29	24	28	35	27	175
Garbage fires	794	665	661	852	1.099	913	637	5621
Grass fires	1856	1794	877	1649	2.322	2168	765	11431
Car fires	47	63	65	67	73	98	66	479
Other fires	420	457	276	457	576	412	283	2881
False alarms	134	115	88	75	94	62	51	619
Total fires	3465	3268	2143	3294	4422	3843	2014	22449
Deceased and wounded people	**2015**	**2016**	**2017**	**2018**	**2019**			**Total**
Deceased	4	13	6	5	7	-	-	35
Wounded	-	-	7	6	10	4	1	28
Dead and wounded animals	**2015**	**2016**	**2017**	**2018**	**2019**			**Total**

Fire Fighting	2015	2016	2017	2018	2019	2020	2021	Total
Dead	-	-	-	3	-	-	-	3
Wounded	-	-	-	-	-	-	-	-

The key **natural hazards** that the country is exposed to include:

1. **Flood** damage due to its low-lying land and exposed positions on the coast; low lying topography and concentrated population on coastal areas in the north makes the country's coastal areas especially vulnerable to **sea level rise**.
2. More than 29 **strong local whirl winds** occurred in the 2015-2019 period.
3. The number of nationally registered building **fires** increased by 15% and number of victims increased by 75% in the 2015-2019 period. Grass and garbage fires also continue to increase, by 357,9% and 412.7%, respectively, with **Paramaribo** and **Wanica** having the most fires.

The National Coordination Center for Disaster Relief (NCCR) is a disaster organization established by the Surinamese state and its role is to coordinate the various services (Police, Fire Department, National Army, NGOs and other parties) so that assistance can be provided in a very effective and organized wat to the areas within the Surinamese territory affected of involves in an incident and the country is currently working on a National Strategy for Disaster Risk Reduction that will be in line with the current National Adaptation Plan, The Paris Agreement, The Regional Comprehensive Disaster Management Strategy and the Sendai Framework for Disaster Risk Reduction[40].

Suriname 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 in 2015. It sets the guidelines for implementing policies and projects that contribute to sustainable development and the conservation of its carbon sinks, in accordance with the global goals of the Paris Agreement, to do its part in limiting the increase in global temperatures to 1.5°C.

In the case of Kwamalasamutu, there have been 2 severe flooding incidents recorded in the past, one in 2008 and 2022. In August 2008, unusually heavy rains inundated several communities in the Eastern and Southern regions of Suriname. Over 250 households were affected in Kwamalasamutu, and farms were severely damaged, and crops destroyed[41]. where flooding affected farms and food security and nutrition. In 2022, heavy rainfall led rivers to burst their banks in Suriname and over 3000 households, businesses and farms in seven districts were affected, including Kwamalasamutu.

In terms of Paramaribo, the main risk associated with flooding in Greater Paramaribo is through inundation from the open sea to the north, and extreme rainfall events over the area combined with poor drainage. Just from 2015 to 2020, there have been 24 flooding events in the Paramaribo district[42].

The low-lying coastal area of Paramaribo is subject to an increase in sea levels, considering the IPCC projections, the area where Zorg en Hoop Airport is located could be below sea level by the year 2050.

[40] https://www.undrr.org/news/suriname-advances-national-disaster-risk-reduction-strategy-ensure-alignment-its-national

[41] COMUN//C4. (2009). From flood relief to food and nutrition security to income generation in Kwamalasamutu, Suriname. https://repositorio.iica.int/bitstream/handle/11324/19465/BVE22018362i.pdf?sequence=2&isAllowed=y

[42] UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

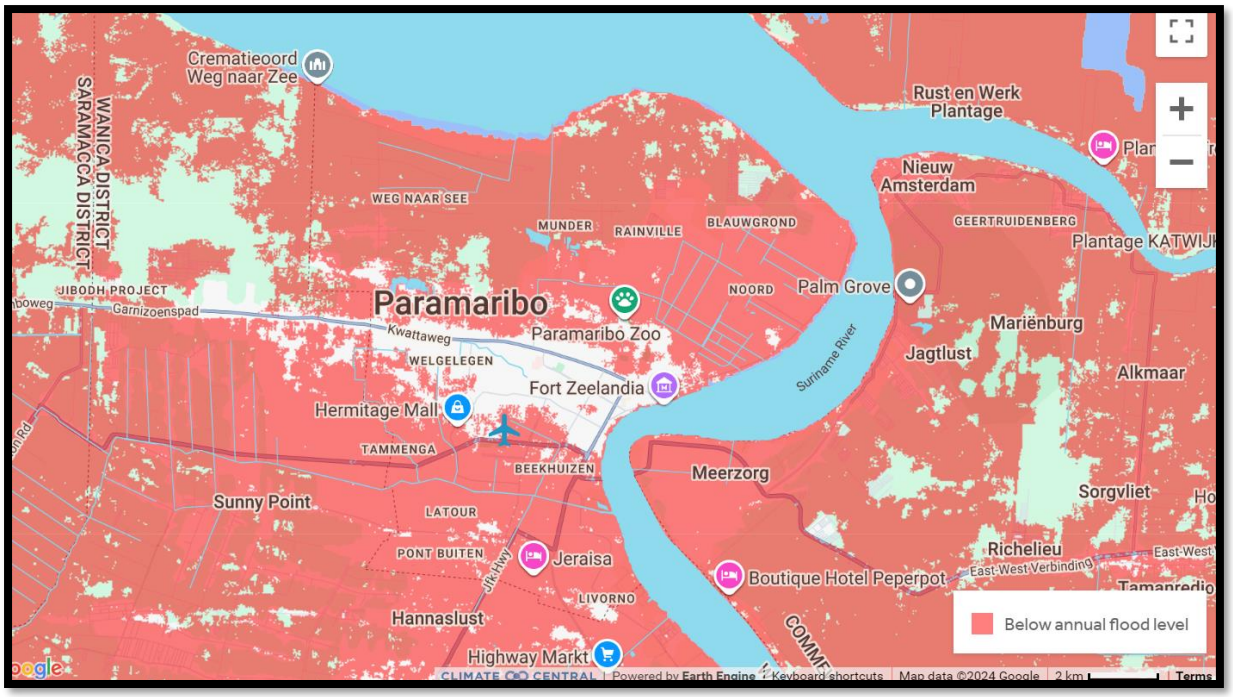
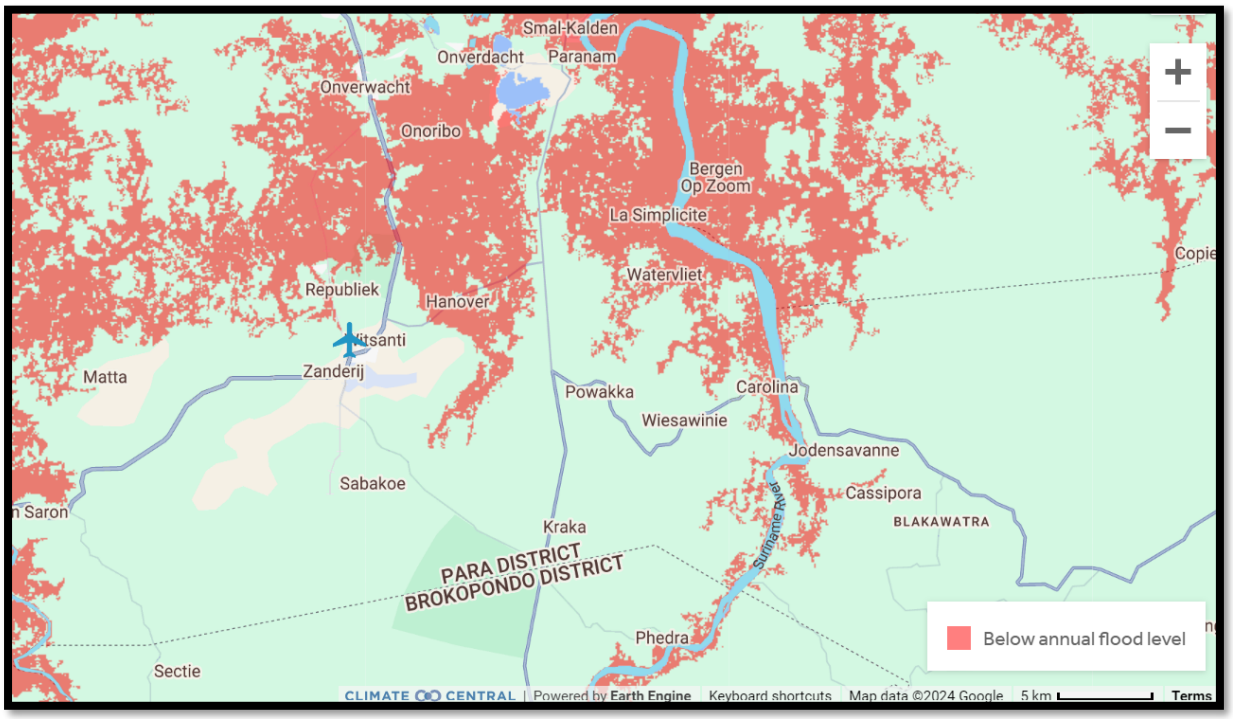


Figure 18. Estimated areas below annual flood level (red) from sea level rise with current projections (IPCC) by 2050. Source: https://coastal.climatecentral.org/

As for the Para District, sea level rise is not of concern due to its location, the main risk is associated with heavy rainfall, strong winds and localized flooding that have affected the area and damaged infrastructure such as roofs in areas of the north and west of the district, latest reported from the years 2020 and 2021[43].



[43] Republic of Suriname. (2022). 10th Environment Statistics Publication 2017-2021. Suriname

Figure 19. Estimated areas below annual flood level (red) from sea level rise with current projections (IPCC) by 2050. Source: https://coastal.climatecentral.org/

4.5. Biological Environment Baseline of Indirect Area of Influence

4.5.1. Flora

Suriname can be divided into two main geographic regions. The northern, lowland coastal plains area has been cultivated, and most of the population lives here, this is where **Paramaribo** is located, the capital of the country, this area is also comprised of a **young** (north) and **old coastal plain** (south) with lush mangroves, sandy beaches and estuaries. The **Para** district, based on the north of the country below Paramaribo district and where the PBM International Airport is located, is considered the mining (bauxite mining mostly) and forestry center of Suriname presents a mixture of forest and savannas with the area of the Airport being surrounded by herbaceous dry grass[44],[45].

The southern part consists of tropical rainforest and sparsely inhabited savanna along the border with Brazil, covering about 80% of Suriname's land surface, this is the area where **Kwamalasamutu** is located[46]. The **savannah belt**, found in the central part of Suriname, is a vast expanse of grasslands dotted with trees. This open habitat is home to grazing mammals such as capybaras and giant anteaters, as well as numerous bird species. The **interior uplands**, located in the south-central region, are marked by rolling hills and pristine forests. This zone provides a habitat for a wide array of mammalian and avian species, including jaguars, tapirs, parrots, and toucans. Lastly, the **Guiana Shield mountains**, situated in the southern part of Suriname, are a treasure trove of biodiversity. With their towering peaks and dense rainforests, these mountains are inhabited by rare species like the Guiana dolphin, harpy eagle, and giant river otters[47].

[44] Based on vegetation map 2010, produced within the Conservation International/KFW project “Avoided deforestation through consolidation and creation of protected areas and forest carbon financing mechanisms in the Guiana region".

[45] Based on information provided by the outreach project of the Hudson Institute of Mineralogy, 1993-2024: https://mindat.org

[46] Foundation of Forest Management and Supervision (SBB), Suriname. https://sbb.sr/over-sbb/

[47] Loftus, S. (2013). REDD+ for the Guiana Shield 1st Working Group Report. REDD+ for the Guiana Shield project, ONF International. https://reddguianashield.files.wordpress.com/2013/12/1st-working-group-report.pdf

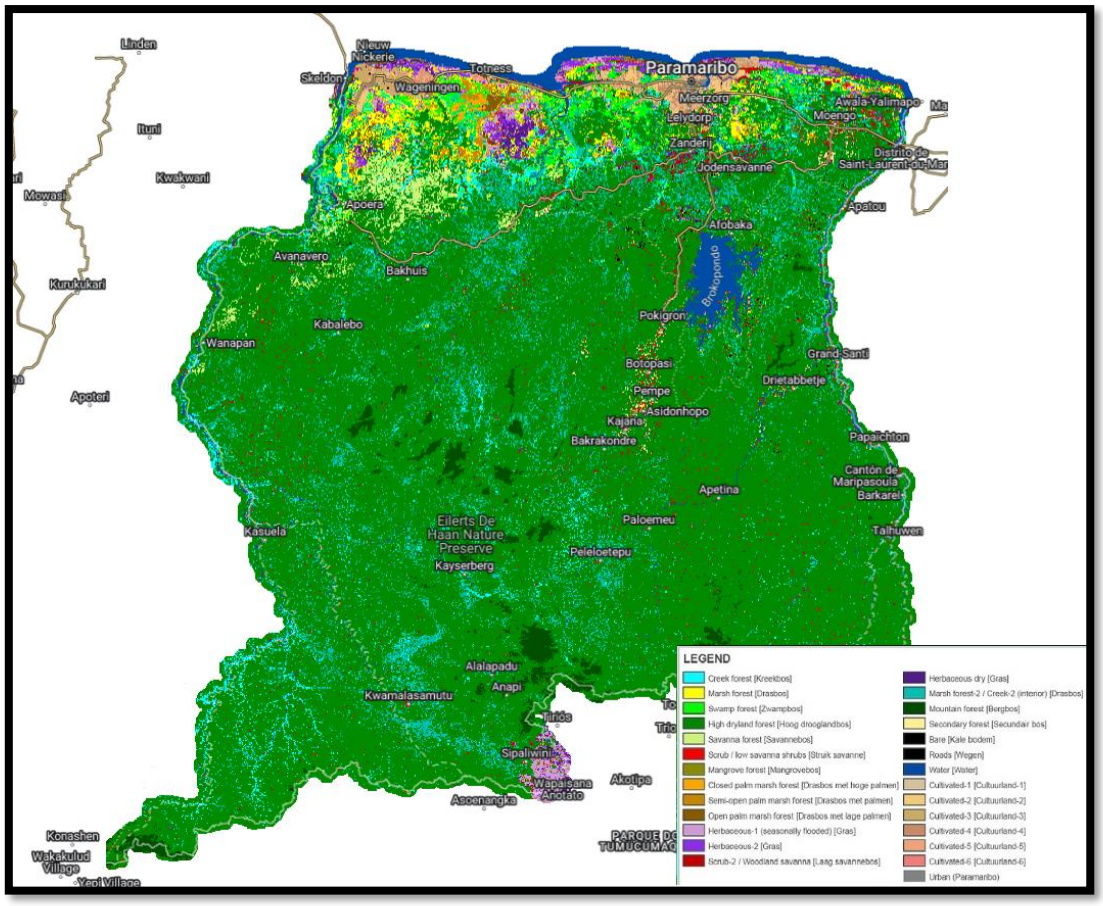


Figure 20. Suriname Vegetation cover map. Source: SAR Vision based on Conservation International Project, https://www.gonini.org/

Suriname is a country with a historical high forest cover and low deforestation rate, the total land area of Suriname is about 16,4 million hectares, of which approximately 93% (15,2million ha) is covered with tropical rain forest, which is almost 0,4% of the total forest on earth[48]. The Surinamese Forest types can be classified into three main groups:

1. **Hydrophytic forest** (1.3 million ha): Mangrove Forest, swamp forest, low swamp forest, high swamp forest and marsh forest.

2. **Xerophytic Forest** (150,000 ha): High savanna, low savanna forest and open woodland savanna.

3. **Mesophytic forest** (13.4 million ha): High dryland forest, ridge, and liana forest.

Figure 21. Existing Forest Types in ha, 2015-2019.

Forest Type	2015-2019
Wet Vegetation Types	**Ha**
Mangrove Forest	90.812
Swamp Forest	241.560
Marsh Forest	1.628.966
Creek Forest	391.434

[48] UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

Total hydrophytic vegetation	2.352.772
Dry Vegetation Types	**Ha**
Savanna Forest	161.237
Woodland Savanna	150.191
Bush Savanna	110.735
High dry Land Forest	12.464.427
Mountain Forest	280.242
Total mesophytic vegetation	**13.166.382**
Secondary Forest	**110.333**
Planted Forest	**7.280**

There are over 400 tree species. From a commercial point of view the mesophytic forest is considered the most valuable. The most common forest type is the high dryland forest, followed by the high swamp forest and marsh forest. The mangrove forests are also of great importance for the protection of the northern coastal region. They form a natural buffer for sea level rise. Mangroves are also nursery of fish and shrimps, the habitat of many species and sequester a great amount of carbon in the soil. There are 6 types of mangroves, mainly two types of parwa or black mangrove, three types of red mangrove (mangro) and a white mangrove species (akira or tjila). Black mangrove is dominant with an area of 74.914ha while the red mangrove occurs in an area of 15.898ha.

The amount of forest occurrence per capita in Suriname is 28 ha. In the period 2015-2019, Suriname's forest area decreased by 0,28%, which represents an area of 429km2. Deforestation rate in this period varies between 0.06 and 0.07. Deforestation has increased due to an increase demand for natural resources, mining is considered the main driver of deforestation, especially Artisanal Small Scale Gold Mining (ASGM) which accounts to circa 80% of all mining activities[49].

There are currently timber species that are protected against logging within the production forest, these include:

- Manilkara bidentata (Bortri)

- Copaifera guianensis (Upru-udu)

- Bertholletia exclesa (Inginoto)

- Aniba mas (Manrowsudu)

- Aniba rosaeodora (Rowsudu)

- Caryocar nuciferum (Sawari (noto))

- Dipteryx odorata (tonka)

The herbarium collection of Suriname consists of circa 6.044 plant species (flowering plants and ferns). The actual number is larger, because there are dozens of specimens of which the species could not be determined. Of the 6,044 specimens of which the type is certain, 187 are mosses, 530 are ferns and

[49] Government of Suriname (2018). Forest Reference Emission Level for Suriname's REDD+ Programme. Paramaribo, Suriname. https://redd.unfccc.int/media/2018_frel_submission_suriname.pdf

over 5327 are seed plants. The top three largest plant families for Suriname are: Fabaceae, Orchidaceae and Rubiaceae. For the largest plant family, the Fabaceae, 38 new species have been registered in 2016 and 7 rare and endemic species[50].

There are **29 critically endangered and endangered plant species** in Suriname according to IUCN Red List, amongst them the Black Wepopi (Xylopia surinamensis), Byrsonima surinamensis and Alexa surinamensis.

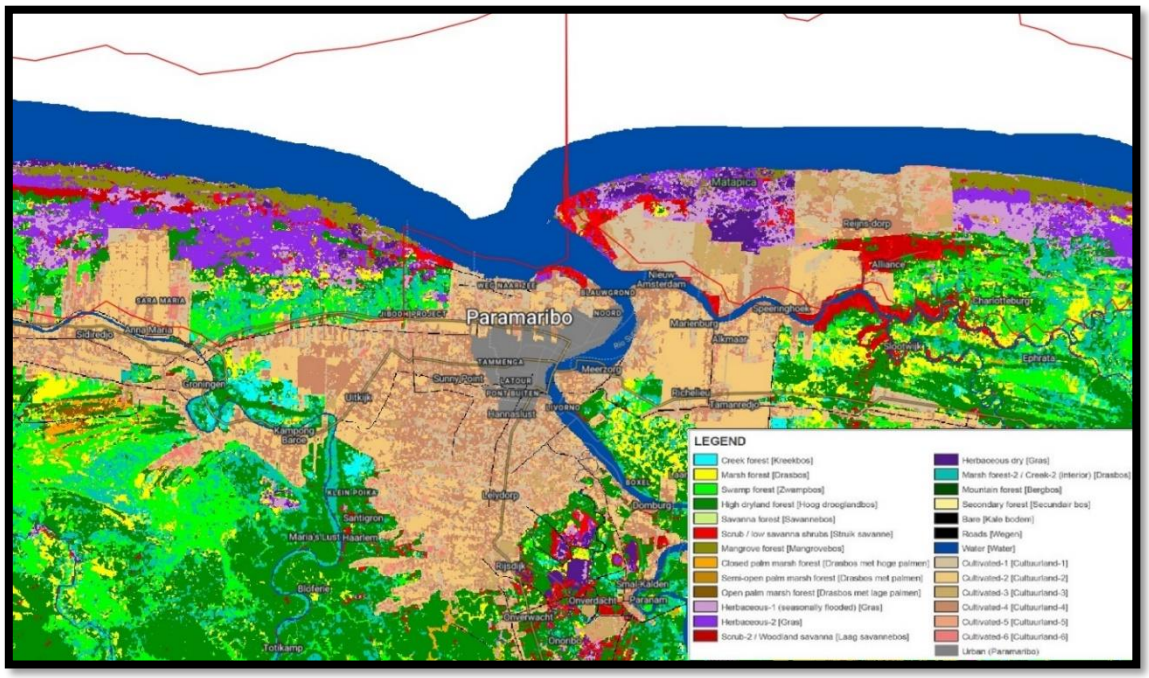


Figure 22. Vegetation Cover Map for Paramaribo. Source: SAR Vision based on Conservation International Project, https://www.gonini.org/

Paramaribo, being in the coastal region of Suriname, presents a large area of mangrove cover on its shores. This region, in contrast to the general mangrove distribution, is predominantly covered by Red mangroves (Rhizophora sp.) with a total cover of 543ha while black mangroves only cover 254ha of land. The surrounding area of the coast is predominantly intervened, with urban and cultivated areas, although there is swamp, creek forests and high dryland forests on the outskirts of the urban area surrounding the Suriname River.

[50] UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

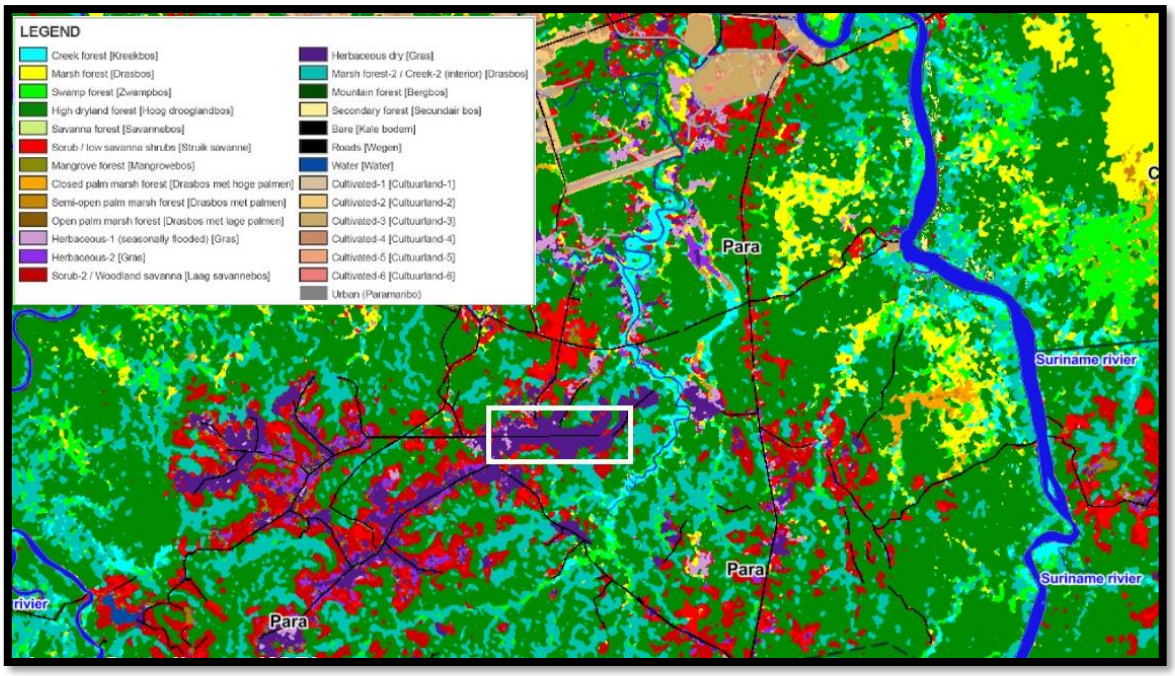


Figure 23. Vegetation Cover Map for Para District (PBM Airport in white box). Source: SAR Vision based on Conservation International Project, https://www.gonini.org/

The **Para District** presents a large area of herbaceous dry grass where the PBM airport is located, surrounded by high dryland and marsh forests

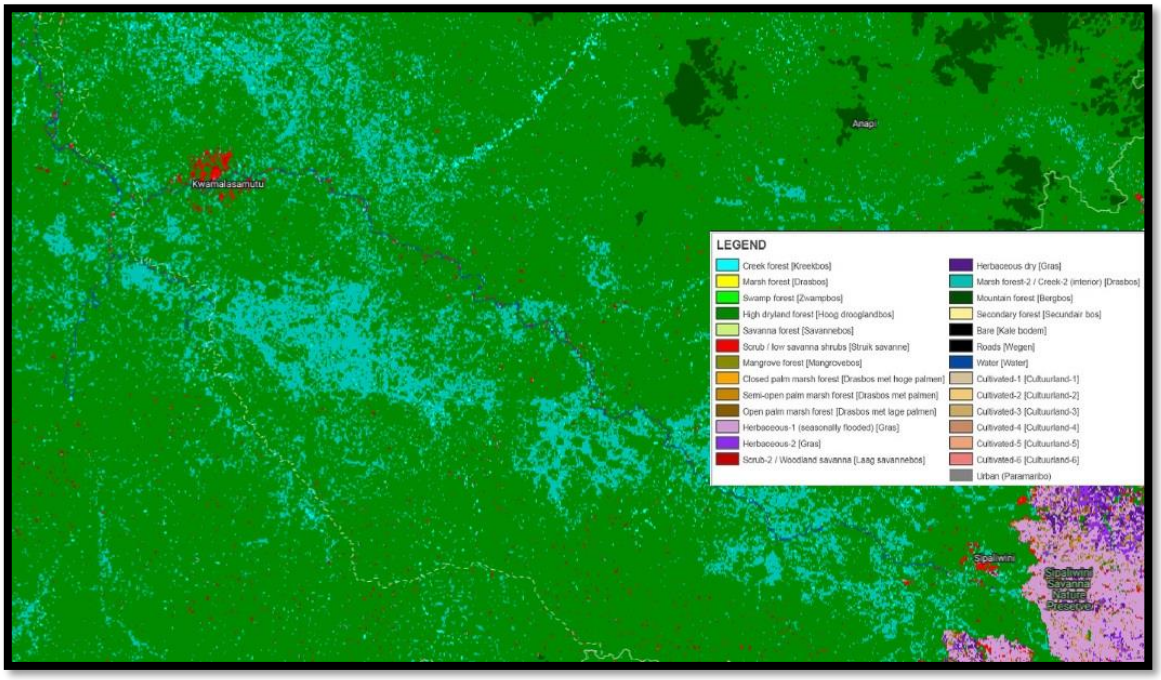


Figure 24. Vegetation Cover Map for Kwamalasamutu. Source: SAR Vision based on Conservation International Project, https://www.gonini.org/

As for **Kwamalasamutu**, as it was stated previously, the southern areas of the country are predominantly covered by high dryland and savanna forests, this area is also surrounded by scattered low savanna shrubs as it can be seen in the vegetation map produced within the Conservation

International/KFW project "Avoided deforestation through consolidation and creation of protected areas and forest carbon financing mechanisms in the Guiana region".

4.5.2. Fauna

Many of the species in Suriname are Guiana Shield endemics, circa 5-20% of animals and 35-40% for plants. Below there is a table containing the number of threatened species following the IUCN Red List of Threatened Species. According to the IUCN list, Suriname does not have any "Extinct" and "extinct in the wild" species, but there are critically endangered and endangered species, including 59 animal species.

Table 25. Threatened Animal and Plant Species in Suriname, 2019. Source: UNDP, 2019.

IUCN Red List	Animals	Plants	Total
Extinct	-	-	**-**
Extinct in the wild	-	-	**-**
Critically Endangered (CR)	5	1	**6**
Endangered (EN)	12	3	**15**
Vulnerable (VU)	42	25	**67**
Near Threatened (NT)	54	5	**59**
Total Threatened	**59**	**29**	**88**
Least Concern (LC)	2123	885	**3008**
Data Deficient	107	13	**120**
Subtotal	2284	903	**3187**
Total	**2343**	**932**	**3275**

There is a high biodiversity of species in Suriname, it can be summarized in:

1- functionally intact coastal wetlands, including mangroves that are of global importance for migratory birds and fish and shrimp nurseries.
2- There is also a vast pristine rainforest expanse that is globally important as a wildlife refuge and a storehouse of living biodiversity.
3- There are unique savannas, including the **Sipaliwini, where Kwamalasamutu is located,** that are part man-made and part of natural origin.

There are several different species located in Suriname, including 196 species of mammals, 730 birds, 102 amphibians, 175 reptiles and marine fauna, with 394 freshwater fish and 4984 vascular plants. Below there are tables containing all families, orders and number of species for Suriname. Out of the 196 species of mammals, 109 are bat species, these mammals belong to 12 orders and 23 genuses, they are hunted for the trade in wild animals and their meat.

Table 26. Mammal Species Family and Type of Suriname. Source: UNDP, 2019.

Mammal Species Family	Type
Opossums	**14**
Anteaters	**3**
Sloths	**2**

Armadillos	**5**
Bats	**108**
Chew monkeys	**4**
Atelidae	**4**
Canids	**2**
Small bears	**3**
Weasels	**2**
Otters	**2**
Feline	**6**
Dolphins	**1**
Sirenians	**1**
Tapirs	**1**
Peccaries	**2**
Deer	**3**
Squirrels	**13**
Porcupines	**4**
Capybaras	**4**
Agoutis	**4**
Guinea pigs	**7**
Rabbits	**1**

In terms of reptiles, out of 180 species detected, 16 are turtles, 4 are caiman species and about one hundred snake species. These reptiles are filled as vermin, hunted for their skin and flesh. Turtle eggs are collected, and turtles die in fishing nets.

Table 27. Reptile Species and Types in Suriname. Source: UNDP, 2019.

Reptile Species Family	Type
Tortoises	**2**
Terrapins	**1**
Lon-necked turtles	**5**
Necked turtles	**1**
Mud and musk turtles	**1**
Sea turtles	**4**
Leatherback turtles	**1**
Alligators and caimans	**3**
Iguanas	**50**
Teju-like	

Skinks	
Geckos	
Boas	108
Colubriden	
Anilidae	
Pit vipers	
Coralsnake species	
Worm lizards	4

Out of the 130 amphibian species, there's two orders and ten families, the worm salamander and the Salientia (frogs and toads), the most species rich is the tree frogs that possess as much as 50 species. The amphibians are collected for trade and all poison dart frogs are registered on the cage species calendar.

Table 28. Amphibian Species Family and Types in Suriname. Source: UNDP, 2019.

Amphibian Species Family	Type
Toads	125
Tropical Grass Frogs	
Tree Frogs	
Stub foot toads	
Poison-arrow frogs or Dart Poison frogs	
Dwarf frogs	
Plain frogs	
Paradoxical frog	
Caecilians	5

There are over 752 bird species, belonging to 20 orders and 36 bird families. They are hunted for the trade in wild animals and their meet.

Table 29. Bird Species and Types in Suriname. Source: UNDP, 2019.

Bird Order	Bird Family
Pelican species	Pelicans
	Frigate birds
	Cormorants
	Snake-necked birds
Heron species	Herons
	Storks
	Ibises
Flamingo Species	Flamingos
Duck Species	Ducks
Raptors	American vultures
	Hawks and Eagles
Owls	Barn owls
	Owls

Fowl	Curassows
Gruiformes	Trumpet birds
Waders and gulls	Jacana's
	Terns
Pigeon species	Pigeons
Parrot Species	Macars, parrots and parakeets
Crow species	Bluejays raven
	Ani's
Nightjar species	Giant nightjars
Hummingbird species	Hummingbirds
Trogon species	Trogons
Coraciiforms	Kingfisher
	Motmots
Woodpecker species	Toucans
	Woodpeckers
Songbirds	Tree climbers
	World blackbirds
	Tanagers
	Eurasian wren
Tyrannides and Eurylaimides	Cotinga
	Manakins
	Tyrants

There are over 400 species of fish, out of which 100 are demersal fishes, also known as bottom fishes, that live and feed on or near the bottom of seas and lakes. They occupy the sea floors and lake beds. There are also pelagic fish that swim in the entire water column, often up to close to the surface.

Table 30. Fish Species and Family in Suriname. Source: UNDP, 2019.

Fish Species Order	Fish Family	Type
Characiformes: Salmonids	Spotty Salmon	135
	Bijzalmen	
	Kopstaanders	
	Roofzalmen (Predatory Salmon)	
	Schijfzalmen	
	Piranha-like	
Gymnotiformes: Electric eel	Mesvissen	16
	Electric eels	
Clupeiformes: Coastal and marine fish		15
Cyprinodontiformes: Killy and livebearers	Killi fish	16
	Four-eye fish	

	Tandkarper	
Pleuronectiformes: Flatfish		**9**
Mugiliformes: Silver Colored slimshore fishing		**4**
Elopiformes: Big rod fishing at sea and in coastal rivers	**Tarpons**	**2**
Perciformes: Perch-like	**Cichilden**	**72**
Siluriformes: Catfish	**Loricaria-acthigen**	**125**
	Corydoras	
	Naaldmeervallen	
	Harnasmeervallen	
	Ongepantserde meervallen	
Tetrafontiformes: Puffers	**Pufferfish**	**2**
Osteoglossiformes (arapaima)		**1**
Batrachoidiformes (Goby-like coastal fish)		**1**
Beloniformes: Gars		**1**
Synbranchiformes: live in oxygen depleted water		**1**
Gasterosteiformes:	**Pipefishes and seahorses**	**1**

A Conservation International's Rapid Assessment Program (RAP) carried out a survey in 2010 in **Kwamalasamutu** region to supply baseline data of biodiversity and water quality. The study conducted surveys and sampling within a 5-10km radius of mainly 3 different camp sites located at least 10km from the Airstrip.

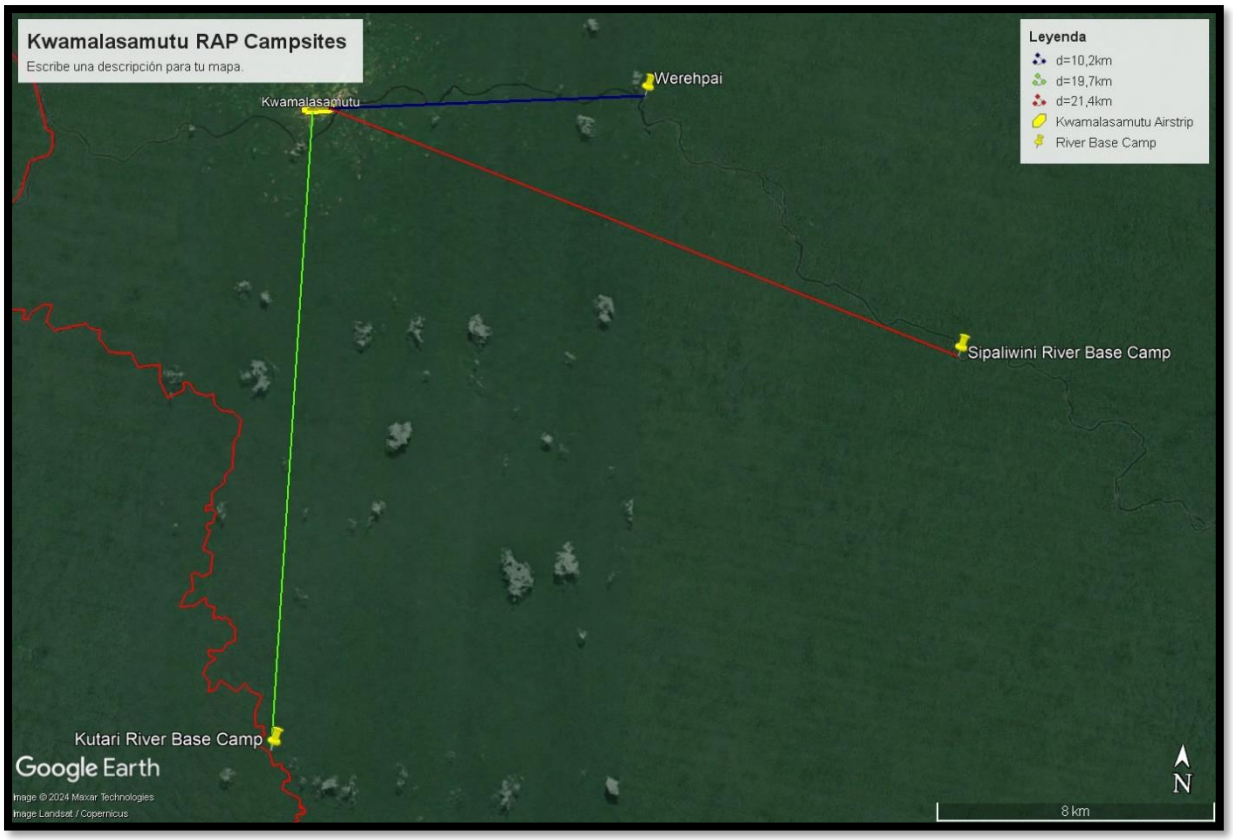


Figure 25. Camp sites where RAP was performed. Source: Conservation International, 2010.

They found **15 species** listed on the IUCN Red List of Threatened Species, many of these play important roles in the forest ecosystem as top predators and dispersers of large seeds, while others include some of the most highly prized animals in the Trio people, amongst them the White-lipped Peccary (Tayasu pecari) listed as near threatened (NT), Jaguar (Panthera onca) also listed as NT, Guianan Spider Monkey (Ateles paniscus) listed as Vulnerable (VU) and the Giant Otter (Pretonura brasiliensis), listed as Endangered (EN)[51]. Below is the complete list of species found on the Red List.

Figure 26. Species listed on the IUCN Red List of Threatened Species that were recorded during the Kwamalasamutu RAP survey. Source: Conservation International, 2010.

Scientific name	English name	IUCN Red List Status
Minquartia guianensis		Least Concern (LC)
Harpia harpyja	Harpy Eagle	Vulnerable (VU)
Tayassu pecari	White-Lippes Peccary	Vulnerable (VU)
Panthera onca	Jaguar	Nearly Threatened (NT)
Cedrela odorata	Spanish Cedar	Vulnerable (VU)
Corythophora labriculata	Dwarf Oemanbaklak	Least Concern (LC)
Chelonoidis denticulatus	Yellow-footed Tortoise	Vulnerable (VU)

[51] Conservation International. (2010). A Rapid Biological Assessment of the Kwamalasamutu region, Southwest Suriname: 29.
https://doi.org/10.1896/054.063.0119

Scientific name	English name	IUCN Red List Status
Ateles paniscus	Guiana Spider Monkey	Vulnerable (VU)
Priodontes maximus	Giant Armadillo	Vulnerable (VU)
Myrmecophaga tridactyla	Giant Anteater	Vulnerable (VU)
Tapirus terrestris	Lowland/Brazilian Tapir	Vulnerable (VU)
Aniba rosaeodora	Pau-rosa	Endangered (EN)
Trichilia surumuensis		Endangered (EN)
Pteronura brasiliensis	Giant Otter	Endangered (EN)
Vouacapoua americana		Critically Endangered (CR)

This information has been validated and updated by consulting the most recent data (2024) from the IUCN Red List of Threatened Species for the Direct and Indirect Areas of Influence, and beyond, with a buffer of 5 km from the project site. Based on this dataset, no Critically Endangered (CR) species have been identified and 1 endangered species (EN) has been found, that is the Giant otter (scientific name: Pteronura brasiliensis), as the field survey also revealed. Other Near Threatened (NT), Vulnerable (VU), Restricted Range (RR), and Migratory (MG) species were also identified in the area.

4.5.3. Protected Areas

Through the creation of nature reserves and other protected areas about 14% of the Suriname land area is protected by law. Suriname has 11 Nature Reserves, 1 Nature Park and 4 Multiple Use Management Areas (MUMA's), as well as 4 proposed protected areas, as it can be seen in Figure 16.

Figure 27. Protected Areas of Suriname. Source: SWRIS.

Paramaribo

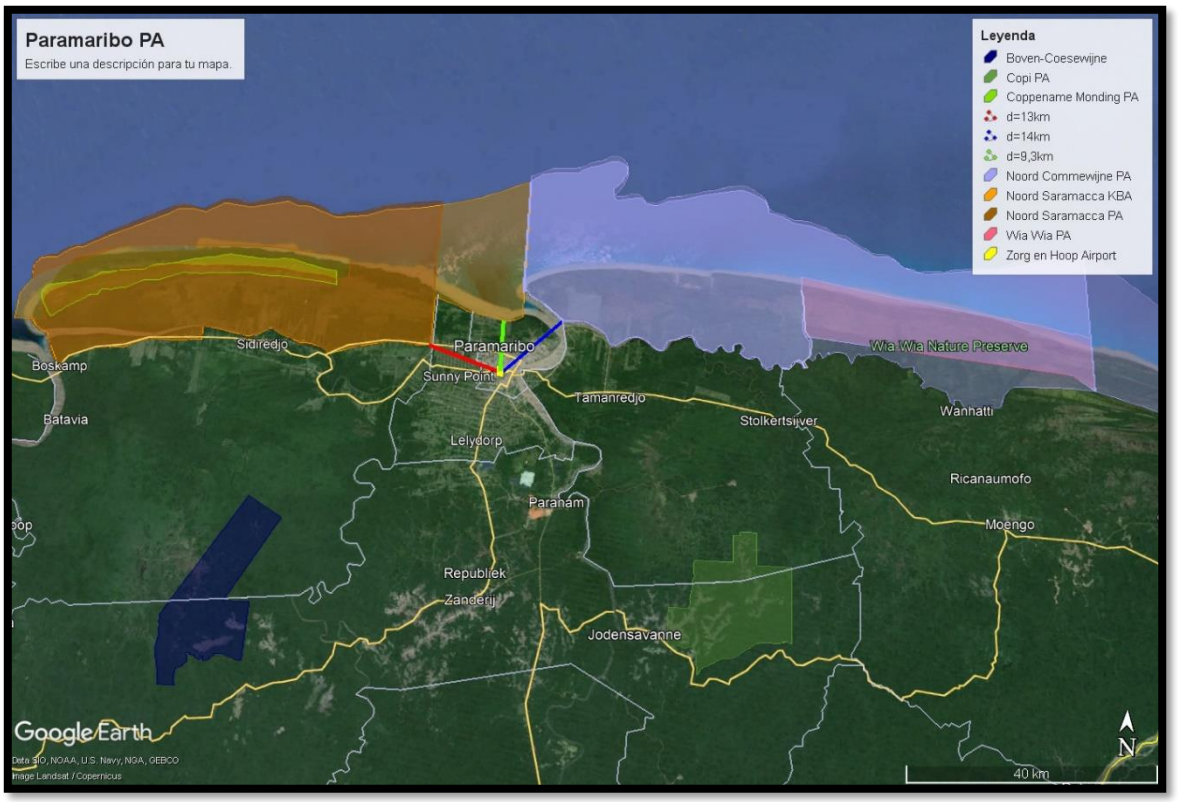


Figure 28. Paramaribo and Protected Areas. Source: PlanEHS, 2024.

Paramaribo is surrounded by 2 terrestrial and marine Multiple Use Management Areas (MUMA's), Noord Saramacca and Noord Commewijne/Marowijne, and 2 Nature Reserves, Wia Wia and Coppename Monding Nature Reserves, and it is over 44km away from the next protected areas: Copi Nature Reserve and Boven-Coesewijne Nature Reserve.

The MUMAs are closest to the city, bordering its limits. Zorg en Hoop Airport is located 13km away from the nearest PA, Northen Saramacca and 14km away from Noord Commewijne. Noord Saramacca is also established as a Key Biodiversity Area and its extension differs from that of the MUMA, the airport is located 9,3km away from the KBA area.

Figure 29. Location of Zorg en Hoop Airport (brown) and closest MUMA (dark green and violet): Noord Saramacca. Source: PlanEHS, 2024.

Northern Saramacca Special Management Area is a 88.400ha marine and terrestrial Multiple Use Management Area (MUMAs), IUCN Category IV, managed by the Surinamese government, which means that is has more functions that only nature protection. MUMAs are designated to maintain biological productivity, ensure the health of globally significant wildlife, and protect resources for sustainable livelihoods. However, notwithstanding this definition, MUMA's are intended to be multiple-use areas, with the conservation of biodiversity and maintenance of ecosystem services as an ultimate management objective. Therefore, natural resources and biodiversity present in MUMA's may be commercially utilized within sustainable limits with permits required for both research and resource extraction. There is a fishery in the shallow lagoons and on the mudflats, and there Is legal and illegal hunting in the swamps. As with all wetlands, the Noort Saramacca IBA is important for mankind because of its biological functions such as nursery for selfish, water filtering and protection from rising sea water level[52].

The Noord Saramacca IBA (larger area) is part of an EBA because of the common occurrence of three range restricted species, Guianan Piculet, Blood-colored Woodpecker and Rufous Crab hawk. The mudflats and the swamps are important for the numerous North-American shorebirds. The 1%

[52] Key Biodiversity Areas Partnership (2024) Key Biodiversity Areas factsheet: Northern Saramacca. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: Birdlife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Downloaded from https://keybiodiversityareas.org/ on Jul 2, 2024.

threshold is met for Scarlet Ibis, Semi-palmated Sandpiper, Semi-palmated plover, Short-billed Dowitcher. Hence it is an IBA on A2, A4i and A4iii criteria and global B1, D1a.

Noord Commewijne/Marowijne Special Management Area is a 61.500ha marine and terrestrial Multiple Use Management Area, category IV IUCN, managed by the Surinamese government. There is fishery in the shallow lagoons and on the mudflats, there is legal and illegal hunting in the swamps. As with all wetlands, the Noord Commewijne/Marowijne IBA is important for mankind because of its biological functions such as nursery for selfish, water filtering and protection from rising sea levels[53].

The area is comprised of black-mangrove forest (Avicennia germinans) of several kilometer wide along the coast with scattered narrow shell and sand beaches which are mainly covered with herb vegetation such as Canavalium maritima and Ipomoea pes-caprae. These beaches serve as important nesting grounds for five species of marine turtles: Dermochelys coreacea, Chelonia mydas, Eretmochelys imbricata, Lepidochelys olivacea and Caretta caretta. IBA criteria is met on A2, A4i and A4ii.

Coppename Monding Nature Reserve is a 12.000ha RAMSAR list estuary, IUCN category IV, aimed at protecting and preserving waterfowl[54]. A wetland complex on a young coastal plain of sand and shell ridges alternating with swamps, dominated by mudflats with mangrove forests on high ground. Inland, saline and brackish lagoons have developed supporting halophytic (salt tolerant) vegetation.

An internationally important area for breeding birds, up to 3,000 pairs of herons, egrets and passage and wintering waterbirds. Impressive numbers of Eudocimus rubber and Calidris pusilla gather at the site. There is limited ecotourism in the reserve and low-level subsistence use by fishermen.

Wia Wia Nature Reserve is a 36.000ha, IUCN category IV reserve rich in mangroves and mudflats, shell and sand ridges run east to west, covered with mixed xerophytic coastal wood and forest, locally rich on cactus (Cereus hexagonus). Mud flats and scattered narrow beaches on the coast insulate black mangrove forests (Avicennia germinans) several kilometers wide. Further inland are brackish and freshwater grass swamps and permanent freshwater swamps covered with Eleocharis mutata, Cyperus articulates, Leersia hexandr, Typha angustifolia, Machaerium lunatum and Erythrina glauca. The area also has hydrophytic swamp wood forest consisting of Pterocarpus officinalis and high hydrophytic swamp forest with Virola surinamensis, Symphonia globulifera and Euterpe oleracea.

Wia Wia is known for high biological productivity. The reserve protects breeding and feeding grounds for large number of local and migratory bird species, Semipalmated Sandpiper (Calidris pusilla) most abundantly, and nursery grounds for fish and shrimp. The beaches serve as important nesting grounds for five species of marine turtles: Dermochelys coreacea, Chelonia mydas, Eretmochelys imbricata, Lepidochelys olivacea, and Caretta caretta[55].

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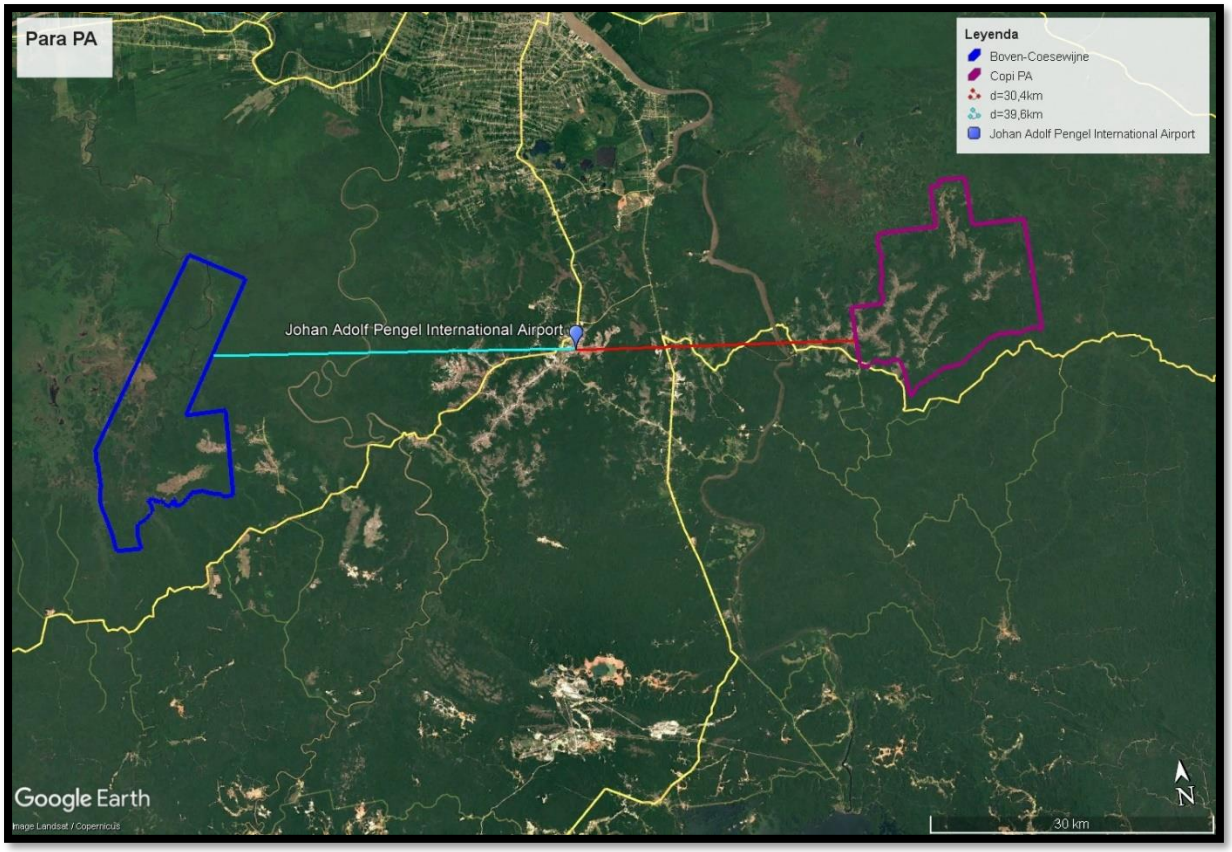
[53] Key Biodiversity Areas Partnership (2024) Key Biodiversity Areas factsheet: Northern Commewijne/ Marowijne. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Downloaded from https://keybiodiversityareas.org/ on Jul 2, 2024.

[54] UNEP-WCMC (2024). Protected Area Profile for Coppenamemonding from the World Database on Protected Areas, July 2024. Available at: www.protectedplanet.net

[55] https://whsrn.org/es/whsrn_sites/wia-wia/

Para District (Zarendij – Johan Adolf Pengel International Airport)



There are no KBA or PA located near Zarendij, where the Adolf Pengel International Airport is located. The closest protected areas are located 30,4km east and 39,8km west, corresponding to Copi Nature Reserve and Boven-Coesewijne reserve, respectively.

Boven-Coesewijne is a 27.000ha terrestrial reserve, IUCN Category IV, managed by the Surinamese government. This nature reserve important for its brown- sand and white-sand savannas. On both sides of the Coesewijne river are temporarily flooded forests and large grass swamps more downstream. It is also known for the West-Indian manatees and the giant river-otters. There is a high biodiversity caused by the many different ecosystems. The local indigenous people who live in the nearby village, Bigi Poika, have the right to hunt and fish in the nature reserve. Also, people from Paramaribo can fish there with a permit. There is also illegal hunting and fishing.

The total number of species is 342. The number of biome restricted species is 22. Hence it is an IBA on the A3 criterion. Relatively little research on birds has been done. Non-bird biodiversity: The Boven Coesewijne area aside from the birds has 40 mammal species, 39 reptile species, 20 amphibian species and 50 fish species. Species of international importance are manatees, giant otters and caimans

Copi Nature Reserve is a 28.000ha terrestrial reserve, IUCN Category IV, managed by the Surinamese government. The area contains freshwater swamps, swamp-and marsh forests, rainforests and savannas. The area is drained by a small black water creek, the Cassewinica Creek, which has a large population of caimans (Caiman crocodilus) and a small group of giant otters (Pteronura brsiliensis).

The Copi NR possesses 4 species of carnivores that are included in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), including the giant otters.

Kwamalasamutu

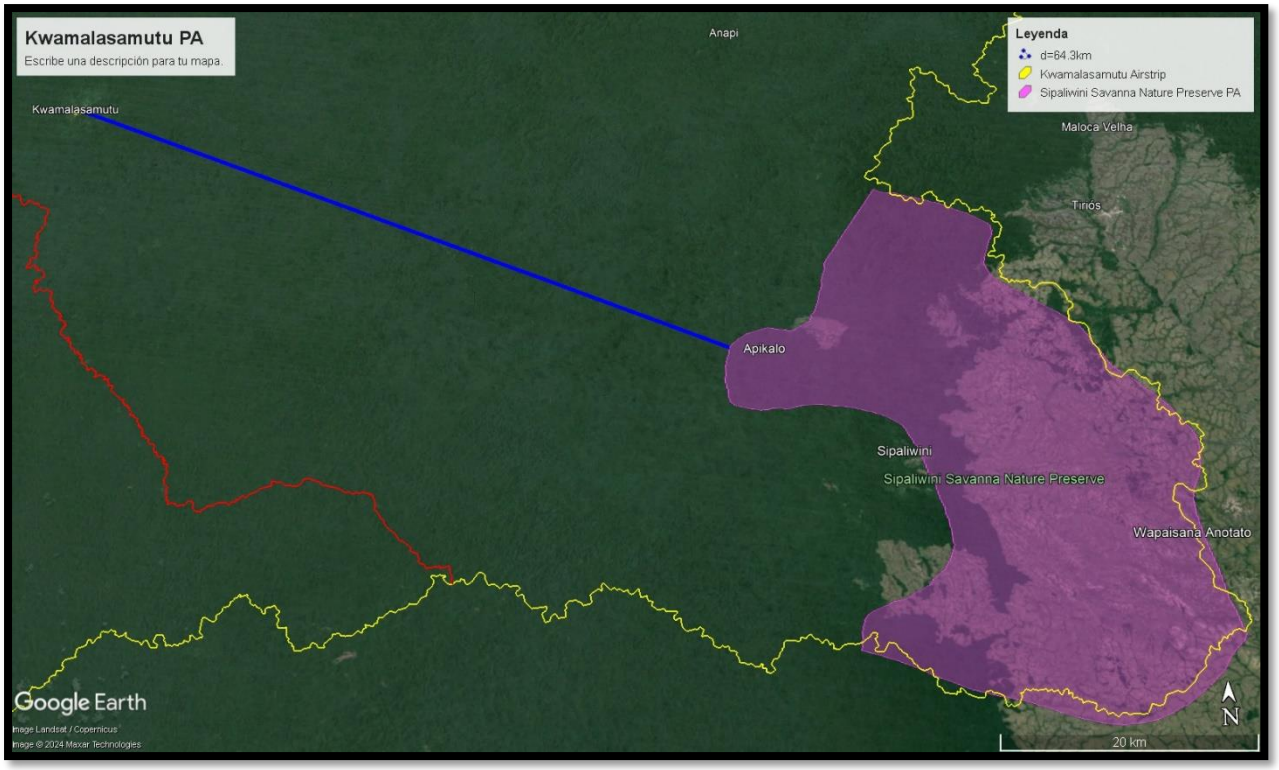


Figure 30. Location of Kwamalasamutu Airstrip and closest Protected Area, Sipaliwini Nature Reserve. Source: PlanEHS, 2024.

There are no KBA located on the town of Kwamalasamutu. The closest protected area is located 64,3km to the southeast and it is the Sipaliwini Nature Reserve.

Sipaliwini Nature Reserve is a 100.000ha terrestrial KBA of savanna, Category IV IUCN, a north extension of the Paru-savanna in Brazil. There are gallery forests, freshwater swamps, isolated patches of forests and granite outcroppings. The site is also habitat for the rare Blue poison arrow frog. There are two airstrips in the nature reserve. There are villages of the local indigenous people near the airstrip[56].

One endangered species occurs in the reserve, Aratinga solstitialis Sun Parakeet. Two near-threatened species also occur here, Euscarthmus rufomarginatus Rufous-sided Pygmy-Tyrant and Polystictus pectoralis Bearded Tachuri. The total number of species is 369 of which 27 are biome restricted. Hence it is an IBA on A1 and A3 criteria. The Sipaliwini savanna is also a habitat for the threatened Poison arrow frog (Dendrobates Azureus), the rare Jabiru mycteria, the jaguar (Panthera onca), the giant river otter (Pteronura brasiliensis).

[56] Key Biodiversity Areas Partnership (2024) Key Biodiversity Areas factsheet: Sipaliwini Nature Reserve. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Downloaded from https://keybiodiversityareas.org/ on Jul 2, 2024.

4.5.4. Ecosystem Services

Ecosystem Services are defined by the Millennium Ecosystem Report as the benefits people obtain from ecosystems. These include:

- provisioning services: corresponding to tangible benefits humans can obtain from the ecosystems. Examples are food (agriculture and livestock), water, biomass, fibers and resins, wood, minerals (including sand, silt and others), fishing and medicinal plants.
- support services: corresponding to services necessary to produce other ecosystem services. Examples are nutrient cycling, carbon capture, soil fertility, soil formation, species habitats, primary production and disturbance regulation.
- regulating services: corresponding to benefits obtained by the ecosystem regulating processes. Examples include climate regulation, biological control, water purification and regulation, pollination and the regulation of natural hazards.
- cultural services: corresponding to immaterial benefits that people can obtain from ecosystems. Examples include recreational and tourism, spiritual and religious.

In ESPS 6, ecosystem services are further classified into two types:

- Type 1: Provisioning, regulating, cultural and supporting services directly managed by the client or over which they have considerable influence, where any impact on them could negatively affect communities.
- Type 2: Provisioning, regulating, cultural and supporting services directly managed by the client or over which they have considerable influence and on which the project **directly depends for its operation.**

A preliminary assessment on the ecosystem services that can be found in the projects areas of influence can be found below. It is important to note that the assessment was performed with secondary information of the area only, given the small scale of the interventions proposed and the minor impacts and risks expected.

Zorg en Hoop Airport is in a densely populated urban setting and expects minor works of rehabilitating existing facilities and acquiring new equipment, the main identifiable ecosystem service that could be impacted by the activities of the project is related to water provisioning and potential contamination due to accidental spills of hazardous substances. The project will be utilizing minerals (mostly sand for concrete) and water for its small-scale facilities upgrades. In the project area there is a rainwater catchment system running adjacent to the airport that serves functions of water regulation. Below, there is an identification of the ecosystem services associated with the project.

Table 31. Ecosystem Services Identified for Zorg en Hoop Airport.

Category	Ecosystem Service	Classification ESPS 6			Service Classification
		Type I	Type II	Not Applicable	
Provisioning	Water	X	X		Type I and II
	Food (Agriculture)			X	Not Applicable
	Food (Livestock)			X	Not Applicable
	Biomass			X	Not Applicable
	Wood			X	Not Applicable

Category	Ecosystem Service	Classification ESPS 6			Service Classification
		Type I	Type II	Not Applicable	
	Minerals (sand, gravel, etc.)		X		Type II
	Fisheries and aquatic resources			X	Not Applicable
	Medicinal Plants			X	Not Applicable
Supporting	Nutrient Cycling			X	Not Applicable
	Carbon capture			X	Not Applicable
	Soil Fertility			X	Not Applicable
	Soil Formation			X	Not Applicable
	Species Habitat			X	Not Applicable
Regulating	Erosion control			X	Not Applicable
	Climate Regulation			X	Not Applicable
	Pollination			X	Not Applicable
	Air purifying			X	Not Applicable
	Water regulation	X	X		Type I and II
	Natural Hazard Regulation	X			Type I
Cultural	Tourism and recreation			X	Not Applicable
	Spiritual and religion			X	Not Applicable

In relation to **Johan Adolf Pengel International Airport**, the airport is located near the town of Zarendij, although it is situated in a mostly rural area. The surrounding area is characterized by dense forests and relatively undeveloped landscape, however there are noticeable areas in satellite image that indicate the area is used for agriculture production. The ecosystem service essential for the area is related to provisioning services: The Para district is known for its round wood production, being the second highest contributing district (25% of the countries production)[57]. The project will be utilizing minerals (mostly sand for concrete) and water for its small-scale facilities upgrades. Below, there is an identification of the main ecosystem services associated with this project.

Table 32. Ecosystem Services Identified for Johan Adolf Pengel International Airport.

Category	Ecosystem Service	Classification ESPS 6			Service Classification
		Type I	Type II	Not Applicable	
Provisioning	Water	X	X		Type I and I

[57] SBB. (2014). Suriname Forestry Sector 2013. Foundation for Forest Management and Production Control. Ministerie Van Ruimtelijke Ordening Grond. En Bosbeheer

Category	Ecosystem Service	Classification ESPS 6			Service Classification
		Type I	Type II	Not Applicable	
	Food (Agriculture)	X			Type I
	Food (Livestock)	X			Type I
	Biomass	X			Type I
	Wood	X			Type I
	Minerals (sand, gravel, etc.)		X		Type II
	Fisheries and aquatic resources			X	Not Applicable
	Medicinal Plants			X	Not Applicable
Supporting	Nutrient Cycling	X			Type I
	Carbon capture	X	X		Type I and II
	Soil Fertility	X			Type I
	Soil Formation	X			Type I
	Species Habitat	X			Type I
Regulating	Erosion control	X			Type I
	Climate Regulation	X			Type I
	Pollination	X			Type I
	Air purifying	X	X		Type I and II
	Water regulation	X	X		Type I and II
	Natural Hazard Regulation	X			Type I
Cultural	Tourism and recreation			X	Not Applicable
	Spiritual and religion			X	Not Applicable

In relation to **Kwamalasamutu**, the airport is in an indigenous community that practices agriculture for subsistence, although they do rely on supplies sent by regular flights. The community obtains water from rainwater catchment systems and water wells supported by solar panels or electricity run pumps. Hence, the ecosystem service essential for the area is related to provisioning services of food and water for the community. Moreover, 12km from the project's location the Werephai caves, petroglyphs dating back to 3000 B.C, can be found, this site could potentially attract tourism and provide for a source of income to the community. The bast not intervened nature surrounding the village and diverse species also attract ecotourism, these are the only visitors said to be received by the community. In terms of services needed for the project, the identification of water uses and materials for the subgrade of the airstrip was analyzed. Below, there is an identification of the main ecosystem services associated with this project.

Table 33. Ecosystem Services Identified for Kwamalasamutu Airstrip.

Category		Classification ESPS 6	

	Ecosystem Service	Type I	Type II	Not Applicable	Service Classification
Provisioning	Water	X	X		Type II
	Food (Agriculture)	X			Type I
	Food (Livestock)	X			Type I
	Biomass	X			Type I
	Wood	X			Type I
	Minerals (sand, gravel, etc.)	X	X		Type II
	Fisheries resources	X			Type I
	Medicinal Plants	X			Type I
Supporting	Nutrient Cycling	X			Type I
	Carbon capture	X	X		Type I
	Soil Fertility	X			Type I
	Soil Formation	X			Type I
	Species Habitat	X			Type I
Regulating	Erosion control	X			Type I
	Climate Regulation	X			Type I
	Pollination	X			Type I
	Air purifying	X	X		Type I and II
	Water regulation	X	X		Type I and II
	Natural Hazard Regulation	X	X		Type I and II
Cultural	Tourism and recreation	X			Type I
	Spiritual and religion	X			Type I

4.6. Socioeconomic Environment Baseline of the Indirect Area of Influence

4.6.1. Population and Growth

Suriname is a country with an estimated population of 616.500 people for 2021, noticing a 1,3% increase related to the year prior and showing an increasing population trend since 2013 data. It has one of the most sparsely populated countries in the world. Out of the total population, over 406.800 people are from an urban setting (over 65% of the entire population of the country and it is a strata term used to describe **Paramaribo**, Wanica, part of Nickerie and part of Commewijne districts),

122.300 from rural areas (determined by the rest of Nickerie and Commewijne, Coronie, Saramacca, **Para** and Marowijne districts) and 87.400 from the interior (Brokopondo and **Sipaliwini** districts)[58].

In that context, **Paramaribo City** is the capital and only significant urban area in Suriname. It is a typical primate city and contains the main political, economic, social and administrative functions[59]. At present, the city population is estimated to be 240,000 inhabitants[60], half of Suriname's population[61].

According to the data from the General Bureau of Statistics (2017-2019)[62], the estimated mid-year population data by age group and sex for Urban Coastal area (which includes Paramaribo and Wanica) in 2017 shows a nearly equal distribution between males and females, with a slightly higher number of females. The population distribution indicates a relatively balanced sex ratio, with slight variations across different age groups. Children aged 0-4 years make up a small percentage of the population, similar to those in the 5-9 years age group. A substantial portion of the population is of working age (20-64 years), contributing significantly to the overall demographic structure.

The Migration Effectiveness Index (MEI) for Paramaribo, which measures the effectiveness of migration flows, reflects the negative net migration. In 2017, Paramaribo had an MEI of 0.1488 with gross internal migration totaling 10,178. However, in subsequent years, the MEI dropped significantly, recording -0.1602 in 2018 and -0.2191 in 2019, with gross internal migrations of 7,364 and 7,450 respectively.

As to The **Para** district, it possesses 24.700 inhabitants according to the latest census data. Based on the information from the General Bureau of Statistics (2017-2019), in 2019 the sex ratio in rural areas (Para district falls into this category), varied across age groups[63]. The overall sex ratio was 105.0, indicating a predominance of males. The 0-14 age group had a nearly balanced sex ratio of 100.7. However, the ratio increased in older age groups, peaking at 114.3 for the 40-44 age group. The only group with a female majority was the 60+ age group, with a sex ratio of 95.9.

On the other hand, **Kwamalasamutu** is a Trio indigenous village in the Sipaliwini district. According to a 2024 United Nations publication[64], the population is estimated to be approximately 1,300 people. Based on the information from the General Bureau of Statistics (2017-2019), in 2019 the sex ration in interior areas (Sipaliwini falls into this category) varied across age group. The overall sex ratio was nearly balanced at 100.7, the 0-4 age gap is balanced, as well as the 30-34 age gap. Ages from 4-30 show slightly higher sex ratios for men (highest being for the 15-19 age gap of 113) while the age gaps of 45-80+ show an increase in women populations, with the lowest sex ratio being for the 80+ of 50.

[58] ABS. (2023). Demographic Data for Suriname 2018-2021.

[59] Verrest, H. J. L. M. (2010). City profile: Paramaribo. Cities, 27(1), 50-60. https://doi.org/10.1016/j.cities.2009.10.005

[60] https://earthobservatory.nasa.gov/

[61] ABS. (2023). Demographic Data for Suriname 2018-2021.

[62] General Bureau of Statistics. (2017-2019). Tables of public demographic data.

[63] Sex Ratio is the number of males per 100 females in a population.

[64] https://caribbean.un.org/en/261496-access-clean-water-indigenous-suriname-village-kwamalasamutu-rehabilitated

4.6.2. Infrastructure and Services

Water and Sanitation

As reported by the Water Action Hub[65] **Paramaribo** experiences several unique challenges concerning water resources. The city's sewage system relies heavily on septic tanks, which often lead to pollution during heavy rainfall. Saltwater intrusion in groundwater is a growing problem, necessitating the mixing of water from wells with varying chloride levels to maintain water quality.

The distribution system suffers from poor maintenance, water theft, and leakages, leading to pump breakdowns, low pressure, intermittent supply, and high contamination risk. In some instances, tanker trucks provide water where the piped supply has failed. The absence of wastewater treatment facilities exacerbates the problem, with septic tank sludge being directly discharged into rivers.

As a result, drinking water is not consistently safe due to the lack of disinfection and monitoring. The high groundwater table and frequent flooding in Paramaribo's coastal areas, combined with inadequate waste disposal and deteriorating infrastructure, heighten the risk of water-related diseases.

Sanitation data from the General Bureau of Statistics show that 78% of **Paramaribo** have access to piped water into their dwellings, while the **Para** district, as part of the rural population, only has 37,6% access to piped water in their dwellings and 33,9% into their yards[66]. As for the **Sipaliwini** district, only 2,2% has access to piped water inside their homes and 3,8% into their yards.

Moreover, according to United Nations[67], the interior area of Suriname, specifically Sipaliwini, has the lowest access to clean water (85%) and (8%) have no service at all. Particularly **Kwamalasamutu** faced significant challenges for several years with accessibility to clean and safe drinking water. The existing water installation system in the Indigenous village of Kwamalasamutu was in a bad state, poorly maintained, and the old construction posed safety risks, especially to children. The lack of reliable access to clean water affects the health, hygiene, and overall well-being of the community members, particularly the estimated 500 children living in the area. From what was seen during the field visit, Kwamalasamutu has a dual system for drinking water, there are water wells located on the outskirts of the village that possess working pumps on solar panels to supply water and additional rainwater catchment systems throughout the village.

As to sanitation services, according to 2018 data, 98,5% of the population in **Paramaribo** have access to improved sanitation facilities (including hand-washing facilities and where excreta is safely disposed in situ or treated off site), while **Para** district exhibits lower coverage of 91,1%. As to **Sipaliwini**, there is only half of the district's population (51,1%) with access to sanitation facilities[68].

[65] https://wateractionhubfrontdoor-d6dwaqhbgwebcfg2.z01.azurefd.net/media/files/2020/08/25/Country_Profile_-_2020-08-25T133124.451.pdf

[66] UNICEF. (2022). The Suriname Country Overview. Sanitation and Water for All.

[67] https://caribbean.un.org/en/261496-access-clean-water-indigenous-suriname-village-kwamalasamutu-rehabilitated

[68] UNICEF. (2022). The Suriname Country Overview. Sanitation and Water for All.

Housing

The data presented were obtained from the Suriname 2018 MICS Survey Findings Report[69]. Since the information is presented at the district level, and because there is no information from Kwamalasamutu, data were extracted from Sipaliwini for this section and Para district for Zarendij.

In Paramaribo 99.2% of households have access to electricity from the interconnected grid, and only 0.8% do not have access to electricity. For cooking, 97.1% of households use clean fuels and technologies, indicating a high level of modern energy use. Para district shows lower values of access to electricity of 85,2% and higher values of people with no access of 8,4%. In Sipaliwini, access to electricity is significantly lower, with only 30.9% of households connected to the interconnected grid and 51.7% using off-grid solutions. A notable 17.4% of households do not have access to electricity. For cooking, only 66.8% of households use clean fuels and technologies, indicating reliance on traditional cooking methods.

The 63.1% of households in Paramaribo have internet access at home, which reflects a relatively high level of digital connectivity, while only 37,1% of people have access to internet in the rural district of Para. Internet access is very limited in Sipaliwini, with only 21.7% of households having internet access at home.

Regarding the materials used for housing, in Paramaribo 83.7% of households have finished flooring, and 99.3% have finished roofing. Additionally, 94.5% have finished exterior walls, showing a high standard of housing quality. The Para district shows lower values with only 75,7% of the population having finished flooring, while over 98,8% have finished roofing. Housing materials in Sipaliwini are less advanced compared to Paramaribo and Para districts. Only 67.6% of households have finished flooring, and 88.7% have finished roofing. Additionally, 74.7% have finished exterior walls, indicating a lower standard of housing quality.

Household assets ownership is also high in Paramaribo. About 92.0% of households own a television, 93.2% own a refrigerator, 91.0% have a washing machine, and 61.9% own a microwave. Additionally, 40.1% have air conditioners, and 83.0% own a fan. Ownership of cars, trucks, or vans stands at 66.7%, and 96.7% of households have mobile phones. Household assets ownership in the Para district shows lower values: 78,2% have access to a TV, 67,6% to a refrigerator, 30,2% have a microwave and only 11% have access to air conditioning. Sipaliwini is much lower: only 42.0% of households own a television, 15.8% own a refrigerator, 27.4% have a washing machine, and 4.7% own a microwave. Air conditioner ownership is extremely low at 0.6%, and only 16.8% of households own a fan. Ownership of cars, trucks, or vans is 5.0%, and 88.3% of households have mobile phones.

Paramaribo shows a relatively high wealth distribution, with 29.7% of households in the richest quintile and only 8.0% in the poorest quintile. Moreover, 66.5% of households own their dwelling, while 32.7% do not, with 18.9% renting their homes. Para district shows lower wealth distribution with only 5,7% of the households being in the richest quintile while 48% of the population is in the poorest. Sipaliwini has a very high percentage of households in the poorest quintile (96.1%) and almost no representation in the richest quintiles. Despite this, 89.9% of households own their dwelling, showing a high rate of homeownership despite economic challenges.

[69] Ministry of Social Affairs and Public Housing. (2019). Suriname Multiple Indicator Cluster Survey 2018, Survey Findings Report. Ministry of Social Affairs and Public Housing.

4.6.3. Education

As in the previous section, the data presented were obtained from the Suriname 2018 MICS Survey Findings Report. Since the information is presented at the district level, and because there is no information from Kwamalasamutu, data were extracted from Sipaliwini.

The literacy rate for women aged 15-49 in Paramaribo is relatively high. Among these women, 97.2% are literate. The highest level of education attended by these women shows that 39.4% have attended lower secondary school, 30.0% upper secondary, and 20.7% higher education. Only a small percentage, 0.2%, have attended pre-primary and 2.5% no education at all. For men aged 15-49 in Paramaribo, the literacy rate is even higher at 98.9%. The distribution of education levels indicates that 46.7% have attended lower secondary school, 26.7% upper secondary, and 13.9% higher education. Only 0.2% have attended pre-primary and 0.9% no education at all.

The literacy rate for women aged 15.49 in the Para district shows similar values than Paramaribo with 94% of women being literate. 16,9% of women have attended and completed primary school, 49,1% lower secondary school and 20,8% upper secondary school. 6,7% of women have attended higher education. As for men, literacy rates increase up to 99,6%. 20,1% attended primary school, 54,3% lower secondary school and 22,1% upper secondary school. Only 3% of men have attended higher education, half of the statistics for women.

The literacy rate for women aged 15-49 in Sipaliwini is significantly lower at 65.8%. In terms of education, 21.1% have attended lower secondary school, 4.3% upper secondary, and none higher education. A 0.4% have attended only pre-primary and 32.9% no education at all, reflecting the challenges in educational access and attainment in this region. For men aged 15-49 in Sipaliwini, the literacy rate is 73.5%. The highest level of education attended by these men shows that 25.5% have attended lower secondary school, 1.7% upper secondary, and none higher education. 0.7% have attended pre-primary and 24.8% no education at all, indicating similar educational challenges as seen in women.

4.6.4. Economy

Main Economic Activities

In Suriname the economic activities are mainly natural resource-based components – as agriculture, fishing and forestry, and mining sector including gold, bauxite and oil.

The main economic activities in the private sector are as follows:

- **Mining and Quarrying:** Extraction of bauxite, gold, oil - significant export revenues. In 2021, mining products, including precious stones/metals and mineral products, constituted approximately 90.9% of the country's merchandise exports, according to the Ministry of Natural Resources of Surinam. Mining activity is concentrated in the east of the country. Three areas north of Kwamalasamutu, from 60 to 80 km away, are exploited for minerals other than gold. The geospatial distribution of the mining zones is shown in Map 21, Map 22, and Map 23. A key element to highlight is that areas and airstrips serving, directly and indirectly, gold mining have been excluded during the latest selection of sites. Furthermore, the State Oil Company N.V. in Suriname has demonstrated significant growth

- **Agriculture and hunting**: Crop cultivation, livestock, forestry. Rice production plays a significant role in agricultural output, covering a total 64% of the production weight and covering substantial areas in Saramacca, Coronie and Nickerie districts.
- **Forestry**. Particularly the Timber industry. Suriname's forest industry is primarily focused on logging and primary sawmilling operations. Despite a relatively low deforestation rate, there has been a significant increase in timber production in recent years, signaling an early stage of the forest transition curve. This growth, along with active legal and illegal mining activities and agriculture sectors, suggests a potential rise in deforestation and related emissions. No deforestation is registered in the area surrounding the Kwamalasamutu airstrip (see Map 25). Corroborating this aspect, Map 24 shows the spatial distribution of roundwood production in the country. The **Para** district is known for its round wood production, being the second highest contributing district (25% of the countries production)[70].
- **Manufacturing**: Food processing, textiles, chemicals, contributing to industrial output and exports.
- **Construction**: Development of buildings, roads, and other infrastructure.
- **Wholesale and Retail Trade:** Distribution of goods to retailers and consumers.
- **Financial Intermediation:** Banks, insurance companies providing financial services.
- **Transport, Storage & Communication**: Transportation, storage, telecommunications infrastructure.
- **Tourism:** Suriname's tourism industry is growing and has a potential to become a significant contributor to the country's economy. Most tourists visiting the country come from Europe, with significant numbers also arriving from South America and Asia.

Employment and labor market

Attending to the active labor force in Suriname, approximately 54.2 percent of the total population are part of the active labor force: 65.1 percent for men and 43.4 percent for women[71]. -It is concentrated in coastal urban areas, where approximately 75 per cent of the economically active population is located.

Suriname shows distinct economic patterns depending on the geographical area. In the rural interior, the economy is characterized by small and medium-sized informal units, primarily focused on extractive activities like gold and timber, with agriculture playing a lesser role. Multinational companies also operate in this region, mainly in gold extraction, likely offering more formal employment. Indigenous communities in the interior rely on primary activities such as hunting, fishing, and subsistence farming, with little demand for labor and limited engagement in market-oriented activities. In contrast, the coastal region, home to urban centers, is more service-oriented, with some manufacturing and extractive industries (such as oil), and the public sector being the largest employer.

Overall, Suriname's labor market consists of formal, informal, and natural resource-based components. The natural resource and mining sector, including gold, bauxite, and oil, drives economic growth and employment. Agriculture, fishing, and forestry also contribute to rural jobs.

[70] SBB. (2014). Suriname Forestry Sector 2013. Foundation for Forest Management and Production Control. Ministerie Van Ruimtelijke Ordening Grond. En Bosbeheer

[71] Suriname Mid-term Labour Market Policy 2022-2025

The manufacturing sector is expanding, creating jobs in food processing, textiles, and construction materials. The services industry, particularly in urban areas, employs many in retail, healthcare, education, and finance. Tourism generates employment in hospitality and related services. Government and public administration are significant employers. The informal economy, consisting of small businesses and informal services, also provides employment opportunities, though not accurately captured in statistics. A structural imbalance exists where sectors driving GDP growth contribute minimally to overall employment.

Poverty

According to UNDP (2020), in 2018 (most recent estimates) 3 per cent of Suriname's population falls within the category of the multidimensional poor, while an additional 4 per cent (about 23,000 people) can be classified as vulnerable to multidimensional poverty.

Additionally, Suriname's Human inequality coefficient, a measure of inequalities in health, education, and income, is 26 per cent, considerably higher than the average (21.5 per cent) for Latin America and the Caribbean region.

Based on data from the Survey of Living Conditions, 2016, 2017, of Suriname, one of the key factors contributing to poverty is the common overlap between poverty and informality. While informal work can offer an alternative to unemployment for many, informal workers generally earn less than formal employees, are not protected by employment laws and regulations, and lack access to social protection benefits such as pensions or retirement funds, leaving them more vulnerable. In Suriname, as in many other countries, poverty and informality reinforce each other, creating a vicious cycle. Estimates indicate high levels of informality in Suriname, with 25 percent of the total private workforce employed informally

Child labor

In 2023, Suriname made efforts to eliminate child labor, as signing the Third Decent Country Work Program with the International Labor Organization, which includes proactive strategies for the prevention and eradication of child labor[72] In addition, Suriname has signed the Child Labor Act, that aims to protect children from exploitation, ensuring they are not engaged in hazardous work and have access to education. It promotes their well-being and supports social development by prohibiting harmful labor practices and encouraging their educational opportunities.

The minimum age for work is 16 years old, while the minimum age for hazardous work is 18 years old. In Suriname, 7.2% of children aged 5 to 14 are engaged in work, while 95.3% attend school. However, 7.3% of children aged 7 to 14 both work and attend school. Although data on hazardous work by children aged 15 to 17 is unavailable, children in Suriname face serious risks, particularly in the worst forms of child labor, including commercial sexual exploitation and dangerous tasks in gold mining.

Children in agriculture face hazards such as using dangerous equipment, carrying heavy loads, and exposure to pesticides. In industry, they participate in gold mining, construction, and wood processing, often involving heavy lifting and exposure to toxic chemicals. Children also engage in street vending, domestic work, and airport luggage transport. Particularly vulnerable are migrant children and those

[72] Bureau of International Labor Affairs, Child Labor and Forced Labor Reports. Suriname. https://www.dol.gov/agencies/ilab/resources/reports/child-labor/suriname

living in Suriname's remote interior, where sex and labor trafficking are prevalent. Informal mining camps in these areas further expose children to exploitation.

While primary school attendance is high, secondary school completion is significantly lower, especially in the interior, where rates are as low as 15%. In 2023, delays in reopening schools in remote areas led to children seeking work, including in artisanal mining. Barriers to education, such as lack of proper documentation and the precarious legal status of migrant families, contribute to the exclusion of children from school. Many migrant children face difficulties accessing education, as families may keep their children out of school to avoid legal scrutiny.

Next there is a table showing Suriname laws and regulations on child labor, and the international standards, according to Bureau of International Labor Affairs.

Table 34. Regulations on Child Labor

Standard	Meets International Standard	Local Legislation
Minimum Age for Work: 16	Yes	Articles 1 (j–l), 3, and 11 of the Children and Young Persons Labor Act
Minimum Age for Hazardous Work: 18	Yes	Articles 1 (k and l) and 11 of the Children and Young Persons Labor Act; Article 1 of the Decree on Hazardous Labor for Youth
dentification of Hazardous Occupations or Activities Prohibited for Children	Yes	Articles 2 and 3 of the Decree on Hazardous Labor for Youth; Article 11 of the Children and Young Persons Labor Act
Prohibition of Slavery, Debt Bondage, and Forced Labor	Yes	Articles 334, 338, and 339 of the Penal Code; Article 15 of the Constitution; Article 1 the Children and Young Persons Labor Act
Prohibition of Child Trafficking	Yes	Article 334 of the Penal Code
Prohibition of Commercial Sexual Exploitation of Children	No	Articles 291, 293, 297, 298, 303a, and 306 of the Penal Code
Prohibition of Using Children in Illicit Activities	No	
Minimum Age for Voluntary State Military Recruitment: 18	Yes	Article 9 of the Conscription Act
Prohibition of Compulsory Recruitment of Children by (State) Military	N/A	Country has no conscription
Prohibition of Military Recruitment by Non-state Armed Groups	No	
Compulsory Education Age: 12	No	Article 39 of the Constitution; Article 20 of the Law on Basic Education
Free Public Education	Yes	Articles 38 and 39 of the Constitution

Source: Bureau of International Labor Affairs, Child Labor and Forced Labor Reports. Suriname.

From the analysis of the previous table, the following gaps between international and local regulations regarding child labor can be observed: Suriname's laws do not sufficiently prohibit the commercial sexual exploitation of children. Although it is illegal to engage in sexual relations with a child under the age of 16, the use of a child under 16 for commercial sexual purposes is not explicitly criminalized. Additionally, while the Penal Code establishes penalties for the production and trafficking of drugs, it does not specifically prohibit the use, procurement, or offering of a child for drug production and trafficking. Furthermore, Article 20 of the Law on Basic Education requires children to attend school only until they are 12 years old. This leaves children between the ages of 12 and 16 particularly vulnerable to the worst forms of child labor, as they are not legally required to attend school nor are they legally allowed to work.

In 2023, both labor and criminal law enforcement agencies in Suriname took action to address child labor. However, several operational gaps hinder effective enforcement, such as insufficient financial resources. The Ministry of Labor, Employment Opportunity, and Youth Affairs (MOL) enforces child labor laws through its Labor Inspectorate and reports cases to the Trafficking in Persons (TIP) Unit of the Suriname Police Force. Leading up to the International Day Against Child Labor, MOL committed to eliminating child labor by 2025. The Suriname Police Force, including its TIP Unit and Youth Affairs Police, is responsible for enforcing criminal laws related to child labor, although the TIP Unit faces challenges in funding and resources. In 2023, there were inspections and criminal investigations, but no penalties were imposed for child labor violations.

Suriname has also made efforts to coordinate government actions to combat child labor. The National Commission on Combating Child Labor (NCUK) has led interdepartmental work to prevent child labor, though its term expired in 2023. Policies like the National Action Plan to Combat Child Labor (2019–2024) have been updated, but the revised version still awaits government approval. Social programs, such as the ILO's Decent Work Country Program and the My Line hotline, aim to address child labor, but remain inadequate, especially in sectors like commercial sexual exploitation and mining. Education programs, such as the initiative supported by the Inter-American Development Bank, also aim to improve access to inclusive quality education for vulnerable children.

To eliminate child labor, the government must take several actions. These include raising the compulsory education age, criminalizing the commercial sexual exploitation of children and their use in illicit activities, and ensuring sufficient resources for enforcement agencies. The Labor Inspectorate and TIP Unit need more funding and staffing to inspect high-risk sectors. Additionally, social programs must be expanded to prevent child labor in agriculture and mining, and to improve access to education, particularly in remote areas. Addressing barriers like school fees, transportation costs, and legal requirements for foreign-born children is also essential.

4.6.5. Transport and connectivity

According to the project profile, although having an area of 164,000 km2, 93% of all population and infrastructure assets are concentrated along the Great Paramaribo and Coastal regions, leaving isolated rural communities in the interior of the country, as Kwamalasamutu, with scarce means of access to medical supplies, food, and essential services. Much of the country away from the coastline is only accessible by boat or by aircraft.

Air transport is the most critical infrastructure mode for remote communities representing the primary connectivity and accessibility link to isolated regions in the country. The dry season makes river transport unreliable, and the interior has no road infrastructure. During the rainy season, low

operational conditions for aerodromes render them non-operable while river journey times are longer to reach emergency health care.

In terms of the current domestic aviation management structure, the Ministry of Transport, Communication and Tourism (MTCT) is responsible for governing, policy development and the regulation of the aviation sector in the country. In the structure of the Ministry there is the Director of Transport and the Deputy Director for Aviation Transport that manages the aviation policies and operations.

Most of the aviation infrastructure is publicly owned and operated. There are 2 departments responsible for the execution on an operational level:

1. **The Civil Aviation Department of Suriname (LVD/CADSUR):** This department serves as an aviation expert and working arm for the Ministry in the policy making, aviation economic licensing and oversight. In addition, this department is the operator of the Air Navigational Service Provider (ANSP) which provides Air Traffic Control (ATC) for the country, Aeronautical Information Services (AIS), Operations of Navigational instruments and related administrative tasks.
2. **The Aerodrome Department (LVT):** This department is responsible for the operation and maintenance of the public aerodromes. Staffing at the airstrips includes a station chief (manager) and a maintenance staff. The staff at airstrips located in villages consists of locals, however on remote airstrips technical staff of LVT are stationed for 3-month periods.

In addition to these government departments, the following authorities have been established in the 90s to elevate the level of safety on international standards:

a) **The Civil Aviation Authority Suriname (CASAS):** The authority serves as the Civil Aviation Authority, which holds its responsibility established by law and is responsible for improving and ensuring safety and security in civil aviation in Suriname by implementing, applying and enforcing safety and security standards. The standards are determined by the International Civil Aviation Organization (ICAO) and are conditional for international aviation activities for the Republic of Suriname. As part of its multiple responsibilities, CASAS also conducts aerodrome safety inspections.
b) **Airport Management Ltd (AML):** This is a fully state-owned company, N.V. Luchthavenbeheer (LHB), that is responsible for the operations of the main international airport, the **Johan Adolf Pengel International Airport**. In the articles of incorporation, this company was setup to be the airport authority to operate multiple airports in Suriname. As of today, LHB only operates the main airport, and provides aviation security duties at the **Zorg en Hoop** airport[73].
c) Lastly, the state is also a sole shareholder of **Surinam Airways (SLM**), the national carrier that connects Suriname to Europe, USA, Brazil and the Caribbean.

Besides some privately owned airstrips, most of all interior airstrips are publicly owned and operated by the LVT. This department within the MTCT is dependent on the bureaucratic government system. As these airstrips are not paved, maintenance especially during the rainy season is key to guarantee safety. Transporting maintenance equipment and consumables into the rural areas due to irregular connections in some cases, is a challenge of itself. Documentation for standardization of procedures,

[73] ILACO. (2024). Final Report: Identification of required maintenance and repair actions on grasshopper airstrips. Project #SU-T1152.

keeping track of statistics in movements as well as conditions as they are remote would be key for planning and development purposes, as well as having trained and qualified personnel.

According to the Inter-American Development Bank Final Report "*Identification of required maintenance and repair actions on grasshopper airstrips*", Suriname has 2 international airport, the Johan Adolf Pengel International Airport which handles jet-engine powered regional and international flights and the Zorg en Hoop airport which handles small planes towards Guyana and French Guyana as well as domestic flights. There are 47 official domestic aerodromes out of which 27 are public and managed by LVT.

Most of the connections into the interior find their point of origin at the Paramaribo city airport, Zorg En Hoop. The aerodrome is the busiest in the country with almost **12.700** flights every year. However, the airstrip does not meet the safety requirements of LVT, according to a runway safety inspection report made by LVT on September 2023[74].

The main operators for scheduled and chartered flights are the privately-owned Gum Air and Blue Wing Airlines, and the NGO, MAF Suriname. In addition to these three, there are other privately owned companies that fly into the interior with fixed wing and rotor aircraft to service the need of air travel, amongst them Suriname Airways, Trans-Guyana Airways, Era Helicopters, Roraima, Zimex, Aero Club Suriname, Eagle Air Services, Hi jet Helicopter Services, Meinfertsma Suriname, Pegasus Air Services, Stichting Vliegen Suriname United Aviation Services, Vortex Air Services

In the southern region of Sipaliwini, where Kwamalasamutu is located, the Mission Aviation Fellowship Suriname (MAF Suriname) serves as the primary airline operator, providing nearly daily flights to indigenous villages. Approximately half of these flights are dedicated to medical purposes, while the remaining flights predominantly support NGOs, with a few commercial flights included.

The Inter-American Development Bank (IDB) conducted a survey in collaboration with DOOR Advisory to understand the domestic air travel market in Suriname. The survey took place at Zorg en Hoop Airport in Paramaribo from May 15th to May 24th, 2024, targeting departing passengers. The methodology involved face-to-face structured surveys with a sample size of 352 respondents.

Most respondents were male, accounting for 67% of the sample. The largest age group was 31-40 years, comprising 29.5% of the participants. Notably, approximately 70% of the respondents had lower than secondary education or no education at all.

In terms of ethnicity and nationality, the primary ethnic groups represented were Maroon (26.4%), Mixed (25.9%), Creole (14.2%), and Indigenous (13.6%). Nearly 70% of the respondents were Surinamese nationals.

Regarding income and employment, 49% of the respondents had paid jobs, 26% were hustling, and 12% owned businesses. The data showed that most of these groups had monthly net incomes exceeding SRD 25,000.

Most passengers booked their tickets less than a week before their travel, with 61% falling into this category. Additionally, 53% of the respondents booked their tickets themselves, while others relied on employers or intermediaries. The primary airlines used were Gum Air (59.4%) and Blue Wing Airlines (38.2%).

[74] ILACO. (2023). IS-440 Diagnosis Report, Identification of required maintenance and repair actions on productive rural roads, bridges and grasshopper airstrips.

The main reason for domestic air travel was work-related activities, with 70% of the respondents traveling for this purpose, predominantly in the mining industry.

Overall, passengers were generally satisfied with the check-in process, which had a satisfaction rate of 90.2%. However, they were less satisfied with ticket prices, with only 33.6% expressing satisfaction. The accessibility of airstrips received the highest satisfaction rate at 74.4%, while the condition of the runways was the least satisfying aspect at 22.1%.

4.6.6. Ethnic Groups

Suriname has a diverse ethnic population due to its colonial history:

- Amerindians: These are the indigenous people of Suriname, including groups like the Kalia, Lokono, Trio, and Wayana, among others.
- Maroons: Descendants of enslaved Africans who escaped captivity and formed independent communities in the interior. Maroon tribes include the Aucaner or N'djuka, Saramaka, Paramaka, Aluku, Kwinti, and Matawai.
- Creoles: People of African or mixed African-European descent, often with roots in slavery and colonialism.
- Hindustanis: Originating from the Indian subcontinent, particularly from areas like Bihar and Uttar Pradesh, brought to Suriname as indentured laborers during the colonial era.
- Javanese: Descendants of Javanese migrants brought to Suriname as contract laborers from the Dutch East Indies (now Indonesia).
- Chinese: A smaller but notable ethnic group in Suriname, with a heritage tracing back to Chinese immigrants who arrived mainly in the late 19th and early 20th centuries.
- Mixed Ethnicities: Many Surinamese individuals have mixed ancestries, blending various ethnic backgrounds and contributing to the country's cultural diversity.
- Other: Lebanese in Suriname represent a minority group primarily involved in trade and commerce, while Brazilians form a smaller portion of the population, mainly comprising immigrants or descendants from Brazil. Europeans, descendants of settlers with a notable Dutch heritage due to Suriname's colonial history, are also part of the diverse ethnic fabric of the country.

According to the First Biennial Update Report to the United Nations in 2022, the composition in percentage of ethnic groups is as follows:

Table 35. Ethnic Dioversty of Suriname's population

Ethnic Group	Percentage
Hindustani	27,4%
Creoles,	17.7%;
Maroons	14.7%;
Javanese	14.6%
Mixed	12.5%.
Amerindians	3,7%
Other	7,0%

Ethnic Group	Percentage
Chinese	1,8%

Source: Biennial Update Report to the United Nations (2022)

Indigenous Peoples and Communities

According to the 2012 census, Suriname's Indigenous population comprises 20,344 individuals, representing 3.8% of the country's total population of 541,638. In addition, there are 72,553 Maroons, constituting 14.7% of the total population. This means that indigenous and tribal peoples represent almost 20% of the population. The largest Indigenous groups are the Kali'ña (Kalina or Caribs), Lokono (Arawaks), Trio, and Wayana. There are also smaller Indigenous groups living in the southern interior, such as the Akurio, Apalai, and Wai-Wai, among others.

The following table shows the communities identified and their location.

Table 36. Ethnic Diversty of Suriname's population

Group	Communities		Location
Indigenous peoples	Kalina (Carib)	14	Coast/ savannah belt
	Lokono (ARowak)	15	
	Mixed Kalina/Lokono	2	
	Trio (Tiriyo)	10	South
	Wayana	5	
	Mixed Trio/Wayana	1	
	Total # indigenous communities	47	
Marroons	Saramaka	70-80	Upper-Suriname River / District Brokopondo
	Ndyuka/Aukaners	70-75	Tapanahony & Cottica River
	Paramaka	11	Marowijne River
	Aluku (Boni)	1	Lawa River
	Matawai	17	Upper-Saramaka River
	Kwinti	2	Coppename River
	Total # Maroon communities	171-186	

Source: KAMBEL, 2006.

The areas where the airports are located there are tree indigenous communities that may be directly or indirectly affected by the project, the **Lokono, Trio, and Kalina**, as shown in **Figure 32 and 33.**

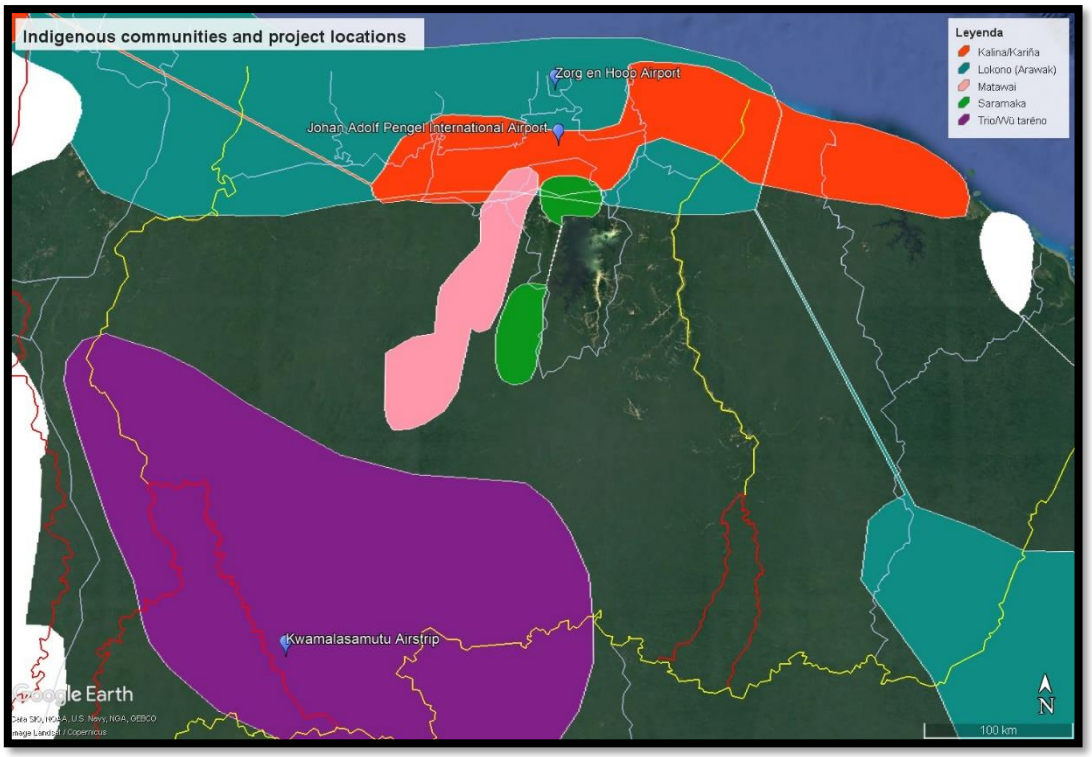


Figure 31 - Indigenous communities and project locations. Source: Prepared by the author

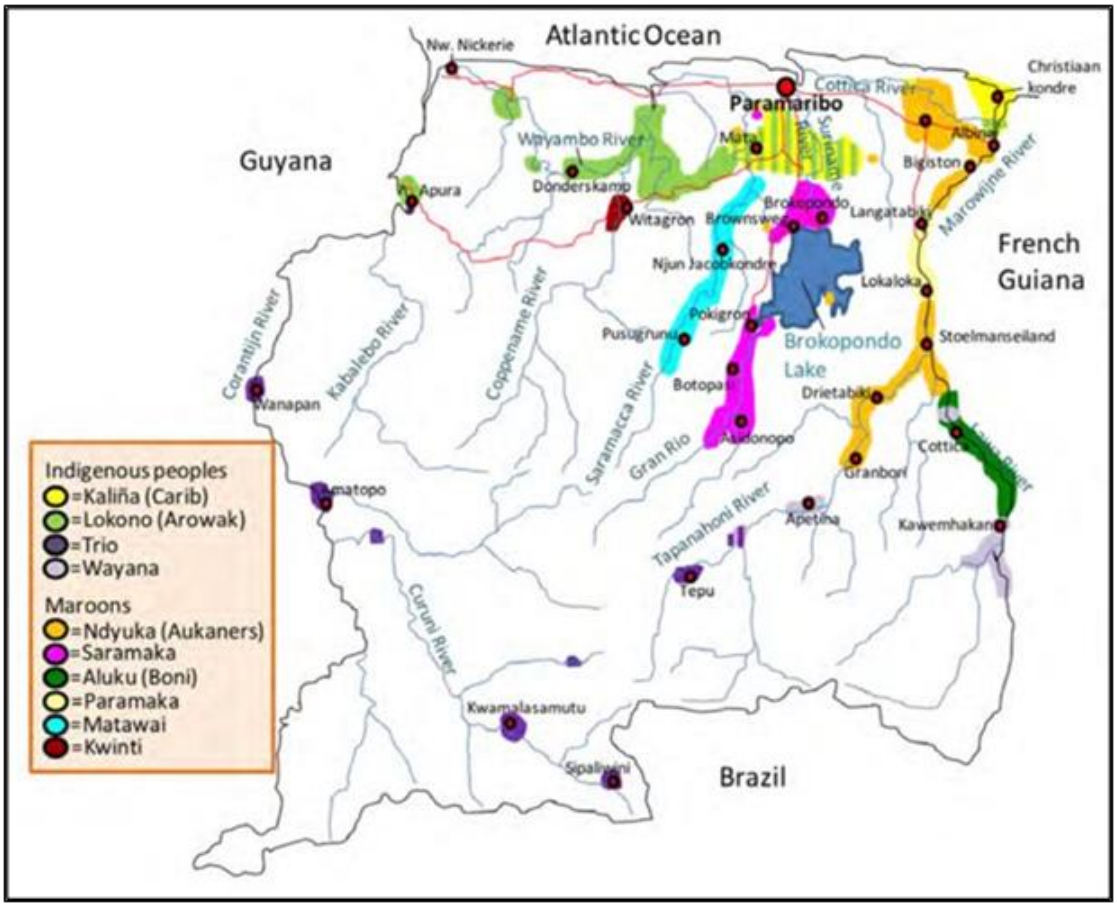


Figure 32 – Demarcation of Indigenous and maroon lands in Suriname (Heemskerk, M). Source: Heemskerk, M (2009)[75]

While the **Lokono** Indigenous community resides in the general area surrounding Zorg En Hoop Airport, it is important to note that the airport itself is located within the urbanized portion of Paramaribo City, the capital of Suriname. The airport itself is situated in a highly urbanized zone. Therefore, there is no indigenous community directly within the airport's immediate area of influence. Given the airport's urban setting and its integration into Paramaribo's urban sprawl, it can be asserted that indigenous peoples do not primarily sustain their livelihoods in this immediate vicinity.

The Lokono (Arawaks) primarily inhabit the northern, coastal areas of Suriname. Known as "lowland Indigenous peoples," the Lokono have long-standing traditions that revolve around fishing, agriculture, and maintaining a close connection to coastal ecosystems. Their settlements are typically located near rivers, which are central to their livelihood and cultural practices. Despite increasing modernization in the coastal areas, Lokono communities continue to maintain traditional governance structures and cultural rituals, including ceremonies and oral storytelling that transmit knowledge across generations.

Similarly, the **Kalina** community historically occupied lands in the area surrounding the Johan Adolf Pengel International Airport. However, the airport’s location, within a highly developed and urbanized zone, means there is no direct indigenous settlement in its immediate area. While the Kalina community may have historical ties to the region, the airport’s current urban context significantly reduces the likelihood of direct cultural or environmental impacts on this community. Nevertheless, ongoing monitoring and engagement with the Kalina people are necessary to ensure that any indirect effects are identified and addressed.

The Kalina inhabit the coastal and riverine areas of Suriname, particularly in the northern regions. They are also known as a "lowland Indigenous people," and traditionally depended on fishing, hunting, and small-scale agriculture, cultivating crops such as cassava and plantains. The Kalina hold a deep connection to their ancestral lands, which are not only sources of livelihood but also spaces for cultural expression and spiritual practices. The Kalina maintain traditional social structures, with leadership often determined by a Granman or village chiefs. Decision-making is typically a communal process, with elders and community members playing important roles. Cultural identity remains strong, with oral traditions, spiritual practices, and ceremonies at the heart of their daily lives.

Finally, the **Trio** indigenous community resides predominantly in the area surrounding the Kwamalasamutu Airstrip. The project activities in this region could have both environmental and social implications.

Trio community live in the southern Suriname, particularly in the Sipaliwini district. Their remote location has allowed them to maintain a largely traditional way of life, based on hunting, fishing, and subsistence agriculture. The Trio has a deep spiritual connection to the rainforest, and their social structure is organized around community cooperation, with decision-making typically conducted by a council of elders and shamans. In recent years, the Trio have faced pressures from external factors such as deforestation, mining, and the spread of modern amenities, which threaten their environment and cultural practices.

[75] Report commissioned by the Gordon and Betty Moore Foundation and Amazon Conservation Team Suriname. (2009). http://mariekeheemskerk.org/Reports/Demarcation_final May2009.pdf

Suriname recognizes the rights of Amerindian communities to their traditional lands. The country's constitution acknowledges the existence of indigenous peoples and their rights to land and resources. In practice, however, the formal recognition and demarcation of these territories can be complex and may face challenges, including legal, political, and economic pressures. The government has been working towards better legal frameworks for land rights, but issues around land tenure and access to resources continue to be a concern for indigenous communities[76]

Furthermore, the legal framework in Suriname regarding Indigenous peoples is a critical component of the analysis, particularly considering the lack of formal land ownership rights for Indigenous communities. Suriname has not yet fully recognized the territorial rights of its Indigenous population.

A S**ocio-Cultural Analysis (SCA) and an Indigenous Peoples Plan (IPP) are presented as complementary document to this ESA**. The SCA and IPP aim to provide an in-depth understanding of the indigenous socio-cultural context, relevant legal frameworks, potential project impacts, and recommendations for mitigating adverse effects. They also outline strategies for ensuring culturally appropriate consultations and establishing grievance mechanisms to address community concerns, including the Free, Prior and Informed Consent (FPIC) requirements, in compliance with ESPS 7 – Indigenous People of the IDB.

4.6.7. Archaeological, Historical and Cultural Heritage

The Paramaribo World Heritage Site Management Plan (WHSMP) emphasizes the focus of archaeological research in Suriname on the pre-Columbian period, with approximately 400 known pre-Columbian sites throughout the country. However, within the Paramaribo World Heritage Site (PWHS), only a few such sites have been identified, primarily along the waterfront and in areas like Kwatta, Charlesburg, and Blauwgrond. Urban archaeological discoveries within the PWHS often occur during construction activities in the historic inner city and include artifacts such as clay pipes, bottles, coins, brick foundations, and water cellars. Noteworthy finds include remains beneath the St. Peter and Paul Cathedral and remnants of "The Resurrected Phoenix" Jewish Theater.

Pre-contact archaeological sites have been recorded across Suriname, with a 2003 synthesis identifying around 109 pre-Columbian sites. These sites are unevenly distributed, with a higher concentration along the coastal plain. However, the interior likely contains significant, undocumented archaeological resources, underscoring the need for further research and preservation efforts beyond the coastal regions.

[76] https://minorityrights.org/communities/indigenous-peoples-in-suriname/

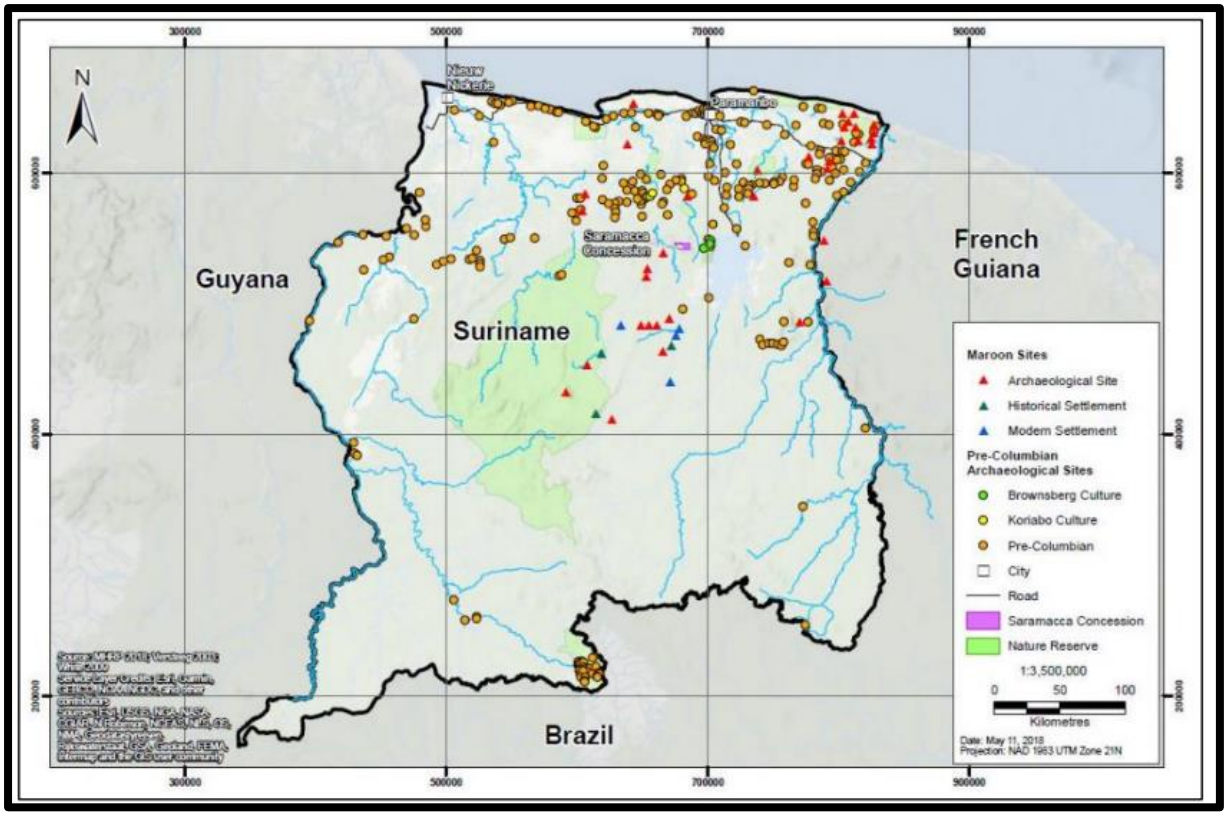


Figure 33 – Archeological Sites of Suriname. Source: Ministre of Natural Resources of Suriname, 2023

Suriname is home to 3 UNESCO World Heritage Sites. Of those, there are 2 cultural sites and 1 natural sites:

- Central Suriname Nature Reserve
- Historic Inner City of Paramaribo
- Jodensavanne Archaeological Site: Jodensavanne Settlement and Cassipora Creek Cemetery

Nevertheless, none of these sites are located within the project area. The closest site is the Historic Inner City of Paramaribo, with its buffer zone located approximately 4 kilometers from Zorg En Hoop airport. The historic inner city is located along the left bank of the Suriname River and is defined by the Sommelsdijkse Creek to the north and the Viottekreek to the south. Laid out from 1683 on a grid pattern along an axis running north-west from Fort Zeelandia, the main streets follow shell ridges which provided a naturally drained base for building. At the end of the 18th century, Dutch engineering and town planning skills enabled the town to be extended over marshy land to the north. Important elements in the townscape are Fort Zeelandia built in 1667 and the large public park (Garden of Palms) behind it, wide, tree-lined streets and open spaces; the Presidential Palace (1730) built in stone but with a wooden upper floor, the Ministry of Finance (1841) a monumental brick structure with classical portico and clock tower, the Reformed Church (1837) in Neoclassical style, and the Gothic Revival Roman Catholic Cathedral (1885) built in wood[77].

[77] https://whc.unesco.org/

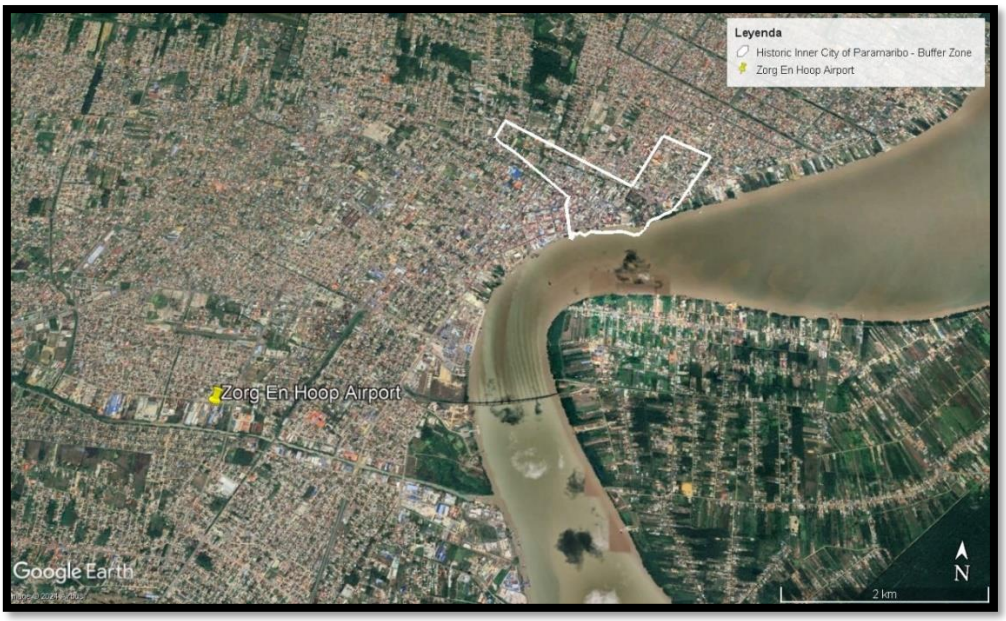


Figure 34 - Historic Inner City of Paramaribo buffer zone and Zorg En Hoop Airport. Source: Prepared by the author

As for the Johan Adolf International Airport, located in Zarendij it is 23,3km away from the nearest cultural heritage site, the Jodensavanne Archaeological Site. This UNESCO world heritage site is located on high ground on the densely forested banks of the Suriname River, it is a serial property that illustrates early Jewish colonization attempts in the New World. The Jodensavanne Settlement, founded in the 1680s, includes the ruins of what is believed to be the earliest synagogue of architectural significance in the Americas, along with cemeteries, boat landing areas and a military post. The Cassipora Creek Cemetery is the remnant of an older settlement founded In the 1650s. Located amidst indigenous territory, the settlements were inhabited, owned and governed by Jewish people who lived together with free and enslaved persons of African and indigenous descent. The settlements had the most extensive arrangement of privileges and immunities known in the early modern Jewish world.

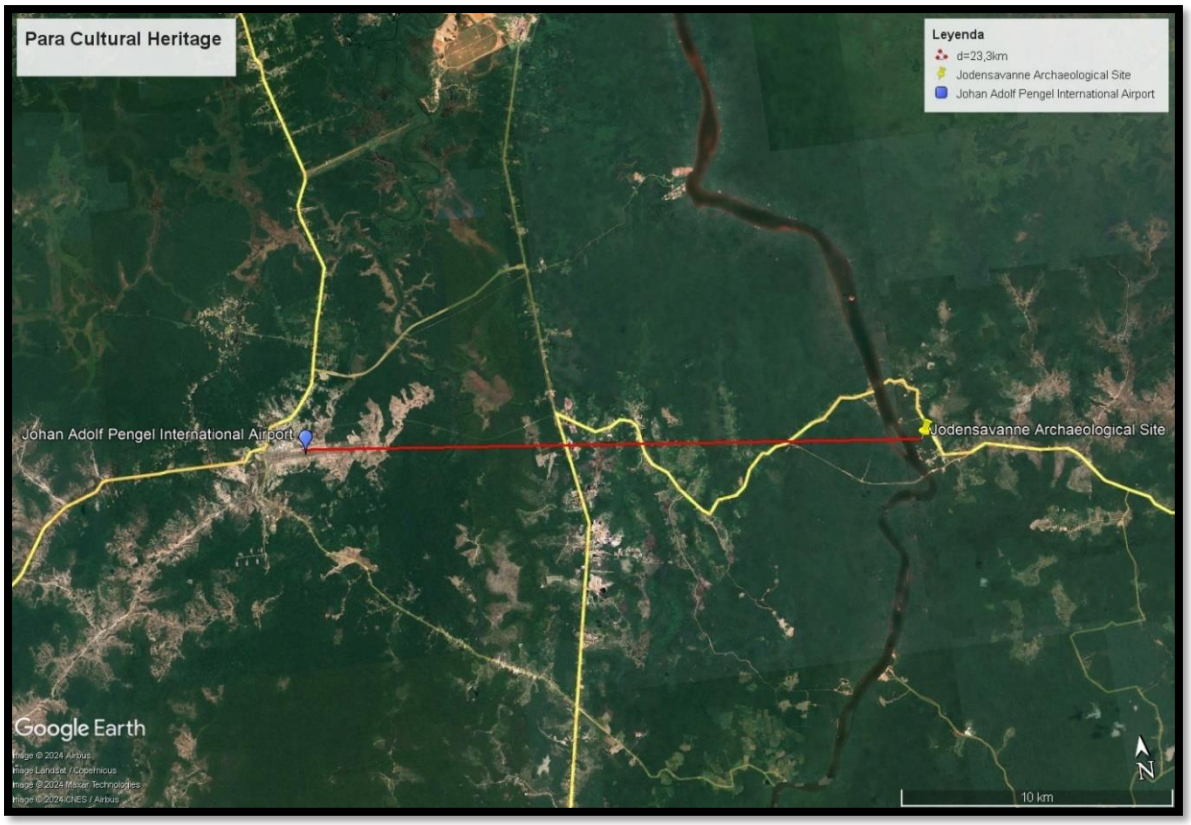


Figure 35. Location of Jodensavanne Archeological Site. Source: Google Earth and UNESCO, 2024.

In the case of Kwamalasamutu, the closest archaeological site is **Werephai Cave**, an archeological site located 12,2km northeast along the Maripa River with petroglyphs dating back to 3000 B.C.

Figure 36. Werehpai Cave with more than 313 petroglyphs, estimated to be over 3.000 years. Source: Conservation International, November 2007.

More than 300 drawings of human and animal figures from the spirit world of the Amerindian people can be seen on the granite rocks. The Drawings on the stone resemble Maya figures. It is believed that the stones were used as ritual spaces, dwellings or hiding places by indigenous tribes in the past.

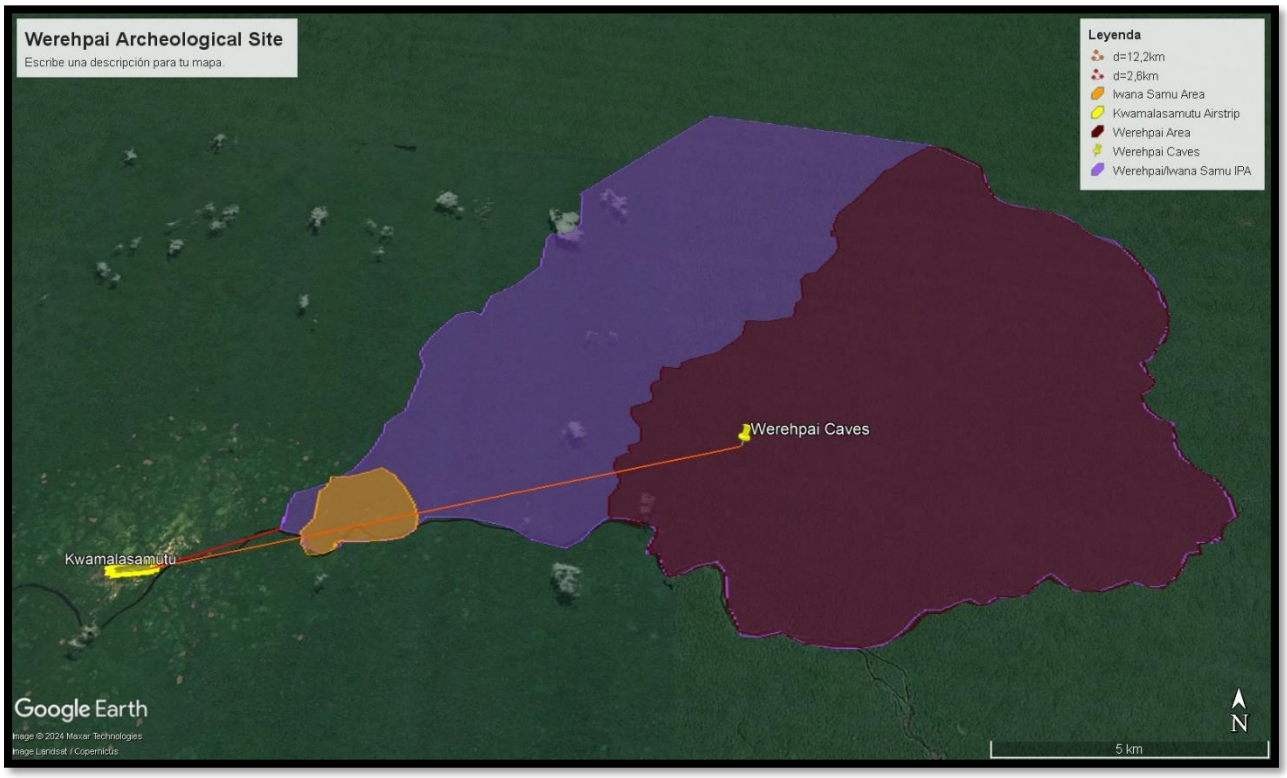


Figure 37. Location of Werehpai/Iwana Samu Protected Areas and Kwamalasamutu. Source: PlanEHS from Conservation International, 2010.

With the aid of the Global Conservation Fund, the site was developed into two sanctuaries or Indigenous Protected Areas (IPAs) around the petroglyphs. The local foundation, Stichting Meu, was assigned the responsibility by the Pata Entu (chief) of Kwamalasamutu for development and management of protected areas. At the same time, the Interamerican Development Bank (IDB) and Japan Fund established a community tourism lodge in Iwana Samu to generate funds required to sustain effective management of the protected areas. In 2007, the two separate sanctuaries were joined into one protected area, the Werephai/Iwana Samu Protected Area, and placed under management of Stichting Meu[78]. Kwamalasamutu is located approx.. 2,6km from the protected areas.

The total area is now ca. 18.000ha and bushmeat hunting is prohibited in the Iwana Samu sanctuary to promote sustainable wildlife populations. Conservation International drafted a report recommending that the site be proclaimed a national heritage site and that the lands indicated as Indigenous Protected Areas be officially issued to the village council of Kwamalasamutu under the Forestry. At present time, a decision has been postponed until the larger national issue of tribal lands is resolved, Suriname is the only remaining country in South America that has yet to enshrine Indigenous land rights in its constitution.

[78] Conservation International. (2010). A Rapid Biological Assessment of the Kwamalasamutu region, Southwest Suriname: 29.
https://doi.org/10.1896/054.063.0119

4.6.8. Gender analysis

In Suriname, gender inequality remains a significant issue despite some progress. The country ranks 95th out of 144 countries in the Global Gender Gap Index, as of 2016, showing a drop from previous years. This index measures disparities in economic participation, education, political empowerment, and health outcomes between men and women. Although the government has made commitments to international frameworks like the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) and the Beijing Declaration, gender gaps persist across various sectors.

One of the challenges in addressing gender inequality in Suriname is the lack of reliable and gender-sensitive data. Data collected by agencies tend to be sex-disaggregated, focusing on quantifiable differences between men and women, rather than exploring deeper gender-related issues, such as societal attitudes or the root causes of gender-based violence. This hampers the development of effective policies to address gender disparities, especially in underrepresented districts outside the capital

According to the Global Gender Gap Index for 2018 [79], Suriname scores well in the field of education with a gender parity of 0.991, and in the field of health with a gender parity 0.973. However, in terms of economic participation and opportunities, the gender parity score is significantly lower at 0.638Other areas where women lag behind men include wage disparity, labor market participation, higher unemployment rates, engagement in higher-paying sectors, and completion of vocational training

The 2016-2017 Living Conditions Survey in Suriname reveals that women's labor force participation is only 43%, compared to 68% for men in urban areas. Furthermore, just 1% of men aged 15-64 engage in unpaid care and domestic work, whereas 19% of women are involved in such activities. Remarkably, 98% of those performing unpaid care and domestic work are women

Violence against women is a critical concern in Suriname. The country ratified the Belém do Pará Convention, which is dedicated to preventing and addressing violence against women in the Americas. However, reports indicate that domestic violence, including intimate partner violence, remains prevalent, with a high number of women reporting physical and sexual abuse. Social norms, stigma, and limited access to justice exacerbate the situation, as many cases go unreported or unaddressed. There are legal mechanisms in place, but their enforcement and reach remain insufficient

Efforts to empower women and close the gender gap have been hindered by both economic and social barriers. Women in Suriname, especially those in rural and indigenous communities, face higher levels of unemployment and economic marginalization. Although female representation in higher education has improved, with women outnumbering men in universities, their participation in the labor market and political sphere remains significantly lower. For instance, women hold only 14.7% of seats in Suriname's National Assembly.

4.7. Direct Area of Influence Baseline

Below is a succinct description of the Direct Area of Influence of each project, accompanied by corresponding photographs showcasing these areas.

[79] WEF. (2018). Global Gender Gap Report 2018. World Economic Forum (WEF).

4.7.1. Kwamalasamutu Airstrip

Figure 38 - Kwamalasamutu airstrip and surronding area. Source: Prepared by the author.

Kwamalasamutu Airstrip is in Kwamalasamutu, Suriname, a Trio Village in the south of Suriname in the Sipaliwini District which can be accessed only by the airstrip or by boat (Sipaliwini River).

As it can be seen in the figure, the landing strip is in an area of dispersed houses, 150m away from the community's center where the gathering buildings are located, accessed by a bridge that is situated over a stream. The airstrip features an unpaved surface with visible patches of grass and exposed bare soil throughout the runway. There is significant degradation of the surface, with an uneven terrain and potholes. During the field visit, it was expressed by the community that it itself handles the maintenance of the airstrip, which entails the cutting of grass and vegetation. These activities usually were performed with machines; however, they are not currently operational due to maintenance issues. Because of this, the maintenance of the airstrip and its Right of Way is being done manually with hand tools and extensive labor.

Figure 39. Kwamalasamutu Airstrip conditions: unpaved, uneven, with patches of grass and bare soil. Source: PlanEHS, 2024.

The village is surrounded by scattered low savanna bushes. The Sipaliwini River runs close to the southern boundary of the town and the airport. About 400 m southbound from the airport, there is a school located. Moreover, about 50m north of the airstrip there is a health center that practices traditional medicine.

During the flight to the village, small and medium scale mining activities were observed, however no activity was visible in the vicinity of the community.

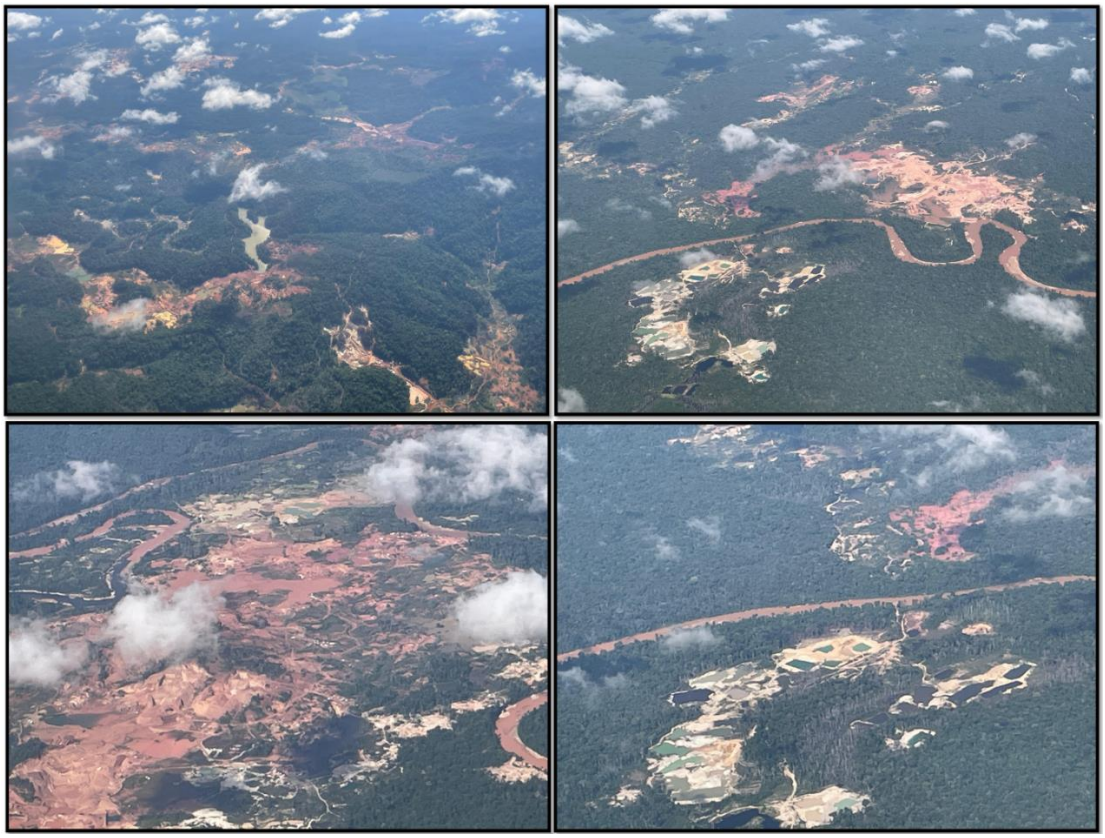


Figure 40. Mining acitvities observed during flight to Kwamalasamutu. Source: PlanEHS, 2024.

Figure 41. Mining Operations Observed during the flight to Kwamalasamutu. Source: PlanEHS, 2024.

The village possesses, as it was said during the visit, a power generator that provides electricity to all the village (although it is often not used due to the lack of fuel). Water is accessed via underground water wells, which are run by a pump that is connected to solar Pannels (it is commented during the visit that the pump can be operated by the power generator, but they often lack fuel, and they must wait for the solar Pannels batteries to charge). There were also several rainwater collection systems in place throughout the village.

When asked about waste management, it was informed that most of the wastes in the village are burnt. They used to **bury** their waste; however, they have since changed tactics due to the extensive labor required for waste burying. Special considerations should be made so as to identify and not disturb former waste burial sites in the context of the project. No other environmental or social liabilities were observed during the visit.

Figure 42. Signs of waste burning in Kwamalasamutu Village. Source: PlanEHS, 2024.

Figure 43. Rain water catchement systems for water. Source: PlanEHS, 2024.

Figure 44. Bridge connecting residential area with the airstrip. Source: PlanEHS, 2024.

Figure 45 - Kwamalasamutu Village and airstrip: bridge that connects the town with the airstrip. Source: Google Images

Figure 46. Traditional medicine health center located approx 50m from airstrip. Source: PlanEHS, 2024.

Figure 47. Main gatherings building (right), houses surrounding it and electricity poles. Source: PlanEHS, 2024.

As it has been mentioned before, the station building of the airstrip shows signs of extreme deterioration: there are multiple humidity and Mold stains on the roof due to leaks, there are

structural wooden beams underneath the station that show evidence of wood rot and insects (which could affect the load-bearing capacity and overall integrity of the structure). Moreover, the old communication system present is no longer operational. It is indicated that, to communicate with the pilots flying the aircrafts, they use cell phones.

The community also stated the need for a bigger warehouse facility, the existing one is lacking any security measures (in terms of fuel and hazardous substances storage), and they require extra room to store fuels for machinery, machinery to cut grass and maintain the airstrip and hand tools. In relation to the maintenance of the airstrip, it is also stated that the machines they possess are not operational due to lack of fuel provided by LVT and issues with their batteries.

Figure 48. Station building signs of deterioration. Source: PlanEHS, 2024.

Figure 49. Warehouse, storage room for maintenance of airstrip (fuel, machinery, tools). Source: PlanEHS, 2024.

Figure 50. Non operational communication system in Station Building. Source: PlanEHS, 2024.

4.7.2. Zorg En Hoop Airport

Figure 51 - Zorh En Hoop Airport and surronding area. Source: Prepared by the author.

Zorg en Hoop Airport is a small domestic airport located in the Paramaribo District, within the city of Paramaribo, Suriname's capital. It primarily serves regional flights to the interior of the country and neighboring nation, Guyana and French Guyana[80]. The airport is used by small aircraft and is a vital hub for flights to remote areas, particularly villages in Suriname's interior, which are otherwise difficult to access due to dense rainforests. In fact, almost all flights to and from the airstrips in the interior part from this airport, possessing 13,000 yearly movements and considered the most important airstrip for domestic flights. Approximately 2 kilometers east of the airport is the Suriname River.

The airport does not receive night flights, it only operates during the day and closes after 7pm. Currently, there are between 40 and 78 flights per day, 2-14 passengers per flight, according to what was said during field visits.

[80] ILACO, 2023, Diagnosis Report: Identification of required maintenance and repair actions on productive rural roads, bridges and grasshopper airstrips.

Figure 52 - Zorg En Hoop Airport. Source: airplane-pictures.net

Figure 53 - Zorh En Hoop Airport and surronding institutions. Source: Prepared by the author.

As can be observed in **Figure 53**, the surroundings of Zorg En Hoop Airport in Paramaribo are characterized by a mix of residential, educational, and recreational facilities. The entrance to the international terminal is bordered by a channel of water, which seems to be a part of the urban drainage system. To the north of the airport lies Annette's Hof Cemetery and Rusthof Cemetery, a Children's Home, the Huize Albertine Retirement Center, and a school, all marked within a short distance from each other and in a 100-meter radius from the aerodrome. To the south of the airport, there are mainly residential areas interspersed with essential community services. To the east, a sports center and a primary school can be observed.

Figure 54. Zorg en Hoop Airport: (a) International Terminal Entrance with channeled water; (b); houses close to the airstrip (left); (c); surrounding Cementery and road; (d) surrounding houses in close proximity. Source: PlanEHS, 2024.

There were no environmental liabilities detected near the landing strip during the field visit, however proper hazardous substance and waste management are to be considered during construction and operation phase of the project due to the nature of the project (upgrading existing facilities) and use of these substances in regular operation. Moreover, there were fuel tanks situated in close proximity to a residential house, noticed during field visit and picked up on news articles regarding the threat it could pose to neighbors[81].

[81] https://www.dbsuriname.com/2024/05/09/is-rapport-over-veiligheid-vliegveld-zorg-en-hoop-uit-februari-2023-in-een-la-beland/

Figure 55. Location of fuel tanks on the north side of the Airport, adjacent to residential homes. Source: PlanEHS, 2024.

In terms of social liabilities, apart from the presence of fuel tanks close to homes that could be a focal point for conflict, there have been none identified. However, there should be an assessment on the noise levels in and around the residential areas adjacent to the airport in order to determine the possible environmental liability from surpassing the allowed levels and social conflicts due to the disturbance. Moreover, the runway safety inspection report made by LVT on September 8th 2023 indicates that the airstrip does not meet safety requirements.

In terms of overall operation, the airport needs a new and modern radio communication system. There are almost no functional radio towers in the interior. A new integrated system would greatly improve direct contact for civilian and government use. Current communications are dependent on commercial telecom providers. With spotty connection at best. A new radio network would allow communication hopping, allowing military and police units to better investigate mining related crimes and the search for suspects. This would also assist the prosecutor's office in tracing the location of suspects for crimes in the interior.

The airport has full water and energy infrastructure, however there are no back-up or emergency facilities such as solar electric systems. Moreover, almost all buildings are in poor conditions and in need of repairs.

Figure 56. Signs of deterioration in Zorg en Hoop Airport buildings. Source: PlanEHS, 2024.

Noise Level Assessment

To assess the baseline noise levels in the areas surrounding the Zorg en Hoop Airport, especially around the residential areas adjacent to the airstrip.

Methodology

Measurements were taken on the north side of the airport at Doekhieweg, the south side at the Parastraat and the east side at the Coesewijnestraat.

Figure 57. Location of noise level sampling points. Source: Google Earth, 2024.

Using a HTI HT-80A Sound level Meter (factory calibrated for professional use) 4 walkabout were done at 08:30s, 11:20, 13:10 and 15:22 on the days 23 and 24th October 2024.

Results (lowest and highest values)

Doekhieweg (Gum Air): 55 to 78 dB

Parastraat: 52 to 73 dB

Coesewijnestraat: 56 to 91 dB

Discussion

Doekhieweg and the Parastraat have high dB averages in the morning between 08:00 and 09:00 hours during the morning rush. At the air-line check-in (Doekhieweg) there is constantly more traffic and average high dB during the day. This coincides with what is expected from a high use commercial area. The Parastraat is mostly residential area and high sounds come from peak traffic hours in the morning, midday and during take-off and landings.

The Coesewijnestraat has consistent higher dB from early morning to late in the afternoon. This is expected from a high-traffic and fast-traffic area.

During takeoff the noise is clearly noticeable, but the dB does not exceed the regular traffic peak. There is a longer high peak ranging about 2-3 minutes. During landing there is an equal high peak lasting about 1-2 minutes. The length of the sound peaks coincides with the engine start and shut-off. The highest dB, 91, was measured at the Coesewijnestraat during take-off.

Conclusion

Although very noticeable the airfield does not contribute as much to the over-all noise pollution compared to the regular traffic. Landing and take-off during the night might give a more noticeable effect due to lack of back-ground traffic noise. Some complaints should be expected during nighttime operations.

There are no direct houses/businesses in the area with the highest dB measurements (Coesewijnestraat). This area is allocated for emergency landings as an extension of the runway.

Remarks and Recommendation

No interviews/polls were taken to assess the noise experience of people living nearby. Their experience regarding the noise pollution may vary greatly depending on the living conditions, construction type of the homes and their location towards the actual used runway.

Dust or Particulate matter may also increase due to airfield use. This was not tested, but it was observed.

A thorough noise study could be done at a later stage the estimate the effect of an all-weather airfield on the local population. This should have a technical and social component. Based on those results noise absorbent measures can be included into the project if deemed necessary or viable.

4.7.3. Johan Adolf Pengel International Airport

Figure 58. Johan Adolf Pengel International Airport location. Source: PlanEHS, 2024.

The Johan Adolf Pengel International Airport (PBM), also known as Zanderij Airport, is the main international airport of Suriname, which handles jet-engine powered regional and international flights. It is situated in the Para District, approximately 45 km south of Paramaribo, the capital city.

The airport is located near Zanderij village (green dot), with a school located at approx. 500m west of the airstrip (O.S Zanderij, yellow dot). There are also visible houses that seem to be abandoned located approx. 500m from the airstrip. The airports departure terminal is surrounded by cafés and restaurants.

Satellite imagery also shows possible agriculture production surrounding southside of the airport, which is consistent with the rural region the airport is in (Para district). This region is also identified as the Hollandse Kamp (white dot), an indigenous community of the area.

There is another indigenous community close to the airport, Wit Santie, located alongside the Kennedy Highway, the main connection between the airport and the city of Paramaribo.

The airport is situated in the Old Coastal Plain and thus underlain by the Zanderij sands and surrounded by a drainage system that drains excessive water via ditches towards the large northwest-situated Coropina creek and the southeast-situated Para River, which finally discharges into the Suriname River. The drainage system consists of a main canal around the airport runway and artificial ditches and creeks along both sides of the runway[82].

There were no visible environmental liabilities during the visit, however there was noticeable waste surrounding the departure terminal. During revision of existing information, there were no social liabilities identified related to the airport.

[82] P-all Consultants N.V. (2019). Environmental and Social Impact Assessment (ESIA) Expansion of the J.A. Pengel International Airport Project Suriname.

Figure 59. Departure terminal and communications tower of Johan Adolf Pengel International Airport. Source: PlanEHS, 2024.

Figure 60. Cafés and restaurants outside Departure Terminal in Johan Adolf Pengel International Airport. Source: PlanEHS, 2024.

Figure 61. Houses located aprox. 500m from the airport. Source: PlanEHS, 2024.

Figure 62. O.S Zandarij school located 500m from the Johan Adolf Pengel International Airport. Source: PlanEHS, 2024.

Figure 63. Businesses and houses located 500m from Johan Adolf Pengel International Airport. Source: PlanEHS, 2024.

Figure 64. Waste observed around the Departure Terminal in Johan Adolf Pengel International Airport. Source: PlanEHS, 2024.

Some of the buildings in the airport show signs of deterioration and/or are subject to maintenance and refurbishment activities, as it was seen during the site visit.

Figure 65. Conditions of the Departure Terminal in Johan Adolf Pengel International Airport. Source: PlanEHS, 2024.

5. Environmental and Social Impacts and Risks

This chapter describes the potential environmental and social impacts and risks for the infrastructure projects (Component 3) of the Essential Air Transport Service for remote communities in Suriname Program (SU-L1071), on the physical, biological, and socioeconomic environment.

5.1. Methodology for the Impact and Risk Assessment

5.1.1. 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, because 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.

5.1.2. 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 improvements and upgrades to aerodrome facilities, which are considered to have a long service life. These enhancements, including the construction of new structures, installation of advanced aeronautical equipment, among others, are designed to be permanently incorporated into the service provider's assets. Therefore, the decommissioning or abandonment stage **was not considered for the impact assessment**.

5.1.3. 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. Transportation, movement and stockpiling of materials, equipment, and machinery. Labor mobilization.
B. Worker camps installation and operation. Fencing in camps and construction fronts.
C. Land clearing, dismantling of facilities (where applicable).

Main work

D. Rehabilitation of existing facilities (demolition, removal of damaged structures, refurbishment).
E. Installation of Aeronautical Equipment.
F. Debris disposal, and final adjustments.

Work demobilization

G. Demobilization of construction sites and workers. Removal of surplus materials.

Project Activities in the Operational Phase

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

H. Operation of renewed and newly installed infrastructures.
I. Maintenance of renewed and newly installed infrastructures.

5.1.4. 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),
6. Wildlife.

Socioeconomic Environment

7. Infrastructure and services. Road network and traffic.
8. Infrastructure and services. Mains services.
9. Infrastructure and services. Waste Management. Municipal solid waste.
10. Infrastructure and services. Waste Management. Special and hazardous waste.
11. Infrastructure and services. Waste Management. Construction and demolition waste.
12. Occupational and Community Health and Safety. Risk of occupational and community accidents
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.

5.1.5. 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. The analysis is comprised of two distinct phases, described as follows.

Common E&S Impacts and Risks

Initially, an assessment was undertaken to evaluate the collective environmental and social impacts and risks common across all projects. This evaluation was graphically represented using a **matrix** format.

The matrix 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 **(Table 25).**
3. **Impact Scope**: indicates whether it is a restricted impact (effect restricted to the Operational Area - OA), local (effect located within the Direct Area of Influence - DAoI), or extended (if it impacts neighboring areas, in 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 with respect to existing or potential projects will be analyzed.

Table 25 provides definitions that serve as a basis for determining the magnitude of the impact.

Table 37. 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	It is defined as one of long duration (persisting over several generations), or one that affects a definable group of

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

Specific E&S Impacts and Risks

Individualized assessments were conducted for each project. These specific analyses delved into the unique and **particular impacts of each project**, focusing on their distinct environmental and social effects.

During this stage of the assessment, the findings of the analysis were articulated and presented in a narrative structure, providing a specific section for each Project.

5.1.6. Mitigation Measures Identification

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

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.

5.1.7. 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.

5.1.8. 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**).

5.2. E&S Impact Assessment General Matrix

5.2.1. E&S Impact Matrix

As a first approach to the analysis, a matrix was prepared to identify environmental and social impacts and risks **common to all projects**. The matrix contains the sign and magnitude of the impact. This matrix is presented in **Figure 33**.

Matrix for the Identification of Environmental and Social Impacts and Risks

Essential Air Transport Service for remote communities in Suriname Program (SU-L1071)

				PROJECT ACTIVITIES WITH ENVIRONMENTAL AND SOCIALIMPACT	Construction phase							Operational Phase	
					Work preparation			Main Work			Work demobilization	Operation	Maintenance
					Transport, movement and stockpiling of materials, equipment, machinery. Labor transportation.	Worker camps installation and operation. Fencing in camps and construction fronts.	Land clearing, dismantling of facilities (where applicable)	Rehabilitation of existing facilities (demolition, removal of damaged structures, refubrishment).	Installation of Aeronautical Equipment.	Debris disposal, and final adjustments.	Demobilization of construction sites and workers. Removal of surplus materials. Camps closure.	Operation of renewed and newly installed infrastructures.	Maintenance of renewed and newly installed infrastructures.
ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED BY THE PROJECT					A	B	C	D	E	F	G	H	I
PHYSICAL MEDIA	AIR	Gaseous emissions and particulate matter		1									
		Noise and vibrations		2									
	WATER	Water table and groundwater. Surface Water		3									
	SOIL	Soil		4									
BIOLOGICAL MEDIA	BIOTA	Flora		5									
		Wildlife		6									
SOCIO-ECONOMIC MEDIA	INFRASTRUCTURE and SERVICES	Road network and traffic		7									
		Main Services (water, sewage, energy, gas)		8									
		WASTE MANAGEMENT	Municipal Solid waste	9									
			Hazardous or special waste	10									
			Construction and demolition waste	11									
	OCCUPATIONAL AND COMMUNITY HEALTH AND SAFETY	Risk of accidents (occupational, road, community accidents)		12									
	SOCIO-ECONOMIC DEVELOPMENT	Labor employment. Commercial and service activities.		13									
	CULTURAL HERITAGE	Cultural, Archaeological and Paleontological Heritage		14									
	LAND USE	Land Use and Activities in the Area. Residential Use		15									
	LANDSCAPE	Visual impact. Landscape perception		16									

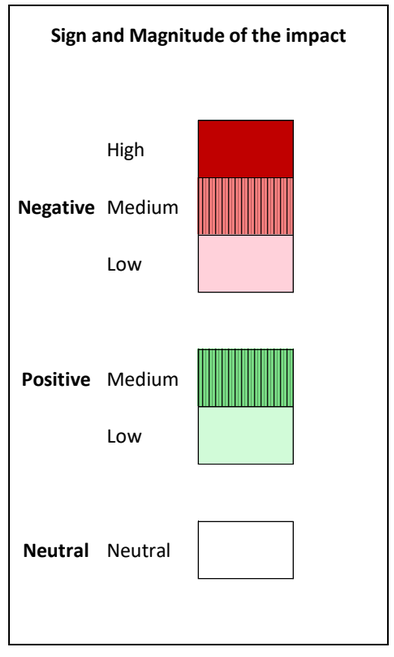


Figure 66. Project Environmental and Social Impacts and Risks Matrix

5.2.2. E&S Impact 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	Local (DAoI)	Extended (IAoI)
Duration	Transitory	Permanent	
Probability	Low	Medium	High
Accumulation	Non-cumulative	Cumulative	

Impact Discussion

During the construction phase, various activities like setting up worker camps, storing materials, moving machinery and vehicles, preparing the site, clearing land, dismantling old facilities, excavating, moving soil, and constructing new infrastructure typically leads to the release of particulate matter and emissions from combustion engines. These emissions contribute to air pollution, which is considered negative in impact. This is of particular importance due to the presence of sensitive receptors in some of the project areas (schools located in the vicinity of PBM and SMZO and health center of Kwamalasamutu).

However, these effects are relatively minor (low magnitude), limited to specific areas (regional~~punctual~~) directly influenced by the construction activities, and temporary, occurring solely during the construction phase (transitory).

Mitigation Measures

- **Covered Transportation and Material Handling:** All materials prone to generating dust will be transported in vehicles equipped with tarpaulins and maintained at adequate humidity levels to minimize dispersion during transit. Additionally, during on-site stockpiling, regular wetting of materials susceptible to dust generation will be enforced. Efforts will be made to minimize stockpile quantities, wherever operationally feasible, to reduce potential emissions.
- **Road and Site Maintenance:** To control dust emissions from roads lacking an asphalt layer, a regular watering schedule will be implemented, ensuring these surfaces are dampened at least twice a day. Furthermore, the speed of construction vehicles using access roads without asphalt will be regulated and limited (ranging from 20 to 40 km/h depending on specific conditions) to decrease dust agitation and dispersion.
- **Dust Control during soil Extraction:** When excavating or moving soil, measures will be taken to mitigate dust emissions. This will include the application of water or other appropriate suppressants to the material during extraction to minimize airborne dust.

- **Machinery Maintenance and Compliance:** Regular maintenance checks and technical verifications will be conducted to ensure construction machinery remains in good working condition. This proactive approach not only minimizes emissions but also ensures compliance with environmental standards and regulations.

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	Local (DAoI)	Extended (IAoI)
Duration	Transitory	Permanent	
Probability	Low	Medium	High
Accumulation	Non-cumulative	Cumulative	

Impact Discussion

During the construction phase, several activities—such as setting up worker camps, storing materials, moving machinery and vehicles, preparing the site, clearing land, dismantling old facilities, excavating, moving soil, and constructing new infrastructure—typically generate noise and vibrations due to the use of machinery and equipment. This is of particular importance due to the presence of sensitive receptors in some of the project areas (schools located in the vicinity of PBM and SMZO and health center of Kwamalasamutu).

These impacts are of low magnitude since the interventions will be carried out in airports, which are areas where noise is typically prevalent. The impact is limited to the project areas directly affected by the construction activities (local~~punctual~~) and is transitory, occurring solely during the construction phase.

Mitigation Measures

- Implementation of an **Information and Community Participation Program** within the Environmental and Social Management Plan (ESMP) to disseminate detailed information to neighboring communities regarding the duration and scheduling of construction works and transparent communication to manage community expectations.
- Careful **scheduling of high noise-generating activities** in collaboration with the community, to avoid impacts during sensitive hours, and prioritizing times that minimize disturbance to residents.
- **Regular inspections and upkeep of construction machinery and equipment** to maintain optimal condition and mitigate noise emissions originating from the equipment.
- **Adherence to established noise guidance levels and standards**, implementing IFC Guidelines, (noise levels of 55 dBA during the day and 45 dBA at night) and/or compliance with specific noise-related legislation at national and local levels.

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	Local (DAoI)	Extended (IAoI)
Duration	Transitory	Permanent	
Probability	Low	Medium	High
Accumulation	Non-cumulative	Cumulative	

Impact Discussion

Construction activities can potentially cause adverse effects on the water table through various mechanisms. Accidental spills, such as those involving hydrocarbons, oils, or other chemical substances used on-site, pose a significant risk, especially in areas that are close to bodies of water. Additionally, inadequate effluent management during construction operations, encompassing sanitary effluents or mixer washing residues, can further contribute to this issue.

Moreover, natural site drainage and surface runoff undergo alterations in projects entailing soil cleaning, movement, and removal of vegetation cover. These modifications disrupt the natural flow patterns and exacerbate the impact on water sources. Moreover, they can reduce the water quality of the areas, affecting the ecosystem service for the adjacent populations.

The impacts and risks associated with these interventions are negative but low in magnitude. These interventions constitute small-scale works and are implemented within previously intervened areas. Furthermore, these impacts are transitory, arising solely during the construction phase of the project.

Mitigation Measures

- Implement an **Effluent Management Program** that:
  - Identifies and categorize all potential sources of effluents,
  - Incorporates specific protocols for handling different types of effluents (domestic, construction, stormwater runoff) to ensure their proper containment, treatment, and disposal, and
  - Includes regular monitoring, testing, and treatment of effluents discharged from the construction site.
- Provide portable toilets to workers, with efficient waste management systems that minimize the release of pollutants into the environment and/or low-water-consumption sanitation solutions to decrease the overall water usage and environmental impact.
- Implement recycling systems for wastewater from sanitation facilities, where feasible, through greywater treatment for non-potable uses like irrigation or construction purposes.
- Implement erosion and sediment control measures to minimize the introduction of sediment-laden runoff into water bodies.
- Conduct regular training sessions for construction personnel on the proper handling, storage, and disposal of potentially harmful substances to prevent accidental spills or leaks.

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	Local (DAoI)	Extended (IAoI)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

Construction activities such as the storage and handling of construction materials, machinery operations, and overall construction practices pose potential risks of soil contamination. This may arise from oil and hydrocarbon spills, mismanagement of sewage effluents, or improper disposal of solid construction waste.

Furthermore, processes like land clearing, soil movement, drilling, excavations, demolition, and subsequent filling can inevitably degrade soil composition. These activities often result in adverse effects such as erosion, compaction, and alterations in the natural sequence of soil layers (edaphic sequence). Soil stockpiling during excavation stages can lead to sediment runoff, particularly impacting nearby water streams and courses, a risk further amplified during flooding or tropical storm events.

These identified impacts, while negative, typically exhibit low magnitude and transitory nature as they occur solely during the construction phase, localized within the immediate project area. ~~(punctual)~~.

Unlike the temporary effects, these alterations are permanent, persisting throughout the entire lifespan of the project. They also manifest as negative impacts of low magnitude, primarily affecting areas that have already been intervened in or degraded and remain localized within the project's direct influence area (regional~~punctual~~).

Mitigation Measures

- Establish a **Hazardous Materials Management Program** that includes:
  - Containment Protocols: Implement containment measures for chemical storage areas to prevent leaks and spills from reaching the soil.
  - Regular Inspections: Schedule routine inspections of storage areas.
  - Spill Response Training: Conduct comprehensive training for all personnel on spill response protocols, emphasizing immediate containment, reporting, and clean-up procedures.
- Establish a **Contingency Plan** that incorporates periodic drills to ensure the effectiveness of spill response actions outlined in the plan and includes regular revisions and updates based on lessons learned from drills or past incidents.
- Implement an **Effluent Management Program** that incorporates specific protocols for handling different types of effluents and ensures frequent servicing and maintenance of sanitation systems to prevent leaks or spillages that could affect the soil.

- Implement **Erosion Control Measures**. Use weather forecasting to anticipate strong storm events and take proactive measures like covering soil stockpiles with reinforced and securely anchored tarpaulins ahead of severe weather.
- Establish a **Tools and Machinery Maintenance Protocol.** Efforts will be made to avoid on-site tool and machinery washing. When such washing is unavoidable, cleaning areas will be designated and equipped with containment measures to prevent the washing of tools and machinery from affecting the surrounding soil. Explore and encourage the use of eco-friendly cleaning agents to minimize environmental impact.
- Adopt an integrated approach for pest and vector control that includes prevention strategies, monitoring, and targeted interventions to **control pests without causing harm to the soil** or surrounding environment.
- During the design phase of paving projects for streets and public spaces, priority will be given to incorporating **alternatives that minimize complete surface waterproofing**, such as permeable pavements or reticulated pavements. Additionally, only native vegetation will be allowed within landscaped areas.

Residual Impact

The residual impact remains low.

Flora and Wildlife

Impact Assessment

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

Impact Discussion

The rehabilitation of the Kwamalasamutu aerodrome could involve vegetation removal, affecting tropical rainforest and savanna habitats. This area supports diverse fauna, including species like capybaras, giant anteaters, and several bird species. Notably, it hosts species listed on the IUCN Red List such as the White-lipped Peccary, Jaguar, Guianan Spider Monkey, and Giant Otter. This process may disrupt the local fauna and pose an additional risk of wildlife being harmed by vehicular movement and construction equipment. Moreover, the community relies on agriculture for food production. However, since the interventions are small and they are mostly centered in already intervened areas used for the operation of the airstrip, no impact is expected on this ecosystem service.

The surrounding area of Zorg en Hoop features significant mangrove cover, primarily Red mangroves, with smaller areas of Black mangroves. However, the planned interventions are small in scale, and therefore, no significant impacts are expected at this site.

Johan Adolf Pengel International Airport is in a rural area, with noticeable agriculture and forestry production, a vital ecosystem service for the adjacent population of the airport. However, due to the

small-scale interventions and their location (inside the airport), no significant impacts to this service are expected.

These identified negative impacts are medium in magnitude and are confined to specific locations within the direct influence area of the project (localpunctual). These alterations are transitory in nature.

Mitigation Measures

- Implement a **Flora and Fauna Management Program** that includes specific guidelines tailored to mitigate impacts on flora and fauna, emphasizing the importance of preserving and protecting native biodiversity.
- Prioritize the retention of mature and significant trees, with clear criteria for removal only when necessary, following the mitigation hierarchy. Compensatory measures should include planting indigenous tree species in nearby areas and guarantee no net loss of biodiversity.
- Develop proactive communication channels with adjacent communities to disseminate information about the planting initiatives, with the aim of engaging neighbors in the preservation of local vegetation.
- Strictly prohibit the introduction of invasive plant species into the project area. Conduct regular inspections and implement measures to prevent their inadvertent introduction or spread, ensuring that only native species are used in landscaping and rehabilitation efforts.
- Implement specific measures for fauna's habitat restoration, such as the installation of nesting boxes or shelters to support the local fauna population.
- Conduct periodic audits to ensure compliance with the Vegetation and Fauna Management Program, making necessary adjustments based on monitoring results and feedback from stakeholders.
- Provide comprehensive training to construction personnel on the importance of biodiversity conservation and the implementation of mitigation measures. Organize awareness programs for workers and local communities to foster a collective responsibility towards protecting flora and fauna.

Residual Impact

Residual impact is expected to be low with proper implementation of mitigation measures.

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	Local (DAoI)	Extended (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 related to the 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 most of the impact is on urban areas such as the Zorg en Hoop and Zarendij regions, impacts are classified as negative, low magnitude, localized in the direct influence area, and transitory in nature (only occurring during construction) for preparation and demobilization activities.

Mitigation Measures

- 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.
- Establish a Road Safety and Traffic Management Program in the ESMP.

Residual Impact

The residual impact is expected to result in low negative impact.

Waste Management

Impact Assessment

Impact Description	Contamination by improper disposal of solid waste		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted	Local (DAoI)	Extended (IAoI)
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.). 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.
- In the special case of Kwamalasamutu, if there is no waste disposal site, a plan for transportation to an appropriate site must be included, ensuring compliance with current regulations.

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	Local (DAoI)	Extended (IAoI)
Duration	Transitory	Permanent	
Probability	Low	Medium	High
Accumulation	Non-cumulative	Cumulative	

Impact Discussion

The execution of these tasks carries inherent risks, primarily of an occupational nature. These risks are attributed to the high-risk nature of various construction activities, encompassing excavations (with the potential for cave-ins and entrapment), electrical work, accidents involving heavy machinery, potential for hearing impairment due to noise-producing equipment, welding and hot work operations, as well as ergonomic hazards.

Additionally, Kwamalasamutu Airstrip is situated in a region with a low population density, posing a risk of encounters with potentially hazardous wildlife. This presents a significant risk to airport workers due to the potential for dangerous animal interactions, which could result in serious injury or health hazards.

In addition, in the case of the Zorg En Hoop and Johan Adolf International Airport, they are located in in densely populated area, with the presence of institutions such as schools and sports centers, which presents a risk of pedestrian and vehicular traffic accidents.

These impacts and risks are classified as negative, of medium magnitude for main work instances and low magnitude for work preparation and demobilization activities, and of a transitory nature (occurring during the work execution phase).

Mitigation Measures

- Implement an Occupational Health and Safety Program within the ESMP that aligns with current national and local regulations and incorporates elements from globally recognized occupational health and safety management systems (ISO 45001:2018).
- Develop a Socio-Environmental Training Program for on-site personnel in the ESMP, encompassing comprehensive training on personal protective equipment (PPE), work-related risks, contingency planning, safe handling of chemical substances, and related subjects.
- Establish a Road Safety and Traffic Management Program within the ESMP, aimed at proactively preventing road accidents involving the community, personnel and construction vehicles through measures such as safe driving practices and proper signage at work sites and detours.
- Create a Works Installation and Camp Set-up Program in the ESMP, ensuring the installation of fencing, access control, and appropriate signage at camp sites, work areas, ditches, and other relevant locations.
- Develop a Contingency Plan within the ESMP to ensure a swift and effective 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	Local (DAoI)	Extended (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.

These impacts are considered positive of low magnitude, of a transitory nature, and geographically distributed in the indirect influence area of the project, except for work demobilization period, where the impact is low negative due to the completion of the tasks.

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	Local (DAoI)	Extended (IAoI)
Duration	Transitory	Permanent	
Probability	Low	Medium	High
Accumulation	Non-cumulative	Cumulative	

Impact Discussion

The rehabilitation and improvement projects at Kwamalasamutu, Johan Adolf Pengel and Zorg En Hoop aerodromes will have impacts on land use and activities in the surrounding areas, particularly in terms of residential use and the dynamics of local communities. The construction activities and subsequent operational improvements may lead to temporary disruptions in flight schedules, affecting the connectivity and accessibility for residents who rely on air transport for essential services and supplies. These disruptions could impact the local economy and daily activities, causing inconvenience to the community.

In the case of Kwamalasamutu, the Werephai Cave archaeological site attracts tourists. The construction phase may disrupt the dynamics of these tourist visits due to a reduction in flights during the runway rehabilitation stages. Moreover, the construction phase of the project will most likely disturb the normal operation of the airstrip and may disrupt the use of it for essential services such as health care and supplies for the population of the village.

The impact is categorized as medium negative for the entire work. These impacts are of a transitory nature.

Mitigation Measures

- Implement an Information and Community Participation Program in the ESMP, which provides adequate communication to neighbors about the construction schedule, potential disruptions, and expected completion dates.
- Implement a phased construction approach to minimize disruptions in flight schedules. By staggering the construction activities, the aerodromes can maintain partial operations, ensuring that essential air transport services remain available for local residents.
- Ensure that emergency services have uninterrupted access to the aerodromes during construction. This is crucial for maintaining the safety and well-being of the local population, especially in remote areas like Kwamalasamutu.
- 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, 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

Residual impact is expected to be low with proper implementation of mitigation measures.

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	Local (DAoI)	Extended (IAoI)
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 because there is an archaeological site near to Kwamalasamutu Airstrip. The activities of soil movement 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	Local (DAoI)	Extended (IAoI)
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

Noise and vibration

Impact Assessment

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

Impact Discussion

Improvements to the airstrips could result in an increase in flight frequencies, which would elevate the noise levels. However, as noise is already present in the area, these changes are anticipated to have a low magnitude of negative impact, punctual, of medium probability and permanent.

Mitigation Measures

- Implement a noise monitoring program to track noise levels during operations.
- Optimize flight schedules to minimize noise during sensitive times, such as early mornings, evenings, and nights. Implementing restrictions on night flights can significantly reduce the disturbance to local residents.

By implementing these mitigation measures, the negative impacts of increased noise levels remain low.

Occupational and Community Safety

Impact Assessment

Impact description	Risk of accidents in maintenance tasks of the airports		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted	Local (DAoI)	Extended (IAoI)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The operation and maintenance of the renewed infrastructure gives rise to risks of accidents and occupational diseases. These can arise from exposure to energized equipment, ergonomic hazards, road safety hazards, etc. In addition, there is an inherent risk to passengers associated with air travel, although this risk becomes insignificant when appropriate safety measures are implemented.

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.

Economic development

Impact Assessment

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

Impact Discussion

The activities in operation and maintenance phase will require labor – skilled and unskilled – and services. This will have a positive impact on employment generation.

These impacts are considered positive, of low magnitude, of a permanent 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

Impact Assessment

Impact Description	Positive impacts on residential activity		
Impact Nature	Negative	Positive	Neutral
Magnitude	Low	Medium	High
Scope	Restricted	Local (DAoI)	Extended (IAoI)
Duration	Transitory		Permanent
Probability	Low	Medium	High
Accumulation	Non-cumulative		Cumulative

Impact Discussion

The optimization of operations for safe and efficient air transport services will significantly improve connectivity and accessibility for local communities. This real estate valuation is qualified as a medium 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.

5.2.3. E&S 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 the following table.

Matrix for the Identification of Environmental and Social Impacts and Risks

Essential Air Transport Service for remote communities in Suriname Program (SU-L1071)

ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED BY THE PROJECT			PROJECT ACTIVITIES WITH ENVIRONMENTAL AND SOCIALIMPACT	Construction phase							Operational Phase	
				Work preparation			Main Work			Work demobilization	Operation	Maintenance
				Transport, movement and stockpiling of materials, equipment, machinery. Labor transportation.	Worker camps installation and operation. Fencing in camps and construction fronts.	Land clearing, dismantling of facilities (where applicable)	Rehabilitation of existing facilities (demolition, removal of damaged structures, refubrishment).	Installation of Aeronautical Equipment.	Debris disposal, and final adjustments.	Demobilization of construction sites and workers. Removal of surplus materials. Camps closure.	Operation of renewed and newly installed infrastructures.	Maintenance of renewed and newly installed infrastructures.
				A	B	C	D	E	F	G	H	I
PHYSICAL MEDIA	AIR	Gaseous emissions and particulate matter	1									
		Noise and vibrations	2									
	WATER	Water table and groundwater. Surface Water	3									
	SOIL	Soil	4									
BIOLOGICAL MEDIA	BIOTA	Flora	5									
		Wildlife	6									
SOCIO-ECONOMIC MEDIA	INFRASTRUCTURE and SERVICES	Road network and traffic	7									
		Main Services (water, sewage, energy, gas)	8									
		WASTE MANAGEMENT – Municipal Solid waste	9									
		WASTE MANAGEMENT – Hazardous or special waste	10									
		WASTE MANAGEMENT – Construction and demolition waste	11									
	OCCUPATIONAL AND COMMUNITY HEALTH AND SAFETY	Risk of accidents (occupational, road, community accidents)	12									
	SOCIO-ECONOMIC DEVELOPMENT	Labor employment. Commercial and service activities.	13									
	CULTURAL HERITAGE	Cultural, Archaeological and Paleontological Heritage	14									
	LAND USE	Land Use and Activities in the Area. Residential Use	15									
	LANDSCAPE	Visual impact. Landscape perception	16									

Sign and Magnitude of the impact

Negative	High	
	Medium	
	Low	
Positive	Medium	
	Low	
Neutral	Neutral	

Figure 67. Project Residual Environmental and Social Impacts and Risks Matrix

5.3. E&S Impacts for Specific Projects

In addition to the previously mentioned impacts common among all projects, distinct and project-specific impacts have been identified. The unique impacts for each individual project (or type of project) are provided in detail below.

5.3.1. Kwamalasamutu

A Conservation International's Rapid Assessment Program (RAP) carried out a survey in 2010 in the Kwamalasamutu region to supply baseline data on biodiversity and water quality. The survey identified 15 species listed on the IUCN Red List of Threatened Species. These species play significant roles in the forest ecosystem as top predators and dispersers of large seeds. Additionally, some of these species are highly valued by the Trio people. Notable species include:

- White-lipped Peccary (Tayassu pecari): Listed as Near Threatened (NT).
- Jaguar (Panthera onca): Listed as Near Threatened (NT).
- Guianan Spider Monkey (Ateles paniscus): Listed as Vulnerable (VU).
- Giant Otter (Pteronura brasiliensis): Listed as Endangered (EN).

Construction phase activities could pose a risk of wildlife being run over or the alteration of their natural habitat. Moreover, this presents a significant risk to airport workers due to the potential for dangerous animal interactions, which could result in serious injury or health hazards. Based on this, the Environmental and Social Management Plan (ESMP) includes a Flora and Fauna Management Program, which outlines several key measures to mitigate the identified impacts.

Additionally, Kwamalasamutu is the largest Trio settlement, home to nearly half of the country's Trio population. However, since the project will be developed on previously intervened areas corresponding to the airport, no impacts on communities' lands are expected. The ESMP includes, as a complementary document, a Socio-cultural Analysis and Indigenous People Plan (IPP), where potential project impacts, and recommendations for mitigating adverse effects are presented. The document also outlines strategies for ensuring culturally appropriate consultations and establishing grievance mechanisms to address community concerns, including the Free, Prior and Informed Consent (FPIC) requirements, in compliance with ESPS 7 – Indigenous People of the IDB.

The rehabilitation of the airstrip might indirectly incentivize mining operations by improving access to remote areas that were previously difficult to reach. Mining operations, if established in the future, could lead to deforestation, habitat fragmentation, and pollution, directly affecting indigenous communities who depend on the land for their livelihoods, cultural practices, and subsistence activities. The cumulative impact of these potential developments, combined with existing land uses, could disrupt the social fabric, leading to increased pressures on local resources, such as water and forests, and alter traditional land use patterns of the indigenous peoples.

Mitigation strategies for the operational phase must consider this indirect impact, even if they do not manifest immediately. A monitoring plan is essential to track any emerging land-use changes, particularly related to mining, and ensure that mitigation measures are in place to protect the rights and environment

of indigenous communities. Additionally, close engagement with local stakeholders is critical to ensure that their concerns, priorities and needs are considered in any future land-use changes that could be catalyzed by the project.

In terms of positive cumulative impacts, this project aligns and increases capacity for the potential requirements in terms of transportation for the upcoming "Sustainable and Inclusive Development of West Suriname (SID-WS) PIMS-9534", a Global Environment Fund project that aims to strengthen integrated landscape conservation and sustainable management in the Western Suriname intact forest landscape. Although it primarily aims to protect biodiversity and promote sustainable economies, the project also involves regional collaboration and governance improvements that could tie into infrastructure growth and aviation demands in the region.

Another project that will produce positive cumulative impact is the "Bio-economy Empowerment in Suriname's Indigenous Communities through Access to Water, Energy and Telecommunications (Bio-SWEET)" SU-L1076 funded by the IDB. This project aims to promote socioeconomic development of the villages in the Amazon rural areas of Suriname by providing reliable access to renewable energy, potable water supply, telecommunication systems and to foster the development of bioeconomy. The project will most likely increase aviation demands in the region and the rehabilitation of the airstrip in Kwamalasamutu will guarantee the availability of materials, equipment's and personnel.

5.3.2. Johan Adolf Pengel International Airport

Johan Adolf Pengel International Airport is in a mid-density population area in Zarendij, a region of the rural Para district. There is a sensitive receptor that was identified during field visit corresponding to a school, less than 500m away from the airport. Construction activities may generate noise and traffic disruptions due to the presence of construction machinery and material transportation. Moreover, this airport, together with Zorg en Hoop, are the only airports that fly internationally, providing the only means of transportation in and out of the country (asides from Guyana and French Guyana) and activities during construction may disrupt the access to the airport, as well as normal operations of the aerodrome and potential accidents from working activities. The ESMP includes different programs such as the Air Quality, Noise, and Vibrations Management Program, the Occupational and Community Health and Safety Program, and the Traffic and Pedestrian Management Program, which establish measures to mitigate these impacts.

Additionally, the presence of the Kolina indigenous community was identified in the project area. However, since the project will be developed on previously intervened areas corresponding to the airport, no impacts on communities are expected. The ESMP includes, as an independent and complementary document, a Socio-cultural Analysis and Indigenous People Plan (IPP), where potential project impacts, and recommendations for mitigating adverse effects are presented. The document also outlines strategies for ensuring culturally appropriate consultations and establishing grievance mechanisms to address community concerns, including open communication channels with the village communities to ensure minimal interruption or disturbance to key activities such as emergency health services, supply transportation, and commercial activities.

During the operational phase, cumulative impacts related to increased noise and emissions could arise from the improvements to the airport and an increase in flights frequency and passengers.

5.3.3. Zorg En Hoop

Zorg Airport is in a densely populated area in the city of Paramaribo. Various institutions such as schools, retirement center, and a sports center are situated nearby. Construction activities may generate noise and traffic disruptions due to the presence of construction machinery and material transportation. However, the ESMP includes different programs such as the Air Quality, Noise, and Vibrations Management Program, the Occupational and Community Health and Safety Program, and the Traffic and Pedestrian Management Program, which establish measures to mitigate these impacts.

Additionally, the presence of the Lokono indigenous community was identified in the project area. However, since the project will be developed on previously intervened areas corresponding to the airport, no impacts on communities are expected. The ESMP includes, as an independent and complementary document, a Socio-cultural Analysis and Indigenous People Plan (IPP), where potential project impacts, and recommendations for mitigating adverse effects are presented. The document also outlines strategies for ensuring culturally appropriate consultations and establishing grievance mechanisms to address community concerns, including open communication channels with the village communities to ensure minimal interruption or disturbance to key activities such as emergency health services, supply transportation, and commercial activities.

The proximity of the airstrip to homes raises concerns regarding cumulative noise and air pollution. As improvements to the airport facilities may lead to increased flights, the cumulative noise levels could exceed acceptable thresholds for residential areas, leading to adverse health effects, such as sleep disturbances, stress, and cardiovascular issues for nearby residents. Continuous exposure to elevated noise levels could also reduce the overall quality of life. In order to mitigate this effect, a noise level assessment will be performed to determine the baseline conditions of the airport and assess whether further mitigation measures are required for the operational phase to reduce noise and vibrations impacts.

5.4 Disaster and Climate Change Risks Assessment

The purpose of this section is to assess, in a simplified and qualitative manner, the hazards that the project may encounter and generate, particularly those associated with natural hazards that could impact the project structurally and/or operationally. Additionally, the evaluation considers the project's potential impact on the community, assets, and environment due to failures within its components. Furthermore, the assessment aims to identify existing hazards to communities and the environment, related to natural hazards, which the project might exacerbate.

As a result of this evaluation, each project intervention is assigned a risk rating (high, medium, or low). For the hazards identified, corresponding mitigation measures are established to address and reduce these risks to acceptable levels.

5.4.1. Legal Framework

The primary regulations relevant to risk management for the Program is:

National Strategy for Disaster Reduction (in process): Suriname is currently working on developing a National Strategy for Disaster Risk Reduction, aligning it with the Multi-Annual Development Plan (2022-

2026), the National Adaptation Plan (2019-2029), the Updated Nationally Determined Contribution (2020), the National Climate Change Policy Strategy and Action Plan (2013), the Paris Agreement, the Regional Comprehensive Disaster Management (CDM) Strategy and the Sendai Framework for Disaster Risk Reduction.

ESPS 4, 'Community Health and Safety,'. In compliance with this standard, all projects involving infrastructure works financed with Program funds must undergo a Disaster Risk Analysis using the IDB Methodology.

5.4.2. Reference Methodology

The methodology employed for this evaluation is delineated in the IDB document “Disaster and Climate Change Risk Assessment Methodology for IDB Projects” (IDB, 2019). This methodology is structured around three core pillars:

- **Identification of Hazards and Vulnerabilities:** This involves pinpointing the natural hazards that may impact a project, as well as assessing the physical, social, and economic characteristics that could render it vulnerable to these hazards.
- **Risk Assessment:** This entails estimating the likelihood of adverse events occurring and evaluating the potential consequences for the project.
- **Risk Management:** This includes implementing measures to reduce the risk from disasters and climate change, such as prevention, mitigation, and preparedness strategies.

The IDB methodology is designed to be flexible, allowing it to be tailored to the specific needs of each project. It encompasses various phases and steps, with efforts and resources allocated according to the identified risk levels. The steps outlined in the IDB methodology are illustrated in the accompanying figure.

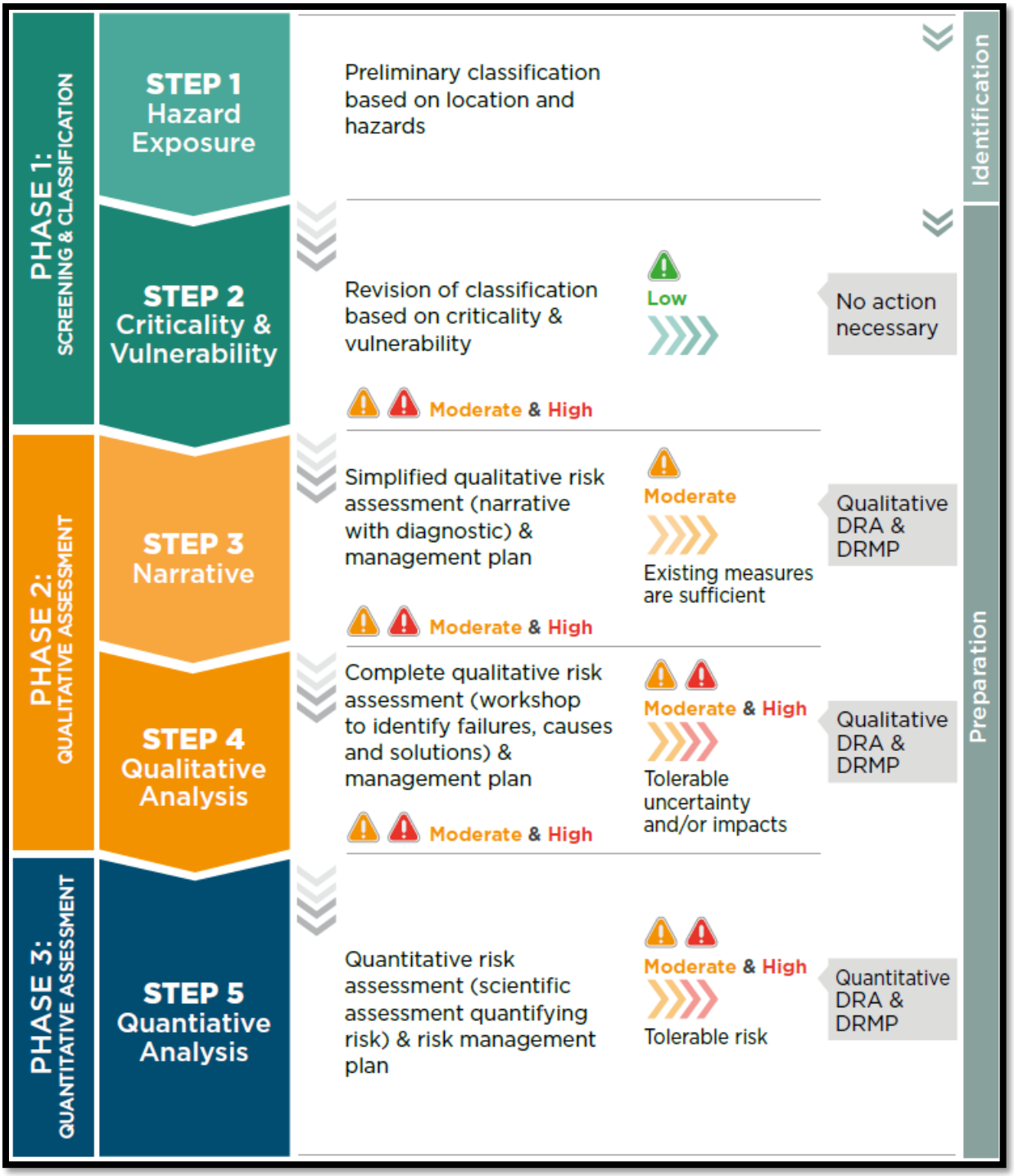


Figure 68. Disaster and Climate Change Risk Assessment Methodology (IDB, 2019).

5.4.3. Procedure

In accordance with the IDB Methodology, the process is developed through the following steps:

Step 1: Exposure to Threats

Current and future threats are identified, and the level of exposure of the project to each threat is determined.

Step 2: Criticality and Vulnerability

The level of vulnerability and criticality is assessed by considering the potential for losses and damages that could result from project activities in the event of failure, in relation to the existing physical, environmental, and socioeconomic conditions.

Step 3: Narrative

A simplified and qualitative analysis of the project risk is conducted, considering the previous steps and available information about the project design and the environment.

Based on this analysis, mitigation measures for the identified risks are proposed and structured within the Disaster Risk Management Plan (DRMP).

The activities undertaken as part of the risk assessment and the findings of this procedure are detailed below.

5.4.4. Hazard Exposure

Increments in extreme events' occurrence and magnitude are expected due to climate change in Suriname. Risk exacerbation may occur locally; therefore, disaster risk must be duly and proactively managed as works are to be implemented in already impacted and vulnerable areas.

Table 32 summarizes the identified natural hazards to which projects under the Program could be exposed. Sections 4.4.5 and 4.4.1 provides a comprehensive description of these hazards.

Table 38 - Relevant hazards for the project

Hazard	Cause	Potential Impacts in Paramaribo	Potential Impacts in Para District (Adolf Pengel International Airport)	Potential Impacts in Sipaliwini (Kwamalasamutu)
Hurricanes	Tails of hurricanes from the hurricane belt	Flooding, infrastructure damage, water-borne diseases.	N/A	N/A
Storm surge	Climate change causing higher sea levels and storm surges	Coastal flooding, erosion, damage to infrastructure	N/A	N/A
Intense rainfall	Increased frequency and intensity of rainfall due to climate change	Urban flooding, blocked drainage channels, impact on recreation resorts	Urban flooding, blocked drainage channels, impact on agriculture activities and operation of the international airport	Intense flooding, evacuation, health impacts (malaria, diarrhea, vomiting)
Drought	Reduced precipitation and increased temperatures due to climate change	Water scarcity, power outages due to reduced hydropower generation	Water scarcity, power outages due to reduced hydropower generation	Reduced river levels, transportation issues, water scarcity
Sea level rise	Global warming causing sea levels to rise	Increased flooding risk, infrastructure damage, contamination of freshwater sources	N/A	N/A
Fires	Increased temperatures and dry conditions	Increased number of grass and garbage fires, damage to buildings and infrastructure	Increased number of grass and garbage fires, damage to buildings and infrastructure	N/A
Strong Winds	Climate change leading to increased frequency of high winds and local whirlwinds	Infrastructure damage, increased risk of fires, disruption to transportation	Infrastructure damage, increased risk of fires, disruption to transportation	Infrastructure damage, increased risk of fires

5.4.5. Project Criticality and Vulnerability

Criticality pertains to the level of significance that a structure or system holds within a broader context, as determined by the scope and nature of the services or functionalities it provides. On the other hand, vulnerability denotes the inherent traits that dictate the proneness of a structure or system to damage.

This phase of the analysis aims to enhance the comprehension of the criticality and vulnerability levels of the project. It complements the preceding assessment to derive a comprehensive classification of disaster and climate change risks, with a specific focus on the project's operations rather than solely on the threats. The primary goal is to delve into the project's features to ascertain its vulnerability to natural threats, the criticality of service interruptions or cancellations, and the benefits it bestows. This approach, crafted from a bottom-up perspective, endeavors to evaluate at the project level the projected response and vulnerability of the infrastructure to potential damages.

In this analysis, categorizing the level of criticality is contingent solely upon the attributes of the specific point under review, without factoring in the impact of the threatening agents (which are addressed in the previous phase).

The IDB Methodology advocates assessing criticality and vulnerability across three key dimensions, according to the type of work.

In alignment with these dimensions, the IDB Methodology lays out guiding criteria to streamline the analysis process. These criteria are elucidated through diagrams illustrating the interplay of the three dimensions, tailored for specific types of projects (typically those involved in offering essential services).

In the case of this program, it is relevant to consider the **Roadway Infrastructure criticality graph**, which although it is mainly roadway oriented, it is useful to be able to perform the analysis in the case of this project. The three analyzed dimensions correspond to the following: Loss of essential services (dimension 1), Interaction with the natural and anthropic environment (dimension 2), and Physical characteristics (dimension 3).

This graph serves as a benchmark for evaluating the infrastructure included in the project. The overall degree of criticality for each project is determined by selecting the highest category obtained among the three dimensions.

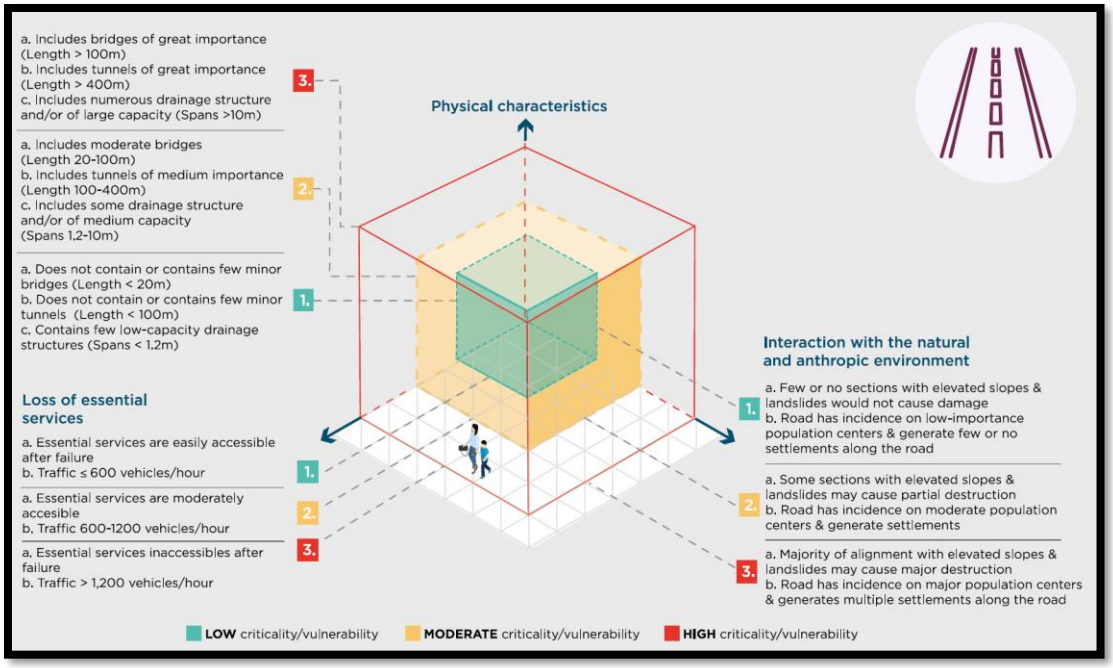


Figure 69. Criticality and Vulnerability Table for Roadway Infrastructure (IDB, 2019).

Based on **Figure 37**, the criteria considered for the evaluation of the criticality of each dimension are presented below.

Indicative thresholds for dimension 1: Loss of essential services.

In this type of works, the criticality of the system is linked to the loss of the capacity to provide transport service to the population. Therefore, to represent this dimension, an indicator of the magnitude of the loss of service has been selected. The quantitative threshold defined for roadway infrastructure was not analyzed due to lack of applicability to the air transport service sector. The following table shows the qualitative ranges defined for the indicator.

Table 39. Dimension 1: Loss of essential services.

Criteria	Low	Moderate	High
Loss of essential services	Essential services are easily accessible after failure.	Essential services are moderately accessible.	Essential services inaccessible after failure.

Indicative Thresholds for Dimension 2: Interaction with the natural and anthropic environment

This dimension considers the characteristics of the environment where the works will be located. The dimension pertaining the presence of slopes due to increased risk of landslides for roadway infrastructure was not valued due to inapplicability to the air transport sector. The following table shows the qualitative ranges defined for the indicators of interest.

Table 40. Dimension 2: Interaction with the natural and anthropic environment.

Criteria	Low	Moderate	High
Interaction with the natural and anthropic environment	The road has incidence on a population center that has low importance for the area's economic activity; the road thus generates few (or no) settlements surrounding the road and connects urban centers of low importance.	Road has incidence on moderate population centers & generates settlements	Road has incidence on major population centers & generates multiple settlements along the road

Indicative thresholds for dimension 3: physical characteristics

Given that the criterion for evaluating physical characteristics presented in the criticality graph related to bridges and tunnels in **Figure ~~37 is~~37 is** not representative for evaluating this type of works, only the transversal drainage works was considered for analyzing this dimension.

Table 41. Dimension 3: Physical Characteristics.

Criteria	Low	Moderate	High
Physical characteristics	The road alignment contains few low-capacity transversal drainage structures (Spans < 1.2m).	The road alignment contains some transversal drainage structures and/or of medium capacity (Spans 1.2-10m).	The road alignment contains numerous transversal drainage structures and/or of large capacity (Spans > 10m)

Criticality assessment

Based on the criteria outlined above, the summary of the criticality assessment results for each project type is provided below.

Table 42. Summary of the criticality assessment.

Project location	Dimension 1 Loss of essential services	Dimension 2 Interaction with the natural and anthropic environment	Dimension 3 Physical Characteristics	Classification
Zorg En Hoop Airport (Paramaribo)	Low	**Moderate**	Low	**Moderate**
Johan Adolf Pengel International Airport	Low	**Moderate**	Low	**Moderate**
Kwamalasamutu Airstrip	**Moderate**	Low	Low	**Moderate**

5.4.6. Risk Narrative

Following the IDB Methodology, a qualitative risk assessment for projects of moderate to high criticality is necessary. This assessment, the third step in the Methodology, involves summarizing the level of risk in a narrative format.

These narratives rely on data gathered from previous steps regarding threats, vulnerability, and criticality.

Based on the findings from this step, appropriate measures to address identified risks are proposed. These measures are outlined in the Disaster Risk Management Plan detailed in the ESMP. The aim is to reduce potential impacts and ensure the safety and resilience of Project interventions against disaster risks and climate change.

Upon analyzing the narratives, it was determined that **all interventions carry a moderate level of risk**. The narrative identified the need to continue to a complete qualitative risk assessment for the operation, Step 4 of the Disaster and Climate Change Risk Assessment Methodology (DCCRAM). This will be conducted before the bidding of the works.

The full narratives can be found below.

Kwamalasamutu Airstrip

The Kwamalasamutu Airstrip, with a population of around 2000 people, receives approximately 571 flights per year (over 10 flights a week), although during field visit it was stated that the airport receives 4-5 flights per week, with a peak of 1 per day during some periods. There is no exact data on the annual number of passengers travelling to this area but, according to the latest survey on passengers, it is the busiest airstrip located in non-mining areas[83]. With a flight time of approx. 2 hours from Zorg en Hoop Airport, air transportation is the only fast and direct mean of transportation to the village, with an

[83] Suriname's Domestic Air Travel Market Survey. (2024).

estimated alternative route from Paramaribo (passing through Nickerie) of 340 hours. Hence, because a failure in the infrastructure would mean a moderately inaccessible essential services, the criticality for loss of essential services is classified as moderate.

Regarding dimension 2, the airport is located is an area with low density of human activities and few installations however it does connect the small village with the densely populated city of Paramaribo. Based on this, the criticality in the impact on population and environment is moderate.

About dimension 3, the intervention in the airport is expected to be over the airstrip, then the works include simple low-rise infrastructure, and the characterization of the physical characteristics dimensions is low.

Analyzing the three dimensions, the overall criticality for this project location is **moderate**.

The primary natural hazards posing risks to Kwamalasamutu include intense rainfall and strong winds, the latest extreme weather event of heavy rainfall and strong winds reported in 2022 left 640 people affected. From field visit, it was informed by the community that heavy rainfall events lasting for 3-4 days produce the inability to operate the airstrip, which requires at least 2 days to dry out and allow its use. These hazards impact the airstrip's operational integrity and the region's connectivity. However, it is important to note that the interventions included in this project are implemented within existing installations and do not alter the current level of risk associated with these installations, in fact, the operations seek to reduce the systems vulnerability to said hazards.

The threats could endanger passengers if not properly managed, although with the implementation of appropriate preventive and structural measures the system would not pose a high risk to passengers. Thus, **the overall risk to the system is rated as moderate**.

To manage these identified risks, mitigation measures have been included in the Disaster and Climate Change Risk Management Plan. These measures will be implemented unless deemed inappropriate due to technical reasons or replaced or discarded following an appropriate analysis of alternatives.

Zorg En Hoop

Situated in a densely populated area of Paramaribo, the airport serves as a primary hub for connections to the interior regions. Failures in the installations at this site could lead to disruptions in service, significantly impacting the passengers. This is particularly critical as most connections to the local destinations originate from Zorg En Hoop Airport, although Johan Adolf Pengel international airport could be used as an alternative for the arrival and departure of essential domestic flights. Based on this, criticality for essential services is considered moderate.

The airport is in an area with high density of human activities. The airstrip is also located close to certain sensitive receptors such as schools and sports complexes, thus the criticality on the dimension of impacts on Population and Environment is considered moderate.

About dimension 3, the works in the airport are expected to be over the airstrip, then the works include simple low-rise infrastructure, and the characterization of the physical characteristics dimensions is low.

Analyzing the three dimensions, the overall criticality for this project location is **moderate**.

The primary natural hazards posing risks to Zorg En Hoop include storm surges, intense rainfall, sea level rise, and strong winds. Paramaribo district has the most reported households affected by intense rainfall and storm surges out of all districts in the 2017-2021 period and its location in the low-lying coastal area of the district also makes it subject to sea level rise, estimated sea level rise considering IPCC current projections show the airport is located in floodable area. These hazards can cause coastal flooding, infrastructure damage, and urban flooding, leading to blocked drainage channels and disruptions to transportation and commercial activities. Moreover, the proximity to various institutions such as schools, retirement centers, and a sports center heightens the risk of adverse impacts on these communities.

However, it is important to note that the interventions included in this project are implemented within existing installations and do not alter the current level of risk associated with these installations.

The threats could endanger passengers if not properly managed, although with the implementation of appropriate preventive and structural measures the system would not pose a high risk to passengers. Thus, **the overall risk to the system is rated as moderate**.

To manage these identified risks, mitigation measures have been included in the Disaster and Climate Change Risk Management Plan. These measures will be implemented unless deemed inappropriate due to technical reasons or replaced or discarded following an appropriate analysis of alternatives.

Johan Adolf Pengel International Airport

Situated in a rural area of Paramaribo, near Zarendij town, this is the main international airport of the country (even though Zorg en Hoop also is considered international since it receives planes from Guyana and Franch Guyana) that handles jet-engine powered regional and international flights. Failures in the installations at this site could lead to disruptions in service, significantly impacting the passengers. This is particularly critical as most international flights depart and arrive to this airport, although Zorg en Hoop could be used as an alternative for the arrival and departure of essential domestic flights. Based on this, criticality for essential services is considered moderate.

The airport is in an area with medium to low density of human activities. However, the airstrip is located close to an identified sensitive receptor, O.S Zanderij School, and it receives jet engines which are known to cause more noise and vibration disturbance, thus the criticality on the dimension of impacts on Population and Environment is considered moderate.

About dimension 3, the works in the airport are expected to be over the airstrip, then the works include simple low-rise infrastructure, and the characterization of the physical characteristics dimensions is low.

Analyzing the three dimensions, the overall criticality for this project location is **moderate**.

The primary natural hazards posing risks to Johan Adolf Pengel International Airport include intense rainfall and strong winds. The area where the airport is located is not subject to sea level rise and the flooding events reported during 2017-2021 show that only 6 households have been affected by these events. During extreme events, however, these hazards can cause infrastructure damage and urban flooding, leading to blocked drainage channels and disruptions to transportation and commercial activities. Moreover, the proximity to a sensitive receptor heightens the risk of adverse impacts on these communities.

However, it is important to note that the interventions included in this project are implemented within existing installations and do not alter the current level of risk associated with these installations.

The aforementioned threats could endanger passengers if not properly managed, although with the implementation of appropriate preventive and structural measures the system would not pose a high risk to passengers. Thus, **the overall risk to the system is rated as moderate**.

To manage these identified risks, mitigation measures have been included in the Disaster and Climate Change Risk Management Plan. These measures will be implemented unless deemed inappropriate due to technical reasons or replaced or discarded following an appropriate analysis of alternatives. Moreover, the plan will be updated prior to the start of the works, to ensure that the plans are adequate and up to date with the final engineering design specifications.

5.4.7. Disaster Risk Management Plan

This Disaster and Climate Change Risk Management Plan aims to propose and systematize mitigation measures for the risks identified in the Disaster Risk Assessment section, with the goal of minimizing their potential damages or impacts throughout the various phases of the project.

The following table provide a portfolio of measures for each type of intervention, including those to be considered during the engineering design, construction, and operation and maintenance (O&M) stages.

Table 43 – Disaster Risk Mitigation Measures for the Program

Measures	Description	Design	Construction	O&M	Type of Measures (Structural / Not Structural)	Responsible for Execution
Measures against Flooding and storm surge	Elevate critical infrastructure and runways above projected flood and storm surge levels.	X			Structural	Design Team, Contractor, Inspection
	Incorporate robust drainage systems to manage and redirect floodwaters.	X			Structural	Design Team, Contractor, Inspection
	Design barriers or levees to protect against storm surges.	X			Structural	Design Team, Contractor, Inspection
	Schedule construction activities during dry seasons to minimize flood risk.		X		Not Structural	Design Team, Contractor, Inspection
	Regularly maintain and inspect drainage and flood protection systems.			X	Not Structural	O&M responsible organization
	Weather forecasting to prepare for storms before they occur. When severe thunderstorms are forecast, consider canceling flights as a precautionary measure to ensure the safety of your operations.			X	Not Structural	O&M responsible organization
	Utilizing advanced technologies such as Ground-Based Augmentation Systems (GBAS) to improve navigation and landing accuracy during low visibility conditions.			X	Not Structural	O&M responsible organization

Measures	Description	Design	Construction	O&M	Type of Measures (Structural / Not Structural)	Responsible for Execution
	Employing collaborative approaches like Airport Collaborative Decision Making (A-CDM) to streamline communication and coordination among stakeholders during weather-related disruptions.			X	Not Structural	O&M responsible organization
Measures for sea level rise	Monitor sea level projections and adjust construction plans as necessary.		X		Not Structural	Design Team, Contractor, Inspection
	Reinforce existing structures with saltwater-resistant materials and sealants. Construct or reinforce sea defenses, preserve or introduce natural barriers and allow some degree of flooding without compromising safety.		X		Not Structural	Design Team, Contractor, Inspection
Measures against Fires	During the construction phase, use fire-resistant construction materials such as metal roofs, fire-retardant coatings, and non-flammable construction materials.		X		Not Structural	Design Team, Contractor, Inspection
	During the construction phase, establish safety zones, keep work areas clear of flammable materials, and have easily accessible and properly functioning firefighting equipment.		X		Not Structural	Design Team, Contractor, Inspection
	Use non-combustible materials such as steel, concrete, masonry, etc. Where possible	X			Structural	Design Team, Contractor, Inspection
	Protect electrical components with fire-resistant coating: exposed components and conduits on poles with metallic conduits and other fire-resistant materials.	X			Structural	Design Team, Contractor, Inspection

Measures	Description	Design	Construction	O&M	Type of Measures (Structural / Not Structural)	Responsible for Execution
	Treat fences and walls with a fire-retardant layer.	X			Structural	Design Team, Contractor, Inspection
Measures against Hurricanes, Storm Surges, and strong winds	During the construction phase, ensure construction materials and temporary structures are properly secured to withstand strong winds during severe storms. This may include using additional anchors and reinforced fastening systems.		X		Structural	Design Team, Contractor, Inspection
	Coordinate with local authorities, emergency services, and aviation stakeholders to develop comprehensive hurricane response plans. This includes coordination for evacuations, resource allocation, and communication strategies during and after the event.			X	Not Structural	O&M responsible organization
Regular Maintenance and Inspection	Frequent maintenance and inspection of structures with special attention to anchors and safety measures against natural hazards.			X	Not Structural	O&M responsible organization Local Government

5.5. Summary of Environmental and Social Impact Assessment

Below is a summary of the environmental and social impact assessment conducted for all types of subprojects in the Program, including major findings in the baseline assessment and major impacts and risks with their corresponding Mitigation Measures.

Table 44 – Summary of Environmetal and Social Impact Assessment

Type of project	Subproject	Benefitted population of project sites	Major Findings in Baseline Assessment	Major Impacts Associated with the project typology	Mitigation Measures Proposed
Airstrips improvements	Rehabilitation of the Kwamalasamutu aerodrome	Kwamalasamutu population and visitors	Kwamalasamutu is only accessible by airplane. Kwamalasamutu is the largest Trio settlement, home to nearly half of the country's Trio population. Kwamalasamutu hosts species listed on the IUCN Red List such as the White-lipped Peccary, Jaguar, Guianan Spider Monkey, and Giant Otter. There is an archaeological site 10 km from the village.	Gaseous Emissions, Particulate Matter, Noise and Vibrations. Water and Soil contamination from accidental spills. Waste Generation. Occupational and community accident risk. Flora and Fauna disturbance (Endangered species in the area). Occupational hazard due to hazardous wildlife contact. Service disruptions.	ESMP
	Installing of Communication Antenna and energy efficient equipment in Johan Adolf Pengel International Airport	All cities in Suriname and international visitors	It is the international airport that receives most international flights in and out of the country. The presence of the Kalina indigenous community was identified in the indirect influence. There are sensitive receptors (schools, homes) near the airport.	Gaseous Emissions, Particulate Matter, Noise and Vibrations. Water and Soil contamination from accidental spills. Waste Generation. Occupational and community accident risk. Service disruptions. Disturbance to the surrounding population	ESMP

Type of project	Subproject	Benefitted population of project sites	Major Findings in Baseline Assessment	Major Impacts Associated with the project typology	Mitigation Measures Proposed
	Rehabilitation of existing facilities in Zorg En Hoop Airport	All the cities in Suriname	Most of the connection into the interior find their point of origin at the Zorg En Hoop Airport. The presence of the Lokono indigenous community was identified in indirect influence. Approximately 4 kilometers from Zorg En Hoop airport there is a buffer zone of an historical site. There are sensitive receptors close to the airport (schools, residential house, sport center)	Gaseous Emissions, Particulate Matter, Noise and Vibrations. Water and Soil contamination from accidental spills. Waste Generation. Occupational and community accident risk. Service disruptions. Disturbance to the surrounding population	ESMP

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 (Ministry of Transport, Communication and Tourism (MTCT) though N.V. Luchthavenbeheer to ensure an adequate level of environmental and social management in the implementation of the activities of the projects. The ESMP outlines necessary environmental and social mitigation measures during the distinct implementation stages of each project.

6.1. Roles and Responsibilities

6.1.1. Design

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

The EA 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 projects, 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 Plan at the Construction Stage (ESMPc) for each project.

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.

6.1.2. Construction

Prior to the start of the works, the EA will conduct the due diligence with the applicable environmental authority to obtain any required environmental clearance for the works.

Prior to the start of the works, The EA will conduct the due diligence with the applicable environmental authority (Ministry of Spatial Planning and Environment - MSPE) to obtain certificate of environmental clearance for the works.

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

The inspection, control, and monitoring activities of the ESMPc will be carried out by EA. EA 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 (MSPE) 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.

6.1.3. Operation and Maintenance

During the operational stage, EA 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.

6.1.4. Role of IDB

The IDB will be in charge of reviewing and supervising the implementation, by EA, 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 EA, 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 26 summarizes the environmental and social management responsibilities of the entities involved in the different phases of the projects.

Table 45 - 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)**	Ministry of Transport, Communication and Tourism (MTCT)		IDB
	Executive Project / Engineering Design	MTCT		IDB
	Environmental and Social Assessment	MTCT (may use external consultants)		IDB
	Public Consultation	MTCT		IDB
	Preparation of E&S Technical Specifications for Bidding Documents	MTCT		IDB
	Environmental Permits	MTCT		MSPE
Construction	**ESMPc: Preparation and Implementation**	Contractors	MTCT	IDB
	Environmental and Social compliance during construction	Contractors	MTCT	IDB
	E&S Progress Reports	Contractors to MTCT (monthly)	MTCT	
	E&S Progress Reports	MTCT to IDB (half-annually)		IDB
	Final E&S Report	Contractors	MTCT	
	Final E&S Report	MTCT		IDB
Operation	**Operation and maintenance of the infrastructure**	The Aerodrome Department (LVT)	MTCT	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/installation ESMP**: aimed at mitigating the impacts and risks of construction activities.
- **Operational ESMP:** aimed at mitigating the negative impacts and risks of the operational stage.

6.2.1. 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.

Table 46. ESMP Programs for the Construction/Installation Phase.

Program Number	Program
1	Monitoring and Control of Compliance with Mitigation Measures
2	Construction Sites Management
3	Air Quality, Noise and Vibrations Management
4	Erosion Control
5	Flora and Fauna Management
6	Energy and Resource Efficiency
7	Waste Management
8	Effluent Management
9	Occupational and Community Health and Safety
10	Traffic and Pedestrian Management
11	Pest and Vector Control
12	Socio-Environmental Training for Site Personnel
13	Disaster Management and Emergency Response
14	Community Information and Participation
15	Chance Find Procedure
16	Chemical Substances Management
17	Works Closure
18	Gender Action Plan

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	
To ensure effective oversight of compliance with the identified mitigation measures, the contractor will establish and maintain a comprehensive "compliance monitoring system". This system will serve as a means to oversee the implementation of each mitigation measure during the construction stage. The compliance monitoring system will include, but is not limited to, the following elements: • Actions to be Implemented: A detailed description of specific actions and steps to be taken to execute each mitigation measure. • Necessary Material Resources: An inventory of the materials, equipment, and resources required to carry out mitigation measures effectively. • Responsible Staff: Identification of personnel responsible for execution and supervision of each mitigation measure, including their roles and responsibilities. • Indicators of Compliance: Establishment of clear and measurable indicators that will be used to assess the degree of compliance with each mitigation measure. • Goals and Frequency of Monitoring: Defined objectives for achieving compliance, along with the frequency and methodology for monitoring progress towards these goals. This structured compliance monitoring system will ensure that the construction project adheres to the established mitigation measures and operates in a manner that minimizes potential environmental or regulatory impacts.	
Monitoring and Compliance	
Indicators • 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 implementation	Works Director
Responsible for control	Works Inspector

Program 2: Construction Sites Management

Program 2: Construction Sites Management	
Socio-environmental effects to be prevented or corrected:	Minimize the environmental and social impacts of the preparatory activities of the works

Management Measures

The work sites must ensure the minimal impact on the environment and incorporate the following considerations:

- Establishment of a materials storage and collection area.
- Implementation of an efficient waste collection and storage system.
- Supply of sufficient water resources for sanitary and operational needs.
- Installation of appropriate signage for safety and guidance.
- Availability of a well-equipped first aid kit.
- When deemed necessary, provision of an electric generator with a waterproof base.

Among the specific recommendations, the following guidelines have been established:

- Provision of Adequate Communication Equipment: All work sites shall be equipped with reliable communication tools, such as radios, to facilitate prompt request for assistance during emergencies.
- Fire Safety Measures: Work sites must be equipped with fire extinguishers or other appropriate fire suppression systems.
- Emergency Response Training: Personnel shall undergo comprehensive training in emergency response procedures, first aid, and proper hygiene practices.
- Site Cleanup: Upon completion of construction activities at each work site, all residual materials must be promptly removed, ensuring a clean and organized environment.
- Machinery Maintenance and Compliance: Regular maintenance checks and technical verifications will be conducted to ensure construction machinery remains in good working condition.
- Runoff management: The drainage of excess water, soil movement, and stockpile management shall prioritize the preservation of natural drainage patterns and land runoff levels to prevent erosion and its associated environmental impacts.
- Efficient and authorized resource use:
- Covered Transportation and Material Handling: All materials prone to generating dust will be transported in vehicles equipped with tarpaulins and maintained at adequate humidity levels to minimize dispersion during transit. Additionally, during on-site stockpiling, regular wetting of materials susceptible to dust generation will be enforced. Efforts will be made to minimize stockpile quantities, wherever operationally feasible, to reduce potential emissions.
- Road and Site Maintenance: To control dust emissions from roads lacking an asphalt layer, a regular watering schedule will be implemented, ensuring these surfaces are dampened at least twice a day. The speed of construction vehicles using access roads without asphalt will be regulated and limited (ranging from 20 to 40 km/h depending on specific conditions).
- Dust Control during Earth Extraction: When excavating or moving soil, measures will be taken to mitigate dust emissions. This will include the application of water or other appropriate suppressants to the material during extraction to minimize airborne dust.
- In the case of Kwamalasamutu, since the village is only accessible by plane and boat, movement of equipment and materials must be especially planned and scheduled with the charter flights companies to ensure no saturation of the regular service. If local material, such as laterite and river sand is used, permitting for quarrying building materials must be up to date, data from source quarries and amounts and transportation details should be recorded.
- With regards to the purchase of solar panels: the acquisition processes of the solar panels will be monitored and solar panel suppliers who have been proven to engage in forced labor activities will be vetoed. MTCT will obtain an affidavit from the vendor to ensure compliance with this aspect (see the affidavit template that must be completed in **Annex 3**).

Program 2: Construction Sites Management	
Monitoring and Compliance	
Indicators • The ratio of work sites where management measures have been applied to the total number of active work sites.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 3: Air Quality, Noise and Vibrations Management

Program 3: Air Quality, Noise and Vibrations Management	
Socio-environmental effects to be prevented or corrected:	Impacts of air quality, dust and noise near community or urban areas.
Management measures	
Emissions Control Measures: • Ensure all construction equipment is maintained in accordance with manufacturer's specifications. • Implement dust suppression measures as necessary in unpaved areas. • Prohibit incineration of non-vegetative wastes (e.g., refuse) at construction sites. • Reduce unnecessary idling of construction equipment and delivery trucks when they are not in active use. • Maintain cleanliness, especially of tires, on work vehicles to prevent tracking of dirt both within and outside the construction site. • Covering of work vehicles transporting friable materials to prevent dispersion of materials beyond the site. • Minimize drop heights of materials during construction operations. • Establish and enact a comprehensive grievance procedure in the event of receiving complaints related to dust and/or exhaust emissions. **Noise Control measures:** • Ensure maintenance of all construction equipment in accordance with manufacturer's specifications to minimize noise emissions. • Strategic Work Scheduling: Plan construction, modification, and rehabilitation activities to take place during daylight hours when heightened noise levels are generally more acceptable to the surrounding community. • Develop and implement a comprehensive Construction Communications Plan to proactively notify neighboring receptors, such as residents, commercial establishments, religious institutions, and hotels, about upcoming construction activities. • Consider Acoustic Enclosures: Evaluate the necessity of installing acoustic enclosures where applicable to mitigate noise generated by construction activities. • Discourage unnecessary idling of construction equipment and trucks to minimize noise emissions and environmental impact.	
Monitoring and Compliance	
Indicators • Absence of grievances voiced by neighboring commercial establishments and/or the local community. **Monitoring** Regular daily site inspections shall be conducted, encompassing the following critical aspects: • Visual assessment for dust migration in order to detect any instances of dust transgressing site perimeters. • Visual assessment of areas with a heightened propensity for dust emissions, such as haul roads, stockpiles, and operational zones. • Equipment and machinery service records.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 4: Erosion Control

Program 4: Erosion Control	
Socio-environmental effects to be prevented or corrected:	Effects of erosion and sedimentation on the environment. Soil disturbance, degradation, and erosion.
Management measures	
Erosion control measures • The minimization of disturbance area will be a paramount objective, and clear demarcation will be established to delineate the boundaries of this zone. • All activities will strictly occur within the designated work zone, ensuring that the work scope is confined to this specific area. • Vehicle movements will be confined to predefined roads and tracks, thereby mitigating potential off-road impacts. • Management of runoff water, and soil displacement and accumulations will be carried out with a primary focus on preserving their natural flow patterns and adhering to the natural runoff levels of the terrain. • Monitoring and periodic inspections will be conducted to assess the effectiveness of sediment controls, particularly after significant rainfall events exceeding 10mm in a 24-hour period.	
Monitoring and Compliance	
Indicators • Absence of Substantial Sediment Deposition: There should be no noticeable accumulation of sediment beyond the designated works area. **Monitoring** • Daily inspections of the work site will be conducted. • Sediment controls will be assessed during site inspections and following significant rainfall events (defined as more than 10mm of rainfall within 24 hours, leading to site runoff). The assessment will also encompass the removal of any accumulated sediments as needed.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 5: Flora and Fauna Management

Program 5: Flora and Fauna Management	
Socio-environmental effects to be prevented or corrected:	Impacts on vegetation cover and wildlife

Management measures

This Program incorporates measures aimed at mitigating impacts on local flora, fauna and ecosystem services and aims to cultivate a shared responsibility among all involved parties in safeguarding and preserving the local flora and fauna. Throughout its execution, regular audits will be carried out to ensure adherence to it. Necessary modifications will be made based on monitoring outcomes and feedback received from stakeholders. Furthermore, comprehensive training sessions will be provided to construction personnel, emphasizing the significance of biodiversity conservation and the application of mitigation measures. Additionally, awareness activities will be organized for both workers and the local communities.

Flora management measures

- Assess the net area of natural vegetation loss and perform a Pre Clearance-Survey to identify species listed on the Red List of Threatened Species of IUCN once construction sites are defined to avoid the removal of those specimens.
- Contractors will, if possible, define previously intervened or environmentally degraded sites for the settlement of camps and any other necessary facilities.
- The Contractor must implement a revegetation scheme for zero net loss of vegetation and prioritize the retention of mature and significant trees, with clear criteria for removal only when necessary. Compensatory measures should include planting native tree species in nearby areas. A 3:1 compensation ratio for tree removal is required.
- Ensure that only native species are used in landscaping and rehabilitation efforts.
- Determine the revegetated area four months after planting, considering surviving vegetation.
- Remove vegetal cover just before construction commences.
- Minimize time on construction sites to limit disturbance to the natural habitat.
- Store the topsoil separately for ground leveling, respecting the edaphic sequence.
- Strictly prohibit the introduction of invasive plant species into the project area. Conduct regular inspections and implement measures to prevent their inadvertent introduction or spread, ensuring that only native species are used in landscaping and rehabilitation efforts.
- Develop proactive communication channels with adjacent communities to disseminate information about the planting initiatives, with the aim of engaging neighbors in the preservation of local vegetation.
- Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade presents a list of pesticides whose use is strictly forbidden in the context of this project.

Fauna

- Ensure all personnel receive proper training in identification and safeguarding of native flora and fauna, as well as protocols for dealing with potentially hazardous animals. In the case of Kwamalasamutu, or any other project identified as having endangered species if IUCN Red List, ensure species that have been reported in the area are properly identified to avoid their disturbance and enhance their protection.
- Establishment of procedures to deter hazardous and endangered wildlife before the start of construction, specifically in Kwamalasamutu and the species identified in the IUCN Red List, including disruptive stimuli (frightening devices, lights, sounds), conditioned taste aversion (odors and chemicals) and electric deterrents (fences, shields collars).
- Implement protocols for wildlife encounters, including the use of protective gear, availability of first aid kits and medical support and avoiding known habitats.
- It is recommended that attempts to exclude, deter, or remove wildlife from the airport be noted. If not already in place, it is recommended that a wildlife log be created and maintained by airport operations to document all wildlife activity observed on the airstrip and document wildlife strikes, as well as including fencing, bird balls, wire grids, pillows, netting or modifying the landscape to deter wildlife.

Program 5: Flora and Fauna Management	
• Movement of personnel and machinery will be restricted to the defined work area. • The camp site and/or the installation of easily dismantled cabins must be properly delimited with perimeter fencing and appropriate security measures. • Implement specific measures for fauna's habitat restoration, such as the installation of nesting boxes or shelters to support the local fauna population. • Implement strategies to deter wildlife from areas earmarked for vegetation clearance. Encourage their relocation to adjacent areas without the need for capture. For less mobile species, promote rescue and relocation to nearby suitable habitats. • Recommend the adoption of reduced vehicle speeds within the project area. • Enforce a strict prohibition on hunting within the project area. • In the case of migratory birds in the area of influence, consider breeding seasons for the planning of activities	
Monitoring and Compliance	
Indicators • Reduction in vegetation cover surface. • Planted trees as part of the 3:1 compensation ratio. • Persistence of revegetated cover surface four months after planting.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 6: Energy and Resource Efficiency

Program 6: Energy and Resource Efficiency	
Socio-environmental effects to be prevented or corrected:	Avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution and resource consumption from project activities.
Management measures	
General requirements: • Personnel training: all personnel must be adequately trained on sustainable practices regarding energy conservation, water, materials and waste management to reduce the number of materials and water used and reuse/recycle as much material as possible. • Maintain a detailed material register with information on quantities, sources and use. • All materials must be sourced from quarries holding valid permits issued by the competent authority and comply with environmental regulations. • Implement systems that monitor and control energy and water to establish the baseline and identify opportunities for energy-saving and water-saving technologies. • Estimate total GHG emissions for the projects to establish a baseline and identify GHG reductions from energy-savings. **Specific measures for water, materials and energy conservation:** • Use environmentally friendly materials and raw materials that are from sustainable production, recycled (reclaimed wood and steel) and/or recyclable to ensure a closed material cycle, when possible. • Capture and utilize rainwater for construction activities, such as dust control and equipment washing, when possible. • Use temporary, weatherproof storage facilities to protect materials from damage and reduce material waste during the construction process • Employ modular construction methods that can reduce waste and improve efficiency by prefabricating components off-site. • Develop a comprehensive waste management plan to reduce the use of single use materials and increase recycling and composting of waste, when possible.	
Monitoring and Compliance	
Indicators • N° Mitigation measures applied to the project **Monitoring** • Energy and water use via monitoring systems. • Waste generation • GHG emissions • Records of materials used: their sources and storage.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 7: Waste Management

Program 7: Waste Management	
Socio-environmental effects to be prevented or corrected:	Pollution due to improper handling of waste generated on site.

Management measures

Waste generated during the construction phase comprises two distinct categories: common household waste, characterized by low hazard, and specialized waste, considered potentially dangerous.

The first category encompasses materials such as packaging waste, plastics, pipe cuttings, wood, cardboard, food scraps, wires, bags containing lime and cement, cables, bricks, and similar non-hazardous items.

The second category comprises hazardous materials such as rags, contaminated wood, filters, gloves, or other solid objects tainted with oils, hydrocarbons, traces of solvents, varnishes, paints, as well as waste stemming from coating and welding electrodes. Additionally, it includes used oils and containers or packaging with residues of the substances.

Waste Management Measures

- Personnel training and waste management: all personnel must be adequately trained to distinguish between the two distinct categories of waste and to rigorously maintain their segregation throughout the entirety of the project's development. This includes the proper handling and management of waste.
- Waste storage and categorization: all waste materials must be segregated based on their inherent properties, such as reusability, recyclability, or categorization as household or special waste. This segregation should occur under controlled conditions to preserve their inherent characteristics and prevent any unintended dispersion.
- Waste disposal prohibitions: no form of waste generated during the construction phase, whether it is of household or special nature, solid or liquid, may be incinerated, buried, or discharged into water bodies or the soil. Strict adherence to these prohibitions is mandatory.
- Prevention of unattended waste: under no circumstances shall unattended waste be left unattended at construction sites, where it may be accessible to both wildlife and individuals.
- Waste documentation: a comprehensive record of the waste generated at each construction site must be diligently maintained, documenting the type, volume, and detailed characterization of the waste produced.
- Effluent management: whenever feasible, the practice of washing tools and machinery on the construction site should be avoided. In cases where this is unavoidable, a designated location must be provided for the temporary containment of effluents. These effluents must be removed from the project area at the conclusion of each phase of work.

Low Hazard Waste Management Measures

- When the recycling of assimilable household waste is both technically and economically viable, it will be carried out.
- Should recyclable materials prove valuable to the residents of the locality, they shall be made available to those who express a need for them, following consultations and mutual agreement with the local populace.
- Waste materials that remain unutilized within the Project Area must be securely stored and promptly removed upon the successful conclusion of each phase of the project.

Special Waste Management Measures

- Special waste must be securely stored in appropriate containers, in compliance with the nature of the substances, and managed as hazardous waste, in accordance with prevailing legal regulations.
- In the event of accidental spills, the Environmental Agency (EA) will be immediately informed, and necessary measures for the containment and elimination of the spilled hydrocarbon or chemical product will be carried out. Immediate absorption using suitable materials (such as absorbent cloths or clay) shall be applied. Any contaminated soil or vegetation shall be treated as special waste.

Program 7: Waste Management	
• Any generation of pathological waste resulting from personal accidents requiring first aid care must be carefully separated, stored, and treated in strict adherence to prevailing legislation. • Hazardous waste generated because of construction activities should be diligently managed, adhering to current legislation. These materials must be securely stored within designated facilities, ensuring their proper preservation. After competition of the works, prompt removal and transportation of special waste to an appropriate facility for treatment and final disposal must be carried out and recorded. • Transportation and disposal of special waste must exclusively be carried out by licensed and authorized operators. Under no circumstances will the ultimate disposal of special waste be conducted at open dumps or landfills designated for household waste. In the case of Kwamalasamutu or any other project developed in secluded indigenous areas, special considerations must be taken to ensure the proper transportation of all wastes generated and disposal to avoid impacts to the community by the improper handling of waste and compliance with current legislation.	
Monitoring and Compliance	
Indicators • Hazardous waste managed according to standards / hazardous waste generated by the project. • Properly managed dry waste and construction surplus / total dry waste and construction surplus generated by the project. **Monitoring** • Training in supervising hazard waste registration forms for key personnel. • Records of the removal of hazardous waste for its ultimate disposal. • Reviewing hazardous waste removal records for compliance. • Verifying accreditation certificates for hazardous waste disposal.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 8: Effluent Management

Program 8: Effluent Management	
Socio-environmental effects to be prevented or corrected:	Pollution due to inadequate management of effluents generated by work activities.
Management Measures	
Effluent Management Measures • Identify and categorize all potential sources of effluents. • Implement specific protocols for handling different types of effluents (domestic, construction, stormwater runoff). • Conduct regular training sessions for construction personnel on the proper handling, storage, and disposal of potentially harmful substances to prevent accidental spills or leaks. • Regularly monitor, test, and treat effluents discharged from the construction site. • Prioritize managing water drainage, soil movements, and stockpiles in alignment with natural flow patterns and land runoff levels. • Implement erosion and sediment control measures to minimize the introduction of sediment-laden runoff into water bodies and impact ecosystem services in the area regarding water provision. • Install impermeable flooring in susceptible areas and a surrounding channel connected to an autonomous drainage system to direct rainwater towards treatment facilities. • Install enough portable toilets or equivalent facilities. Prioritize toilets with efficient waste management systems and low-water-consumption sanitation solutions. Effluents from these facilities will be removed and sanitized daily by authorized operators or service providers. • Implement wastewater recycling systems for sanitation facilities, where feasible, using greywater treatment for non-potable purposes like irrigation or construction. • Establish a **Tools and Machinery Maintenance Protocol**. Efforts will be made to avoid on-site tool and machinery washing. When such washing is unavoidable, cleaning areas will be designated and equipped with containment measures to prevent the washing of tools and machinery from affecting the surrounding environment. Explore and encourage the use of eco-friendly cleaning agents to minimize environmental impact.	
Monitoring and compliance	
Indicators • Effluent types managed according to standards / Total effluent types generated by the project. **Monitoring** • Record sheet documenting the withdrawal and inspection of portable toilets by the contractor.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 9: Occupational and Community Health and Safety

Program 9: 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

The contractor shall regularly ensure compliance with relevant standards and regulations, including international best practices (such as the International Finance Corporation guidelines). This will involve retaining a team of professional advisors.

All personnel are required to receive training on equipment operation, machinery use, and vehicle operation in accordance with prevailing regulations within protected areas.

Clear and permanent identification of all available elements must be conducted, alongside the use of signage and instructional materials for educational purposes.

The contractor must supply Personal Protective Equipment (PPE) and provide comprehensive induction training to workers, covering PPE types, proper usage, characteristics, and limitations.

Occupational Health and Safety Subprogram

A comprehensive assessment of risk factors associated with each job role, including an enumeration of the workforce exposed to these risks, must be carried out. The following measures are recommended to enhance workplace safety:

- Conduct **Daily 5-Minute Safety Talks** before commencing work. Topics should be tailored to the specific risks associated with ongoing activities.
- Develop and implement **Safe Work Procedures** for the safe execution of activities. Emphasize adherence to established safety protocols.
- Regularly **inspect and ensure the proper functioning of equipment, machinery**, and essential safety apparatus such as fire extinguishers.
- Apply **Safety Data Sheets** for hazardous products, ensuring that relevant information is readily accessible to workers.
- Provide necessary **Personal Protective Equipment** (PPE) to all workers on the construction site in accordance with the specific requirements of their tasks.
- **demarcate work** areas and storage zones using appropriate signaling in order to promote awareness and help prevent accidents.
- Develop a comprehensive **Contingency Plan** and ensure that all workers are proficiently trained in its implementation to address unforeseen circumstances.
- Conduct proper **Waste Management** by exercising control over the collection, treatment, and disposal of residues and waste, while adhering to basic sanitation standards.
- Verify that personnel operating equipment possess the necessary **licenses and certifications**.
- **Training in Environmental, Health, Hygiene, and Occupational Safety.**

The following activities are classified as high-risk within the occupational context, and demand a diligent commitment to safety protocols, continuous training, and strict adherence to established guidelines to mitigate potential hazards and ensure the well-being of personnel involved:

- Work at Heights and on Scaffolding
- Hot Work (Welding)
- Machinery Maintenance
- Electrical Work
- Hazardous Wildlife Encounters

Community Health and Safety Subprogram

This subprogram is designed to address potential risks and impacts on the health and safety of communities affected by the project. The Contractor is required to conduct a comprehensive evaluation of the project's

Program 9: Occupational and Community Health and Safety

potential effects on the health and safety of the affected communities, with specific attention to individuals facing vulnerability due to their unique circumstances, such as children and indigenous groups. Subsequently, the Contractor is expected to propose mitigation measures in strict adherence to the mitigation hierarchy. The assessment will encompass the following key aspects:

- Thorough evaluation of the impact on **traffic and road safety**, with the aim of minimizing any adverse effects on the community.
- Implementation of clear and effective **signaling** and delineation measures at work sites to enhance safety and minimize potential hazards.
- Rigorous management and safety protocols for handling **hazardous materials** to prevent any harm to the health and safety of the affected communities.
- Development and implementation of a comprehensive **emergency preparedness and response plan**, ensuring swift and effective actions in the event of unforeseen circumstances.
- **In the specific case of Zorg en Hoop Airport**, efforts should be made to include in the design of the project recommendations made on the Runway Safety Inspection report made by LVT on September 8th, 2023, so as to ensure the airstrip meets safety standards, including an analysis on the location of fuel tanks and their potential movement to areas that pose less risk to neighboring houses.
- In the specific case of Kwamalasamutu or any other project developed in secluded indigenous areas, ensure that all activities are planned and scheduled with consideration of the impact of interruption of service of aircrafts to the community in manners of supplies, medical services and commercial activities and establishing measures to minimize them by establishing **communication and information channels** with all affected stakeholders.

The Contractor is expected to integrate these measures into the project's execution, reflecting a commitment to responsible and conscientious project management.

Labor Management Procedure Subprogram

The contractor is required to formulate a comprehensive Labor Management Procedure (LMP) designed to articulate a structured framework governing the actions and responsibilities of both the employer and the workforce. This protocol is applicable to individuals employed directly by the contractor and extends to personnel engaged through third-party entities (sub-contractors).

The primary objective of the LMP is to establish and maintain employment relationships grounded in the principles of equal opportunities and equitable treatment. The employment of child or forced labor is strictly prohibited. The contractor, along with its subcontractors, is expressly prohibited from engaging individuals below the minimum age of employment as prescribed by relevant legal statutes, with a minimum threshold of no less than 15 years of age.

The LMP will include the creation of a **grievance redress mechanism**. This mechanism is designed to provide a channel through which workers, and where applicable, their affiliated organizations, can voice concerns related to the workplace. Additionally, it serves as a platform for the lodging of complaints pertaining to instances of sexual and gender-based violence. The contractor is tasked with ensuring the effectiveness and accessibility of this grievance redress mechanism to facilitate a transparent and responsive resolution process.

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 Labor Insurance / Total number of workers in the project

Monitoring

Program 9: Occupational and Community Health and Safety	
• 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 implementation	Works Director
Responsible for control	Works Inspector

Program 10: Traffic and Pedestrian Management

<table>
<tr><th colspan="2">Program 10: Traffic and Pedestrian Management</th></tr>
<tr><td>Socio-environmental effects to be prevented or corrected:</td><td>Accidents and incidents that affect occupational and community health and safety</td></tr>
<tr><td colspan="2">Management measures</td></tr>
<tr><td colspan="2">The Master Contractors will prepare the Traffic and Pedestrian Management Program. Consultation with key stakeholders will be conducted prior to Program finalization. The Contractors will ensure implementation of this Program.
The Traffic and Pedestrian Management Program shall:
• Identify the sensitive location (religious facility, educational facility, heath facility, commercial areas) along the site access roads.
• Identify the road condition, traffic congestion areas and peak traffic load period.
• Identify the traffic hotspots like road junctions, market areas, school areas.
• Provision of traffic marshal (signalman) in identified traffic sensitive locations.
• Identify any major road repairing requirement along the site access road.
• Prepare the Traffic and Pedestrian Management Program based on local sensitivity (religious gathering, school timing, market timing and peak traffic timings).
• Implement procedure to follow road safety requirements by the drivers & helpers.
• Implement procedure to check fit certificates of the vehicles to minimize the emission of air and noise.
• Monitor road conditions to identify any damage of road or structures and remedy immediately to reduce the potential for significant impacts to the local communities.
Contractors are responsible for ensuring that drivers receive instructions in accordance with the Traffic and Pedestrian Management Program to maintain appropriate speeds. Additionally, they must conduct induction and training sessions for all drivers to promote safe driving practices. Furthermore, contractors are obligated to enforce compliance among drivers, ensuring adherence to all legal and project-specific safety regulations relevant to road safety measures.</td></tr>
<tr><td colspan="2">Monitoring and Compliance</td></tr>
<tr><td colspan="2">Indicators
• Number of work fronts marked with signs in accordance with the approved Traffic and Pedestrian Management Program /Number of work fronts that require signage in accordance with Traffic and Pedestrian Management Program.
• Number of road accidents.
Monitoring
• Weekly inspection program
• Monthly inspection report
• Road safety accident records</td></tr>
<tr><td>Responsible for implementation</td><td>Works Director</td></tr>
<tr><td>Responsible for control</td><td>Works Inspector</td></tr>
</table>

Program 11: Pest and Vector Control

Program 11: Pest and Vector Control	
Socio-environmental effects to be prevented or corrected:	Spread of pests and vectors
Management Measures	
To safeguard public health, it is strongly advised that the Contractor engages the services of a certified and proficient company with the following responsibilities: • Pest disinfection: before the removal of green waste and soil movement, the contracted company should conduct thorough pest disinfection. This involves the use of appropriate products and methods to eliminate pests effectively. • Municipal coordination: the contracted company must collaborate with municipal authorities to prevent the unlawful deposition of municipal solid waste on neighboring properties without structures and in adjacent streets. This coordination helps maintain a clean and sanitary environment. • Product protocols: to ensure safety, it is recommended to request and monitor the protocols for the products used in pest elimination. This includes assessing potential side effects and residual impacts, ensuring that only approved and safe products are utilized. • Waste management: the company responsible for pest disinfection must manage the waste generated during their operations. They should promptly remove containers used for pest control, and evidence of proper disposal should be provided. • Food handling and fire prevention: to prevent the attraction of rodents and snakes, no food remnants should be left exposed, and open fires should be avoided. Both hot food and ash can be an attractant for these species, posing risks to public health. • Eco-friendly pest control: when addressing pest and vector control, prioritizing environmentally conscious products is imperative. It is essential to explore alternatives with minimal ecological impact for non-targeted species. Whenever feasible, the use of highly toxic substances should be minimized or avoided entirely for cultural or biological practices.	
Monitoring and compliance	
Indicators • Completed pest and vector disinfection/control applications to the total planned applications in the Program. **Monitoring** • Verification of disinfection certificates in alignment with the predetermined disinfection schedule, including projected fumigation dates, specified products for use, outlined safety protocols, Contingency Plan, etc. • Validation of bait withdrawal and proper final disposal confirmation.	
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 regarding the personnel's role in preserving, protecting, and conserving the environment, as well as ensuring occupational safety in the performance of their duties

Management measures

Socio-Environmental Training

To carry out the training process, informative sessions will be conducted prior to the commencement of work. Subsequently, ongoing exchange and training meetings will be organized, tailoring content to meet the specific requirements of diverse projects with environmental implications. Additionally, drills addressing emergency response protocols will be conducted.

The planning and execution of these training sessions will be conducted under the oversight of safety, hygiene, and environmental professionals employed by the contractor. The training program encompasses a comprehensive agenda, including, but not limited to, the following topics:

- Basic induction in environmental protection.
- Evaluation and control of risks with a focus on personnel safety.
- Management of environmental contingencies such as spills and fires.
- Fire prevention and control measures.
- Comprehensive waste management procedures.
- Protection and management of plant and wildlife in the immediate environment.
- Safe handling of chemical substances.
- In the case of Kwamalasamutu and other projects located in indigenous groups land, incorporate a cultural sensitivity and indigenous customs training, including introduction to history, culture and social structure of the local community, traditional practices and customs, appropriate communication and interaction protocols and information on sacred and protected areas and cultural heritage.
- Familiarization with the company's Code of Conduct and addressing gender-related issues.
- The implementation of this program will ensure a thorough understanding of essential environmental and safety protocols, contributing to the effective management of potential risks and emergencies.

Code of Conduct

The Contractor is required to develop and implement a comprehensive Code of Conduct for Site Personnel, as exemplified in Annex 2, Appendix A. This code shall be incorporated into employment contracts for both the Contractor and Subcontractors, adhering to the guidelines outlined in the LMP. To mitigate the risk of gender, social, political, cultural, or racial conflicts, and to maintain order, the Contractor must take necessary measures and precautions. This includes preventing tumult or disorder among construction personnel, employees hired by them, or Subcontractors, while ensuring the preservation of order, protection of inhabitants, and the security of public and private property within the project's area of influence.

The Code expressly prohibits harassment, violence, exploitation, and racism. Its application is mandatory for all individuals involved in the project, both during and outside of working hours.

Non-compliance or infringement of the established rules of conduct will result in sanctions, fines, or dismissals, depending on the severity of the violation. All construction personnel, irrespective of their hierarchical level, are required to participate in training sessions and discussions related to the Code.

Furthermore, the Contractor is obligated to conduct a minimum of two activities addressing non-discrimination and gender equity for all personnel affected by the project. These activities will focus on: 1) the prevention of sexual exploitation of children and adolescents, including labor and criminal consequences; and 2) fostering positive relationships between men and women in the workplace.

Program 12: Socio-Environmental Training for Construction Personnel	
Prior to these activities, the Contractor must submit an Action Plan for approval by the Construction Management. This plan should outline the responsible parties for implementation, the methodology, and the schedule. Upon completion, a comprehensive evaluation report must be submitted. Additionally, the Contractor is required to establish, within an agreed-upon timeframe with Construction Management, a protocol addressing sexual harassment in the workplace.	
Monitoring and Compliance	
Indicators • 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 implementation	Works Director
Responsible for control	Works Inspector

Program 13: Disaster Management and Emergency Preparedness and Response

Program 13: 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

Contingency Prevention and Control Strategies

Contractor Responsibilities:

- Strict compliance with general and specific regulations, rules, procedures, and instructions pertaining to health, hygiene, and occupational safety.
- Identification and mitigation of all potential risks leading to workplace accidents or occupational illnesses.
- Identification and rectification of unsafe conditions within work areas.
- Enforcement of standards and procedures outlined in environmental management plans.
- Development of programs aimed at enhancing working conditions and implementing procedures to ensure greater safety during project execution.
- Implementation of training and awareness campaigns for workers focused on Occupational Health practices.
- Periodic communication of specific job risks to each worker, along with information about environmental risks and preventive measures.
- Ensuring that the design, engineering, construction, operation, and maintenance of equipment align with safety norms and procedures endorsed by Construction Supervision.
- Establishment of periodic and preventive maintenance programs for machinery, equipment, and facilities.
- Facilitation of inspections and investigations related to occupational health conditions conducted by competent authorities.
- Provision of necessary and suitable personal protective equipment based on the level of risk, adhering to Industrial Safety recommendations.
- Development of an emergency response plan in collaboration with the National Emergency Management Organization (NEMO).
- Ensuring availability of essential resources and materials for effective response to emergencies.

Employee Responsibilities:

- Execute tasks with utmost care, ensuring operations adhere to safety standards, environmental regulations, and the guidelines outlined in the management plan programs.
- Vigilantly monitor machinery and equipment to promptly identify and report any risks or dangers to superiors. Address human, physical, mechanical, or environmental issues that arise during work.
- Refrain from operating unauthorized machines or allowing unauthorized personnel to handle equipment under their responsibility.
- Avoid the introduction of alcoholic or intoxicating substances in the workplace and avoid working under their influence.
- Workers operating machinery with moving parts must avoid wearing loose clothing, jewelry, or accessories. If they have long hair, secure it with a cap or hairnet.
- Safely utilize and maintain company-provided work items, safety devices, and personal protective equipment. Maintain cleanliness and order in workplaces and services.
- Actively participate in company-approved programs for preventing occupational accidents, illnesses, and community health issues.

Program 13: Disaster Management and Emergency Response

- Promptly report any procedures or operations that violate safety regulations and pose a threat to individuals, colleagues, or company assets.
- Vehicle drivers must adhere to internal traffic regulations and those of protected areas during work execution.
- Propose activities that promote occupational health within the workplace.
- Implement actions specified in emergency protocols and strategies.

Measures to apply to all Natural Hazards and Threats:

- Establish an emergency brigade that will provide training to all personnel on aid, rescue, and risk prevention related to emergencies linked to natural threats, available vehicles equipped to contribute during a state of emergency, communication methods suitable for the situation, equipment, and resources to face various natural emergencies, and defining internal and external support.
- Train personnel on measures to implement.
- Develop a specific Emergency Protocol for Natural Disasters for each project.
- Establish an effective communication system that alerts site personnel of any meteorological or geophysical warnings to activate the emergency protocol for natural disasters. This protocol should be activated by the emergency brigade.
- Identify and evaluate the structural capacity of nearby locations to act as shelters in the event of a natural disaster.
- Keep the keys for all equipment and rolling materials on-site in a place accessible to a responsible person present on-site (administrative officer or security officer), as well as the schematics or plans of the facilities.
- Conduct periodic drills for all identified threats that require them. The frequency of the drills should not be less than every six months for each threat. For the drills, safety zones should be marked and outlined on a visible plan for all workers, as well as evacuation routes.
- Provide site personnel with the following minimum equipment and materials to respond to various natural events that may affect the project's operational area:
  - Absorbent material and sealed containers
  - Personal protective equipment (filter mask, polyethylene gloves, safety glasses, rubber boots, etc.)
  - Shovels
  - Fire extinguishers
  - Internal and external communication equipment (radio and cell phone)
  - A first aid kit equipped with, but not limited to (gauze, bandages, cotton, hydrogen peroxide, alcohol and sterilized water, ointments and rehydrating creams for burns).
  - Megaphone
  - Stretchers
- Maintain proper cleanliness of the construction area, avoiding the accumulation of all types of waste, including construction/demolition debris and pruning waste, which may obstruct normal runoff flow, be carried away by it, or become projectiles during strong wind episodes.
- Establish safe storage areas for materials, tools, and waste, away from flood-prone areas, paying special attention to not creating any obstruction or blockage of natural or artificial watercourses, whether permanent or temporary.
- Establish safe and adequate systems for protecting materials, tools, and waste, including waterproof and fireproof covers, as well as anchors to prevent being carried away by strong winds or runoff.
- Implement communication and awareness campaigns about existing dangers in the construction area during natural disaster episodes or extreme weather events to ensure the community around the operational work area is isolated from these events.
- Socialize the emergency preparation and response plan with nearby communities.
- After the emergency, review the affected area and assess damages. Determine additional measures to incorporate in the future based on recorded damages. Communicate these lessons learned to the

Program 13: Disaster Management and Emergency Response

relevant authorities for inclusion in other projects within the Program. Utilize the nearest fire extinguishers to prevent the fire from spreading.

- Request external support when necessary and initiate control procedures with available resources as a first response.
- Establish means for maintaining constant communication, such as radios or telephones.
- Evacuate individuals from the work front and the camp until the emergency is under control.
- Identify and evaluate the emergency, determining the point of occurrence, cause, magnitude, consequences, actions to follow, and necessary support for control.

Fire Prevention and Control:

The Contractor is responsible for preventing and controlling fires in the workplace. In case of a fire, the following actions will be taken:

- Utilize the nearest fire extinguishers to prevent the fire from spreading.
- Request external support when necessary and initiate control procedures with available resources as a first response.
- Establish means for maintaining constant communication, such as radios or telephones.
- Evacuate individuals from the work front and the camp until the emergency is under control.
- Identify and evaluate the emergency, determining the point of occurrence, cause, magnitude, consequences, actions to follow, and necessary support for control.
- Implement a vegetation irrigation protocol during periods of low precipitation.

Actions in Case of Floods:

- In the event of flash flooding, immediately move to higher ground.
- Establish infiltration and drainage systems for runoff water in the project's direct influence area to redirect flows and reduce impacts on the construction area. This must be done while ensuring that no third parties are affected.
- Stay vigilant for sudden flooding in streams, drainage channels, and other areas.
- Avoid driving through flooded areas.
- Once the emergency is controlled, the emergency coordinator will prepare a comprehensive final report.

Action Plan for Natural Hazard Emergencies:

Upon receiving notification of a meteorological or geophysical alert, the Emergency Protocol will be activated, determining the actions to be taken according to the level of alert received.

Alert Level 1: **Non-hazardous Conditions**

Description: At this level, meteorological phenomena are anticipated that do not pose an immediate danger but require suspending activities to safeguard the integrity of personnel and equipment.

Actions to take:

- Suspend construction activities. This may be necessary, for example, in the presence of rain or light winds that interfere with normal activities.
- Properly safeguard equipment and corresponding protections to prevent damage.
- Maintain a minimal presence of personnel on the construction site, limited to security personnel and brigade members.

Alert Level 2: Natural Events with Potential Damage

Description: Adverse events are expected that could result in some level of damage to personnel, equipment, or the project.

Actions to take:

- Immediately activate the emergency plan, assigning specific roles and responsibilities to the response team.
- Verify the availability and condition of all emergency supplies, ensuring quick access if needed.
- Conduct a quick and thorough inspection of facilities and work areas to identify and mitigate possible risks.

Program 13: Disaster Management and Emergency Response

- Communicate the situation to local authorities, informing them of the preventive measures taken.
- Keep the team informed about the situation and the possibility of alert escalation, ensuring their preparedness to act as necessary.

Alert Level 3: Severe Damage Imminent

Description: The occurrence of a highly damaging event is imminent, requiring immediate actions to ensure personnel safety and minimize material losses.

Actions to take:

- Initiate evacuation of the construction site, prioritizing the safety of workers, and suspend all construction activities.
- If necessary, direct workers to designated shelter areas within the site or in nearby locations, using established evacuation routes.
- Maintain constant communication with local authorities and follow updates on the disaster situation to adjust actions as necessary.

After the event happened:

- Reporting and investigation of emergencies: Once the emergency is under control, the emergency coordinator, with the support of the rest of the team, will prepare a report on the incident. This report must be submitted to the work supervision, which will inform the MOPC and other interested entities.
- The contingency report must contain at least the following:
- Date and time of the event and date and time of the initial notification
- Date and time of the end of the emergency
- Exact location of the emergency
- Origin of the emergency
- Cause of the emergency
- Areas and infrastructure affected
- Personnel and/or communities affected
- Consequences of the impact
- Action plan developed and response times used in controlling the emergency, description of prevention, mitigation, correction, monitoring, and restoration measures applied
- Necessary support (requested/obtained)
- Estimated recovery costs
- Improvement actions to be implemented in the project to avoid new occurrences of the event or similar events.

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.
- Number of operational emergency brigades in the Project/Number of emergency brigades defined in the natural disaster preparedness and response plan
- Number of trained emergency brigades/Number of emergency brigades defined in the natural disaster response plan
- Number of drills conducted/Number of scheduled drills

Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 14: Community Information and Participation

Program 14: Community Information and Participation	
Socio-environmental effects to be prevented or corrected:	Misinformation of the public regarding the progress and tasks of the project.
Management measures	
Contractor Responsibilities: • **Project Reporting:** Maintain timely and updated records on the project's implementation and progress. Promptly address queries, observations, complaints, and claims from the Works Inspection, proactively identifying and implementing solutions to identified problems. • **Communication Channels:** Provide the public with a transparent and accessible means of communication. Establish a complaints book for public access. Make available a 24-hour contact telephone number, an email address, and a web interface for the community to submit their claims, complaints, and suggestions. Ensure that all submitted comments are promptly analyzed and receive a swift response. • **Community Information and Participation:** Implement the Community Information and Participation Program consistently throughout the project's lifecycle. Give special attention to ensuring clear, transparent, and timely communication with all individuals benefiting from the program. • **Community Engagement:** Establish a mode of engagement with the community affected by the project's development. Inform the community about the project's schedule and progress to foster transparency. • **Access to Information:** Facilitate equal access to information, with a commitment to promoting gender equity among all interested social sectors. These responsibilities underscore the contractor's commitment to effective communication, community engagement, and transparency throughout the project. **Communication Campaign** A communication campaign must be created to communicate to the directly affected population surrounding the airport the works to be implemented. The communication campaign should explain: - purpose of the project - description of the project and activities - expected impacts and risks - mitigation measures - communication channels for feedback (project level, IDB and ICIM) Communication channels can include community meetings, social media, local radio, printed materials and workshops. **In the specific case of the Kwamalasamutu airstrip**, appropriate communication channels with the communities of the village, Medical Clinics and Tourism sector (especially pertaining Werephai Cave activities) must be ensured when planning the start of all activities pertaining the project, especially the activities that will interrupt the service of aircrafts, safeguarding the minimum interruption or disturbance to key activities in the village such as emergency health services, supply transportation and commercial activities.	
Monitoring and Compliance	
Indicators • 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. • Number of communication campaigns performed	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 15: Chance Find Procedure

<table>
<tr><th colspan="2">Program 15: Chance Find Procedure</th></tr>
<tr><td>Socio-environmental effects to be prevented or corrected:</td><td>Destruction of historical, cultural, archaeological, and paleontological heritage.</td></tr>
<tr><td colspan="2">Management measures</td></tr>
<tr><td colspan="2">This program will be systematically implemented throughout the duration of the project, with the following key provisions:

• Continuous Monitoring: A permanent monitoring initiative will be conducted across the entire area directly impacted by the project to identify any archaeological elements.
• Immediate Action on Discovery: Should any property of potential archaeological significance be discovered; the construction team is obligated to promptly cease activities that may impact the identified area. Adequate surveillance measures will be implemented to prevent unauthorized access and looting.
• Alternative Worksite Consideration: If necessary, the project team will explore alternative locations for project activities to mitigate any potential impact on archaeological finds.
• Notification of Competent Authority: The relevant national authority will be promptly notified, and the project will adhere to their instructions for further action in response to the archaeological discoveries.
• Salvage Operations: In the event of cultural remains emerging during activities such as ditching, earth removal, or excavations, salvage operations will be promptly initiated. Recognized archaeologists, under supervision, will conduct these operations with the utmost consideration for preserving the contextual integrity of the archaeological remains. Work will resume only upon the archaeologist's determination of an appropriate timeframe and location.
• Comprehensive Reporting: Upon completion of the project, a comprehensive final report will be prepared. This report will detail the quantity and nature of the recovered materials and will be submitted to the competent authority.
• Consultation with Competent Authority: The competent authority will be consulted regarding the proper procedures for delivering archaeological materials as part of the project's commitment to compliance and transparency.</td></tr>
<tr><td colspan="2">Monitoring and Compliance</td></tr>
<tr><td colspan="2">Indicators
• 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.</td></tr>
<tr><td>Responsible for implementation</td><td>Works Director</td></tr>
<tr><td>Responsible for control</td><td>Works Inspector</td></tr>
</table>

Program 16: Chemical Substances Management

Program 16: Chemical Substances Management	
Socio-environmental effects to be prevented or corrected:	Pollution due to inadequate management of chemical substances used by work activities.
Management Measures	

If the contractor refuels heavy machinery in the vicinity of the worksite, tanker trucks must be used, and the following procedures must be considered during refueling:

- Park the vehicle in a way that does not cause interference, allowing for a quick exit.
- Ensure the presence of fire extinguishers near the refueling site (within a distance of no more than 3 meters).
- Verify that there are no sources that could cause a fire in the surrounding area.
- Check the coupling of the hoses.
- Use spill containment trays.
- In case of a spill or fire, follow the procedures outlined in the Contingency Plan.
- Immediately report any spills or product contamination to the environmental inspector.

There should be a report and authorization form for fuel refilling.

Polyethylene material should be placed over the area where any corrective maintenance on heavy machinery (greasing and checking oil levels) will be carried out. In this case, the delegated Site Supervision must be notified of the day, place, and reasons for the maintenance.

The person responsible for the site must report and clean up any fuel, oil, and toxic substance spills. If there are accidental spills on the ground, they must be immediately removed, and the Site Supervision must be notified. If the spill exceeds approximately 5 liters, the affected soil must be removed and treated as special waste. Small, spilled volumes can be collected with synthetic absorbent materials, rags, sawdust, or sand. The final cleaning of the site can be done with water and detergent.

The minimum daily storage allowed in the work area must be agreed upon with the competent authority. Tanks containing fuels or lubricants should be stored away from any building, ideally at a distance greater than 6 meters. The storage of fuels or lubricants should be in metal containers with spring-closed lids or in plastic tanks. They should be properly labeled with the substance they contain and have warning signs of “flammable” and “no smoking”.

When concrete is mixed on site, the application of chemicals that require handling measures is sometimes needed. An inventory of the chemical products should be made before starting work, classifying them according to the type and degree of physical and health risks associated with their use.

All flammable substances must be properly protected, safeguarded, and stored under safe conditions and restricted according to their use and level of hazard. All chemical products should be labeled to provide essential information about their classification, the hazards they pose, and the safety precautions that should be observed by workers.

Persons handling chemical products should ensure that when chemical products are transferred to other containers, their identification and all industrial safety and occupational health precautions are maintained, in accordance with the relevant Plan.

It will be mandatory to have safety data sheets for the chemical products at the site and to inform employees about them during induction training. These sheets should contain essential detailed information about their identification, supplier, classification, hazards, precautionary measures, and emergency procedures. A registry of these sheets should be created and made accessible to all interested workers and their representatives.

Program 16: Chemical Substances Management	
Use of compounds found in Annex A and B of the Montreal Protocol on Substances that Deplete the Ozone Layer, mainly chlorofluorocarbons (CFCs), halogens, carbon tetrachloride and 1,1,1,-trichloroethane, is forbidden in the context of the project. Implement procedures for the safe decontamination of equipment that has contained chemicals, using methods that neutralize chemical residues before their removal or recycling. Conduct training on the safe handling of chemical substances, emergency procedures, and proper use of PPE. In the specific case of Kwamalasamutu, special consideration must be taken to ensure safe transport to the village of chemical substances used in the construction activities, including authorized transportation systems and providers.	
Monitoring and compliance	
Indicators • Percentage of compliance in inspections conducted on facilities and chemical substance management procedures. **Monitoring** • Registration forms for training of key personnel in chemical substance management. • Registration forms for chemical substances stored on-site. • Report and authorization forms for fuel refilling.	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

Program 17: Works Closure

<table>
<tr><th colspan="2">Program 17: Works Closure</th></tr>
<tr><td>Socio-environmental effects to be prevented or corrected:</td><td>Impacts on the environment once the work is finished.</td></tr>
<tr><td colspan="2">Management measures</td></tr>
<tr><td colspan="2">Mitigation measures
All installations utilized in the execution of the project will undergo systematic removal.
An exhaustive examination of environmental and social liabilities will be conducted, and identified issues will be promptly addressed and remedied.
Disposal of waste and solid materials must adhere to the guidelines set by environmental and social supervision, ensuring their correct transportation and disposal to approved sites.
Areas where vegetation has been cleared must undergo revegetation using the same species originally present.
Surplus reusable or recyclable materials are eligible for donation, while the delivery of materials constituting environmental liabilities is strictly prohibited.
The incineration of waste during the dismantling process is expressly forbidden.
Dismantled sites are obligated to be left in impeccable condition, seamlessly integrated into the surrounding environment.</td></tr>
<tr><td colspan="2">Monitoring and Compliance</td></tr>
<tr><td colspan="2">Indicators
Absence of claims by the authorities, the surrounding population, and the community in general.
Monitoring
Photographic record before and after work.</td></tr>
<tr><td>Responsible for implementation</td><td>Works Director</td></tr>
<tr><td>Responsible for control</td><td>Works Inspector</td></tr>
</table>

Program 18: Gender Action Plan

Program 18: Gender Action Plan	
Socio-environmental effects to be prevented or corrected:	Gender inequality, exclusion of woman. .

Management measures

Mitigation measures

- Develop a **stakeholder engagement** with a gender focus conducted for the project
  - Develop a gender sensitive mapping of key stakeholders, including women's organizations, vulnerable groups, NGOs working on gender related issues, government gender institutions, etc.
  - Ensure stakeholder engagement and analyses are inclusive and gender-responsive, recognizing and addressing to the different rights, needs, roles and interests of women and men
  - Conduct gender-sensitive consultations with affected communities to gather input on specific gender-related challenges and potential project impacts.
  - Communications and awareness programs instituted to ensure public knowledge of the project and gender sensitive issues.
  - Develop a communication program with gender sensitivity strategies throughout the whole project's life cycle. Report project results desegregated by sex, gender impacts of the project
- Develop a **Grievance Mechanism** with a gender focus perspective.
  - Ensure the grievance mechanism includes a gender-sensitive approach that addresses the unique needs and concerns of women and vulnerable groups.
- **Training and Capacity Building**
  - Enhance the capacity, provide training, and raise awareness about gender inequality for all project stakeholders.
  - Develop and provide gender sensitivity training for all personnel involved in the project, with special emphasis on preventing gender-based violence and promoting equality
- **Equal employment opportunity**
  - Include a clause on equal employment opportunities based on merit in all job descriptions and terms of reference related to the project, ensuring both women and men have access to the same opportunities.
  - Promote initiatives to increase women's participation in technical and decision-making roles, actively working to balance gender representation in leadership positions.
- Promote a safe and inclusive work environment
  - Include gender considerations in the **code of conduct** for all workers (see **Annex 2,** Labor Management Procedure)
  - Implement policies and practices that actively prevent discrimination based on gender, ensuring a fair and inclusive work environment for all.
  - Prohibit the hiring of individuals with a history of gender-based violence.
  - Ensure that separate, safe, and accessible facilities for women are available in project areas, including sanitation and changing areas where applicable.
- **Safety Measures for Women and Vulnerable Groups**
  - Integrate safety measures into project infrastructure designs to mitigate risks of sexual and gender-based violence (SGBV). These measures may include enhanced lighting, safe spaces, and security protocols.
  - Maintain communication with local organizations that provide support services for victims of SGBV, ensuring that resources are available for those affected.
  - Work closely with local organizations that specialize in supporting victims of sexual and gender-based violence (SGBV), ensuring that appropriate services and support mechanisms are in place throughout the project's implementation.

Program 18: Gender Action Plan	
Monitoring and Compliance	
Indicators • Gender disaggregated data from the stakeholder events. • Percentage of complaints properly treated, with gender considerations • Number of workers trained in the programs. • Percentage of female labor force participation	
Responsible for implementation	Works Director
Responsible for control	Works Inspector

6.2.2. 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 28 outlines the minimum requirements that the Environmental and Social Management Plan must meet for the Operational Phase.

During the Operational Phase, MTCT will oversee the operation and maintenance of the infrastructure to be built and of the equipment and machinery, according to the guidelines presented below.

Table 47 - Operational Environmental and Social Management Plan

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
Waste Management Program	Contamination due to inadequate management of assimilable household, and hazardous waste.	Development and implementation of a Waste Management Program	MTCT	Environmental Audit of the sites	Competent authority
Fauna and Flora Management	Impacts on vegetation cover and wildlife	Development and implementation of a Wildlife Management Program	MTCT	Persistence of revegetated cover surface Hazardous Wildlife encounters/Management	Competent authority
Occupational Health and Safety Program	Occupational risks due to the maintenance of infrastructure.	Compliance with current national regulations. Adopt international best practices.	MTCT	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 for the non-attention to the claims and complaints.	There must be an efficient tool for receiving, registering, monitoring and resolving claims.	MTCT	Registration of claims and complaints	Competent authority

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
Training Program	Lack of knowledge about the role of personnel in the preservation, protection and conservation of the environment and occupational safety in the exercise of their functions.	Minimum training: - Basic induction in environmental protection and safety. - Communication Systems - Risk assessment and control. Security of persons, movable and immovable property. - Electrical Work - Road safety - Monitoring for suspected land-use change for illegal trafficking and/or mining activities	MTCT	Percentage of operators trained according to Training Program Training Registration Sheets	Competent authority
Maintenance Program	Deterioration of the airstrip due to lack of proper maintenance measures	Regular maintenance of the machinery used to maintain the airstrip. Provision of fuel, tools and other resources required for the	MTCT	Maintenance of machinery Fuel provided (L/month) Tools provided	Competent authority

Plan / Program	Impact to avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance, Records	Supervision
		maintenance of the airstrip Monitoring and control of potential land-use change regarding mining operations in the area			
Contingency Plan	Poor management of environmental/occupational contingencies	Define the structure and organization for emergency response, the roles and responsibilities of the people, the necessary resources, and the preventive and operational strategies to be applied in each of the possible scenarios.	MTCT	Number of environmental and safety accidents managed according to the defined procedure / Total number of environmental and health accidents occurring in the project.	Competent authority

6.3. Budget for Implementation of the ESMP

Table 29 includes the estimated costs, schedules, and responsible entities for the implementations of the ESMPs.

Table 48. 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 MTCT operational budget]	Throughout the lifecycle of the infrastructure	MTCT

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 spent by the contractor).

7. Conclusions

This Environmental and Social Analysis evaluated the environmental and social impacts and risks associated with the Projects of the **Essential Air Transport Service for remote communities in Suriname (SU-L1071)**.

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 and water 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.

Additionally, projects have specific vulnerabilities that need attention. Kwamalasamutu, Zarendij and Paramaribo are home to indigenous communities, and although no impacts to these communities are expected, special measures are included in the Stakeholder Engagement Plan to prevent conflicts.

Furthermore, in Kwamalasamutu, animal species included in the IUCN Red List were identified; therefore, a Flora and Fauna Management Plan is included in the ESMP to prevent impacts on the environment.

Finally, Zorg En Hoop airport is in a densely populated area and Johan Adolf Pengel in a low-density populated area but with the presence of sensitive receptors around it, such as schools and homes. However, no high impacts on the population are expected and corresponding mitigation measures are included in the ESMP.

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.

The application of adequate mitigation measures is detailed in Chapters 5 and 6 of this study. Along with the application of good construction practices that guarantee compliance with national regulations, and the IDB Environmental and Social Performance Standards, these measures are expected to mitigate all the identified impacts and risks.

In their operational phases, these projects are expected to yield long-term positive impacts on communities by optimizing operations for safe and efficient air transport services.

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

References

Amazon Conservation Team (visited June 2024): https://www.amazonteam.org/the-shamans-and-apprentices-program-a-promise-to-kwamalasamutu/

Bureau of International Labor Affairs, Child Labor and Forced Labor Reports. Suriname. https://www.dol.gov/agencies/ilab/resources/reports/child-labor/suriname

Caribbean Community Climate Change Centre. (2014). Final National Climate Change Policy, Strategy and Action Plan for Suriname. https://cdn.climatepolicyradar.org/navigator/SUR/2015/national-climate-change-policy-strategy-and-action-plan_c9ada1a3f34fedf38f5803132d02b323.pdf

COMUN//C4. (2009). From flood relief to food and nutrition security to income generation in Kwamalasamutu, Suriname.

Conservation International. (2010). A Rapid Biological Assessment of the Kwamalasamutu region, Southwest Suriname: 29.

Corte Interamericana de Derechos Humanos. (2015). Caso Pueblos Kalina y Lokono vs. Surinam (Sentencia de 25 de noviembre de 2015). Fondo, Reparaciones y Costas.

Foundation of Forest Management and Supervision (SBB), Suriname (visited June 2024): https://sbb.sr/over-sbb/

General Bureau of Statistics. (2017-2019). Tables of public demographic data.

Gersie, K. (2021). The interplay between Tectonic Activity, Climate and Sea-Level Change in the Suriname River Valley, Tropical South America. Quaternary. 4. 11. https://doi.org/10.3390/quat4020011

GFDRR. (2022). Suriname Natural Hazard Risk. https://www.gfdrr.org/en/suriname

Government of Suriname (2018). Forest Reference Emission Level for Suriname's REDD+ Programme. Paramaribo, Suriname. https://redd.unfccc.int/media/2018_frel_submission_suriname.pdf

Green Growth Suriname (visited June 2024): https://greengrowthsuriname.org/granman-jimmy-toeroemang/

Heemskerk, M., & Delvoye, K. (2007). TRIO BASELINE STUDY: A sustainable livelihoods perspective on the Trio Indigenous Peoples of South Suriname (Final report). Stichting Amazon Conservation Team-Suriname.

Indigenous Peoples in Suriname. Minority Rights Group: https://minorityrights.org/communities/indigenous-peoples-in-suriname/

IADB. (2014). SU-T1070: Assessment of Aquifer Potential and Groundwater Level.

ILACO. (2024). Final Report: Identification of required maintenance and repair actions on grasshopper airstrips. Project #SU-T1152

Kambel, Ellen-Rose. Indigenous Peoples and Maroons in Suriname. [In line]. 2006. p 9-10. Available in: https://publications.iadb.org/publications/english/document/Indigenous-Peoples-and-Maroons-in-Suriname.pdf

Key Biodiversity Areas Partnership (2024) Key Biodiversity Areas factsheet: Sipaliwini Nature Reserve. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Downloaded from https://keybiodiversityareas.org/

Key Biodiversity Areas Partnership. (2024). Key Biodiversity Areas factsheet: Northern Commewijne/ Marowijne. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Downloaded from https://keybiodiversityareas.org/

Key Biodiversity Areas Partnership. (2024). Key Biodiversity Areas factsheet: Northern Saramacca. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife International, IUCN, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, World Wildlife Fund and Wildlife Conservation Society. Downloaded from https://keybiodiversityareas.org/

LACGEO. Latin America & Caribbean Geographic. Water Bodies of Suriname (visited in June 2024): https://lacgeo.com/water-bodies-suriname

Loftus, S. (2013). REDD+ for the Guiana Shield 1st Working Group Report. REDD+ for the Guiana Shield project, ONF International. https://reddguianashield.files.wordpress.com/2013/12/1st-working-group-report.pdf

Ministry of Social Affairs and Public Housing. (2019). Suriname Multiple Indicator Cluster Survey 2018, Survey Findings Report. Ministry of Social Affairs and Public Housing.

NASA (visited June 2024): https://earthobservatory.nasa.gov/

PRESTO Geosystems. https://www.prestogeo.com/products/soil-stabilization/geoweb-load-support/

Republic of Suriname. (2015). Final National Climate Change Policy, Strategy and Action Plan for Suriname.

Republic of Suriname. (2020). Nationally Determined Contribution, in fulfillment under the Paris Agreement on climate change.

Republic of Suriname (2022). 10th Environment Statistics.

Republic of Suriname. (2022). First Biennial Update Report to the United Nations Framework Convention on Climate Change.

Safety Audit Results: USOAP interactive viewer (visited in June 2024): https://www.icao.int/safety/pages/usoap-results.aspx

SBB. (2014). Suriname Forestry Sector 2013. Foundation for Forest Management and Production Control. Ministerie Van Ruimtelijke Ordening Grond. En Bosbeheer

Suriname Mid-Term Labour Market Policy 2022-2025 https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@americas/@ro-lima/@sro-port_of_spain/documents/publication/wcms_856014.pdf

Suriname Water Resources Information System (visited in June 2024): https://www.swris.sr/

THE REPUBLIC OF SURINAME. First Biennial Update Report (BUR1) to the United Nations framework convention on climate change. Geographic profile. 2022.

UN (Visited June 2024): https://caribbean.un.org/en/261496-access-clean-water-indigenous-suriname-village-kwamalasamutu-rehabilitated

UN Water Action Hub (Visited June 2024): https://wateractionhubfrontdoor-d6dwaqhbgwebcfg2.z01.azurefd.net/media/files/2020/08/25/Country_Profile_-_2020-08-25T133124.451.pdf

UNDP. (2020). 9th Environment Statistics Publication 2015-2019. Suriname.

UNDRR (visited June 2024): https://www.undrr.org/news/suriname-advances-national-disaster-risk-reduction-strategy-ensure-alignment-its-national

UNEP-WCMC (2024). Protected Area Profile for Coppenamemonding from the World Database on Protected Areas, July 2024. Available at: www.protectedplanet.net

UNESCO (Visited June 2024): https://whc.unesco.org/

UNICEF. (2022). The Suriname Country Overview. Sanitation and Water for All.

Verrest, H. J. L. M. (2010). City profile: Paramaribo. Cities, 27(1), 50-60. https://doi.org/10.1016/j.cities.2009.10.005

Western Hemisphere Shorebird Reserve Network (visited June 2024): https://whsrn.org/es/whsrn_sites/wia-wia/

Annex 1. Stakeholder Engagement Plan

Introduction

As part of the socialization process of the Essential Air Transport Service for remote communities in Suriname (SU-L1071), 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", ESPS 2 “Labor and Working Conditions”, ESPS 4 “Community Health, Safety and Security”, ESPS 6 “Biodiversity Conservation and Sustainable Management of Living Natural Resources”, ESPS 7 “Indigenous People”, ESPS 8 “Cultural Heritage” 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. The MTCT 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. The MTCT shall take steps to maintain confidentiality where required and where necessary to protect personal data.

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

Objective

The objective of the consultation process is to promote the engagement of the affected population and other interested parties from initial stages of the project and throughout the project’s life cycle. Stakeholders will be informed on Projects description, 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 to determine the possibility of incorporating them into the design of the Project, when appropriate.

Institutional Arrangements for Plan Implementation

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

General Principles of ESPS 7 Applicable to the Program. Free, Prior and Informed Consent (FPIC).

One of the project sites proposed is in an indigenous settlement, Kwamalasamutu and the grassy airstrip serves as the principal connection between the region and the coast. The village was officially created in 1975, and different small nomadic tribes came together in the settlement. The largest of these tribes is the Trio and the Trio language is the lingua franca of the people in the village. Kwamalasamutu has turned into the political and cultural center for the Trio people of Suriname.

Therefore, within the general guidelines of the participation process, the following requirements established according to Performance Standard 7 "Indigenous Peoples" must be met:

- The borrower will respect and consider the rights of indigenous peoples and individuals enshrined in the corresponding legal obligations and commitments, which will include relevant national and international legislation and indigenous legal systems. These systems are recognized in national legislation.
- Whenever possible, adverse impacts on indigenous communities affected by the project should be avoided.
- If it is not possible to avoid adverse impacts after exploring alternatives, the borrower will minimize or provide restoration or compensation for such impacts in a culturally appropriate manner and proportionate to the nature and extent of these impacts and the vulnerability of the indigenous communities affected by the project.
- The borrower will undertake a process of engagement with the indigenous communities affected by the project, as required by Performance Standards 1 and 10. This process includes stakeholder analysis and engagement planning, information disclosure, consultations, and participation in a culturally appropriate manner. Additionally, the process will include the following: (i) Participation of representative bodies and organizations of indigenous peoples (such as councils of elders or village councils), as well as members of the indigenous communities affected by the project; (ii) Allowing sufficient time for the decision-making processes of indigenous peoples; (iii) Inclusion of indigenous consultation protocols when they exist.
- The borrower and the indigenous communities affected by the project will identify mitigation measures in line with the mitigation hierarchy described in Performance Standard 1, as well as opportunities for culturally appropriate and sustainable development benefits.
- The borrower will ensure that the agreed-upon compensation measures are delivered in a timely and equitable manner to the indigenous communities affected by the project.
- Information about the Program and the projects to be executed must be disclosed in the relevant local language, in a manner and format that is culturally appropriate and accessible to illiterate and semi-literate audiences, and through channels suitable for the diverse groups of stakeholders.

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, indigenous 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.**
- **Planning how the interaction with the stakeholders identified will be conducted.**
- **Documents to disclose and availability of information.**
- **Dissemination of the consultation process through the MTCT website, social media, and other means.**
- **Development of content and documentation to be socialized.**
- **Public consultation procedure.**
- **Response to complaints and claims submitted through the proposed Grievance Redress Mechanism (GRM).**
- **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 30 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 the MTCT. 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.

Below is a general stakeholder mapping for the program and a specific stakeholder map for each of the projects.

Table 49 - General Stakeholder Mapping for Projects in the Program. Source: PlanEHS, 2024.

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
Institutional Stakeholders	**Ministry of Transport, Communications and Tourism (MTCT) (Ministerie van Transport, Communicatie en Toerisme); N.V. Luchthavenbeheer**	Executing Agency
	Aerodrome Department (LVT)	Interested Party
	Civil Aviation Safety Authority Suriname (CASAS)	Interested Party
	Ministry of Regional Development and Sport (Ministerie van Regionale Ontwikkeling en Sport)	Interested party
	Ministry of Land and Forest Management (Ministerie van Grondbeleid en Bosbeheer)	Interested party
	Ministry of Public Health (Ministerie van Volksgezondheid)	Interested Party
	Ministry of Spatial Planning and Environment (MSPE) (Ministerie van Ruimtelijke Ordening en Milieu)	Interested Party
	Beneficiary cities (authorities)	Interested Party
	Airline Operators for scheduled and chartered flights	Affected Party
	Vereniging Van Inheemse Dorpshoofden In Suriname (VIDS)	Interested Party
	Representatives of local communities and tribes	Interested Party
	Stakeholders related to other infrastructure in the project areas (E.g.,	Affected Party

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
	Staatsolie Power Company Suriname, water supply etc.)	
	Tourism Stakeholders (Suriname Hospitality & Tourism Association, Suriname Conservation Foundation)	
	Businesses in the area	Affected Party
	Civil Society Organizations (in particular, those working in environmental, health and social issues)	Interested Party
Community	**Population of the villages reached by the Project and community in general**	Interested Party

Table 50. Stakeholder Mapping for Zorg en Hoop Airport, Paramaribo. Source: PlanEHS; 2024.

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
Institutional Stakeholders	**Ministry of Transport, Communications and Tourism (MTCT) (Ministerie van Transport, Communicatie en Toerisme); N.V. Luchthavenbeheer**	Executing Agency
	Aerodrome Department (LVT)	Interested Party
	Ministry of Regional Development and Sport (Ministerie van Regionale Ontwikkeling en Sport)	Interested Party
	Paramaribo District Commissioner	Affected Party
	Civil Aviation Safety Authority Suriname (CASAS)	Interested Party
	Ministry of Land and Forest Management (Ministerie van Grondbeleid en Bosbeheer)	Interested party

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
	Ministry of Public Health (Ministerie van Volksgezondheid)	Affected Party
	Ministry of Spatial Planning and Environment (MSPE) (Ministerie van Ruimtelijke Ordening en Milieu): Aerodrome Department (LVT)	Interested Party
	Beneficiary cities (authorities)	Interested Party
	Airline Operators for scheduled and chartered flights (Suriname Airways, Gum Air, Blue Wing Airlines, MAF Suriname, Trans-Guyana Airways, Era Helicopters, Roraima, Zimex, Aero Club Suriname, Eagle Air Services, Hi jet Helicopter Services, Meinfertsma Suriname, Pegasus Air Services, Stichting Vliegen Suriname United Aviation Services, Vortex Air Services)	Affected Party
	Representatives of local communities and tribes	Affected Party
	Stakeholders related to other infrastructure in the project areas (E.g., operators of electricity networks, water supply etc.)	Affected Party
	Tourism Stakeholders (Suriname Hospitality & Tourism Association)	Affected Party
	Businesses located in and around Airstrip	Affected Party
	Civil Society Organizations (in particular, those working in environmental, health and social issues)	Interested Party
Community	**Population reached by the Project and community in general**	Interested Party

Table 51. Stakeholder Mapping for Kwamalasamutu Airtrip. Source: PlanEHS, 2024.

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
Institutional Stakeholders	**Ministry of Transport, Communications and Tourism (MTCT) (Ministerie van Transport, Communicatie en Toerisme); N.V. Luchthavenbeheer**	Executing Agency
	Aerodrome Department (LVT)	Interested Party
	Ministry of Regional Development and Sport (Ministerie van Regionale Ontwikkeling en Sport)	Interested Party
	Sipaliwini District Commissioner	Affected Party
	Civil Aviation Safety Authority Suriname (CASAS)	Interested Party
	Ministry of Land and Forest Management (Ministerie **van Grondbeleid en Bosbeheer)**	Interested party
	Ministry of Public Health (Ministerie van Volksgezondheid)	Affected Party
	Medical Mission Primary Health Care, Suriname (Medische Zending)	Affected Party
	Ministry of Spatial Planning and Environment (MSPE) (Ministerie van Ruimtelijke Ordening en Milieu)	Interested Party

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
	Beneficiary cities (authorities)	Interested Party
	Airline Operators for scheduled and chartered flights (Mission Aviation Fellowship Suriname – MAF, Blue Wings Airline)	Affected Party
	Representatives of local communities and tribes (Granman Jimmy Toeroemang)	Affected Party
	Stakeholders related to other infrastructure in the project areas (E.g., operators of electricity networks, water supply, boat transportation, etc.)	Affected Party
	Conservation International	Interested party
	Amazon Conservation Team	Interested Party
	Tourism Stakeholders (Suriname Hospitality & Tourism Association, Suriname Total Adventures Tour, etc.)	Affected Party
	Businesses located in Airstrips and local communities	Affected Party
	Civil Society Organizations (in particular, those working in environmental, health and social issues)	Interested Party
Community	**Population of the villages reached by the Project** (Trio Tribe) **and community in general**	Interested Party

Table 52. Stakeholder Mapping for Johan Adolf Pengel International Airport, Para District. Source: PlanEHS; 2024.

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
Institutional Stakeholders	**Ministry of Transport, Communications and Tourism (MTCT) (Ministerie van Transport, Communicatie en Toerisme); N.V. Luchthavenbeheer**	Executing Agency
	Aerodrome Department (LVT)	Interested Party
	Ministry of Regional Development and Sport (Ministerie van Regionale Ontwikkeling en Sport)	Interested Party

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
	Para District Commissioner	Affected Party
	Civil Aviation Safety Authority Suriname (CASAS)	Interested Party
	Ministry of Land and Forest Management (Ministerie van Grondbeleid en Bosbeheer)	Interested party
	Ministry of Public Health (Ministerie van Volksgezondheid)	Affected Party
	Ministry of Spatial Planning and Environment (MSPE) (Ministerie van Ruimtelijke Ordening en Milieu): Aerodrome Department (LVT)	Interested Party
	Beneficiary cities (authorities)	Interested Party
	Airline Operators for scheduled and chartered flights (Caribbean Airlines, Copa Airlines, Fly All Ways, GOL, KLM, Surinam Airways and Trans Guyana Airways)	Affected Party
	Representatives of local communities and tribes (Wit Santie, Hollandse Kamp and Zarendij Village)	Affected Party
	Stakeholders related to other infrastructure in the project areas (E.g., operators of electricity networks, water supply etc.)	Affected Party
	Tourism Stakeholders (Suriname Hospitality & Tourism Association)	Affected Party

Type of Stakeholder	Stakeholder	Relationship with the Program/Project
	Businesses located in and around Airstrip	Affected Party
	Civil Society Organizations (in particular, those working in environmental, health and social issues)	Interested Party
Community	**Population 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 EA's website and other means, and available to the public for at least 14 days prior to the consultation events.

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

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

It is important that the disclosure of the event is designed with a gender perspective and culturally appropriate.

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 EA 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/Program
- Website with the publication of the documentation and a space for the inquiries and claims regarding the Project.
- Procedure of the consultation process, including the type of engagement activities (e.g., public meetings, workshops, focal groups, written consultations, online consultations, door to door, etc.)
- Duration of the consultation process
- Date and location of all engagement activities (e.g., public meetings, surveys, leaflet distribution) including a copy of any invitation to the stakeholders or records of invitations made orally.

- 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.
- Number of participants
- Video/photos of the events
- Summary of concerns, inquiries, propositions, and ideas of stakeholders involved and how where they included into the project design, mitigation plan or management of activities.

Development of the Public Consultation Process

The consultation process was carried out in person. The coordination of the process overseed EA with social specialists with experience in consultation instances.

Two meaningful consultations were be carried out in October 2024. The first one was a general consultation with all key stakeholders and Indigenous and Tribal communities held in Paramaribo, regarding the interventions on the Zorg En Hoop airport and Johan Adolf Pengel International Airport. Here, because of the absence of impacts and risks specific to Indigenous and Tribal Communities and the substantial integration of people with Indigenous or Afro-descendant origins within the city demography, a dedicated consultation was found not to be needed.

In Kwamalasamutu, a consultation with the Trio Indigenous communities took place. The event consisted in the presentation of the project, its description, main impacts and risks, mitigation measures and existing GRM, it was verbally presented and translated by the local translator to the community and Granman and printed copies of the presentations were distributed amongst the community. Ongoing dialogue will be maintained throughout the Program lifecycle to adapt to community concerns and preferences through the Grievance Mechanism, fostering trust and collaboration. Moreover, during the consultation event a representative of the community was established as the liaison with the MTCT and IDB, ensuring an appropriate and open communication channel with the community throughout the project's life cycle.

Publication on the website

EA 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.

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

Grievance Redress Mechanism

The Program and its projects will have a feedback / claims management system that includes their entry / reception, analysis, monitoring, and resolution.

The principles of the GRM are:

- The interaction/claims management system will have mechanisms in accordance with the local context and the sociocultural characteristics of the groups involved in each project to be financed by the Program, with special consideration and respect for the most vulnerable groups (Youth, Women, people with disabilities, migrants, people belonging to indigenous communities, among others).
- The procedures for complaint, the process that will follow, the deadline and the resolution mechanisms will be widely disseminated for the knowledge of interested parties and complainants.
- In all cases, a record will be kept of the reception, analysis and resolution of claims and conflicts.

GRM Guidelines

In general, the Mechanism will follow the following guidelines:

- **Proportional:** The Mechanism will proportionally consider the level of risk and possible negative impacts on the affected areas.
- **Culturally appropriate:** The Mechanism will be designed to consider the local customs of the area.
- **Accessible:** The Mechanism will be designed in a clear and simple way so that it is understandable to all people. There will be no cost related to it.

- **Anonymous:** The complainant may remain anonymous, as long as it does not interfere with the possible resolution of the complaint or problem. Anonymity is distinguished from confidentiality in that it is an anonymous complaint, the personal data (name, address) of the complainant are not recorded.
- **Confidential:** The Program will respect the confidentiality of the complaint. Information and details about a confidential report will only be shared internally, and only when it is necessary to report or coordinate with the authorities.
- **Transparent:** The process and operation of the Mechanism will be transparent, predictable, and readily available for use by the population.

Management of the GRM

The procedure begins with the presentation of the consultation, claim, complaint and / or suggestions (orally or written) by any person linked to the actions of the Program. The process ends with the closure and agreement in the resolution of both parties. The process will be documented by means of a record (in a physical and digitized file).

Complaints received by EA must be addressed and classified.

Complaints received at the level of individual projects to be financed by the Program (via the contractors of each work, or departmental or municipal agencies) must be redirected to EA for management and follow-up.

Scope

The GRM applies and may be used by any person (general population) who expresses any type of claim, complaint or query related to the activities planned by the projects to be financed by the Program.

Dissemination of the Grievance Redress Mechanism

For the reception and registration of claims, a specific email address and a complaints mailbox will be enabled in the workshops of the contractors of projects under the Program.

Information on these means of receiving complaints must be disseminated through the different dissemination channels used by the Program, among which are:

1. **Signs at Worksites:** Each project will include the contact details of the executing agency for receiving complaints (telephone, email, and website)
2. **Formal and informal meetings** in places close to the works of the projects, for the dissemination and communication of activities related to environmental preservation and conservation defined in the project, as well as to disseminate the means to address concerns

and claims. In these meetings, EA's contact details for receiving complaints (telephone, email and/or website) will be disseminated.

3. **Social networks of EA** (WhatsApp, Instagram, Facebook, Twitter, etc.).
4. **Others** (to be agreed with the community)

The specific dissemination mechanisms should be detailed based on the information collected on the specific communities to be impacted by the benefits of the Program.

Receipt and Registration of Claims

The following mechanisms and channels will be available for the reception of concerns:

- Email: [to be completed by MTCT]
- Phone number: [to be completed by MTCT]
- Website: [to be completed by MTCT]

Claims Evaluation

In the case of a claim related to the work, it will be considered and responded to by the Contractor company or the Executing Agency.

If the claim or complaint is rejected, the complainant will be informed of the decision and the reasons for it. To this end, relevant and understandable information will be provided in accordance with the sociocultural characteristics of the claimant.

Complaints received will be categorized according to the following:

- **NOT ADMISSIBLE:** Complaints or claims that do not meet one or more of these requirements:
    - It is not directly related to the work, its contractors, and the actions of the project.
    - Its nature exceeds the scope of GRM.
    - There is no real cause of the action.
    - There are other formal mechanisms and institutions for filing complaints according to the nature of the complaint.
    - Related to labor issues must be addressed to the corresponding instances of the construction company.
- **LOW IMPORTANCE**: This category corresponds to complaints that do not require resolution, but only require information or a certain clarification that must be provided to the complainant. This category includes complaints that have been previously evaluated and received a definitive response from the Program.

- **MEDIUM IMPORTANCE:** Complaints and claims related to health, the environment, transportation, and contractors and subcontractors.
- **HIGH IMPORTANCE:** Includes complaints related to the safety of personnel, as well as those related to the health and safety of construction workers.

Within a period not exceeding **ten working days**, the social manager of the contractor or the unit in which the complaint is registered will have to evaluate the documentation presented by the claimant.

Where possible, if additional information is required for the proper evaluation of the complaint, EA will contact the complainant within a maximum of ten working days, to obtain the necessary information. Once the complaint is completed and reviewed, project staff will proceed to register the complaint.

The file should include, along with the complaint, a summary and the name of the person who received and processed it. Registration information will be updated periodically to reflect the current status of the case until the complaint has been finalized.

Grievance Closure and Monitoring Mechanism

The resolution of claims will be carried out through two instances:

1. **Internal**. The management of reception of claims and resolution of conflicts is the responsibility of EA and will be referred to the competent agency in the subject according to the complaint / claim.
2. **Mediation**. Cases of claims and conflicts not resolved in the first instance will be dealt with under the mediation mechanism. The person in charge of this instance must have sufficient authority to mediate for the resolution of claims and conflicts, and sufficient independence to project credibility in the parties.

Conflict Resolution

In the event that there is no agreement between EA and a complainant, either because of a rejected concern or because there is no agreement on the solution to be implemented, the means to reach a joint agreement between the parties must be arbitrated. This may include, among others: promoting the participation of technical third parties, inviting dialogue tables, mediations, conciliations, etc.

EA shall ensure that claims handling and dispute resolution are conducted in an appropriate and comprehensive manner.

In the event that the complaint cannot be handled within the scope of the work, the interested party may present his claim through the regular Justice procedures.

The IDB's Independent Consultation and Investigation Mechanism (ICIM), available on its website https://www.iadb.org/mici/, is also available.

Deadlines for Response to Claims

All complaints must be registered, and your proposed solution must be communicated to the interested party within the following deadlines: low importance complaints will be dealt with within a maximum period of 30 calendar days, medium-importance complaints will be dealt with within 15 calendar days, and high importance complaints will be dealt with within a maximum period of 7 calendar days. The deadlines set can be adjusted by EA.

In all cases, a complaint response report will be drawn up and signed by the person who filed the complaint in accordance with the attention of the complaint. EA will systematize the complaint records and the minutes of attention of these.

The information provided will be relevant and understandable according to the sociocultural characteristics of the person who consults.

Likewise, it will oversee supervising the process, detecting deviations and ensuring its solution.

Monitoring and Documentation

EA will be responsible for maintaining an up-to-date database with all documentation and information related to complaints submitted. It will also be responsible for following up on the complaint processing process, in coordination with the areas involved, and for facilitating the complainant's participation in the process.

A follow-up form will be completed for each case. Once an agreement is reached, follow-up will be followed up to confirm that the relevant resolution measures are being implemented.

The complaint registry must demonstrate that all these actions and processes were carried out in accordance with this document.

It will include:

- Date on which the complaint was registered.
- Person responsible for the complaint.
- Information on the remedies proposed/communicated by the complainant (if applicable).
- Date on which the complaint was closed.
- The date of the response was sent to the complainant.

In the Semi-annual Compliance Reports, EA will report to the IDB on the status and follow-up of the management of complaints and grievances received in the framework of the execution of the Program's projects.

Monitoring

Any complaint closed with conformity by the complainant must be monitored for a reasonable period in order to verify that the reasons for the complaint or claim were effectively resolved. The estimated period for this purpose is 6 (six) months from the response and / or solution to the claim.

Implementation Timeline

The GRM will be available throughout the execution of the Program.

IDB Program Grievance Mechanism

In addition to the Grievance Redress Mechanism (GRM) of the Program implemented by EA, the IDB on the Project page (https://www.iadb.org/en/project/BL-L1045) has a public access mechanism with which complaints and claims that have not been resolved with the mechanism of each project can be managed.

IDB's Independent Consultation and Investigation Mechanism

The IDB also has an Independent Consultation and Investigation Mechanism (MICI, more info at https://www.iadb.org/en/mici/mici-independent-consultation-and-investigation-mechanism), which can also be accessed to process complaints that could not be resolved at the previous two levels of grievance mechanisms.

MICI is a grievance office independent of the project teams, which facilitates dispute resolution processes to resolve concerns raised. In addition, it conducts independent investigations to determine whether the IDB Group has met its standards and improve the Group's practices.

Keep in mind that the handling of a complaint must start at the local level to be eligible at the next level. All grievance mechanisms will be available throughout the duration of the Program.

Annex 2. Labor Management Procedure (LMP)

Introduction

The purpose of this Labor Management Procedure (LMP) is to establish the scope and application of ESPS 2 "Labor and Working Conditions" for the SU-L1071 Program.

The Labor Management Procedure will be managed as part of the Environmental and Social Management Plan (ESMP). The requirements included in the LMP will be systematically integrated into the legal requirements of the Program, the tender documents and the contracts of the contracting companies and suppliers.

The LMP is a dynamic document and should therefore be revised and updated as necessary during the life cycle of the Program.

The LMP presents the guidelines, guidelines and minimum contents for the labor management and working conditions of the works of the Program to be fulfilled by the main contractor, the companies involved and the executing agency. The responsibility for ensuring compliance with this procedure shall be the responsibility of EA.

The LMP is governed by the principles of equality, opportunity and fair treatment ensuring that no employment decisions will be made based on personal characteristics outside the requirements inherent to the job, refraining from discrimination in any aspect of the employment relationship, such as recruitment and hiring, remuneration (wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, dismissal or retirement and disciplinary practices. Measures shall be taken to prevent and address violence, harassment, intimidation, or exploitation, especially regarding women, persons of diverse sexual orientations and gender identities, persons with disabilities, and migrant workers. Under no conditions shall child or forced labor be permitted.

A safe and healthy work environment shall be ensured, considering the risks inherent in the Program and specific hazards for women, persons of diverse sexual orientations and gender identities, persons with disabilities, children (of working age, in accordance with this Performance Standard), and migrant workers. Measures shall also be taken to prevent accidents, injuries and illnesses that may arise from, be associated with, or occur during work, minimizing, to a reasonable extent practicable, the causes of hazard factors.

Scope of the Labor Management Procedure (LMP)

Environmental and Social Performance Standard 2 "Labor and Working Conditions" of the IDB's Environmental and Social Policy Framework pursues the following objectives:

- Respect and protect the fundamental principles and rights of workers.
- Promote fair treatment, non-discrimination and equal opportunities for workers.

- Establish, maintain and improve relations between workers and the employer.
- Ensure compliance with national legislation on employment and labor.
- Protect workers, including those in vulnerable situations, such as women, persons of diverse sexual orientations and gender identities, persons with disabilities, children (of working age, in accordance with this Performance Standard) and migrant workers, workers hired by third parties and workers in the main supply chain.
- Promote safe and healthy working conditions and promote workers' health.
- Prohibit any employment of children under the age of 15 (and none under 18 for the management of hazardous materials), as defined by the ILO.[84]
- Prohibit any forced labor employment.

This standard applies to:

- **Direct workers:** are persons employed or hired directly by the borrower to work specifically in relation to the Program. The direct worker is employed or hired by the borrower, is paid directly by the borrower, and is subject to the borrower's instructions and day-to-day control.
- **Contract workers:** Persons engaged through third parties to perform work related to core functions of the Program for a considerable period of time where that third party exercises continuous control over the work, working conditions and treatment of the worker in relation to the project[85]
- **Main supply chain workers**: Workers in the main supply chain, provides goods and materials to the project, where the supplier exercises control over this worker for the work, working conditions and treatment of the worker[86]

Where public employees are working in connection with the Project on either full-time or part-time basis, they will be subject to the terms and conditions of their existing public sector employment agreement or arrangement, unless their employment or hiring has been effectively legally transferred to the Project.[87]

Requirements relating to gender equality and stakeholder participation (including a grievance mechanism) should also be considered in the implementation of this Performance Standard in accordance with ESPS 9 and 10. In no case and under no circumstances shall child and forced labor be permitted.

[84] International Labour Organization.

[85] The core functions of the project are those corresponding to the construction, production and service processes that are essential for a specific activity, without which it could not continue.

[86]Primary or primary suppliers are those that continuously supply goods or materials essential to the core functions of the project.

[87] ESPS 2 is not intended to interfere with the relationship between the borrower when it comes to a government agency and its public administration officials, who are typically employed under specific terms and conditions that may reflect mandatory legal requirements.

Description of the Project's Workforce

Identification and characterization of workers involved in the project:

Depending on the activities foreseen in the project, it is estimated that the organization of the workforce involved will be as follows:

1. **Direct workers:** In accordance with the organizational structure foreseen for this Program, it is considered that the direct hiring of personnel under the modality of contracting services will be coordinated by EA and are mostly linked to the hiring of personnel to carry out the supervision and technical inspections (environmental and social) of works.

2. **Project workers:** It is expected that the largest number of staff will be employed under this category. The contracting companies will carry out the construction works foreseen for each project.

3. **Workers in the main supply chain:** Personnel employed by the companies' supplying inputs and infrastructure linked to the works foreseen by the Program. The Program must carry out due diligence to ensure that inputs produced under conditions of forced labor are not procured and that the working conditions of suppliers comply with current regulations with their personnel.

Table 1. Summary Table of Type of Workers Linked to the Project

Type of Worker	Characteristics
Direct Workers	Individual Consultants directly hired by the Program
Contract workers	Workers hired by the contracting firms hired by the project. It is expected by the type of works that the largest number of people involved in the Program be incorporated under this modality of contracting.
Primary Supplier Workers	The number of workers to be hired under this modality and the specific characteristics will be information provided by the contractor awarded the work.

Assessment of possible occupational hazards

Depending on the activities to be carried out by the staff in the project, the main risks for each of the most relevant jobs must be identified.

The existing risks involve adopting measures for the prevention of accidents and incidents with the development of safe working methods, with a correct choice and training of personnel to perform such work, in addition to using the appropriate tools and personal protection elements (PPE).

The following table provides a summary of the main activities, with the possible risks identified and those responsible.

Table 2 – Example of activities and risks identified in the project

Activity Group	Activity	Location	Risks identified	Responsible
Management and Administratio	• Planning, design, execution and implementation, evaluation and monitoring of Projects	Office: EA	No specific and significant risks are identified. Possible risks related to occupational health and safety in internal environments (ergonomic risks, accidents, stress, mental load, psychophysical factors)	EA
Training and Awareness for people hired by the contractor	• Train, inform and raise awareness especially among construction personnel both orally and in writing about the expected environmental and social problems, the implementation and control of environmental and social protection measures and the specific and relevant aspects applicable to the execution of projects in accordance with current environmental and social regulations and regulations. • Conduct gender-sensitive training and code of conduct for all contracted personnel, including the management staff of the contractor company. • Have updated the technical file of the personnel with the training carried out and the elements of security and personal protection delivered	Workshops / offices	No specific and considerable risks are identified if the facilities of the workshops comply with current regulations. Possible risks linked to occupational health and safety in internal environments (accidents, stress, mental load, psychophysical factors).	Contractor (Environmental and Social Manager)

Activity Group	Activity	Location	Risks identified	Responsible
Civil works of infrastructure and equipment	Carrying out interventions for airstrips rehabilitation	Kwamalasamutu Airstrip / Johan Adolf Pengel International Airport / Zorg En Hoop Airport	Specific risks are identified that can be avoided with the corresponding security measures and protocols. **In workshops and place of work:** • Risks of gender-based violence • Occupational and community accident risks **In the recruitment processes**: • Risk of exclusion of vulnerable groups • Exclusion of local labor and discrimination • Influx of labor from outside the place. **In the execution of the planned works:** **Occupational hazards:** • Accidents and falls of different levels. • Falling objects. • Road accidents (circulation of trucks and machinery). • Temporary hearing loss due to operation of equipment and machinery. • Accidents due to hazardous wildlife encounters. **Ergonomic risks:** • Forced posture; Repetitive motion; Cargo handling; Application of forces: Overexertion	Contractor Company

Activity Group	Activity	Location	Risks identified	Responsible
Construction supervision	Supervise the environmental and social management plan, occupational safety, and health; monitor environmental, social, health and safety risks, their impacts and actions taken (including in the field, if necessary).	Office / Field activities at the site of implementation of the works	**In Office:** No specific and considerable risks are identified. Possible risks linked to occupational health and safety in internal environments (accidents, stress, mental load, psychophysical factors). **In the field:** Risks linked to accidents in the work area. They can be minimized if PPE is properly used.	EA / Construction Inspection

Description of prevention and mitigation measures to address possible risks in the workplace.

Based on the identification of the main risks by activity group, the priority measures to prevent and minimize the risks identified are detailed below, by way of example:

Prevention and mitigation measures in the workshops:

- Implement hygiene, safety and health standards and conditions.
- Install workshops of size according to the number of people employed and as required by Laws and Decrees.
- Training and awareness on health and safety, non-discrimination and prevention of gender-based violence, prevention of child exploitation, forced labor, prevention of discrimination and / or violence against people from indigenous communities or vulnerable groups in compliance with the code of conduct and hazardous wildlife encounters.

Prevention and mitigation measures in staff recruitment processes:

- The contractor will seek to approach its recruitment process with a gender perspective, seeking to make equal opportunities for men and women effective.
- Personnel with criminal records related to sexual crimes, sexual harassment, prostitution, and trafficking in persons will not be hired in order to protect the integrity of the population linked to the work.
- The contractor will try to prioritize the local skilled and unskilled local labor, especially of the beneficiary parties of the works and surrounding localities.
- Non-discrimination requires that the contractor/EA not make employment-related decisions based on personal characteristics, such as gender, race, ethnic, social and indigenous origin, religion, political opinion, nationality, disability and sexual orientation that are not related to job requirements. They cannot affect equality of opportunity or treatment in employment.
- The contractor shall develop and implement the **code of conduct** and provide training for its knowledge and understanding. See Appendix A for the proposed content of the code of conduct. This Code is aimed at ensuring respectful and harmonious ties in the workplace in which the Program and its projects are developed in such a way as to ensure a work environment free of discrimination and/or violence based on gender, gender identity, sexual orientation, cultural identity, religion, ethnic or national origin, trade union membership, disability or any other discrimination typified in current legislation.

Prevention and mitigation measures in the execution of civil works of infrastructure and equipment of the project:

- Review the environment in which the tasks will be developed. If power poles, hazardous materials tanks or other items are present in adjacent areas, they could catch fire or fall on workers in the event of evacuation.
- Provision of personal protection elements (PPE) and tools and machinery in perfect working order.
- Training and advisory programs for the people employed by the contractor on the inherent risks of their tasks and the mitigation measures, actions and good practices to be implemented to

ensure the health, safety and hygiene of the employees, the population, and the protection of the environment.
- Code of conduct.
- Evaluate the state of gas, electricity and water facilities near the intervention area.
- Examine the distribution of workspaces verifying that there are no elements that could interfere with a rapid evacuation.
- Identify safe areas.
- Determine accessibility to fire protection equipment, emergency lights, first aid equipment, etc. (they should always be in place of easy access).
- Define the resources available to avoid and respond to an emergency.
- Make an inventory of those security elements that the organization has (fire extinguishers, first aid kit, etc.).
- In the case of works carried out in the vicinity of routes, traffic management measures, signaling and communication program to the community must be extreme.
- Implement protocols for wildlife encounters, including the use of protective gear, availability of first aid kits and medical support and avoiding known habitats.

Protocols and procedures to address cases of gender-based violence during the life cycle of the project.

The Contractor will establish reporting procedures, protocol for responses to unacceptable conduct and internal accountability measures in situations of gender-based violence within the framework of the operation.

In terms of prevention, in addition to urging the development of actions aimed at dismantling all types of situations of inequality, discrimination and exclusion in the workplace, actions can be implemented to raise awareness and train on gender issues. The training program will be defined according to the demands of the different work teams.

To address cases of gender violence, immediate contact should be made with local authorities who are experts in the field, to ensure adequate treatment of the victim of violence, providing specific advice and accompaniment.

Grievance Redress Mechanism (GRM) for Project Labor Management

The Program has a Grievance Redress Mechanism (GRM), and at the same time the LMP has a simultaneous mechanism that aims to arbitrate the means and mechanisms to facilitate the reception of concerns exclusively (queries, claims, complaints, suggestions) of workers linked to the Projects of the Program, and respond to them to solve them, and to anticipate potential conflicts.

Likewise, workers may appeal directly to the courts, applying the general system in force in the country.

Principles of the GRM for the Labor Management Procedure

Each project will have a feedback/claims management system that includes input/reception, analysis, monitoring, resolution and return to the people who are working linked to the projects.

The principles that the system will observe are the same as those that govern the general GRM of the Program:

- The interaction/claims management system will have mechanisms in accordance with the local context and the sociocultural characteristics of the people involved in each project, with special consideration and respect for the most vulnerable groups (young people, women, people with disabilities, migrants, among others).
- The complaint procedures, the process that will follow, the deadline and the resolution mechanisms will be widely disseminated for your knowledge by the interested parties, that is, by direct workers, contractors, and primary suppliers.
- In all cases, a record will be kept of the reception, analysis and resolution of claims and conflicts.

GRM Guidelines

In general, the mechanism will follow the following guidelines:

- **Proportional:** The Mechanism will proportionally consider the level of risk and possible negative impacts on the affected areas.
- **Culturally appropriate:** The Mechanism will be designed to consider the local customs of the area.
- **Accessible:** The Mechanism will be designed in a clear and simple way so that it is understandable to all people. There will be no cost related to it.
- **Anonymous:** The complainant may remain anonymous, as long as it does not interfere with the possible solution to the complaint or problem. Anonymity is distinguished from confidentiality in that it is an anonymous complaint, the personal data (name, address) of the complainant are not recorded.
- **Confidential:** The Program will respect the confidentiality of the complaint. Information and details about a confidential report will only be shared internally, and only when it is necessary to report or coordinate with the authorities.
- **Transparent:** The process and operation of the Mechanism will be transparent, predictable, and readily available for use by the population.

Management of the specific GRM for the Labor Management of the projects of the Program

The procedure begins with the presentation of the consultation, claim, complaint and / or suggestions (orally or written) by any worker linked to the works. The process ends with the closure and agreement

in the resolution of both parties (the claimant and the contractor). The process will be documented by means of a record (in a physical and/or digitized file).

Complaints received of receipt enabled during the implementation of the Project must be attended and classified.

The claims received via the contractors of each work, or agencies of the municipal jurisdiction (if applicable) must be redirected to EA for management.

Reception and registration of claims for the labor management of the projects of the Program

- Office of contractors (specific modality for operators and employees)
- Suggestion box / complaints book available in the workshops (Specific for operators and employees).
- EA offices (via telephone, mail, or other way enabled to make the claim) specific for direct employees, contractors, and workers in the main supply chain).
- Offices of the municipalities involved.
- Others (to be defined during the life of the Program).

Claims Evaluation

All claims that enter through the various channels must be registered and managed considering the criterion of proportionality (level of risk and possible negative impacts).

In the case of a claim related to employees of the contractor, it will be considered and responded to by the Contractor company with supervision of EA.

EA must also resolve all complaints and queries related to the works of the projects of the Program that occur in the labor field of its offices and dependencies.

After receiving a claim, it must be evaluated by EA in terms of severity, safety implications, complexity, and impact, among others, to take immediate action as appropriate. Complaints must be answered in a timely manner according to the urgency of the order.

If the claim or complaint is rejected, the worker will be informed of the decision and the reasons for it. To this end, pertinent, relevant, and understandable information will be provided according to the sociocultural characteristics of the workers.

When possible, if additional information is required for the correct evaluation of the complaint, the EA team will contact the worker to obtain the necessary information.

The file must include, together with the complaint, a summary of the procedures and steps taken. Registration information will be updated periodically to reflect the status of the case until the complaint has been finalized.

Conflict resolution

In all cases EA must ensure that the attention of claims and the resolution of conflicts are carried out in an adequate and timely manner, and that all workers linked to the projects of the Program have a satisfactory management of their claim.

Responding to Complaints

Low-importance claims will be dealt with within a maximum of 30 calendar days, medium-importance claims will be dealt with within 15 calendar days and high-importance claims will be dealt with within a maximum of 7 calendar days. The established deadlines can be adjusted by EA.

Monitoring and documentation

EA will be responsible for maintaining an up-to-date database with all documentation and information related to complaints that are submitted as part of labor management. This team is also responsible for following up on the complaint processing process, in coordination with the areas involved, and for facilitating the participation of the worker in the process.

The complaint registry must demonstrate that all these actions and processes were carried out in accordance with this document.

It will include:

- Date on which the complaint was registered.
- Person responsible for the complaint.
- Information on the corrective measures proposed/communicated by the complainant (if applicable).
- Date on which the complaint was closed.
- The date of the reply was sent to the complainant.

Deadlines

All complaints must be registered, and your proposed solution must be communicated to the interested party within a stipulated period (30 days is suggested). The deadlines set can be adjusted.

Monitoring

Any complaint closed with compliance by the complainant must be monitored for a reasonable period in order to verify that the reasons for the complaint or claim were effectively resolved. The estimated period for this purpose is 6 (six) months from the response and / or solution to the claim.

As initially indicated, this document is dynamic in nature, therefore the specific procedures for the implementation of the Grievance Mechanism for Labor Management will be strengthened with the implementation of each project.

Appendix A - Code of Conduct - Model and Suggested Content

Model Standard Code of Conduct for Workers

We are the Contractor company [enter the name of the company Contractor]. We have signed a contract with [enter employer name] to [enter job description, consulting, folder preparation contract, construction or site supervision, work as a skilled worker, watchman, construction assistant, other].

These activities will take place at [enter the Site and other places where the work will be carried out]. Our contract obliges us to implement measures to address environmental and social risks related to assigned work activities, including risks of sexual exploitation, sexual abuse, and harassment.

This Code of Conduct is part of our measures to address environmental and social risks related to the construction site [..... of the SU-L1071 Program**.** It applies to all our personnel at the managerial, administrative, or technical level, workers and other employees at the Construction Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and to any other personnel who support us in the execution of the Works and in the administration and management of the Program. All these individuals are referred to as "Contractor Personnel" and are subject to this Code of Conduct.

This Code of Conduct identifies the behavior we require of all Contractor and executing agency personnel.

Our workplace is an environment where unsafe, offensive, abusive, or violent behavior will not be tolerated and where all people should feel comfortable raising issues or concerns without fear of retaliation.

Contractor/EA personnel shall:

1. Carry out his duties competently and diligently.

2. Comply with this Code of Conduct and all applicable laws, regulations, and other requirements, including requirements to protect the health, safety and welfare of other contractor personnel and any other person.

3. Maintain a safe working environment including:

- ensure that workplaces, machinery, equipment and processes under the control of each person are safe and free from health risk.
- use the required personal protective equipment.
- use appropriate measures relating to chemical, physical and biological substances, and agents.
- Follow applicable emergency operating procedures.

4. Bring up work situations that he/she believes are unsafe or healthy and move away from work situations that he/she reasonably believes pose an imminent and danger to his/her life or health.

5. Do not use violence and treat others with respect, and do not discriminate against specific groups such as women, migrant workers, children and people with disabilities.

6. Not engaging in sexual harassment, which means unwanted sexual advances, requests for sexual Favors, and other verbal or physical conduct of a sexual nature with the contractor's or Employer's other personnel.

7. Not engaging in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In Bank-financed operations/projects, sexual exploitation occurs when access to Bank-financed Goods, Works, Consulting or Non-Consulting services is used to extract sexual gain.

8. Not or engage in sexual abuse, which means actual or threatened physical intrusion of a sexual nature, either by force or under unequal or coercive conditions.

9. Engage in any form of sexual activity with persons under the age of 18, except in the case of a pre-existing marriage.

10. To complete the relevant training courses to be given in relation to the environmental and social aspects of the Contract, including health and safety, sexual exploitation, and abuse (SA) and sexual harassment (SA) matters.

11. Not to retaliate against anyone who reports violations of this Code of Conduct, either to us or to the Employer, or anyone who makes use of the Contractor's Staff Grievance Management Mechanism or the Program Grievance Management Mechanism.

12. In special cases such as chance finds, training should be given on the heritage value of places, objects for the country. Avoiding looting by carelessness or lack of vigilance.

RAISE CONCERNS

If any person observes behavior that they believe may represent a violation of this Code of Conduct, or that otherwise concerns them, they should raise the issue promptly. This can be done in any of the following ways:

1.Contact [enter the name of the Contractor/EA's Social Expert with relevant experience in handling cases of sexual exploitation, sexual abuse and harassment, or if such person is not required under the Contract, another person designated by the Contractor to deal with these matters] in writing at this address [write contact address] or by telephone at [insert telephone number] or in person at [place of contact] ;

2.Call [write phone number] to contact the contractor/EA hotline and leave a message.

The identity of the person shall be kept confidential unless the necessary allegations are reported under national law. Anonymous complaints or denunciations may also be filed and given all due and appropriate consideration. We take all reports of potential misconduct seriously and will investigate and take appropriate action. We will provide recommendations to service providers who can help support the person who experienced the alleged incident, as appropriate. There will be no retaliation against any person who raises a good faith concern for any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Staff may result in serious consequences, including termination and possible referral to legal authorities.

FOR CONTRACTED PERSONNEL:

I have received a copy of this Code of Conduct written in a language I understand. I understand that, if I have any questions about this Code of Conduct, I may contact [enter contractor/EA contact person(s) with relevant experience (including sexual exploitation, abuse, and harassment cases in handling those types of case cases)] requesting an explanation.

Name of staff: [insert name]

Signature:

Date: [day month year]

Countersignature of the authorized representative of the Contractor / EA:

Signature:

Date: [day month year]

Annex 3. Affidavit Template for the Acquisition of Solar Pannels

AFFIDAVIT TEMPLATE

Company Name: …….
Company Registration Number (CRN): …….
In my capacity as owner/representative of the company……. CRN……., I declare under oath that I have no knowledge of the existence of forced labor in the production of the solar panels we provide …….. .

Signature, Name and Identification Number of owner/representative

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