



ADAPTATION FUND

AFB/PPRC.23/13
24 September, 2018

Adaptation Fund Board
Project and Programme Review Committee
Twenty-Third Meeting
Bonn, Germany, 9-10 October, 2018

Agenda Item 6 g)

PROPOSAL FOR SURINAME

Background

1. The Operational Policies and Guidelines (OPG) for Parties to Access Resources from the Adaptation Fund (the Fund), adopted by the Adaptation Fund Board (the Board), state in paragraph 45 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US\$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the endorsement of the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would ultimately require the Board's approval.

2. The Templates approved by the Board (Annex 5 of the OPG, as amended in March 2016) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.

3. The first four criteria mentioned above are:

- (i) Country Eligibility,
- (ii) Project Eligibility,
- (iii) Resource Availability, and
- (iv) Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
(v) Implementation Arrangements.

5. It is worth noting that at the twenty-second Board meeting, the Environmental and Social Policy (ESP) of the Fund was approved and at the twenty-seventh Board meeting, the Gender Policy (GP) of the Fund was also approved. Consequently, compliance with both the ESP and the GP has been included in the review criteria both for concept documents and fully-developed project documents. The proposal template was revised as well, to include sections requesting demonstration of compliance of the project/programme with the ESP and the GP.

6. At its seventeenth meeting, the Board decided (Decision B.17/7) to approve "Instructions for preparing a request for project or programme funding from the Adaptation Fund", contained in the Annex to document AFB/PPRC.8/4, which further outlines applicable review criteria for

both concepts and fully-developed proposals. The latest version of this document was launched in conjunction with the revision of the Operational Policies and Guidelines in November 2013.

7. Based on the Board Decision B.9/2, the first call for project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Fund was sent out on April 8, 2010.

8. According to the Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

9. The following fully-developed project titled "Urban Investments for the Resilience of Paramaribo: Building adaptive capacity of Paramaribo communities to climate change-related floods and sea level rise through strategic urban planning and sustainable infrastructure investments" was submitted by the Inter-American Development Bank (IDB), which is the Multilateral Implementing Entity of the Adaptation Fund.

10. This is the second submission of the proposal using the two-step submission process. It was first submitted in the twenty-eighth meeting where the Board decided:

- (a) *To endorse the project concept, as supplemented by the clarification response provided by the Inter-American Development Bank (IDB) to the request made by the technical review;*
- (b) *To request the secretariat to transmit to IDB the observations in the review sheet annexed to the notification of the Board's decision, as well as the following issues:*
 - (i) *During project development, a more comprehensive assessment of expected beneficiaries, linked with the expected outcomes and outputs, should be provided;*
 - (ii) *The fully-developed project document should further demonstrate the coherence and integration between its components;*
 - (iii) *The fully-developed project document should provide more information on how land management planning at the municipal level related to national goals;*
 - (iv) *The fully-developed project document should elaborate on the analysis that will be carried out to make sure that biodiversity benefits are maximized, and potential impacts on local vegetation minimized;*
 - (v) *The fully-developed proposal should demonstrate that further consultations have taken place in order to ensure that the communities fully support and feel ownership over the adaptation effort, including the measures selected;*

the comprehensive consultation process should cover key issues that were not discussed before, such as inundation, climate change and gender;

(vi) During the fully-developed proposal preparation stage, a more elaborate plan for ensuring sustainability of the infrastructure should be provided, including the perspectives from the communities consulted;

(vii) At the fully-developed project document stage, an Environmental and Social Management Plan should be prepared as required, including all subprojects or activities identified during project development;

(c) To request IDB to transmit the observations under sub-paragraph (b) to the Government of Suriname; and

(d) To encourage the Government of Suriname to submit through IDB a fully-developed project proposal that would address the observations under sub-paragraph (b) above.

(Decision B.29/10)

11. The current submission was received by the secretariat in time to be considered in the thirty-second Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number SUR/MIE/Urban/2017/1, and completed a review sheet.

12. In accordance with a request to the secretariat made by the Board in its 10th meeting, the secretariat shared this review sheet with IDB, and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

13. The secretariat is submitting to the PPRC the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section. In accordance with decision B.25.15, the proposal is submitted with changes between the initial submission and the revised version highlighted.

Project Summary

Suriname – Urban Investments for the Resilience of Paramaribo: Building adaptive capacity of Paramaribo communities to climate change-related floods and sea level rise through strategic urban planning and sustainable infrastructure investments

Implementing Entity: IDB

Project/Programme Execution Cost: USD 580,000

Total Project/Programme Cost: USD 9,082,000

Implementing Fee: USD 768,000

Financing Requested: USD 9,850,000

Project Background and Context

Suriname is exposed to several natural and climate change-influenced hazards, particularly because its low-lying lands contain the highest population densities and greatest concentrations of economic activities. The country's low income status further increases vulnerability to climate change. The main natural and climate change related disasters are flooding (both coastal and inland), drought, heat exposure, strong winds and groundwater salinization. Climate change is projected to affect over 40% of Suriname's GDP by 2050.

The general objective of the proposed project is to contribute towards increasing the adaptive capacity of communities living in the Paramaribo city (the capital city of Suriname) and adjacent metropolitan vulnerable areas to cope with observed and anticipated impacts of climate change on floods and sea level rise. It seeks to incrementally respond to Paramaribo's challenges and complement current efforts lead by the GoS to protect the city by initiating a first phase of adaptation measures to demonstrate the benefits to be accrued through adapting to climate change and create an enabling environment to facilitate a long term participative and dynamic adaptation process.

This would be done through a suite of hard measures in the historic downtown area of Paramaribo that would illustrate the benefits climate-resilient urban development, along with establishing the city adaptation framework and plan, capacity building, and monitoring and evaluation.

Component 1: City adaptation framework and plan (USD 550,000)

This component would develop a city-broad plan to build climate resilience in the city in line with a long-term adaptation process. Said plan will guide policy makers and city planners in prioritizing investments and programs to achieve climate resilience. Also design and implement a Dissemination Strategy of the Adaptation Plan for the general public.

Component 2: Downtown adaptation measures (USD 7,572,000)

This component would implement adaptation measures in the historic downtown area of Paramaribo that illustrate the benefits of building climate resilience as part of a long-term planning strategy for the city and its metropolitan area.

Component 3: Capacity building and implementation of a learning and management plan (USD 380,000)

This component would build capacity across the GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan; development and implementation of Knowledge Management Plan and carry out training to technical and managerial staff on adaptation planning and management.

Component 4: Program Administration (USD 580,000)

This component would result in a robust plan and implementation structure to allow the proposed project to be implemented, monitored and evaluated.



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ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: REGULAR-SIZED PROJECT

Country/Region: **Suriname**
 Project Title: **Urban Investments for the Resilience of Paramaribo: Building adaptive capacity of Paramaribo communities to climate change related floods and sea level rise through strategic urban planning and sustainable infrastructure investments**
 Thematic Focal Area: **Urban development**
 Implementing Entity: **Inter-American Development Bank**
 AF Project ID: **SUR/MIE/Urban/2017/1**
 IE Project ID: _____ Requested Financing from Adaptation Fund (US Dollars): **9,850,000**
 Reviewer and contact person: **Saliha Dobardzic** Co-reviewer(s): _____
 IE Contact Person: _____

Review Criteria	Questions	Comments	Comments September 10, 2018
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes.	-
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes.	-
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes.	-
	2. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in	Yes, notably through implementing a group of strategic and cost-effective adaptation hard measures in the historic downtown area of Paramaribo that illustrate the	-

	climate resilience?	benefits of building climate resilience as part of a long-term planning strategy for the city and its metropolitan area.	
	3. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Yes (p. 55) CR 1: According to the Adaptation Fund Gender Policy, the proposal should describe how the project would contribute to improving gender equality, the empowerment of women and the project interventions' suitability to meet the adaptation needs of targeted women and men. Please demonstrate that the proposed interventions would allow women to participate as sufficiently visible actors and decision-makers.	CR 1: Addressed.
	4. Is the project / programme cost effective?	Yes. A detailed cost-benefit analysis was undertaken and compared with other options to determine the most positive-value projects.	-
	5. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	Not clear. CR 2: Please demonstrate consistency of the proposed project with urban or local government plans or strategies that may cover the target area.	CR 2: Addressed.
	6. Does the project / programme meet the relevant national technical standards, where applicable, in	Yes, as elaborated in the ESIA document submitted.	-

	compliance with the Environmental and Social Policy of the Fund?		
	7. Is there duplication of project / programme with other funding sources?	No. There is a complementary intervention also financed by IDB, and an on-coming investment by the World Bank that would also complement this proposed project.	-
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	<p>Not clear. The proposal states that a Knowledge Management Plan will be developed to capture information, data and lessons learned, but not much else. Currently, it appears as if the project does not yet have a plan for a learning and knowledge management component to capture and feedback lessons. This project appears to have a lot of potential to generate important insights, however this potential appears to be overlooked and neglected. Also please note that Knowledge and Learning is one of the three pillars of Adaptation Fund's Medium Term Strategy, and is therefore considered a quite important aspect of Adaptation Fund investments.</p> <p>CR 3: Please describe in detail when and how the Knowledge Management Plan will be developed, as well as the reasons for not already developing it during the project development stage.</p>	<p>CR 3: Addressed.</p> <p>CR 4: Addressed.</p>

		CR 4: If possible, please provide further information on the knowledge management plans, including clarifying how the knowledge management strategy outcomes will be sustained over time (i.e. at the end of the project).	
	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Yes. CR 5: Please explain how the participants have been informed and selected to participate in consultative process.	CR 5: Addressed.
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Yes.	-
	11. Is the project / program aligned with AF's results framework?	Yes.	-
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Not clear. Please see the comment on knowledge management above.	-
	13. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Yes.	-
Resource Availability	1. Is the requested project / programme funding within the cap of the	Yes.	-

	country?		
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes.	-
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes.	-
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes.	-
Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	Not clear. CR 6: In accordance with the Adaptation Fund GP, the proposal should “ <i>assess whether any possible EE has the capacity to carry-out gender responsive activities. Identifying implementation partners with a commitment to gender equality and helping to build their gender capacity can be crucial elements for the success of gender responsive project/programme implementation</i> ”. Please assess whether any possible EE has the capacity to carry-out gender responsive activities, and update the proposal accordingly, if applicable, in accordance with the GP.	CR 6: Addressed.

	2. Are there measures for financial and project/programme risk management?	Yes. The proposal identifies several risks and outlines potential mitigation measures.	-
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	Yes, including a detailed assessment of risks and the approach to managing those risks.	-
	4. Is a budget on the Implementing Entity Management Fee use included?	Yes.	-
	5. Is an explanation and a breakdown of the execution costs included?	Yes. CAR 1: Mid-term evaluation costs should be budgeted under the IE fee. For more information on costs and fees, please visit: https://www.adaptation-fund.org/generic/costs-and-fees/	CAR 1: Addressed.
	6. Is a detailed budget including budget notes included?	No. CAR 2: Please provide a detailed budget, at activity/output level, including budget notes.	CAR 2: Addressed.
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	Yes.	-
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the	No. CAR 3: please explain how the IE	CAR 3: Addressed.

	supervision of the M&E function?	fee will be utilized in the supervision of the M&E function.	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	Not clear. Please fill the results framework alignment table. CAR 4: Please provide indicative core indicator targets (see https://www.adaptation-fund.org/wp-content/uploads/2016/04/AF-Core-Indicator-Methodologies.pdf)	CAR 4: Addressed.
	10. Is a disbursement schedule with time-bound milestones included?	The numbers provided in the table do not fully add-up. Please see the disbursements for Year 1. CAR 5: Please correct the table.	CAR 5: Addressed.

Technical Summary	<p>The purpose of this project is to contribute towards increasing the adaptive capacity of communities living in the Paramaribo city and adjacent metropolitan vulnerable areas to cope with observed and anticipated impacts of climate change on floods and sea level rise. The specific objectives are to generate:</p> <ul style="list-style-type: none"> i. City Adaptation Framework and Plan: Establish a framework for managing knowledge and disseminating lessons learned that could be used in future resilience programs for the city of Paramaribo and that could be part of a city-level Adaptation Plan; ii. Downtown Adaptation Measures: Implement a group of strategic and cost-effective adaptation hard measures in the historic downtown area of Paramaribo that illustrate the benefits of building climate resilience as part of a long-term planning strategy for the city and its metropolitan area; iii. Capacity Building: Build capacity across local communities and GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan; and iv. Monitoring and Evaluation: Ensure there is a robust plan and implementation structure to allow the Proposed Project to be implemented, monitored, evaluated and lessons learned disseminated. <p>While the proposal is overall strong, currently it lacks some essential details that are expected at the full project proposal stage. This includes the knowledge management plan, a detailed budget, and core indicator targets. These and other issues were discussed through the Corrective Action Requests (CAR)</p>
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	<p>and Clarification Requests (CR) raised in this initial review.</p> <p>The final technical review finds that all the CARs and CRs have been adequately addressed.</p>
Date:	09/11/2018



ADAPTATION FUND

**REQUEST FOR PROJECT/PROGRAMME
FUNDING FROM THE ADAPTATION FUND**

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, D.C., 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: afbsec@adaptation-fund.org



ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND**PART I: PROJECT/PROGRAMME INFORMATION**

Note: The IDB and the Government of Suriname presented a Concept Note proposal to the Adaptation Fund in January 2017 to apply for grant funds for adaptation measures in downtown Paramaribo. Following the Adaptation Fund's endorsement of the Concept Note in March 2017, this Full Application builds upon the original proposal and provides more detail and context for the Proposed Project. All new edits and additions in Part I are shown in red text, and Parts II and III are new.

Project/Programme Category:	Regular
Country/ies:	Suriname
Title of Project/Programme:	Urban Investments for the Resilience of Paramaribo: Building adaptive capacity of Paramaribo communities to climate change-related floods and sea level rise through strategic urban planning and sustainable infrastructure investments.
Type of Implementing Entity:	Multilateral Implementing Agency
Implementing Entity:	Inter-American Development Bank
Executing Entity/ies:	Ministry of Public Works, Government of Suriname
Amount of Financing Requested:	\$9,850,000* (in U.S Dollars Equivalent)

**Note that this amount has increased by US\$48,381 compared to approved Concept Note proposal. This slight increase in price arises from more detail being developed for the Project since the original Concept Note submission, as detailed in Part II.*

Project / Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

INTRODUCTION

CONTEXT AND VULNERABILITY AT A NATIONAL LEVEL

1. Suriname, one of the smallest countries in South America, is located on the north-eastern coast of South America and shares borders with French Guyana (east), Brazil (south), Guyana (west) and Atlantic Ocean (north). The country has a large variety of biological species and owns natural resources that represent a total forest area of 50 million hectares. Suriname also has substantial reserves of petroleum, bauxite, gold, granite and other minerals. Approximately 400 million tons of bauxite deposits are in Suriname and together with gold and production of crude oil represent the major economic sectors in the country (MLTDE, 2008). Mineral and energy sectors (gold, oil and alumina) account for approximately 30% of the GDP.
2. Suriname is a small, open, commodity-based economy that is vulnerable to external shocks. On the back of high international commodity prices, Suriname grew at a high average yearly rate (3.8% or a total real per capita income growth of 65%) over the past decade, and therefore was one of the Caribbean's best performing economies given its rich endowment in natural resources (World Bank 2016). Growth is driven by exports from the extractive sector (gold, oil, and bauxite), which generate 90% of foreign exchange earnings and 45% of government revenues. Suriname (in common with other small economies) relies on imports to satisfy most domestic demand for goods (imports account for more than 80% of consumption), while total trade has averaged around 145% of GDP over the past five years. The transmission mechanism of the wealth generated in the extractive sector to the rest of the economy relies highly on public spending on goods and services, infrastructure and, importantly, wages and salaries of employees in the public sector and in public enterprises. The domestic private sector, limited by the small size of the economy, is geared towards satisfying domestic demand mainly with imports. As a consequence, the private sector expands or contracts responding to changes in public spending that drive aggregate demand (IDB, 2016).
3. The recent historical growth in Suriname's per capita income has not translated into a significant improvement in social indicators. Suriname has a literacy rate of 94.7% and life expectancy of 71 years. The country ranks 103rd out of 186 countries in the 2015 Human Development Index (HDI), with slight improvements over the previous years. The country's HDI rank is mostly due to improvements made in income levels over the past decade, however, both the education and health indicators fall below comparable countries categorized with a high HDI. Only 45.9% of the population has a secondary education compared to 66.6% for comparable countries while there are only 9.1 physicians per 1,000 people in Suriname compared to 20 in other high HDI countries. Data on poverty and inequality are scarce but offer indications that Suriname is somewhat in line with regional averages. Conventional income-based poverty and inequality indicators are outdated, while

a recent household survey of the General Bureau of Statistics did not produce any new estimates due to low response rates. Although robust growth in income per capita over most of the past decade may have reduced absolute poverty, its impact on inequality in recent years is more uncertain. A 2013 United Nations inequality-adjusted human development indicator (HDI) estimated that the loss in human development due to inequality in 2006 was broadly in line with the regional average (IMF 2014). The 2015 Human Development Report published by the United Nations Development Program indicated that about 7.4% of the population lived in multidimensional poverty at end-2010, which is below the regional average of 12%. The unemployment rate in Suriname is estimated at 8.9% in 2015 (IMF 2016). Female unemployment is higher than male (about 4 percentage points), and youth unemployment is significantly higher (above 20% in 2013).

4. According to UNFCCC (2015) and the Environment Statistics (2016), the total population of Suriname is estimated on 558,773 habitants but it is expected that the population reach 2.5-3 million at the end of this century. The Surinamese population is presently multi-ethnic and multi-religious including ethnic groups such as Hindustani (from India), Creoles (African descent), Javanese (from Indonesia), Maroons (descendants of runaway slaves), Amerindians (the original inhabitants), Chinese, Lebanese and descendants of European settlers. The largest part of the Surinamese population is found within the Paramaribo and Wanica districts (74.4% of households). In 2004, the population density across Suriname was estimated at 3.0 people per square kilometre, making Suriname a very lowly populated country. However, the most densely populated districts are Paramaribo and Wanica with population densities of 1,335 and 194 people per square kilometre respectively, as shown in *Figure 1* (SNC, 2013). In addition, more than 90% of the diverse economic activities in production, manufacturing, horticulture, agriculture, financial and banking services, community, society and public services occur within the Paramaribo and Wanica Districts (MLTDE, 2008).

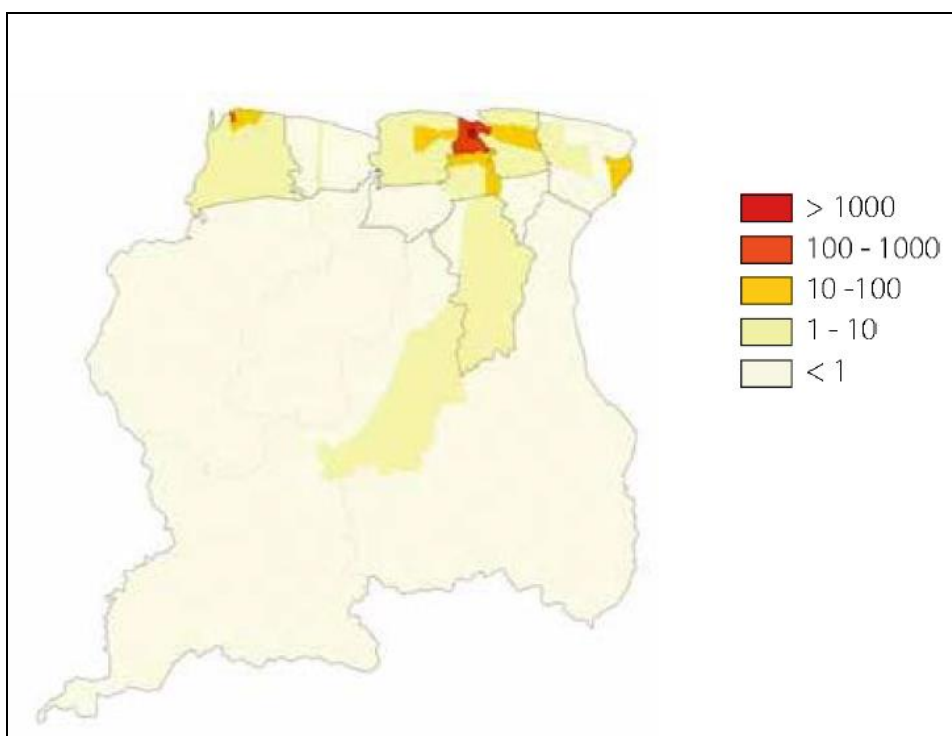


Figure 1: Population Distribution and Density per District on 2004 (Source: Figure 1.12 of SNC, 2013).

CLIMATE CHANGE VULNERABILITY CONTEXT AT A NATIONAL LEVEL

5. Suriname is a highly vulnerable country to the effects of climate change. Firstly, the country is exposed to several natural and climate change-influenced hazards. Secondly, the low-lying lands most vulnerable to these hazards also coincide with the areas of highest population density and economic activity. And thirdly, the low-income status further increases the population's vulnerability to climate change.
6. Suriname is susceptible to natural and climate change-related disasters, as detailed in its Second National Communication to the UNFCCC (SNC, 2013). These include flooding (both coastal and inland), drought, heat exposure, strong winds and groundwater salinization. Scientific analysis projects that temperatures will increase, sea level will rise, and the proportion of total rainfall that falls in heavy events will increase (though average rainfall will decrease). *Table 1* presents the future climate change projections for Suriname based on the A2 IPCC (Intergovernmental Panel on Climate Change) scenarios. It is projected that climate change impacts would affect over 40% of Suriname's GDP (UNFCCC, 2015). Some of the main socio-economic sectors being impacted by climate change include agriculture, livelihoods, water availability, health and biodiversity.

Table 1: Climate Change Projections for Suriname based on A2 IPCC Scenarios

Parameters	Value	Year	Source
Air Temperature overall annual mean	+2.6 °C (annual); +2.6 °C (December, January and February); +2.7 °C (March, April and May); +2.6 °C (June, July and	2050s	The Caribsave Climate Change Risk Atlas (CCCRA, 2012)

Parameters	Value	Year	Source
	August); +2.7 °C (September, October and November)		
Precipitation	-6% (annual); -3% (December, January and February); -8% (March, April and May); -8% (June, July and August); -8% (September, October and November)	2050s	The Caribsave Climate Change Risk Atlas (CCCRA, 2012)
Wind Speed	+0.30 m/s (annual); +0.30 m/s (December, January and February); +0.20 m/s (March, April and May); +0.30 m/s (June, July and August); +0.30 m/s (September, October and November)	2050s	The Caribsave Climate Change Risk Atlas (CCCRA, 2012)
Weather extremes, including intensity	+8% (annual); +10% (December, January and February); +9% (March, April and May); +7% (June, July and August); +21% (September, October and November)	2050s	The Caribsave Climate Change Risk Atlas (CCCRA, 2012)
Sea Level Rise (SLR)	+0.5 meter	2050s	Estimated based on info from CCCRA, Sea Level Rise in the Caribbean and The Second National Communication.

7. Flooding and sea level rise (SLR) presents a significant threat to Suriname given this extensive low-lying coastal zone and the concentration of socioeconomic activities within this area. Suriname's vulnerability is exacerbated by the fact that its main low lying coastal areas also coincide with the main population centers and areas economic activity. Suriname possesses a significant deltaic region related to four main rivers: Suriname River, Saramacca River, Coppename River, and Nickerie River. This includes sizeable north coastal plains (low-lying coast) where over 80% of the population live and where the major economic activities and infrastructure are concentrated (SNC, 2013; UNFCCC, 2015). *Figure 2* shows the low-lying flat areas at the north part of Suriname that are prone to floods (approximately 2,000 km²).

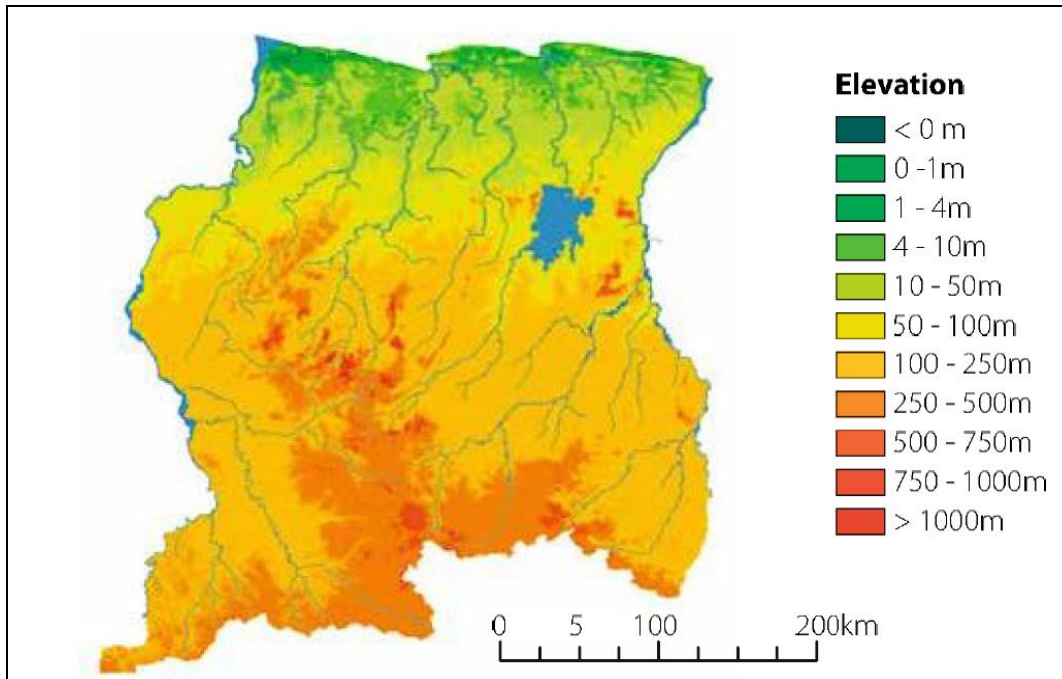


Figure 2: Topography of Suriname (Source: Figure 1.3 of SNC, 2013).

8. Even though Suriname is located outside of the hurricane area, hurricane effects are often experienced in the form of heavy rainfall. Meteorological conditions in Suriname are also influenced by climate systems including Sibusies's (Sibi = sweep, Busie = forest), Inter Tropical Convergence Zone (ITCZ) and the El Niño phenomenon (Environment Statistics, 2016). Flooding occurs through a number of mechanisms including when sea level rises during spring tide, during tropical storms by impacting low-lying coastal and riverine development and/or by rainfall-induced accumulation of water due to outdated and insufficient drainage systems. Consequently, Suriname experiences frequent flooding, particularly in the northern coastal plain and riverine areas which are generally of low elevation and flat. Table 2 shows a summary of the historical floods in Suriname between 2004 and 2015 based on information obtained from the Environment Statistics (2016).

Table 2: Historical Flooding Events in Suriname (Source: Adapted from Environment Statistics 2016 and NCCR Situation Analysis)

Date	Natural Disaster	Affected Areas	Population
9/7/2004	Floods associated with rainfall from Hurricane Ivan	Not specified	Unknown
6/5/2006	Flood due to excessive rainfall	Gran Rio and Pikin Rio rivers, Paramacaans on the Marowijne River, upper Marowijne, Tapanhony and Lawa, (Mofina) Suriname and Sipaliwini River	25,000 people
June 2006	Floods due to heavy rainfall	Villages along the upper Marowijne river and the upper Suriname River	20,000 people
2006/2007	Flood	Coropina triangle, Vier Kinderen, La Prosperite and Republiek	500 people
29/4/2007	Floods due to	Paramaribo	

Date	Natural Disaster	Affected Areas	Population
	continuous rainfall		
28/5/2007	Flood due to excessive rainfall	Sipaliwini, Northern Marowijne, Tapanahony River, Lawa and Curuni	5,000 people
6/8/2008	Flood due excessive rainfall	Southern part of the interior: Djumu, Asidonhopo, Semoisi, Awaradam	Unknown
1/10/2009	Flood due to excessive rainfall	Paramaribo	Unknown
2/4/2009	Flood due to excessive rainfall	Paramaribo	Unknown
10/3/2009	Flood due to excessive rainfall	Paramaribo	Unknown
5/3/2009	Flood due to excessive rainfall	Paramaribo	Unknown
14/7/2010	Coastal flooding as a result of dam fail	Saramacca: La poule, Peperhol, north part of Wayambo	Unknown
24/4/2010	Flood due to excessive rainfall	Paramaribo	Unknown
16/4/2010	Flood due to excessive rainfall	Paramaribo: Margarethalaan	unknown
22/4/2010	Flood due to excessive rainfall	Paramaribo: Poelepantje	Unknown
17/5/2013	Flood due to excessive rainfall	Saramacca: Misgusnst	Unknown
16/5/2013	Flood due to excessive rainfall	Commewijne: Frederikdorp	Unknown
16/5/2013	Flood due to excessive rainfall	Para, Paramaribo, Marowijne (Cottica)	Unknown
20/6/2013	Tail of a heavy tropical storm/flooding (heavy rainfall)	Paramaribo, Wanica, Saramacca, Marowijne (Galibi). Roof were torn away (30 houses), trees uprooted and damaged power poles, advertising signs and Street lighting	300 people affected
27/12/2013	Flood due to excessive rainfall	Paramaribo, Wanica, Saramacca	Unknown
6/7/2014	Storm	National: Paramaribo, Coronie, Commewijne, Saramacca en Nickerie	150+
7/6/2014	Storm	Nickerie: Nieuw Nickerie	100 houses
2/5/2015	Flood	Marowijne: Alale Kondre	Unknown
18/5/2015	Persistent rainfall	Wanica: Hanna's Lust	
21/6/2015	Storm	Paramaribo: Zorg en Hoop	1 injured and 35 homes affected
28/6/2015	Storm	Paramaribo	1 (death)
27/7/2015	Flood	Saramacca	unknown
16/1/2016	Hailstorm	Paramaribo and surroundings	

9. The flooding risk of local communities living in costal and/or riverine areas of Suriname is amplified when considering the vulnerability of the areas that flood. For example, as discussed above, about two thirds of the Surinamese population live and work in the Paramaribo/Wanica area, which is prone to significant flooding. A 1999 study entitled "Country Study Climate Change Suriname" (and also known as the Netherlands Climate

Assistance Programme Phase 1, NCAP-1¹) identified risk zones for inundation from the sea and rivers, as shown below in *Figure 3*, showing the current vulnerabilities of the northern coastal areas to flooding.

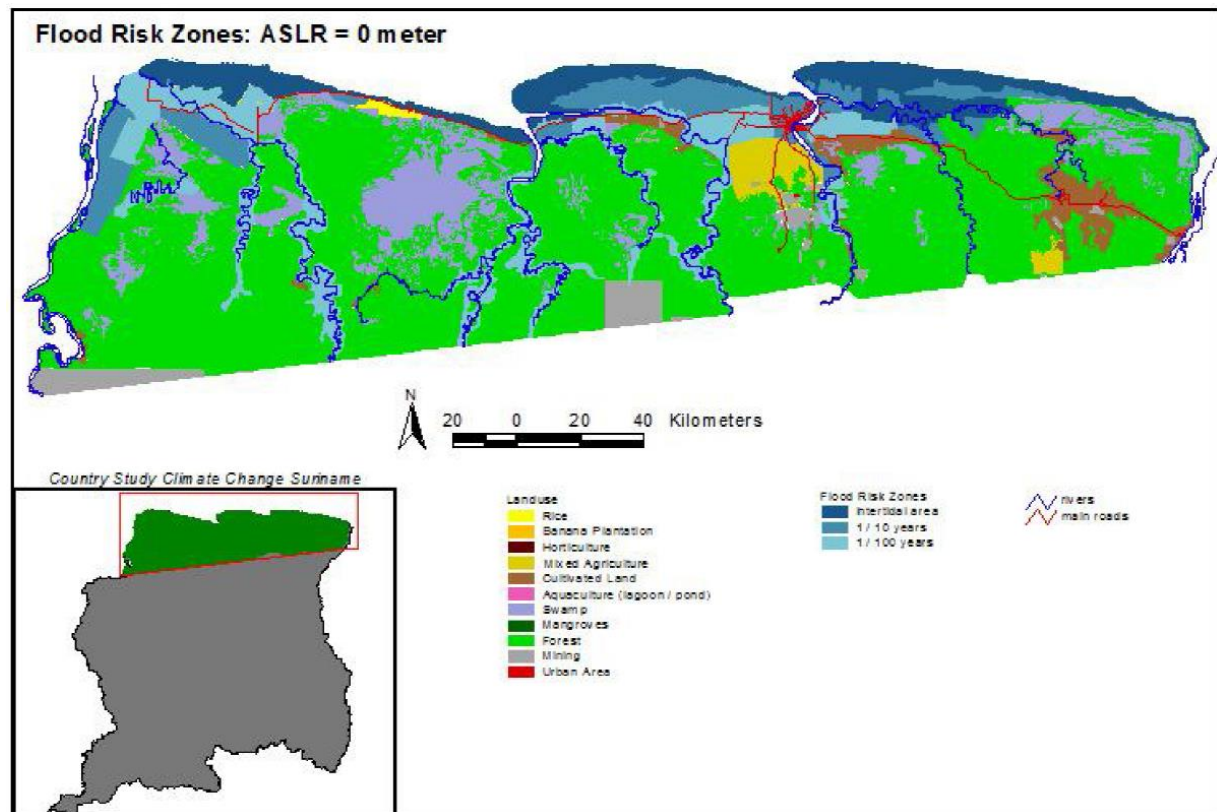


Figure 3: Flood Risk Zones for the Suriname coastal plain (Source: Figure 6-4 of Country Study Climate Change Suriname).

10. In a comparative analysis of the impacts of SLR on land, population, GDP, urban and agricultural extent, and wetlands in 84 developing countries, Suriname was ranked highest in Latin America and the Caribbean in terms of population and GDP impact, and was second only to Guyana and the Bahamas in terms of urban and agricultural extent (World Bank 2007 cited on IDB and IIC, 2016). At the global level, Suriname ranks among the top most affected countries overall. Suriname's entire economic zone is located within its coastal areas. Estimates of impacts of 1 meter SLR and storm surge in CARICOM member states, including Suriname, show that nearly 1,300 km² of land will be lost, over 110,000 people will be displaced, at least 149 multimillion dollar tourism resorts (including beaches) will be damaged or lost together with over 550 km of roads lost (Simpson et al, 2010). Other expected impacts include loss and damages to the agriculture, forestry and fisheries sectors as a result of increase ambient temperatures. Adaptation efforts so far remain insufficient and the continued impacts of climate change could further intensify the country's

¹ <https://www.weadapt.org/knowledge-base/national-adaptation-planning/methodology-of-suriname-ncap-project>

vulnerabilities, negatively affecting key sectors such as agriculture, water, energy, health and tourism.

11. The low-income segments of the population are disproportionately affected by climate risks. This is mainly due to poorer quality housing in environmentally sensitive areas and generally lower coping mechanisms in the case of hazard events. Lower income households often work in agriculture or informal activities that depend on the climate and are more exposed to communicable diseases that could become more prevalent as climate changes. Expected temperature increases, coupled with changes in rainfall patterns, will have significant impacts on human health through potential increases in the incidence of parasitic and infectious diseases (including a possible increase of vector diseases such as malaria in the interior and dengue in the coastal zone) (Government of Suriname 2013 cited on IDB and IIC, 2016). Of note in relation to these vulnerabilities is the expected disparity in impact among certain groups in society, such as women in the country's interior and farming communities (UNDP 2009 cited on IDB and IIC, 2016). Similarly, critical social infrastructure is also highly vulnerable to the effects of climate change.
12. Recognizing the vulnerabilities faced by Suriname to natural hazards and the additional effects of climate change, the United Nations Development Programme (UNDP) will develop a National Adaptation Plan (NAP) in 2017 based on UNDP's Suriname National Climate Change Policy Strategy and Action Plan (NCCPSAP). While this is under development, it can be confirmed that the proposals and interventions contained in this application are aligned and consistent with the NAP / NCCPSAP and also with IDB-funded climate change vulnerability assessment for Paramaribo city.

URBAN VULNERABILITY: A FOCUS ON PARAMARIBO

NATIONAL IMPORTANCE OF PARAMARIBO

13. Paramaribo is the capital city of Suriname and is located on the banks of the Suriname River along the northern coast of the country. Paramaribo and the surrounding urban areas is the main population center of Suriname, and where more than 70% of the country's population resides. Furthermore, Paramaribo is the main commercial and economic center, and also the location for the majority offices and activities of the GoS, which as reported earlier, is a key driver of the country's economy (IDB and IIC, 2016).
14. Paramaribo is the business and financial center of Suriname. Even though it does not produce significant goods itself, almost all revenues from the country's main export products (minerals, oil, agriculture and forestry) are channelled through the city, where the majority of banks, insurance corporations and other financial and commercial companies are headquartered. It is estimated that approximately 75 percent of Suriname's GDP is centered in Paramaribo (IDB and IIC, 2016).
15. Tourism is also an increasingly important sector for Paramaribo, both as a destination in its own right, and also as a gateway to the inner country areas. Paramaribo is a former Dutch colonial town dating from the 17th and 18th centuries. The Historic Inner City of Paramaribo is a UNESCO World Heritage Site and its certification is based on the following criteria:

- Paramaribo is an exceptional example of the gradual fusion of European architecture and construction techniques with indigenous South American materials and crafts to create a new architectural idiom; and
- Paramaribo is a unique example of the contact between the European culture of the Netherlands and the indigenous cultures and environment of South America in the years of intensive colonization of this region in the 16th and 17th centuries.

16. Paramaribo is therefore critical to the economic and development success of Suriname.

VULNERABILITY OF PARAMARIBO

17. Paramaribo sits in the lower elevation norther area of the country and is highly vulnerable to flooding and sea level rise, consistent with what has been described above. Table 2 shows the frequency with which flooding has affected Paramaribo, and this represents the principal hazard and risk facing Paramaribo.
18. A follow-up to the NCAP-1 study, the study “Promotion of Sustainable Livelihood within the Coastal Zone of Suriname, with Emphasis on Greater Paramaribo and in the Immediate Region”, known as the Netherlands Climate Assistant Programme Phase 2 (NCAP-2) (Naipal and Tas, 2016), demonstrated that a significant part of the Paramaribo area is highly vulnerable. For example, it cites that along the riverbank of the Suriname River and also in the southern part of the Paramaribo/Wanica area, the ground level is low, varying between 1.50 to 1.80m NSP, whereas the 1 in 10-year high water in the Suriname River is 1.93m at the north of Paramaribo and 2.00m near the center and south of the city.
19. Paramaribo does have some existing defences and protection measures in place, however these are not always sufficient for current levels of flooding and are insufficient when considering future implications of projected climate change (see *Figure 4*). For example, along the Suriname River from the north to the south, local protection measures in the form of earthen dams exist which aim to prevent flooding of the river at high tide. However, at locations the elevation of the top of the available structures and infrastructure is lower than the current high-water levels and as a consequence, flooding occurs (NCAP-2).



Figure 4: Examples of existing Flood Defences along the left bank of the Suriname River (Source: IDB, 2016).

20. Another key contributing factor to the flooding experienced in Paramaribo is the fact that the drainage system is undersized and poorly maintained. The current system is largely based on the original drainage design from colonial times to support the former plantation network and is therefore inappropriate for the city as it is today. Thirty-five open and closed drainage canals and channels form the current drainage system of Paramaribo. The canals can be characterized as a mixed system because in addition to rainwater, they also receive discharges of domestic waste water (partially treated by septic tanks). Interviews with local experts and government officials, and site visits as part of the IDB's Emerging and Sustainable Cities Program, revealed that flooding within Paramaribo's drainage system occurs due to a combination of poor maintenance of the existing canal network (including waste deposition), lack of maintenance of outlet structures (sluices and pumping stations), unregulated development in areas intended to support drainage such as retention areas, and additional growth of the urban area meaning drainage infrastructure may be under-sized (MOGP, 2001).
21. Flooding and drainage issues in Paramaribo are therefore a noted priority for the GoS², as highlighted in the fourth pillar "Utilization and Protection of the Environment" of Suriname's National Development Plan 2017-2021. The GoS has undertaken several initiatives to address climate change adaptation challenges, including the formulation of: The Climate Action Plan for the Coastal Zone of Suriname; the Integrated Coastal Zone Management Plan (ICZM), which provides several recommendations on several adaptation solutions for the North Paramaribo-Wanica coastline; National Contingency Plan; and the Second National Communication to the UNFCCC (2013). and the Nationally Determined Contribution to the UNFCCC process (2015). Furthermore, Suriname has participated in Phases I and II of the Netherlands Climate Assistance Program and the European Union Global Climate Change Alliance Program (2011-2015). The latter has led to the formulation of the National Climate Change Policy, Strategy and Action Plan of 2015 and the strengthening of the Meteorological Services, as well as training in climate modelling and vulnerability and risk assessments.
22. More specifically for Paramaribo, the GoS has been conducting several studies to identify appropriate adaptation measures for the city. In 2009 the GoS conducted a river protection study, which proposes the construction of a river dike to the north of Paramaribo to protect the city's historical center against flooding due to increasingly high-water levels in relation to global sea-level rise. In fact, the ICZM Plan backs this proposal and further recommends the construction of dikes along the left bank of the Suriname River from Leonsberg to the Saramacca canal. Based on these recommendations and earlier studies as mentioned above, the GoS partially (incomplete due to lack of funding) built the dike and river protection (flood wall) on different parts of the Suriname River bank in 2011.
23. In addition, the Inter-American Development Bank (IDB) has developed a partnership with the GoS with respect to supporting the sustainable development of Paramaribo. This includes the application of the IDB's Emerging and Sustainable Cities (ESC) assessment methodology to Paramaribo (the ESC Study). The ESC Study is a systematic approach to assessing the current baseline situation in a city with respect to a host of key topics, sectors and sustainability indicators, and to use this information through analysis and extensive

² While administratively Paramaribo forms its own district in Suriname, it does not have its own municipal or city government. The GoS maintains governance and management over the city.

engagement with city stakeholders to develop key urban sustainability priorities for a city. Climate vulnerability and risk is a critical lens of the ESC Study through which a city's sustainability challenges and opportunities are considered. In the case of Paramaribo, the IDB has commissioned a hazard and risk analysis for the greater Paramaribo area (see *Figure 5*) with the aim of identifying areas of vulnerability and highest risk to natural hazards, and also proposing adaptation recommendations to build resilience (ESC Risk Study). This is on-going work and will be completed by February 2016; however key findings to date have been integrated into this project proposal.

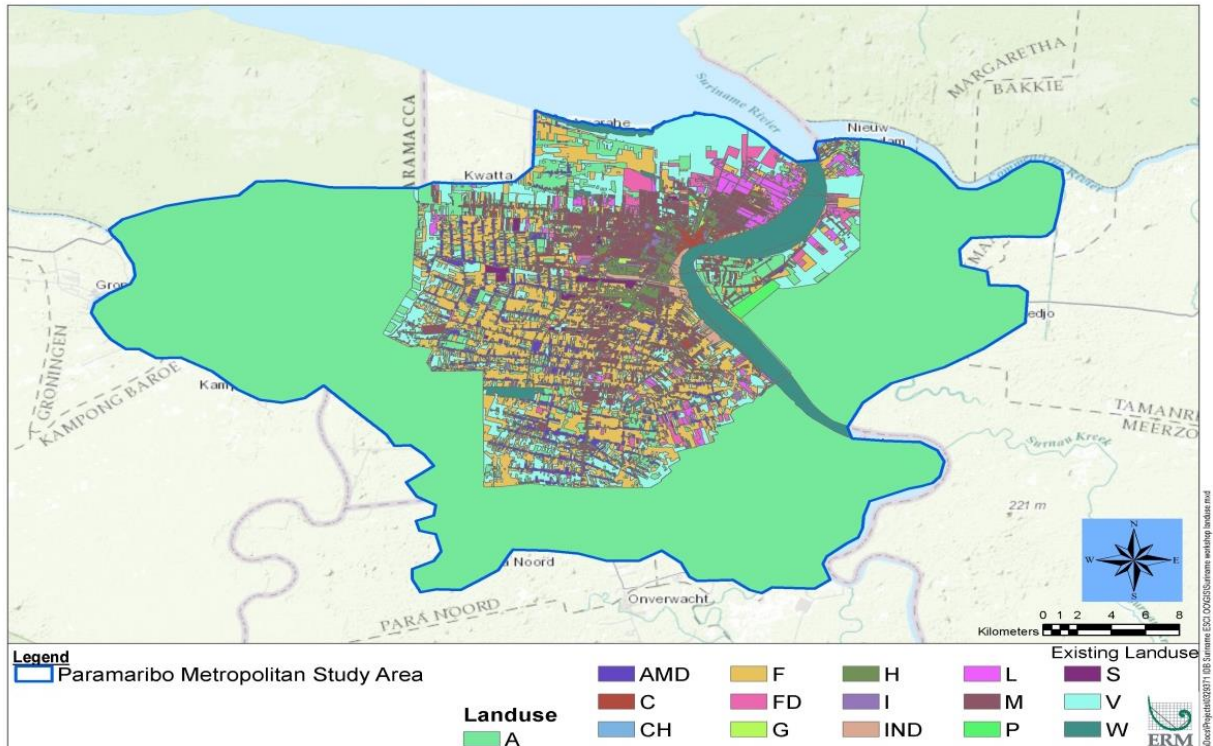


Figure 5: Paramaribo Metropolitan Study Area for the IDB's ESCI (Source: IDB, 2016).

24. In addition, the IDB is also funding a grant for the Revitalization of the Historic Centre of Paramaribo (IDB Urban Rehabilitation Program), which has been conceived to tackle the most urgent problems affecting the historical downtown and promote a sustainable urban revitalization process. This area embraces Paramaribo's UNESCO world heritage site (see *Figure 6*). The IDB also commissioned focused hazard and risk studies in this area (Downtown Risk Study).

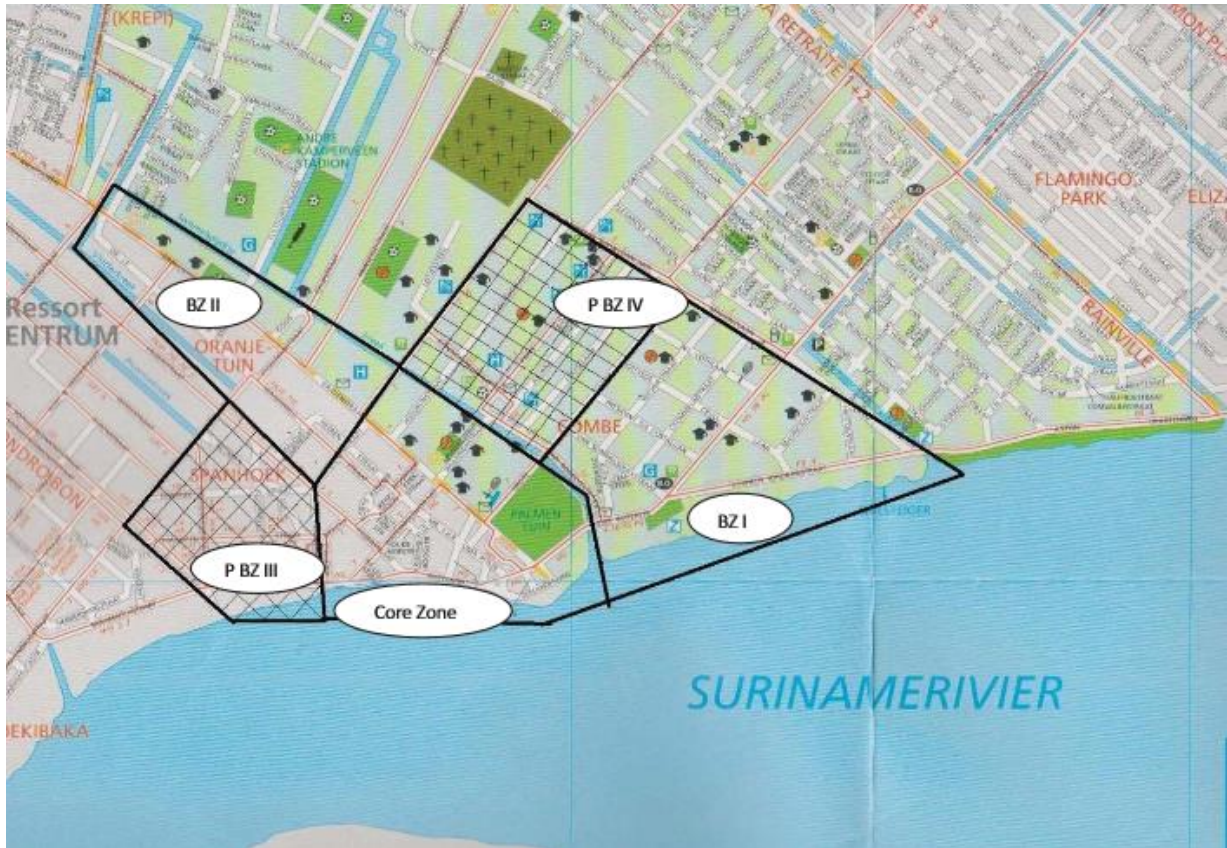


Figure 6: Program Area (Core Zone of Paramaribo World Heritage Site)

25. The ESC and Risk studies included a focus on flooding (which was prioritized as a hazard through engagement with the city stakeholders) and used the climate change projections presented in *Table 1*. The studies modelled inland and coastal flooding hazards both for the current situation and also for the future (out to the year 2050) when considering climate change projections for a series of different return periods. These results were then used to generate hazard maps for the city, such as the one shown in *Figure 7* which presents the 1 in 100-year coastal hazard map for the Paramaribo Study Area with climate change projections integrated for 2050.

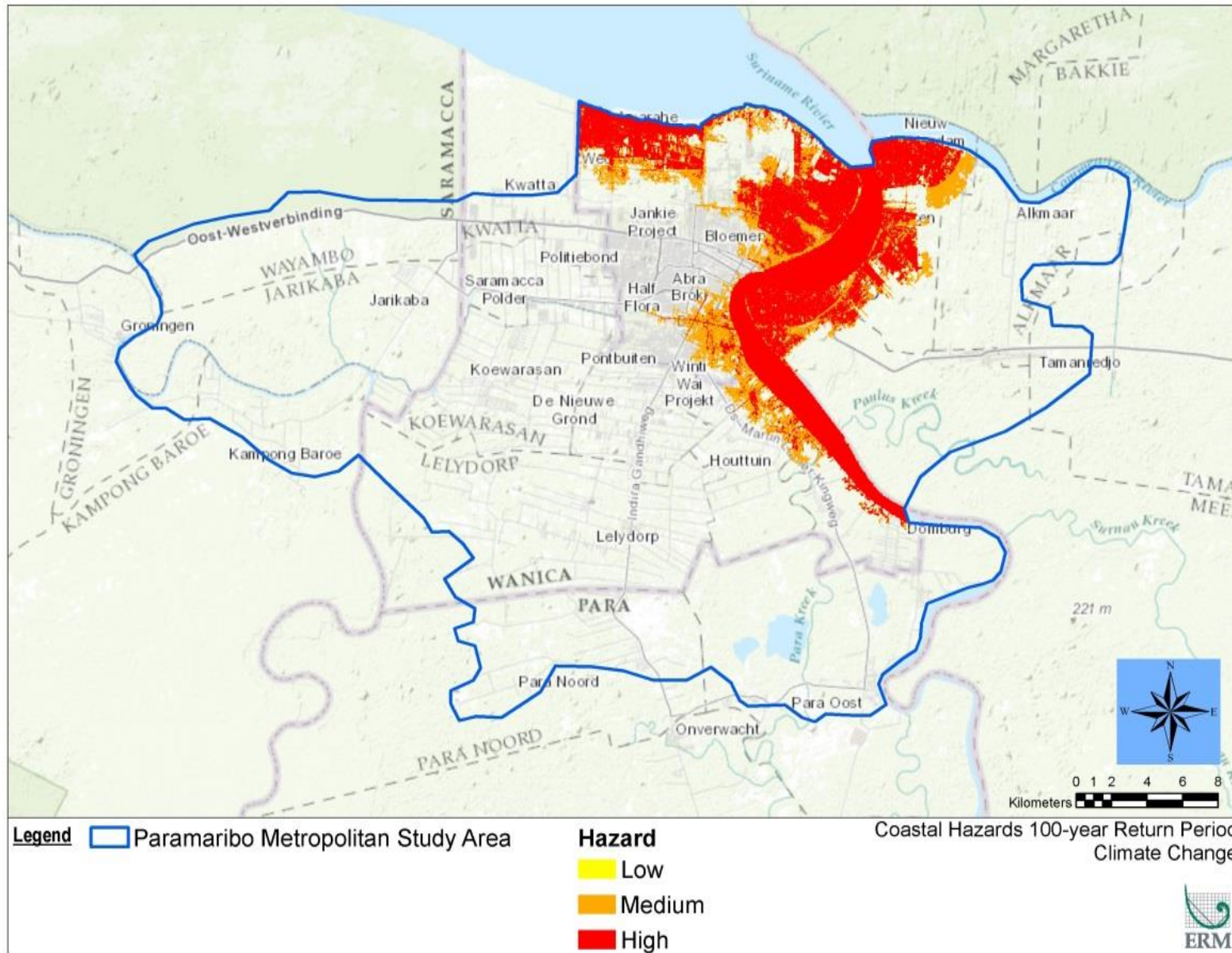
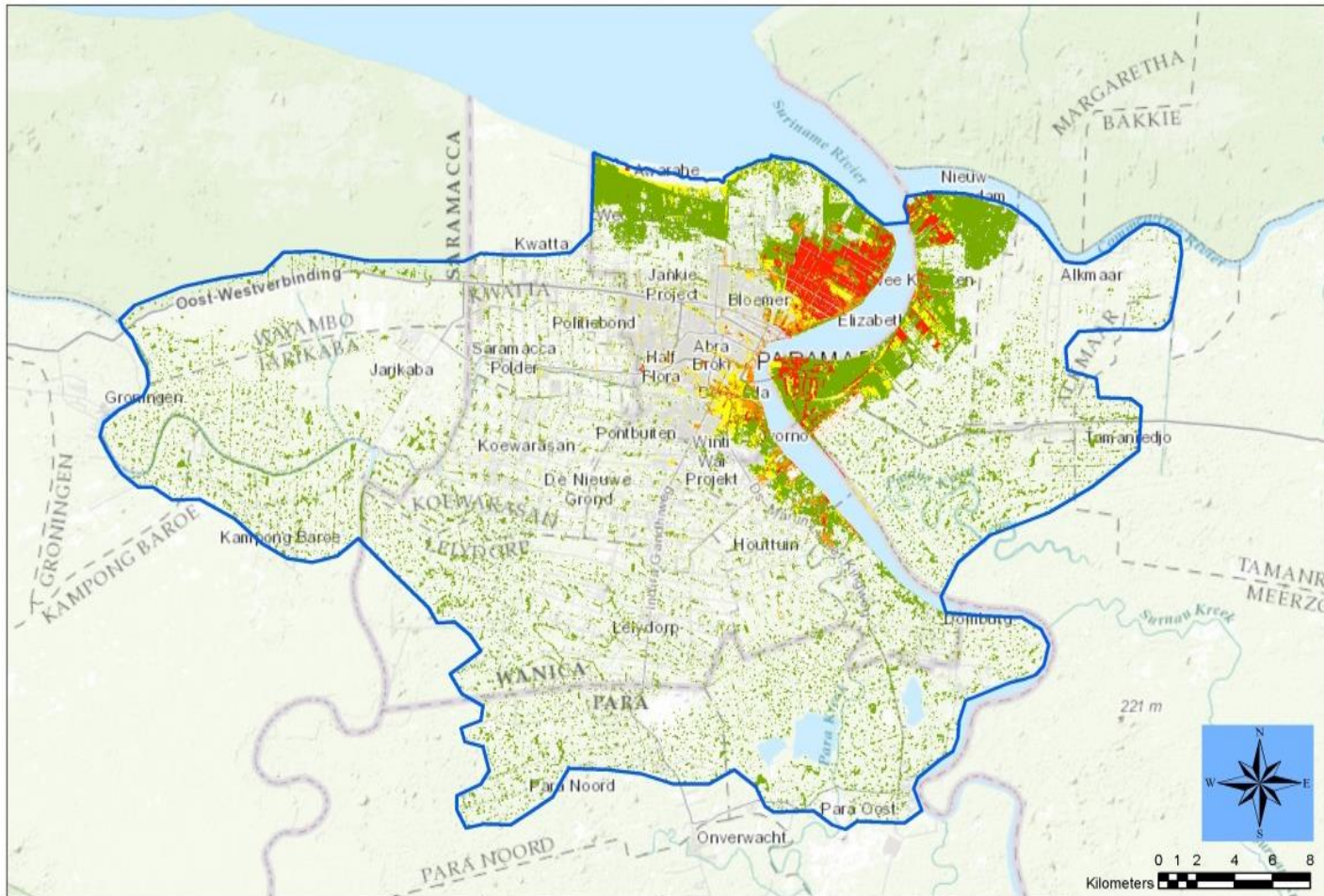


Figure 7: 100-year coastal hazard map for Paramaribo with climate change projections for 2050 horizon (Source: IDB 2016)

26. As can be seen in *Figure 7*, the modelling shows areas of high vulnerability for Paramaribo along the Suriname River and for the emerging urban areas along the northern coast. Risk maps have also been generated by linking the coastal and inland flooding hazard findings to population areas and economic land-value. For example, *Figures 8* and *9* show the economic and population-based risk maps created for the ESC Study area, which is the larger Paramaribo Metropolitan area. These risk maps serve as basis to identify areas of Paramaribo where climate adaptation measures are needed to increase climate resilience into the future.



Legend

Paramaribo Metropolitan Study Area

Economic Risk (\$/m²)

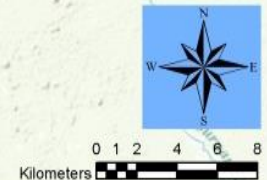
20-94

95-171

172-247

248-950

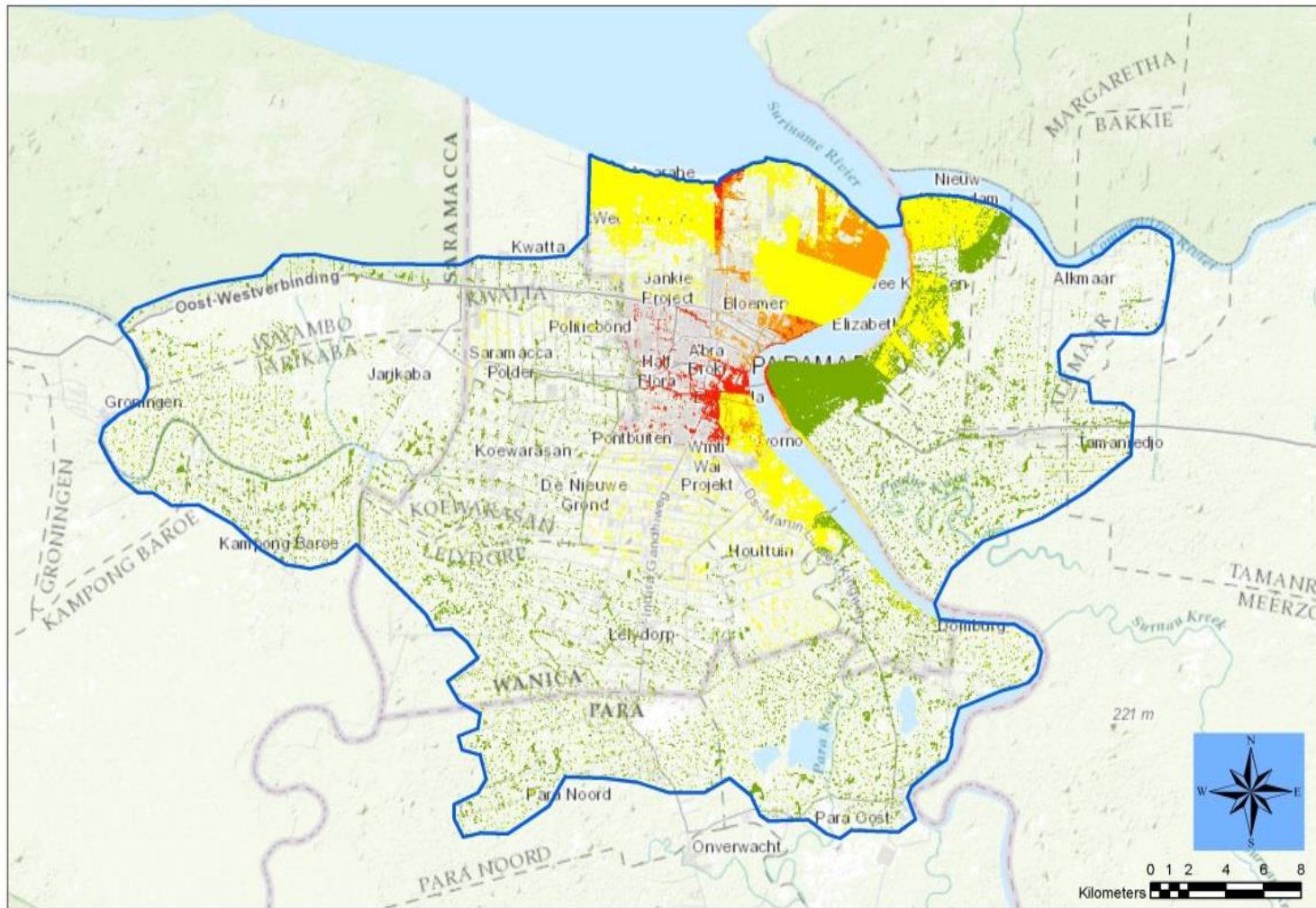
Economic Risk with 100-yr Return Period
Climate Change



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Figure 8: Paramaribo Metropolitan Economic-based risk map with Climate Change for 100-year return period (Source: IDB, 2016)³

³ Economic-based risk refers to the level of potential asset loss due to hazards and vulnerability. The color codes refer to the economic risk of the area, where high (red) and low (green) damage costs are identified as results of natural events including climate change for a return period of 100 years.



Legend

Paramaribo Metropolitan Study Area

Population Risk (1/km²)

- 2-124
- 125-555

Population Risk with 100-yr Return Period Climate Change

- 556-987
- 988-5600



Figure 9: Paramaribo Metropolitan Population-based risk map with Climate Change for 100-year return period (Source: IDB, 2016)

27. Based on the information presented in *Figures 7 to 9*, Paramaribo and its broader metropolitan area has six priority areas which have higher vulnerability and risks to flooding and sea level rise including:

- Along the east bank of the Suriname River at (i) New Amsterdam and (ii) Meerzorg;
- Along the west bank of the Suriname River at (iii) Noord and (iv) Downtown (the Historic Center of Paramaribo);
- Along the northern coast following the (v) canal that serves Munder; and
- West of the Downtown area (vi) adjacent to Tammenga.

28. Stakeholder discussions and workshops with GoS agencies and also non-governmental agencies have also been undertaken as part of the risk studies to understand current capacity, management plans and resources for managing and responding to natural hazards and disasters. This analysis also overlaps with the ESC Study city indicator process. While this process is ongoing, some current insights and conclusions include:

- The GoS does not have existing risk maps for natural hazards;
- The GoS has an emergency contingency plan, however this does not appear to be widely disseminated and is also limited in its extent due to budget and resource constraints;
- There is only a basic infrastructure in place for an early warning system; and
- Disaster risk management has not currently been carried through to any broader city development planning;

29. The above studies were performed at the metropolitan level. These economic and population based-risk maps reinforce the urgent need for the implementation of a group of adaptation measures that go from the development of capacity building activities at different government levels and local communities, to the deployment of key infrastructure to protect the coast along the waterfront of this area.

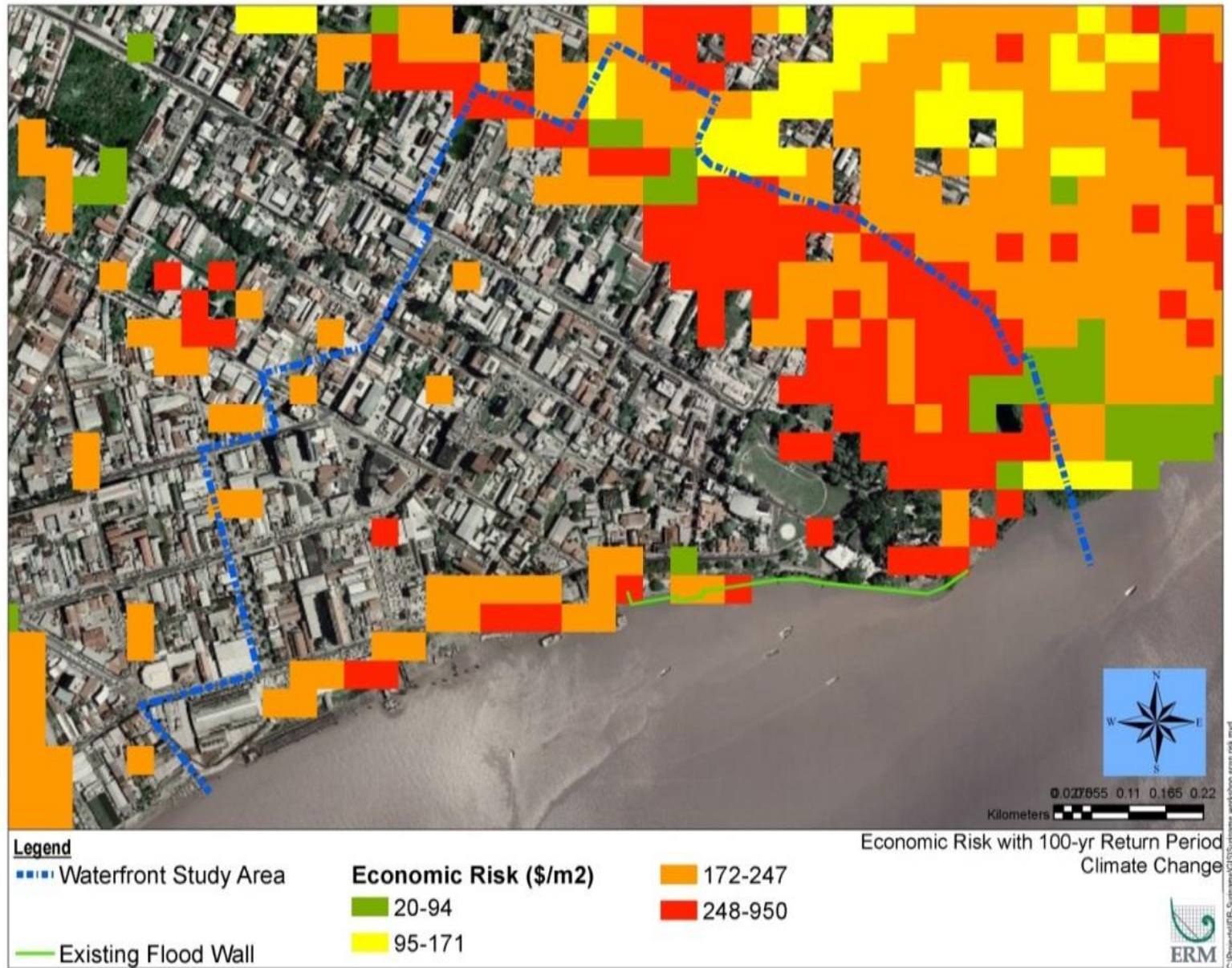
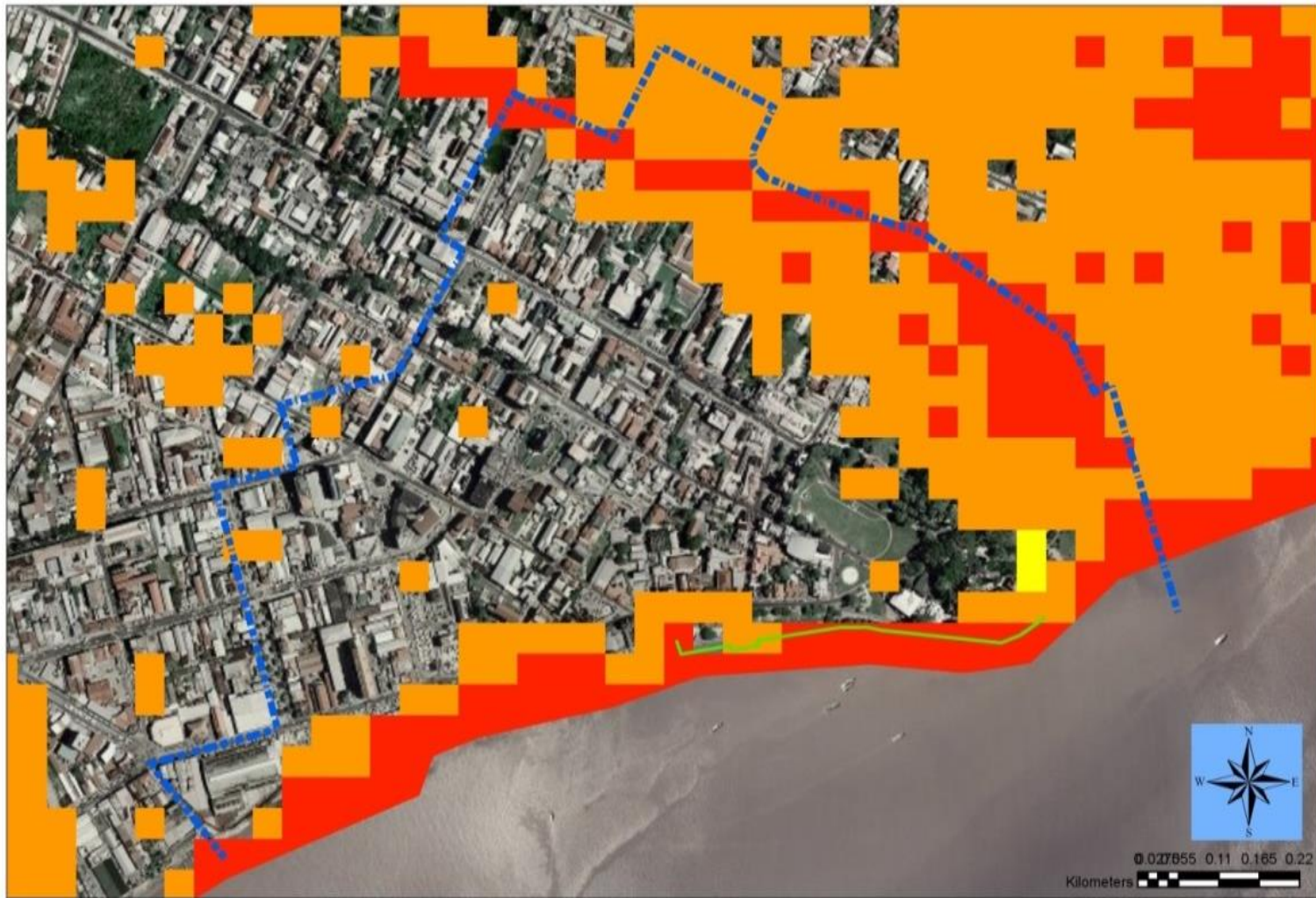


Figure 10: Waterfront Economic-based risk map with Climate Change for 100-year return period (Source: IDB, 2016)



Legend

Waterfront Study Area	Population Risk (1/km²)	556-987
Existing Flood Wall	2-124	988-5600
	125-555	

Population Risk with 100-yr Return Period Climate Change



© Project/AFB-Suisun/AFB/PPRC/Climate Change workshop prep note.mxd

Figure 11: Waterfront Population-based risk map with Climate Change for 100-year return period (Source: IDB, 2016)

30. In summary, Paramaribo is highly vulnerable to climate change and natural hazards (floods) and given the prominent and integral role Paramaribo plays at the national level, Paramaribo's vulnerability has national consequences in terms of economic and social impacts. The challenges Paramaribo faces include:

- Vulnerability (both in terms of population and economic exposure) to flood hazards which will be further compounded by projected sea level rise;
- This vulnerability is largely in areas of the city that are important population centers and economic hubs; in order to put in place a sustainable growth plan for the city, it is necessary to better know the river and how it would interact under new hydrological conditions posed by a changing climate- that is, additional knowledge of gradual changes to local hydrology need to be monitored, filed and analyzed.
- There are several challenges that threaten Paramaribo's capacity to effectively cope with observed and anticipated effects of climate change on the frequency and magnitude of floods and sea level rise, namely limited resources; limited institutional capacity; the low-income status of much of the population limits their own ability to build resilience; and absence of a coordinated understanding and resulting action plan to build adaptive capacity.

31. The adaptation and resilience requirements identified through existing GoS and IDB studies suggests that over \$60 million of investment is needed to support a city-wide fully implemented adaptation strategy. It is recognized that this level of capital expenditure is not feasible given the current economic situation in Suriname. This Proposed Project therefore seeks to incrementally respond to Paramaribo's challenges and complement current efforts lead by the GoS to protect the city by initiating a first phase of adaptation measures to demonstrate the benefits to be accrued through adapting to climate change and create an enabling environment to facilitate a long term participative and dynamic adaptation process. The Proposed Project takes advantage of the existing studies and analysis performed by the IDB and GoS to date to implement a focused adaptation solution (specific to the Downtown area), as well as create an overarching city framework to build capacity and structure in support of further adaptation and resilience building.

Proposed Project Objectives:

PROGRAMME OBJECTIVE

32. The general objective of the Proposed Project is to contribute towards increasing the adaptive capacity of communities living in the Paramaribo city and adjacent metropolitan vulnerable areas to cope with observed and anticipated impacts of climate change on floods and sea level rise. The specific objectives of this proposed Project are to generate:
- i. **City Adaptation Framework and Plan:** Establish a framework for managing knowledge and disseminating lessons learned that could be used in future resilience programs for the city of Paramaribo and that could be part of a city-level Adaptation Plan;
 - ii. **Downtown Adaptation Measures:** Implement a group of strategic and cost-effective adaptation hard measures in the historic downtown area of Paramaribo that illustrate

- the benefits of building climate resilience as part of a long-term planning strategy for the city and its metropolitan area;
- iii. **Capacity Building and implementation of a Learning and Knowledge Management Plan:** Build capacity across local communities and GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan; development of a Knowledge Management Plan to help structure all the information and practical knowledge on climate resilience generated by the project; and
 - iv. **Monitoring and Evaluation:** Ensure there is a robust plan and implementation structure to allow the Proposed Project to be implemented, monitored, evaluated and lessons learned disseminated.

The above components represent the 'Project' or 'proposed Project' as presented through this application.

PROPOSED PROJECT STRATEGY

33. To deliver on the identified objectives, the GoS and IDB are proposing under this Proposed Project four main components (noting the components are not necessarily sequential), as described below.

(i) City ADAPTATION FRAMEWORK AND PLAN

34. This component is seen as an enabling step to ensure that decision makers and stakeholders have a robust framework to ensure investments on climate resilience are implemented in a structured manner and promote long-term adaptation in the city. The absence of such a plan will mean an on-going piece-meal approach to resilience planning, which will not be of benefit to the city or its residents. This framework and plan will be aligned to the National Adaptation Plan being prepared by the UNDP.
35. The studies carried out by the GoS and IDB for the city of Paramaribo to date, including recent ESC and Historic Downtown Study, provide solid foundations for a city-broad Adaptation Plan. Therefore, the focus of this component will be to build consensus and agreement on the objectives, priorities, actions and responsibilities that need to be built into the Paramaribo Adaptation Framework and Plan. Key steps will include:
 - Workshops with local communities and other Paramaribo stakeholders including government officials to outline and discuss the requirements of the Adaptation Plan for the city and its metropolitan area;
 - Broader community engagement activities to build awareness and understanding of the Plan and to ask for feedback and additional input to fill in existing information gaps;
 - Establish a coordination and cooperation framework for the Plan to define main actors and ensure responsibilities for its implementation and tracking of performance are fully understood and established;
 - Build key priorities, focus areas and definition of goals for the Plan; and
 - Ensure alignment of the plan with existing planning documents and other relevant information and pre-agreed actions with local communities and city developers.

- Design, organize and deliver workshops on the Adaptation Plan for the general public, focusing on gender-equality and local vulnerable communities within the metropolitan area.

(ii) DOWNTOWN ADAPTATION MEASURES

36. The work of IDB and the GoS undertaken in 2016 identified the key areas in Paramaribo where hard adaptation measures are needed. One of the identified priority areas is the Historic Downtown Area (HDA), which is vulnerable to floods and which will be further exacerbated by climate change anticipated impacts. This area is also the focus of GoS and IDB investments to try and reinvigorate the area both to protect its historic character and to act to stimulate economic growth through increased vibrancy and use of the area.
37. In the IDB and GoS' Concept Note application to the Adaptation Fund, a series of potential adaptation measures were presented comprising physical measures; complementary green infrastructure measures; drainage maintenance and upgrades; and management and maintenance measures. In addition, results were presented of preliminary risk studies financed by IDB assessing the vulnerability of the downtown area. The IDB and GoS have subsequently worked on a series of detailed studies for the Downtown area to assess a range of adaptation measures and through environmental, social, economic and technical analyses, have identified a specific set of adaptation measures that form the basis of this Full Application. Part II has been updated to present this additional work and analysis.

(iii) CAPACITY BUILDING AND IMPLEMENTATION OF A LEARNING AND KNOWLEDGE MANAGEMENT PLAN:

38. Based upon the final structure of the Paramaribo Adaptation Plan, the requirements within the GoS and other key stakeholders for capacity building will also need to be identified and actioned. It is expected that this will fall into the following two areas:
- Training and capacity building for the key individuals and departments tasked with specific actions and responsibilities within the Adaptation Plan – under this programme, it is expected that initial training needs will be delivered, and a broader training plan will be provided to the GoS for ongoing delivery; and
 - Institutional strengthening needs will be identified and shared with the GoS with respect to ensuring climate change and adaptation is mainstreamed into relevant policies, development planning and regulations – under this programme, the institutional strengthening will be identified and then the implementation will be a separate responsibility of the GoS;

Main activities include:

1. Prepare, organize and deliver capacity building and technical training workshops on the Paramaribo Adaptation Plan for different government bureaus, including the Ministry of Public Works and the National Environmental Coordination Unit.

2. Formulate a long-term training plan, along with key training materials, to facilitate continuous capacity building for technical staff of the GoS on the Adaptation Plan.
 3. Conduct an institutional evaluation to enhance the GoS capacity to mainstream climate change and adaptation practices into relevant policies and regulations.
39. In addition, a Learning and Knowledge Management Plan will also be developed (please see additional information on pages 55-57). This Plan ensure that:
- Information, data and lessons learned are captured;
 - This information is appropriately managed and stored so that it is readily accessible and understandable;
 - This information is shared among stakeholders and appropriate training sessions are delivered; and
 - A review and evaluation step are included to ensure this data management process is working effectively and also evolving as the data and information sets develop.

(iv) MONITORING AND EVALUATION

40. Monitoring and evaluation is critical to the successful implementation of a project. A monitoring and evaluation plan will be developed as per the following:
- **Monitoring** - The purpose of monitoring activities will be to follow up as the Proposed Project progresses to ensure that it is meeting the original expectations and achieving the expected results. A Results Matrix (RM) will be developed which will enable the identification of issues and problems during execution that can be corrected in due time. The monitoring program will be based on the RM, and on the associated project plans.
 - **Indicators** - Monitoring activities will be guided by a series of selected Key Performance Indicators (KPIs) that will be defined in the RM. Each defined indicator will include a unit of measure, frequency of measurement and a means of verification.
 - **Progress Reporting** – The required frequency of periodic monitoring reports will be defined.
 - **Coordination and Monitoring** - The requirements for relevant administration and management requirements for the Proposed Project’s monitoring activities, which will include: (i) to develop, maintain and update the data regarding monitoring indicators; (ii) coordinate the collection and processing of information on project actions and prepare progress reports; (iii) identify problems, delays and external factors affecting the project and proposing, where appropriate, remedial measures; and (iv) support monitoring meetings and program evaluation.
 - **Monitoring Plan** – The frequency of monitoring will be defined.
 - **Evaluation** – The evaluation of the Proposed Program will be done once the Proposed Program has been completed in order to determine if its objectives have been achieved based on a specified and agreed criteria.

Project / Programme Components and Financing:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

For the case of a programme, individual components are likely to refer to specific sub-sets of stakeholders, regions and/or sectors that can be addressed through a set of well defined interventions / projects.

The following Table 3 presents an overview of the Project's components, outcomes, main outputs and their costs.

Table 3: Proposed Project's components, outcomes, main outputs and costs.

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
<p>(i) City-level Adaptation Framework and Plan: Develop a city-broad plan to build climate resilience in the city in line with a long-term adaptation process. Said plan will guide policy makers and city planners in prioritizing investments and programs to achieve climate resilience. Also design and implement a Dissemination Strategy of the Adaptation Plan for the general public.</p>	<p>City-wide Adaptation Plan developed and endorsed by city major and local vulnerable communities.</p> <p>No less than 3 dissemination workshops on the scope and purpose of the Adaptation Plan for the general public, with a focus on gender-equality and local vulnerable communities in the metropolitan area.</p>	<p>Strengthened awareness and ownership of adaptation and climate risk process by Paramaribo citizens including the metropolitan area.</p> <p>Increased public awareness on the negative effects of climate change.</p> <p>Public ownership of adaptation and climate risk reduction plans and processes within the metropolitan area.</p>	\$550,000

<p>(ii) Downtown Adaptation Measures: Implement adaptation measures in the historic downtown area of Paramaribo that illustrate the benefits of building climate resilience as part of a long-term planning strategy for the city and its metropolitan area</p>	<p>Enhanced flood protection measures along the Suriname River next to the Historic Downtown area, comprising: (a) replacement of historic flood wall with the construction of a 250-meter sheet-piled wall on the south side of Waterkant Street to prevent flooding and erosion along the left bank of Suriname River; (b) Rehabilitation of the Sommelsdijck Canal pump station and sluice gates; (c) enhancement and expansion of an existing area of mangroves immediately downstream of the Sommelsdijck Canal pump station; and (d) the development of a surface water Drainage Management Plan (DMP) (see Part II for further details and justification for the adaptation measures).</p>	<p>Reduced flood risk exposure of community, leisure, tourist and business areas on the waterfront adjacent to the historic downtown area. A consequential outcome is that implementation will act as the enabler for the broader regeneration program proposed by the GoS and IDB.</p>	<p>\$7,572,000</p>
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<p>(iii) Capacity Building and implementation of a learning and management Plan: Build capacity across the GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan; development and implementation of Knowledge Management Plan and carry out training to technical and managerial staff on adaptation planning and management.</p>	<p>Training plans and materials for key stakeholders in Paramaribo in adaptation planning and management.</p> <p>No less than 3 technical workshops to technical and managerial staff on the implementation of the Adaptation Plan. Special emphasis will be made to ensure a gender balance participation in the workshops.</p> <p>Institutional evaluation to identify specific actions to enhance the GoS capacity to mainstream climate change and adaptation into policies, regulations and development planning.</p>	<p>Strengthened GoS institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses caused by flooding and sea level rise.</p> <p>Increased participation of women in decision making processes related to the implementation of adaptation measures in Paramaribo</p>	<p>\$380,000</p>
<p>(iv) Program Administration: Develop a robust plan and implementation structure to allow the Proposed Project to be implemented, monitored and evaluated.</p>	<p>Monitoring and Evaluation plan developed</p>	<p>Ensuring stated outcomes are achieved and delivered.</p> <p>Practical knowledge about adaptation processes in cities is increased.</p>	<p>\$580,000</p>
<p>(v) Project Cycle Management Fee: Ensuring appropriately qualified project management capabilities are applied.</p>	<p>On-time and on-budget delivery of the Project</p>	<p>Ensuring stated outcomes are achieved and delivered.</p>	<p>\$768,000</p>
<p>Amount of Financing Requested</p>			<p>\$9,850,000</p>

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Submission of Concept to AF	01/09/2017 (Complete)
Approval of the Concept by the AF Board (Estimate)	03/2017 (Complete)
Submission to AF of a Full Programme Proposal	08/2018

Milestones	Expected Dates
Approval of the Full Programme Proposal by the AFB (Estimate)	10/2018
Start of Project/Programme Implementation	07/2019
Mid-term Review (if planned)	07/2021
Project/Programme Closing	07/2023
Terminal Evaluation	07/2023

PART II: PROJECT / PROGRAMME JUSTIFICATION

Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

41. The Proposed Project that forms the basis of this Full Application comprises the following main components:

- City Adaptation Framework and Plan;
- Downtown Adaptation Measures;
- Capacity Building and implementation of a learning and knowledge management plan; and
- Monitoring and Evaluation.

The predominant component (in terms of cost and scale) are the adaptation measures themselves.

City-Wide Adaptation Plan

42. The purpose of the city-wide adaptation plan is to develop a city-broad plan to build climate resilience in the city in line with a long-term adaptation process. Said plan will guide policy makers and city planners in prioritizing investments and programs to achieve climate resilience and compiling lessons learned in order to identify strategies and programs that can be applied to future resilience programs for the city of Paramaribo. The Adaptation Plan provides a continuous, iterative, standardized process to implement future city-wide adaptation measures. The plan will build on existing information and studies held by the GoS, the IDB and also other interested stakeholders such as the World Bank. It will anticipate climate impacts to, and

vulnerabilities for, the city of Paramaribo, and project how climate change is expected to lead to impacts ranging from sea level rise to extreme weather events.

43. The plan will identify potential key infrastructure and other city services that could be impacted by climate change and encourage the integration of identified climate risks and vulnerabilities within relevant Governmental policies and actions.
44. The process of developing the plan will involve meaningful stakeholder engagement and interaction to both ensure collective participation, local endorsement and the opportunity to disseminate adaptation knowledge for the general public.
45. The plan will be structured to systematically consider adaptation and resilience factors including the following:
 - Define the city's vulnerabilities and risks and the associated framework for adaptation;
 - Define relevant factors in considering adaptation including latest knowledge/research on climate change; short-, medium- and long-term risk management considering uncertainty; and consideration of local and regional characteristics;
 - Define and comment on existing measures and actions related to climate change and extreme weather events;
 - Define the necessary ongoing monitoring of climate change and its impacts;
 - Project future climate change and its impacts
 - Assess impacts, vulnerability, resilience, and risk and determine the need for adaptation measures;
 - Scope and prioritise the agreed adaptation measures;
 - Ensure that climate change adaptation is wholly integrated with disaster risk reduction;
 - Define the roles and expectation of the GoS, stakeholders and other relevant actors;
 - Define a Climate Leadership Team for the city;
 - Ensure full engagement and consultation with vulnerable groups;
 - Define linkages to sectoral policies and regulations, such as building codes and planning zones, to reflect climate change risks;
 - Develop relevant performance indicators for climate change adaptation;
 - Identify, prioritise and cost proposed adaptations and the associated interlinkages.

- Define steps to track and assess progress and effects of adaptation actions and measures;
- Communication approach including sharing with the public;
- Process for review, adapting to change and responses to feedback.

46. A Dissemination Strategy of the Adaptation Plan and knowledge generated by its development will be designed and implemented. No less than three dissemination workshops will be undertaken on the scope and purpose of the Adaptation Plan for the general public, with a focus on gender-equality and local vulnerable communities in the metropolitan area. Objectives of the Dissemination Strategy include:

- Increased public awareness on the negative effects of climate change;
- Public ownership of adaptation and climate risk reduction plans and processes within the metropolitan area;
- Increased participation of women in decision making processes related to the implementation of adaptation measures in Paramaribo; and
- Improved policies and regulations that promote and enforce resilient measures.

Assessing the Flooding Hazard and Risk in the Downtown Area

47. Since the submission of the original Concept Note application, the IDB and GoS have worked on a series of environmental, social, economic and technical studies to identify specific adaptation measures for the downtown area. The details of these studies and the findings are summarised in the following paragraphs and relevant supporting information is cross-referenced.

48. Building off the city-level analysis that the IDB prepared as part of the ESC work (as presented in the original Concept Note), the IDB and GoS supported a detailed site-specific risk analysis related to flooding in the historic center of Paramaribo. Physical hazards due to flooding from extreme climate events were calculated and these were then used to estimate vulnerability based on asset, population density, and land use information. Maximum water levels and precipitation for 10-, 25-, 50-, and 100-year return periods were used to inform this analysis, as well as future climate change projections. The physical hazards from flooding were evaluated using high resolution numerical modelling of the study area and estimating risk using analytical approaches along with a geospatial data analysis (GIS) system. In addition to the baseline flood assessment, a flood modelling study was conducted by applying infrastructure improvement alternatives to evaluate the effectiveness adaptation alternatives. This work is summarised below, and the full **Site-Specific Risk Analysis report (dated July 2018) is contained in Annex A.**

49. The analysis was performed using HEC-RAS and FLO-2D models, which are approved by the U.S. Federal Emergency Management Agency for delineating flood hazards, regulating floodplain zoning and designing flood mitigation in riverine as well as urban systems. These models were used to estimate the likely occurrence of flooding hazards within the Study Area for 10-, 25-, 50-, and 100- year return periods using site-specific data collected from

various Surinamese institutions, published reports and site visits. A probabilistic inland flood hazard analysis was performed using historic precipitation data to obtain Intensity Duration Frequency (IDF) distribution during wet season using a nearest neighbour weather generator tool. Similarly, probabilistic coastal flood hazard analysis was performed using Highest Water Levels (HWLs) obtained for various return periods in the Suriname River near the Study Area. Similar inland and coastal flooding analysis was also conducted for future years (2020, 2050 and 2080) using climate change projections for precipitation (derived new IDF for climate change years) and sea level rise obtained from Regional Climate Models driven by HadAM3 and ECHAM4. A series of both inland and coastal flooding hazard maps of the Study Area and the Canal were created for the subsequent socio-economic risk analyses that resulted in the development of economic and population risk maps that quantified damages in terms of financial loss and population affected in the Study Area.

50. Analysis of flood modelling results show that in the Study Area, most of the flooding occurs due to HWLs in the Suriname River caused by storm surges occurring at spring high tide conditions. The baseline simulations clearly show that flooding in the Study Area begins at the low ground elevation level of the Waterkant Street and Paramaribo Central Market, spreads inland and then expands east and west of the Water Taxi area towards the existing flood wall (see Figures 12-15 below). The ground elevation near the Fort Zeelandia and the Van Sommeldijkse Canal area well above the 100-yr baseline HHWL resulting in no flooding. Inland flooding in the Study Area is caused by precipitation and water logging shows up in various regions, spread out sporadically with more inundation occurring along the Van Sommeldijkse Canal (see Figures 16-18 below). The inland flooding happens due to overflow from the drainage system at the Canal and various manholes in the street and non-operating condition of sluice gates and pumps at Knuffelsgracht Street and near Central Market.

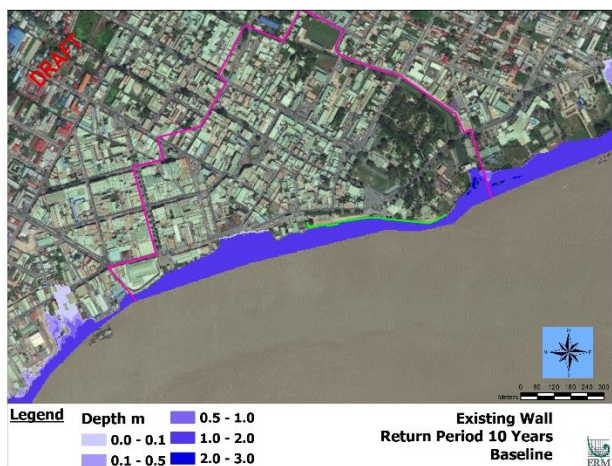


Figure 12: Coastal flooding inundation map of the Study Area with the existing flood wall for the baseline scenario at 10-year return period

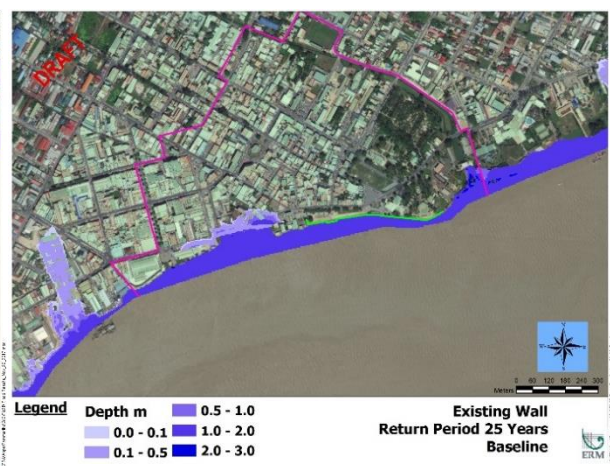


Figure 13: Coastal flooding inundation map of the Study Area with the existing flood wall for the baseline scenario at 25-year return period

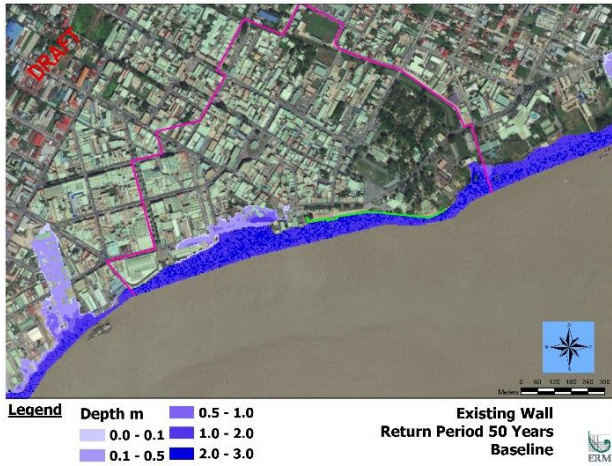


Figure 14: Coastal flooding inundation map of the Study Area with the existing flood wall for the baseline scenario at 50-year return period

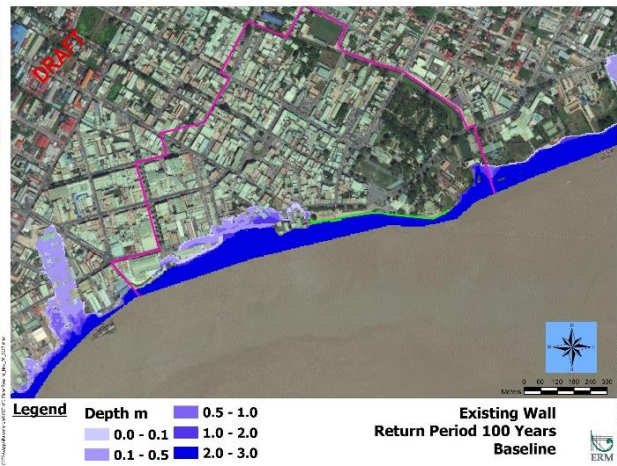


Figure 15: Coastal flooding inundation map of the Study Area with the existing flood wall for the baseline scenario at 100-year return period

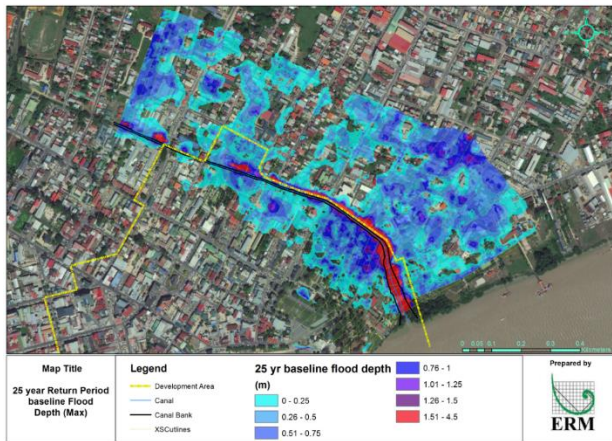


Figure 16: Inland flooding map, including canal water overflow for the baseline scenario at 25-year return period

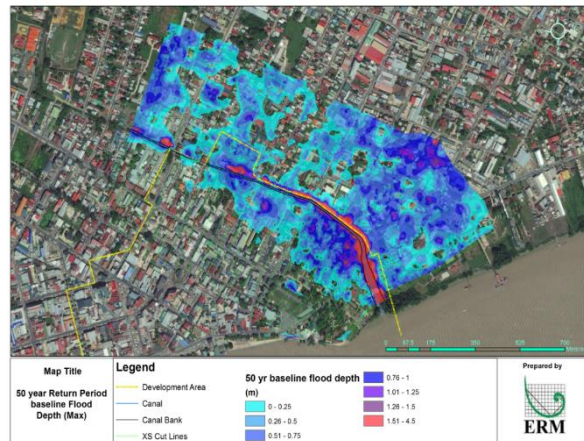


Figure 17: Inland flooding map, including canal water overflow for the baseline scenario at 50-year return period

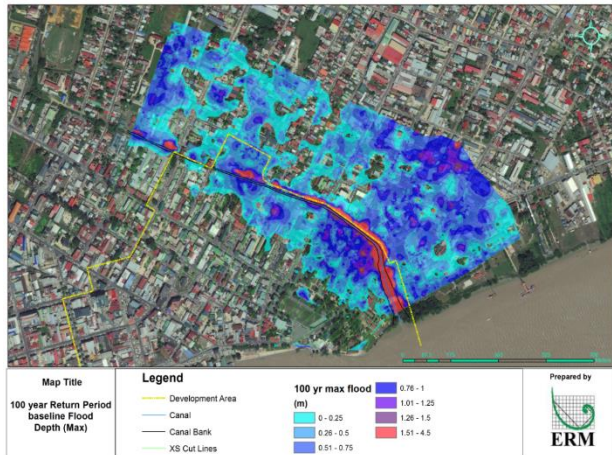


Figure 18: Inland flooding map, including canal water overflow for the baseline scenario at 100-year return period

51. With climate change, coastal flooding occurs more frequently causing more damage and disruption due to sea level rise. As sea level rises, coastal flooding events shift from being minor to more extensive, resulting in more damages. Sea level rise occurrence is a slow, multi-decadal process that alone results in gradual coastal erosion, subsidence and saline intrusion. However, using extreme value theory to combine sea-level projections with wave, tide and storm surge, the intensity and frequency of coastal flooding increases to a catastrophic level (due to gradual destabilization of the coastal region by sea level rise being impacted by extreme flood waves). Even regions with limited water-level variability will be subjected to unusual flood events. This can be clearly seen in the hazard maps of the Study Area developed for climate change scenarios at various return periods (Figures 19-25 below).
52. Areas inundated with 0.0 m to 0.5 m of water correspond to low hazard; areas inundated with 0.5 m to 1.0 m of water correspond to medium hazard and areas inundated with greater than 1.0 m of water tend to correspond to high hazard levels. The general flooding coastal flooding pattern remains the same near the Water Taxi area for future years due to climate change. However, the flooding spreads to a larger region on the east and west of the Water Taxi area resulting in more inundation along the rear of the existing flood wall. In addition, more flooding happens in the Fort Zealandia area and on either side of the Van Sommeldijckse Canal for future years due to climate change. This happens because of the limited storage and drainage capacity of the Canal, and small-sloped flood plain regions on either side of it. There is not much change in the inland flooding for future years because of small percent increase in precipitation due to climate change.

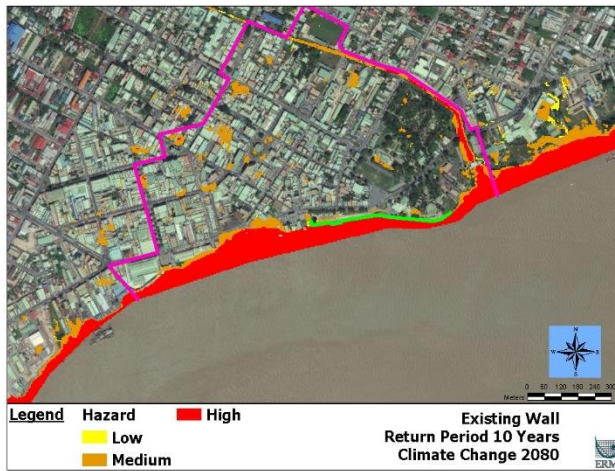


Figure 19: Coastal and inland flooding hazard map of the Study Area with the existing flood wall for the climate change 2080 scenario at 10-year return period

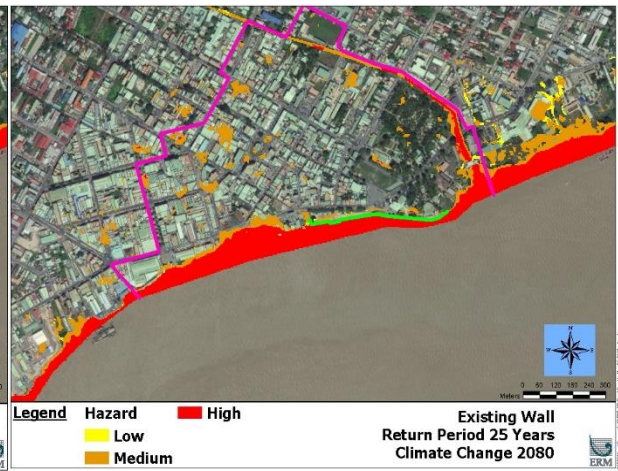


Figure 20: Coastal and inland flooding hazard map of the Study Area with the existing flood wall for the climate change 2080 scenario at 25-year return period

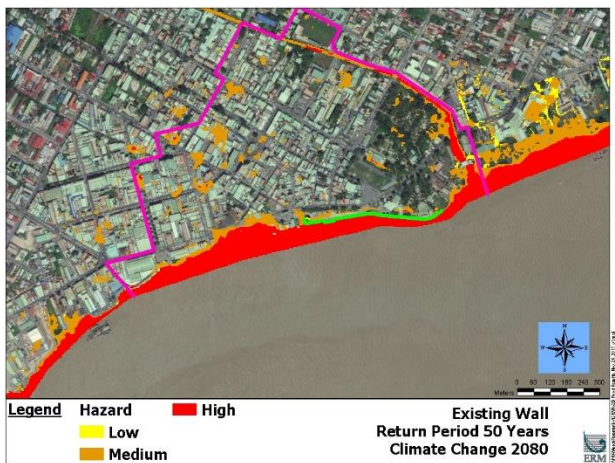


Figure 21: Coastal and inland flooding hazard map of the Study Area with the existing flood wall for the climate change 2080 scenario at 50-year return period

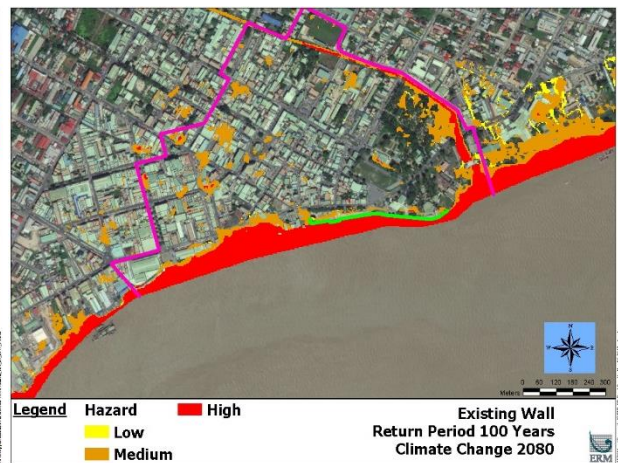


Figure 22: Coastal and inland flooding hazard map of the Study Area with the existing flood wall for the climate change 2080 scenario at 100-year return period

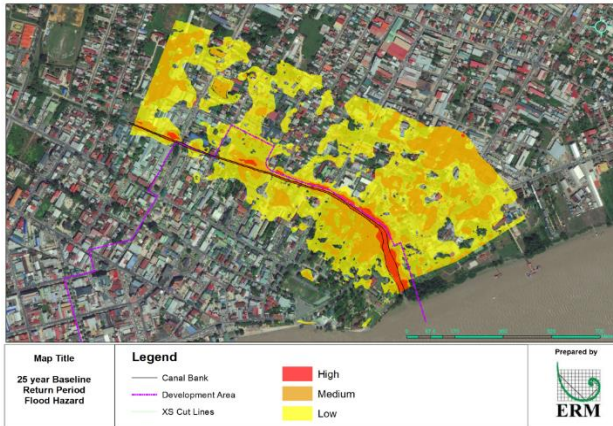


Figure 23: Flooding hazard map of the Canal and its surroundings for the climate change 2080 scenario at 25-year return period

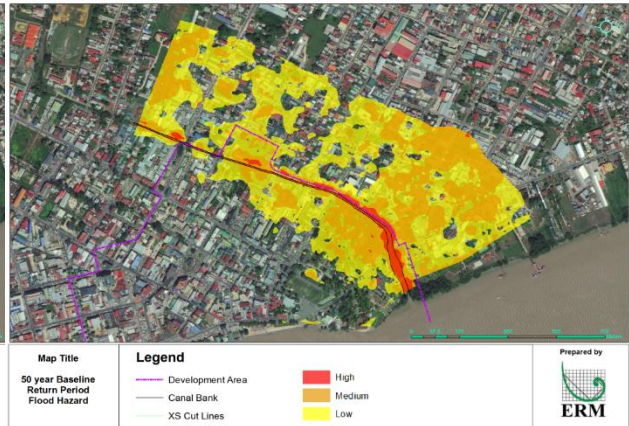


Figure 24: Flooding hazard map of the Canal and its surroundings for the climate change 2080 scenario at 50-year return period

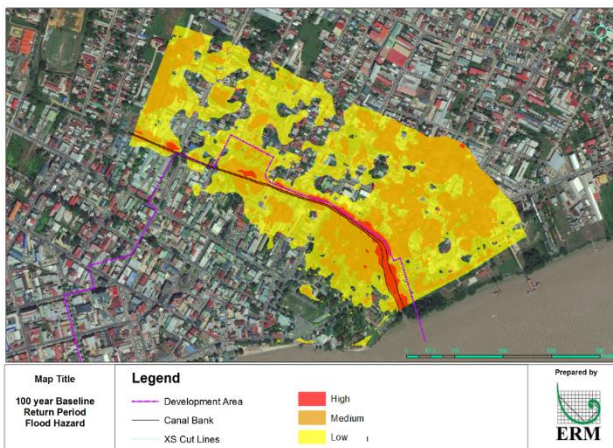


Figure 25: Flooding hazard map of the Canal and its surroundings for the climate change 2080 scenario at 100-year return period

53. Based on this analysis, it can be concluded that two important topographical features of the riverbank control the coastal flooding dynamics in the Study Area:

- i. the inland elevation; and
- ii. the inland slope.

The first one restricts the onset of flooding and the second one restricts the spread of flooding. For inland flood dynamics, slope initiates the flooding (run off) and low infiltration and inefficient natural and constructed storm water drainage system spreads the flooding resulting in human and property risks. The study results show most of the flooding in the Study Area is caused by the combined influence of storm surge, tides and sea level rise, using extreme value theory. In addition, the impact from an increase in sea level rise,

overlaid even on a typical storm surge is much larger than the corresponding increase in extreme precipitation resulting in less inland flooding as compared to coastal flooding.

Identification of Potential Adaptation Measures (Alternatives Analysis)

54. With the cause and extent of flooding better defined, a series of potential adaptation measures were identified and assessed. This work is summarised below, and the full **Alternatives Selection report (dated February 2018) is contained in Annex B**. Proposed adaptation measures were selected based on a systematic evaluation of alternatives undertaken in two stages.
55. The first stage consisted of identifying a broader universe of technical solutions within the framework of floodwall, green infrastructure, and drainage system improvements that may function separately or as integrated solutions. Table 4 presents a wide range of potential technologies/alternatives that were initially identified using a variety of sources, including previous experience, local knowledge, and team brainstorming/consultation. Local past experiences on similar projects was considered in determining what might work/ not work and was incorporated in the Table 4 below. These technologies were then evaluated based on site-specific conditions, implementability, cost, and effectiveness. Technologies that were deemed inappropriate based on comparison with these criteria were eliminated from further consideration. Rather than involving the universe of alternatives, the purpose of this initial screening of technologies was to streamline the process and to limit the number of alternatives that underwent more detailed evaluation.

Table 4: Initial Technology/Alternative Screening

Technology/ Alternatives	Process	Retained	Eliminated	Remarks
Regulation and Policies	Government Policy, Zoning and Land Use Options	X		Can be used for future development
Business Relocation	Relocate business/market along the shoreline and design the vacated area for recreational use		X	Livelihood and social impact, public resistance, costly
New Flood Protection Wall	Flood protection wall (sheet piles with brick or concrete cap)	X		Effective, supported by flood model
New Tidal Basin with Flow Controls	Create new tidal basins with flow controls (tidal gates, pumps)		X	Limited space within city center for new infrastructure, costly
Rehabilitate existing old retaining wall	Retrofit existing old retaining wall (sheet piles)	X		Effective, supported by flood model
Rehabilitation - Existing Flood Control Mechanicals	Rehabilitate/retrofit existing tidal gates, sluice gates, and other flood controls	X		Effective, supported by flood model
Rehabilitation - Drainage System	Rehabilitate/retrofit existing stormwater infrastructure (improve efficiency of the existing network)	X		Effective, current status -poorly maintained

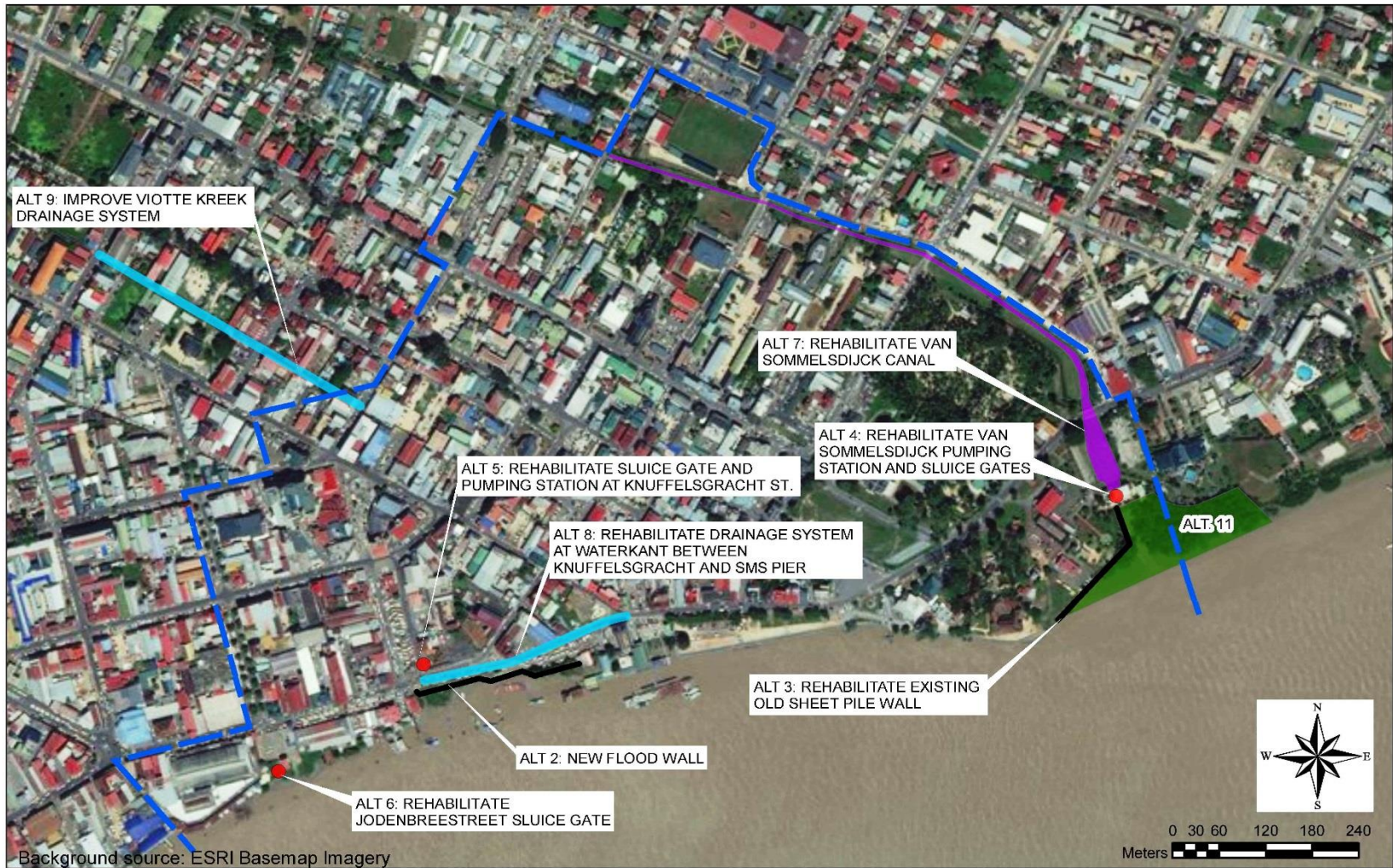
Technology/ Alternatives	Process	Retained	Eliminated	Remarks
Shoreline Erosion Protection/ Stabilization	a) Riprap/gabions/articulated concrete blocks along shoreline	X		Effective for erosion protection
	b) Timber groins to promote sediment accumulation and vegetative growth in select areas		X	Space constraints consider using in combination with mangrove establishment
	c) Create buffer with enhanced mangrove	X		Proven technology in study area
Dredging	Dredging to increase capacity of Suriname River		X	Likely little impact on flood elevation and velocity, costly
Stormwater Retention and Release	a) Install underground stormwater retention system (retention vaults, pipes) and release water at lower rate	X		Secondary benefit to flood mitigation, including source of water for fire protection
	b) Construct aboveground stormwater retention and release system (swale, ponds) in open spaces	X		
	Pervious pavement: Use alternative to impervious materials (permeable pavements, vegetation,)	X		Consider implementing in select areas of city center to reduce runoff
Rainwater Harvesting/Reuse	Retrofit building with storage tanks and reuse water for toilets, etc.,		X	Difficult to implement on a large enough scale to have an impact
New Wastewater Treatment Plant	Separate storm and sewer and install WWTP for sewer		X	Although beneficial, limited impact on flood protection, costly

56. The technology screening described above resulted in selecting 14 targeted site-specific alternatives that represent viable options while preserving the concept to mitigate climate change issues considering both inland and coastal flooding. These 14 targeted site-specific alternatives are summarized in Table 5 and shown on Figure 26. A stakeholder engagement was conducted on 8 November 2017 in Paramaribo to present the project and solicit feedback on these identified alternatives. The meeting included presentation of the identified alternatives as well as a description of the criteria used to evaluate the alternatives and identify those that are preferred.

Table 5: Site-Specific Alternative Description

Technology/ Alternatives	Site-Specific Alternatives	Description
Regulations and Policies	Alternative 1: Government policy, zoning, and land use options	Incorporates government interventions via policies, zoning, and land use limitation with a goal of allowing more open space and green in the city center, enforce built-up area restrictions, enhance water management, update master plan, and implement environmental policies (waste collection).
New Flood Protection Wall	Alternative 2: New flood protection wall from Knuffelsgracht Street to SMS Pier	Includes a new flood protection wall, approximately 250 meters (m) long, for a section from Knuffelsgracht Street to SMS Pier along south side of Waterkant Street. The flood wall consists of metal sheets pushed into the ground several feet below the ground surface. The sheet pile will be reinforced along the embankment side with riprap/stone. The sheet pile will be finished with concrete/brick cap on top with a two- to four-meter wide walkway. Roadside drainage along the wall will be improved and trees/plants will be planted. Existing historic landing for small boats and a steel jetty that are within the limits of the proposed flood protection wall will be rehabilitated during the wall construction.
Rehabilitate Existing Old Retaining Wall	Alternative 3: Rehabilitate existing old retaining wall between Fort Zeelandia and sluice gate in Van Sommelsdijck Canal	Includes replacing part of existing steel sheet piles between Van Sommelsdijck Canal sluice gate and Fort Zeelandia; riprap stone will be added in the embankment to increase passive pressure and bearing capacity of existing piles. Other components include reprofiling clay dike, increasing steel sheet pile wall crest level, and making walkways for pedestrians.
Rehabilitation –Existing Flood Control Mechanicals	Alternative 4: Rehabilitate Van Sommelsdijck pumping station and sluice gates	The existing pumping station is old and only partially functioning. This alternative includes adding/refurbishing one pump capacity (4.5 m ³ /s), upgrading existing mechanical and electrical system, upgrading sluice gates structures, widening the inland water storage area, and automating operation.
	Alternative 5: Rehabilitate sluice gate and pumping station at Knuffelsgracht Street	This alternative will require new pumps and new sluice gates, including new concrete structure and raising top level for high water level (HWL) protection.
	Alternative 6: Rehabilitate Jodenbree Street sluice gate near Central Market	Involves minor improvement of existing sluice gate near Central Market, adding new gates, raising top level for HWL protection.

Technology/ Alternatives	Site-Specific Alternatives	Description
Rehabilitate Drainage System	Alternative 7: Rehabilitate Van Sommelsdijck Canal	Van Sommelsdijck Canal will be rehabilitated starting from the canal pump station to a maximum of 700 meters up-gradient. The expansion includes removing sediments and debris from the existing canal, profiling/regrading the canal to gain appropriate capacity, lining the canal bottom with concrete, and installing concrete/brick retaining wall on both sides of the canal. To add functionality, walkways will be constructed on both sides of the expansion with parking facilities at certain locations. This component also includes rehabilitating drainage (culvert) at Tourtonnelaan Street crossing (upgradient end of the canal rehabilitation section).
	Alternative 8: Rehabilitate drainage system along waterfront between Knuffelsgracht and SMS Pier	Includes improving existing stormwater and sewer drainage system including pipes and inlet for approximately 300-meter segment of the Waterkant Street between Knuffelsgracht and SMS pier. Undersized/small diameter underground pipes and inlets/outlets will be removed and replaced with larger capacity pipes and inlet/outlet structures. After the pipes and inlet/outlet replacement, the overlying road will be repaved. This upgrade will ensure better collection and discharge through the Knuffelsgracht pump station and sluice gate.
	Alternative 9: Improve Viotte Kreek drainage system	Use large culverts or open "U" concrete channel structure to improve discharge/reduce maintenance for approximately 350 meters between Zwartehovenburg Street and Klipstenen Street.
Shoreline Erosion Protection/ Stabilization	Alternative 10: Riprap/gabions/ articulated concrete blocks along shoreline	This alternative focuses on erosion control by using riprap/gabions/articulated concrete blocks for approximately 300 meters of shoreline.
	Alternative 11: Create buffer with enhanced mangrove plantings	The existing mangrove area immediately south of the Van Sommelsdijck Canal pump station will be slightly expanded and enhanced by planting more trees and constructing other natural features (trapping units/wooden quays) to facilitate growth, sediment entrapment, and protection against erosion.
Stormwater Retention and Release	Alternative 12: Install underground stormwater retention system	Installation of stormwater retention system such as vaults and large diameter pipes to release water at a lower rate.
	Alternative 13: Construct aboveground stormwater retention and release system	Construction of swales, ponds, or similar features in open spaces. Approximately four such aboveground units are assumed.
	Alternative 14: Construct permeable pavements or similar alternatives to impervious surfaces	Reduction in surface runoff from impervious surfaces by converting existing surfaces to more permeable options. Permeable pavement is assumed to be installed in Keizer Street, Knuffelsgracht bus terminal, along Waterfront, along Viotte and other canals.



Background source: ESRI Basemap Imagery

LEGEND

- WATERFRONT STUDY AREA
- DRAINAGE IMPROVEMENTS
- RETAINING WALL
- CANAL IMPROVEMENTS
- MANGOVES
- PUMP AND SLUICE GATE IMPROVEMENTS

NOTES:

1. FOLLOWING ALTERNATIVE ARE NOT DEPICTED BECAUSE IT IS EITHER NOT LOCATION-SPECIFIC OR THE EXACT LOCATION NOT FEASIBLE.
 - ALT 1: GOVERNMENT POLICY ZONING AND LAND USE
 - ALT 10: RIPRAP/GABIONS FOR EROSION PROTECTION
 - ALT 12: UNDERGROUND STORMWATER RETENTION SYSTEM
 - ALT 13: ABOVEGROUND STORMWATER RETENTION SYSTEM
 - ALT 14: PERMEABLE PAVEMENTS, SUBSURFACE INFILTRATION BOX

ALTERNATIVES MAP



Figure 26: The Fourteen Targeted Site-specific Alternatives

57. A set of site-specific criteria were then developed to assist in evaluating the 14 alternatives identified. These evaluation criteria were broadly classified into four main categories.

- i. Technological achievement
 - Meeting flood protection through design life
 - Technological approaches
 - Integration of green technologies
 - Compatibility with existing flood protection or drainage improvements
 - Capital versus operation and maintenance (O&M)-intensive measures
 - Long-term effectiveness
- ii. Socio-political achievement
 - Social consideration
 - Regulatory and government involvement
 - Compatibility with UNESCO World Heritage Site restrictions
- iii. Environmental achievement
 - Stabilization of the river and drainage systems
 - Flood protection
 - Naturalization of the river bank
 - Ecosystem enhancement
- iv. Programmatic achievement
 - Implementability
 - Cost

58. Using these evaluation criteria, a multi-criteria evaluation (weighted sum model) was performed to identify the preferred alternatives. Based on the method discussed in Annex II, the alternatives that scored highest were considered the preferred adaptation measures, as identified in Table 6, and these were submitted to further analysis.

Table 6: High Ranked Site-Specific Alternatives

Site-Specific Alternatives	
Alternative 2	New flood protection wall from Knuffelsgracht Street to SMS Pier
Alternative 3	Rehabilitate existing old retaining wall between Fort Zeelandia and sluice gate in Van Sommelsdijck Canal
Alternative 4	Rehabilitate Van Sommelsdijck pumping station and sluice gates
Alternative 5	Rehabilitate sluice gate and pumping station at Knuffelsgracht Street
Alternative 7	Rehabilitate Van Sommelsdijck Canal
Alternative 8	Rehabilitate drainage system along the waterfront between Knuffelsgracht and SMS Pier
Alternative 11	Create buffer with enhanced mangrove plantings

59. These seven highest-ranked alternatives were then grouped into three groups that best represent the options to address the critical components of the project, i.e., address the current and future expected flooding in the Study Area, and also meet the cost restrictions associated with the Adaptation Fund. Table 7 summarises the groupings.

Table 7: Grouped Alternatives

Group	Alternative	Alternative Description	Benefits	Drawbacks
Group A	Alt 2	New flood protection wall from Knuffelsgracht Street to SMS Pier	<ul style="list-style-type: none"> • Strong measure for coastal flood protection • Adaptive to future by increasing wall height 	<ul style="list-style-type: none"> • May temporarily obstruct view • Inland flood control requires operation of pump and gates
	Alt 4	Rehabilitate Van Sommelsdijck pumping station and sluice gates	<ul style="list-style-type: none"> • Addresses critical flood area 	<ul style="list-style-type: none"> • Flood wall overlaps with existing water taxi business and may have impacts on livelihoods
	Alt 11	Create buffer with enhanced mangrove plantings	<ul style="list-style-type: none"> • Address both coastal and inland flooding 	<ul style="list-style-type: none"> • Management of potentially impacted sediment • Resolution of historic land concession required
Group B	Alt 3	Rehabilitate existing old retaining wall between Fort Zeelandia and sluice gate in Van Sommelsdijck Canal	<ul style="list-style-type: none"> • Minimal construction disturbance to rehabilitate existing wall 	<ul style="list-style-type: none"> • Critical flood area not addressed • Only portion of canal is rehabilitated • Inland flood control requires pump and gates operation • Management of potentially impacted sediment
	Alt 4	Rehabilitate Van Sommelsdijck pumping station and sluice gates	<ul style="list-style-type: none"> • Added functionality along canal for walkways 	
	Alt 7 (*reduced)	Rehabilitate Van Sommelsdijck Canal (250 m)	<ul style="list-style-type: none"> • Address both coastal flood and limited (reduced segment of canal improvement) 	
	Alt 11	Create buffer with enhanced mangrove plantings		
Group C	Alt 4	Rehabilitate Van Sommelsdijck pumping station and sluice gates	<ul style="list-style-type: none"> • No view obstruction 	<ul style="list-style-type: none"> • Critical flood area partially addressed by new pump station (PS) – Alt 5 • Construction disturbance at new PS – Alt 5 • Inland flood control requires pump and gates operation
	Alt 5	Rehabilitate sluice gate and pumping station at Knuffelsgracht Street	<ul style="list-style-type: none"> • Added functionality along canal for walkways 	
	Alt 7 (*reduced)	Rehabilitate Van Sommelsdijck Canal (250 m)	<ul style="list-style-type: none"> • Address both coastal flood and limited (reduced segment of canal improvement) 	

Group	Alternative	Alternative Description	Benefits	Drawbacks
	Alt 11	Create buffer with enhanced mangrove		

Further Analysis of Potential Adaptation Measures

i. Further Flood Risk Analysis

60. The effectiveness of various alternatives was evaluated by modelling them using the baseline flood model setup (details contained in Annex A). For example, the flood modelling study results for Alternatives 2 and 3 and Alternative 4 show that there is significant improvement in the reduction of flood hazard along the river waterfront (using alternative 2 and 3, see Figure 27) and near the Van Sommeldijkse Canal for small return periods (alternative 4, see Figure 28). For future years of 2050 and 2080 with large return periods, effectiveness of flood control decreases due to the routing of flood water from neighbouring regions of the riverfront. A similar analysis holds good for the other alternatives identified.

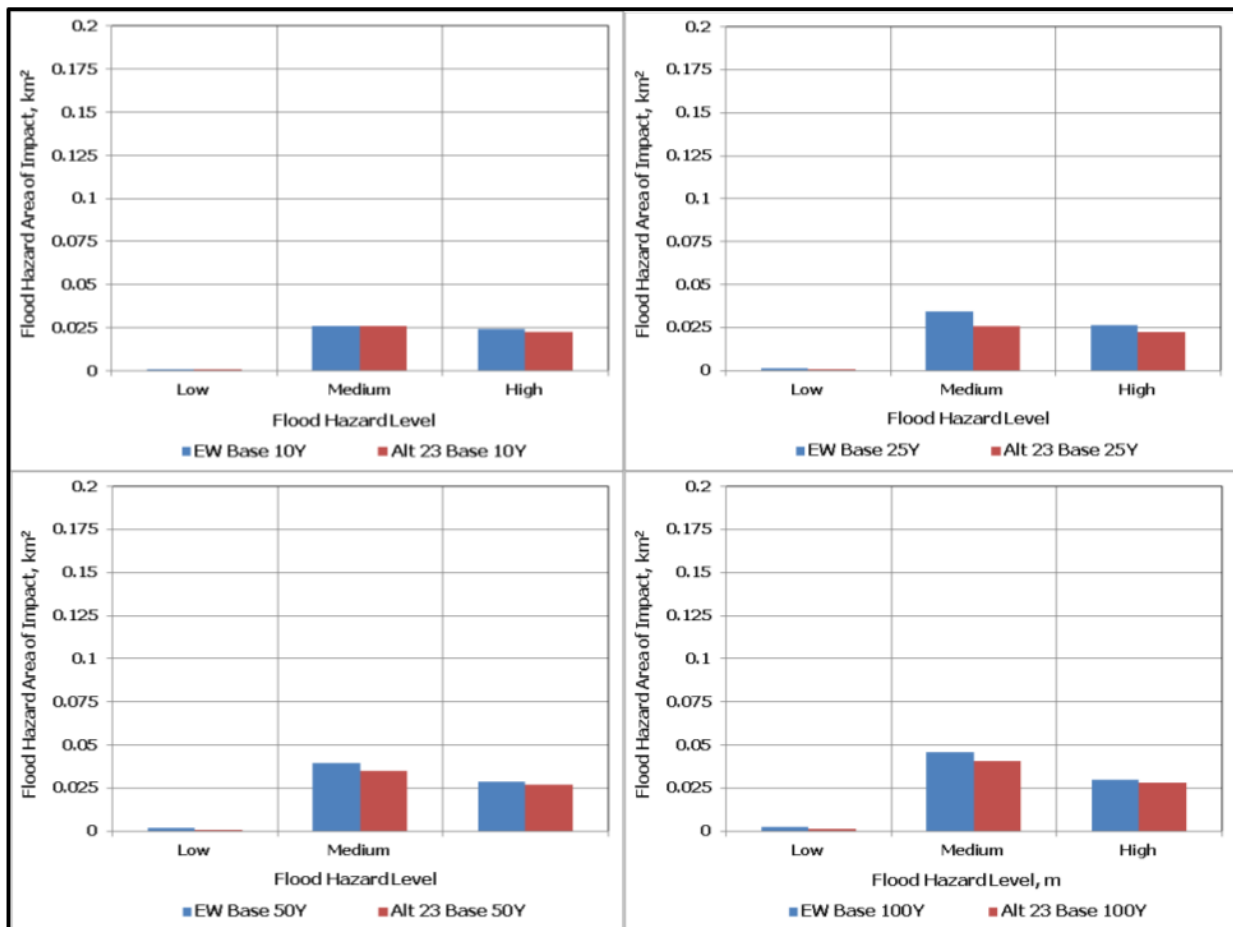


Figure 27: Comparison of coastal flooding hazard areas of impact within the Study Area between the existing floodwall (EW) and with the addition of the Alternative 2 and 3 conceptual design floodwalls for the baseline scenario at 10-, 25-, 50-, and 100- year return periods

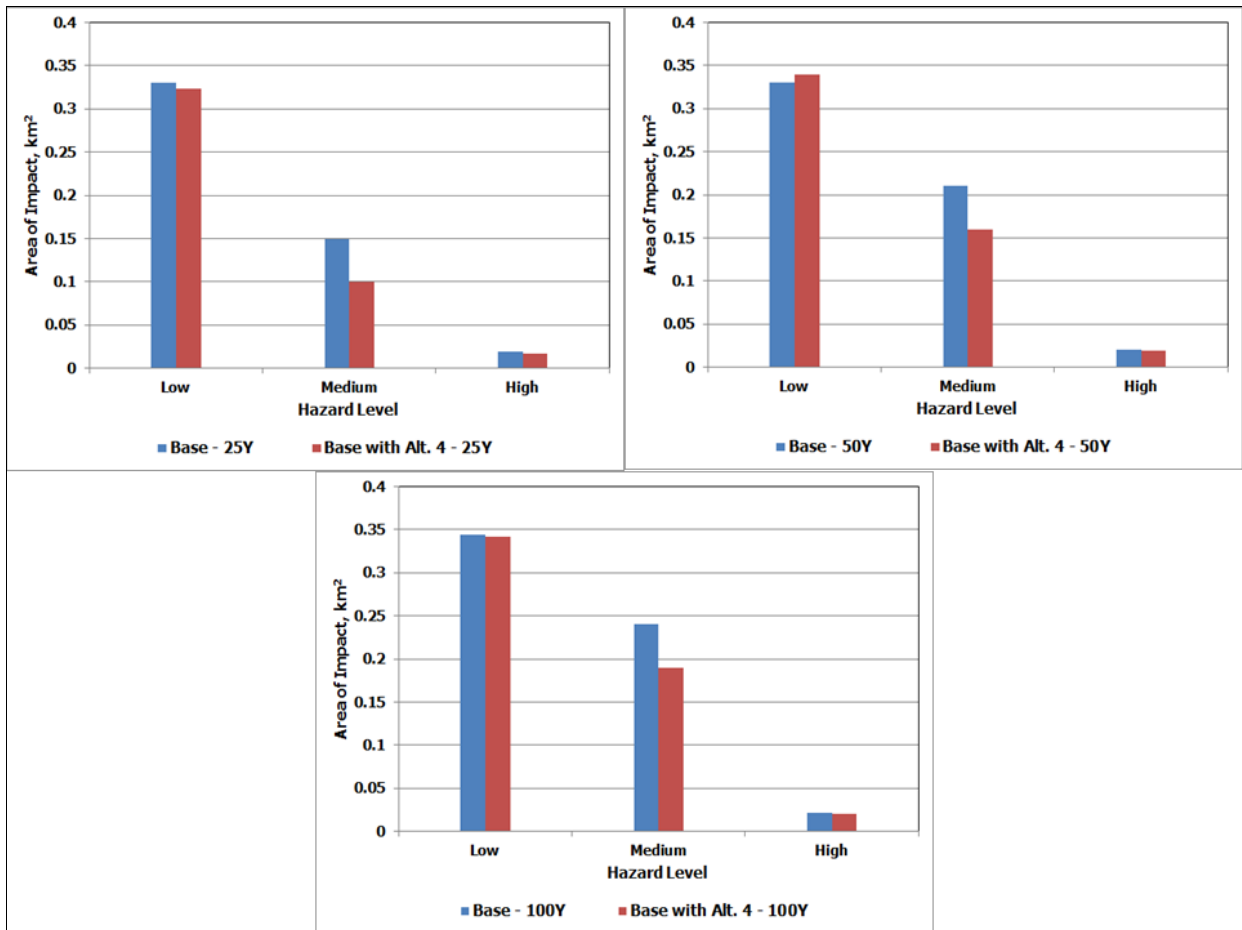


Figure 28: Graphical comparison of flood hazard areas of impact of the Canal and its surroundings between the existing configuration and with the addition of the Alternative 4 option at 25-, 50- and 100-year return periods

ii. Benefit Cost Analysis

61. The alternatives were also further assessed through a detailed benefit cost analysis (BCA). The detail behind the BCA is contained in the full **Benefit Cost Analysis report (dated July 2018) is contained in Annex C**. The BCA assessed which groups of projects provide the highest positive net present value (NPV). Benefits are principally measured as the reduction in total damages from floods with the adaptation measures compared to the damages that would occur without the projects, under the scenario where climate change increases the frequency and severity of floods over time. Costs include both capital and operating costs.
62. Table 8 shows that while all groupings have a positive NPV, Group A has the largest positive value.

Table 8 Net Present Value by Group of Alternatives (\$millions)

Group Name	PV Total Benefits	PV Total Costs	PV Net Benefits
Group A (2,4)	\$33.9	\$8.0	\$25.8
Group B (3,4,7)	\$16.3	\$8.2	\$8.1
Group C (4,5,7)	\$9.9	\$8.9	\$1.0

Confirmation of Proposed Adaptation Measures

63. Based upon the analyses performed, the three alternatives in Group A have been selected for this Proposed Project. They demonstrate confirmed benefits against the flooding and show a strong financial benefit. The three adaptation measures comprise (i) Construction of a new flood protection wall; (ii) Sommelsdijck Canal pump station and sluice gates rehabilitation; and (iii) Enhancement of mangroves. Figure 30 depicts the location of these components within downtown Paramaribo and the following sections describe each component in more detail. Further preliminary design proposals and details are contained in the **Design Details (dated July 2018) contained in Annex D.**



LEGEND

- WATERFRONT STUDY AREA
- KNUFFELSGRACHT PUMPING STATION
- RETAINING WALL
- MANGOVES

LOCATION OF PROJECT COMPONENTS



C:\Anapols\Projects\04.23\04.05 Suriname Climate Change SAGS\Alternatives Map_4.mxd

Figure 30: Location of Project Components

i. Construction of a New Flood Protection Wall

64. The existing shore protection consists of a brick retaining wall, which has collapsed in several areas, mainly because of erosion and wear and tear over time (see Figure 31 below). Although the exact date of construction for the wall is unknown, it was present in historic photographs dating back to the 1940's. As part of this Project, this historic flood wall on the south side of Waterkant Street will be replaced with a modern sheet pile wall extending approximately 250 meters from Knuffelsgracht Street to the SMS Pier along the south side of the waterfront (Waterkant Street, see Figures 32 and 33).



Figure 31: Existing Historic Flood Protection Wall – Note Extensive Disrepair

65. The proposed sheet piles will be coated to protect them against corrosion. The steel sheet pile wall will be reinforced along the river side with locally available riprap/stone and finished with a concrete/brick cap. The rip-rap provides erosion controls and sufficient passive pressure to keep the steel sheet piles stable. The rip-rap will be designed with a slope not steeper than 1 vertical (V): 3 horizontal (H). On the river side of the current wall, the existing shore level is high due to silt sedimentation, so a portion of the shoreline will be excavated to enable the placement of the rip-rap.
66. The existing sidewalk along the new flood protection wall will also be rehabilitated and extended to meet the new wall location (new flood wall will be located approximately 2-3 m from the existing brick retaining wall). Similarly, a new stormwater drainage system will be

installed along the flood wall, under the new sidewalk, connected to the existing stormwater inlets. The drainage will then discharge collected stormwater to the river through two outlets with check valves (non-return) to protect the area from inflow during high water levels in the river.

67. The existing landing for water taxis (small boats), including its roof, will be rehabilitated, and the entrance will be made suitable for use by the water taxis after construction of the new and taller flood protection wall. As part of early engagements with representatives from the water taxis, temporarily relocating the water taxi landing to the “old steel jetty” 100 meters east of their existing location was discussed, and the proposal appears to be satisfactory. Part of the nearby existing parking area for public transportation (see Figure 32) will be used during construction of the flood protection wall and rehabilitated after. As part of early engagements with representatives from the buses, temporarily relocating buses to the parking in the general area along Riverside/Broki and along the main road in close cooperation with the Traffic Police was discussed and appear to be satisfactory. This will also be further discussed as part of future engagements.



Figure 32: Aerial View of the Waterfront (Along Waterkant Street)

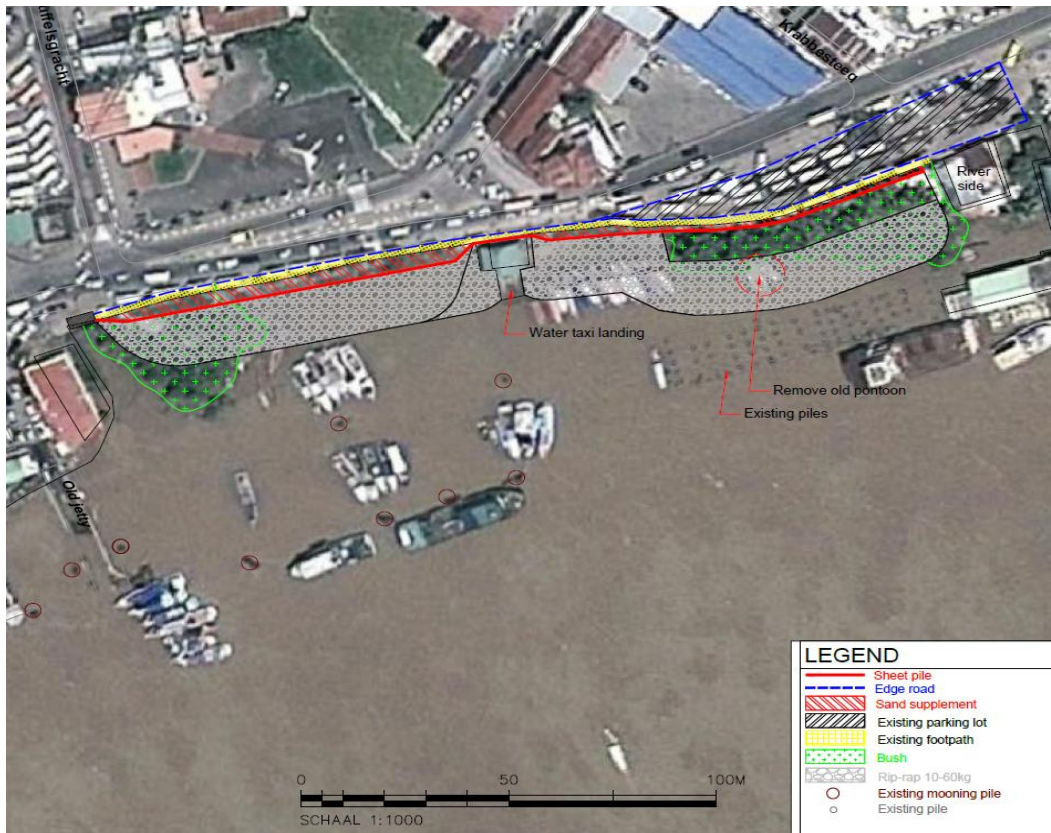


Figure 33: Concept for the New Flood Wall

ii. Sommelsdijck Canal Pump Station and Sluice Gates Rehabilitation

68. The catchment area of the Van Sommelsdijck creek (Canal) is about 700 hectares and consists of mostly urban and semi-urban area. The rainfall run off and overflow of mostly domestic wastewater is collected through the main canal via side branches and conveyed to a basin up-gradient to the sluice and pumping station. The sluice/pumping station discharges water collected in the water basin to the Suriname River periodically by gravity (sluice gates) and/or pumping (pumps). The rehabilitation of the sluice/pumping station Van Sommelsdijck consists of 3 main activities, as shown on Figure 34 and listed below:

- Improvement of the water basin;
- Rehabilitation of sluice gates and pumping station; and
- Improvement of the outflow.



Figure 34: Rehabilitation Components of Sluice/Pumping Station at Van Sommelsdijck Canal

69. Improvement of the water basin: The water basin consists of an area of approximately 1800 m². Currently, the basin bottom is too shallow to store enough water for regular operation due to sedimentation and plant/weed growth (see Figure 35). Improvement activities include excavation of the basin to approximately 1.5-meter depth to increase the volume of storage. The side slope of the basin will be graded to 1V:3H, and the top of the embankment will be restored with grass protection.



Figure 35: Existing Condition of Water Basin

70. Rehabilitation of sluice gates and pumping station: Currently, only one sluice gate and two pumps (out of three pumps) are operational, however the supporting control system is not operational (see Figure 36). The hydraulic system is faulty and the monitoring switches are not in operation. The sluice gate and pumps are operated manually. The proposed rehabilitation of the sluice gates and pumping station mainly includes the following activities:

- Rehabilitation of the valve control system, installation of a new electrical control system, rehabilitation of the electrical and instrumentation systems, and the rehabilitation of the automatic lubrication system.
- Complete overhaul of pump #1. Once pump #1 is rehabilitated, an inspection of pump #2 will be conducted, and depending on the results of this inspection, critical parts of pump #2 will be repaired. Similarly, pump #3 will also be inspected and repaired if needed.
- Rehabilitation of four vertical lift sluice doors and the hydraulics system.



Figure 36: Existing Pump House

71. Improvement of the outflow: The outflow channel is currently filled with sediment from the river (see Figure 37). The outflow channel will be dredged/excavated to ensure sufficient discharge from the gravity sluices.



Figure 37: Existing Condition of Outflow Area

iii. Enhancement of Mangroves

72. Mangrove trees protect the embankments and coastal lines because the roots of the mangrove not only dissipate wave strength, but also the water velocity before reaching land. The net amount of sediment deposition plays an important role in the maturation of mangrove trees. The absence of mangrove trees along the embankment or shoreline can disrupt the balance between sediment deposition and erosion, leading to problems such as sediment erosion. Mangrove areas also create a good habitat for different animal species.
73. An existing mangrove forest is immediately downstream of Sommelsdijck Canal pump station at the confluence of the canal and the Suriname River as shown in Figure 38. In order to create a better environment for mangrove trees to grow, the net sediment deposition has to be much larger than the amount of sediment that is being washed away by the river. The existing mangrove area will be slightly expanded and enhanced to facilitate growth, sediment entrapment, and protection against erosion. The OWTC is currently working with Professor Sieuwnath Naipal of the Anton de Kom Universiteit van Suriname, and other entities to design and construct green solutions along the coasts of Suriname to help with rising sea levels and to protect against erosion. Professor Naipal was consulted on the design and implementation of green solutions and the design proposed below was based on local experience and expert knowledge.



Figure 38: Mangroves North and South of the Canal Confluence

74. The enhancements will include constructing sediment trapping units (STU's). STU's are permeable structures that partly dissipate the energy of the waves, while water with lots of sediments is being "sieved". This way the sediment settles inside the structure. When enough sediment is settled and well consolidated, natural mangrove growth can take place.
75. The proposed STU's consist of wooden piles installed at specific distances along the shoreline. The space between the piles is filled with wood materials (such as bamboo) to trap sediments behind the STUs. A typical detail of an STU is shown on Figure 39.

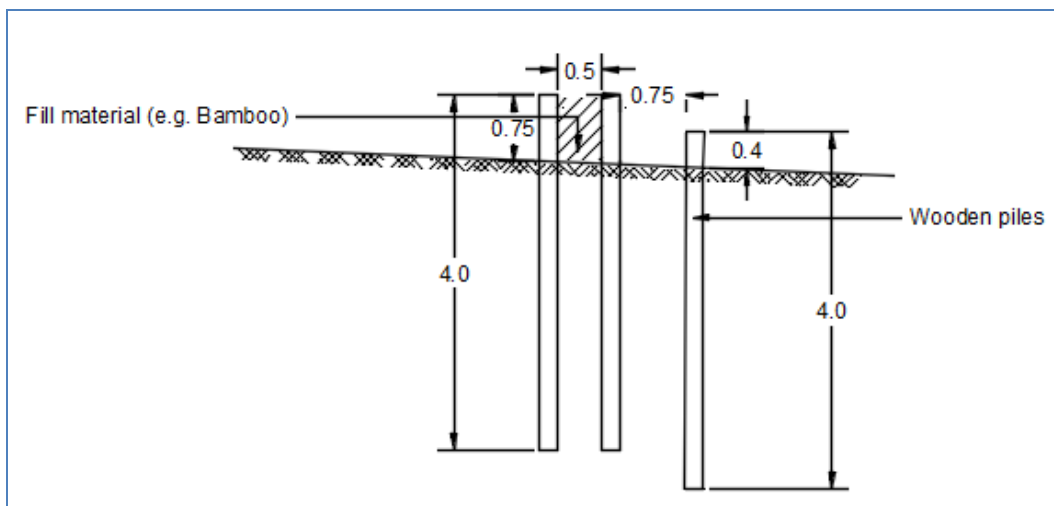


Figure 39: Typical Detail of Sediment Trapping Unit.

76. Based on the size and location, the mangrove enhancement areas are divided into two sub-areas, depicted in Figure 40 below. By implementing STU structures in the project area, the net amount of sediment deposition and mangrove growth is expected to increase significantly. The increased mangrove vegetation prevents erosion of the area. Currently, there is no protection at the outflow section of the pumping station which runs through the mangrove area (See Figure 40). A protection STUs will be installed along the either side of the outflow channels to prevent siltation of the outflow channel. During high flow periods silts and sediments carried by the flow will be deposited behind the STUs installed along the outflow channel.



Figure 40 Mangroves Enhancement Areas

iv. Surface Water Drainage Management Plan

77. In addition to the above three measures, a surface water Drainage Management Plan (DMP) for the urban area of Paramaribo will be developed with the following objectives in mind:

- To facilitate the coordinated management of stormwater and wastewater systems within catchments, and within the urban areas;
- To protect property and infrastructure against flooding by waterways;
- To reduce instances of local flooding by surcharging stormwater under storm event conditions;
- To reduce risks to the general public associated with stormwater and related infrastructure;
- To integrate management initiatives within other Government department management plans; and
- To manage the drainage assets so that they provide a satisfactory level of service for the life of the asset and within their design parameters.

78. The DMP will utilise existing information and studies held by the GoS, the IDB and also other interested stakeholders such as the World Bank. It will be developed to ensure the main surface water catchments are defined and understood, and appropriate management initiatives identified to ensure appropriate functioning and maintenance of the drainage infrastructure. Key considerations to be built into the DMP include:

- Definition and linkage to community outcomes in terms of environmental, social and economic outcomes;
- Define key legislation and relevant policies;
- Overlay of the known and projected growth, demand and sustainability aspirations/objectives of the city;
- Define the key challenges and opportunities for stormwater drainage per catchment, and define focus areas, actions and associated outcomes;
- Define performance expectations for these actions including levels of service, performance measures and cost effectiveness;
- Define relevant long-term infrastructure strategies; significant infrastructure issues (e.g. climate change, aging networks, urban development etc.) and relevant significant planned projects;
- Provide operations, maintenance and renewals expectations; and
- Define cost implications for implementation.

Capacity Building and implementation of the Knowledge Management Plan

79. In order to ensure strengthened awareness and ownership of adaptation and climate risk process by the GoS and other relevant stakeholders, a **Capacity Building Plan (CBP)** will also be developed and implemented. The aim of the CBP will be to build capacity across the GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan for the city of Paramaribo and carry out training to technical and managerial staff on adaptation planning and management as well as the associated environmental and social considerations. In addition, the project will finance a Learning and Knowledge Management Plan, which will capture information, data and lessons learned from project preparation and execution phases and ensure that it is appropriately managed and stored so that it is readily accessible and understandable to the appropriate stakeholders. This plan will be reviewed and evaluated in to ensure an effective data management process that evolves as the data and information sets develop.

80. At least three technical workshops to technical and managerial staff on the implementation of the Adaptation Plan will be undertaken, and special emphasis will be made to ensure a gender balance participation in the workshops.
81. The plan will include an evaluation, in conjunction with the GoS, of existing capacities, knowledge and understanding, and this gaps analysis will be used to define focus areas and needs, which may include:
- Need for focused training and education of relevant GoS officers and other identified stakeholders;
 - As part of the plan implementation, provide supporting resource to work with and shadow GoS officers as part of their capacity building;
 - Ensure that the plan is sequential and logical to ensure early successes;
 - Workshops to work through the plan including basic introduction to adaptation terminology; overview of Paramaribo vulnerabilities; run through of prioritised actions; and the monitoring and evaluation framework.
82. An important part of the CBP will be to ensure that gender equality is a central requirement of the project. and that all relevant GoS stakeholders, in particular the Ministry of Public Works, are suitably trained in gender topics. This will ensure that as the Executing Entity, the Ministry of Public Works will have the necessary capacity to carry out gender responsive activities.
83. All of the engagement activities shall be conducted in Dutch and where necessary other relevant local languages.
84. **Strategy for implementing the Knowledge Management Plan.** As part of its Knowledge Management Strategy (KMS), this project will promote the creation, dissemination and re-use of key knowledge on resilience to climate change and will facilitate a better understanding of its main challenges with the final aim of promoting economic, social and environmental development in Suriname and also in other coastal cities in the region.
85. Specifically, objectives of the KMS include the promotion of: (i) relevant activities conducive to the dissemination of knowledge in the implementation of climate resilience activities in low-lying coastal areas; (ii) up to date knowledge that contribute significantly to the understanding of the extent and magnitude of projected climate change effects on sea level and hydro-meteorological variables; and (iii) the coordination between the various actors of the project in such a way that the

generation and dissemination of knowledge activities are developed and implemented in line with their initiatives and actions both at national and local levels.

86. The Knowledge Management Strategy to be followed for the development of the KMP will add value to the project by:
- Providing with the right information/knowledge on ways to implement effective actions for climate resilience;
 - Collecting and sharing good/best practices and tools;
 - Learning from the project successes/failures to design/innovate and improve related actions and programs in coastal areas of medium-size cities;
 - Facilitating cross-project learning inside the project team, and among countries in the Region;
 - Guiding the production of updated and properly packaged knowledge products to its intended audiences;
 - Connecting the knowledge demand/needs of the audiences with the knowledge offer/production of the project.
87. The steps that will be followed to elaborate the KMP include: (i) the definition of the target audience, (ii) the identification of knowledge and learning needs (Capacity Building Plan), (iii) organize and prioritize needs. Based on these first steps, the following activities will be undertaken: (i) propose knowledge and learning activities, (ii) validate or re-package/deliver products according to audiences, (iii) disseminate, (iv) re-use and evaluate. The development of the Knowledge Management Plan will start from the very first day of project execution (Project Inception Workshop) and will be completed during the first year of project execution. It will be then used and evaluated during the remainder time of project execution.
88. Knowledge on the effectiveness of actions to minimize disaster and climate risks must first be created within or outside the project scope, until it is ready for distribution to stakeholders. The creation process involves the conversion of tacit knowledge into documented explicit knowledge. The explicit knowledge created should be easily understood outside its linguistic, organizational and cultural context. It should facilitate the transfer of this newly categorized knowledge into a form that will be of use to groups beyond the creators of the knowledge. Once created, knowledge should be validated to ensure the highest level of quality. This process will involve project specialists, external experts from local or international universities, centers of excellence or development practitioners (WB, UN, CAF among others).
89. For the project, knowledge is an essential factor in developing innovation capacity, and its capacity to identify risks on a timely basis and to take steps to mitigate them.

Development effectiveness and results-driven programming require that decisions be based on information, evidence, and knowledge on impacts, outputs, and performance. In this context, knowledge needs to be organized and stored, but also renewed and brought up to date continuously, so they do not become obsolete or irrelevant.

90. The objective of the dissemination step is to publicize the existence of new knowledge in order to promote its reuse. The method and format of dissemination depends on the audience and their needs. In some cases, the knowledge generated through studies financed by the project needs to be adapted from its original form.

91. The Re-use step is related to the process by which knowledge is applied in other experiences and / or contexts. It requires a major effort to ensure that this knowledge will be accessible to interested users. It also needs systematic documentation to ensure a demonstration effect. The re-use will ensure the achievement of the project's goal of contributing to the improvement of development results.

92. The KMS knowledge products and tools will be organized in four pillars consisting of actions aimed at improving the acquisition, dissemination, exchange, use and re use of knowledge necessary to help countries build capacity in a relevant, timely manner and of high quality, according to the strategic guidelines and the development needs and challenges of the country of Suriname. These pillars are: (i) technical training, (ii) learning from the experience, (iii) knowledge sharing and (iv) dissemination and outreach.

93. The categorization of principal knowledge and learning methods for the proposed Knowledge Management Strategy to follow during project execution is as follows:

	Technical and professional training	Learning from IDB's experience	Knowledge sharing	Dissemination and communication
Paramaribo and other coastal cities	<ul style="list-style-type: none"> - Conferences, face to face trainings, virtual learning, mobile learning, mobile training as defined in the Capacity Building Plan 	<ul style="list-style-type: none"> - Case studies; - Policy briefs; - Semi-annual reports; 	<ul style="list-style-type: none"> - South-to-south cooperation, including lessons learned from other related project within the country and neighbour 	<ul style="list-style-type: none"> - Blog publication; - Internet- Web-page for the project; - Info Guides;

	(CBP); - Formal peer to peer learning;	- Mid-term and final project reports; - Final project evaluation;	countries; - Studies generated by the project; - Drainage Management Plan - Adaptation Plan and framework; - Community of Practice;	
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The Proposed Project Components

94. Table 9 below describes the proposed project components and details how these will contribute to climate resilience.

Table 9: Summary of the components forming the Proposed Project

Project Component	Description	Contribution to Climate Resilience
		-
City Adaptation Framework and Plan	Develop a city-wide Adaptation Plan including the dissemination of lessons learned that could be used in identifying strategies and programs that can be applied to future resilience programs Establish a framework for managing knowledge and disseminating lessons learned that could be used in future resilience programs for the city of Paramaribo and that could be part of a city-level Adaptation Plan	-The adaptation plan will provide a framework for managing, prioritizing and implementing adaptation and resilience measures along with a standardized approach. -Local vulnerable communities increase their knowledge about: (i) the evolution of floods and sea level rise associated-risks under climate change in Paramaribo and metropolitan areas and (ii) potential adaptation measures to cope with observed and anticipated changes in the local hydrology.
Downtown Adaptation Measures	Implement adaptation measures comprising (i) Construction of a new flood protection wall; (ii) Sommeltdijck Canal pump station and sluice gates rehabilitation; (iii) Enhancement of mangroves; and	These measures will provide: - Flood protection through physical adaptation measures along the west bank of the Suriname River; - Erosion control measures to minimize impacts in the subtidal zone;

Project Component	Description	Contribution to Climate Resilience
	(iv) development of a surface water DMP (as shown in Figure 30).	- Data knowledge and exchange with a greater understanding and data sets regarding hydrological and sediment transport in the Suriname River; and Sympathetic flood control measures through complementary green infrastructure measures.
Capacity Building	Build capacity across the GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan	-Strengthened institutional capacity of GoS on adaptation; -Access to the use of materials and tools that facilitate the management, dissemination and transfer of knowledge on climate change adaptation issues for the city of Paramaribo and its metropolitan area.
Monitoring and Evaluation	Ensure there is a robust plan and implementation structure to allow the Proposed Project to be implemented, monitored and evaluated	-Stepwise methodology/procedure to monitor and evaluate the successful implementation of proposed measures while building local capacity to monitor long term effectiveness of implemented measures to cope with observed and anticipated climate change impacts on floods and sea level rise.

A. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

95. With respect to Benefits, the proposed project will provide several prominent social, economic and environmental benefits as shown in Table 10:

Table 10: Summary of Proposed Benefits

Benefits	Contribution to Climate Resilience
Economic	- Prevention of damage and business interruption from flooding events; - Increase interest and use of the waterfront area; and - Facilitation of rehabilitation of the Downtown Historic Area, which in turn will attract more visitors and residents to the area as well as investment.
Social	- Reduced flooding impacts to homes and personal wellbeing; - Increased income and job opportunities in the waterfront area; - Facilitation of rehabilitation of the Downtown Historic Area which will increase the protection of the country's cultural heritage; - Improve safety of the waterfront area; - Improved public health through maintenance of drainage systems; and - The Downtown area is used by vulnerable populations such lower-income

Benefits	Contribution to Climate Resilience
	traders, and the measures will provide them with greater certainty on continuity of trading activities.
Environmental	<ul style="list-style-type: none"> - Protection of the Suriname River through sediment and erosion control; and - Better knowledge of the dynamics and parameters of the Suriname River.

96. In support of the Proposed Project, and Environmental and Social Impact Assessment (ESIA) has been prepared to align with local regulatory requirements, the IDB's environmental and social policies, and the Adaptation Fund's Environmental and Social Policy. The detail of this assessment is contained in the **ESIA in Annex E**. While the Proposed Project is anticipated to deliver benefits as described above, it is also acknowledged that the Proposed Project could also potentially lead to environmental and social impacts. Potential environmental and social impacts resulting from Project-related activities include:

- Emissions and noise from construction vehicles and equipment;
- Loss or disturbance of vegetation and wildlife;
- Wildlife injury or mortality;
- Habitat alteration (mangroves and aquatic);
- Loss of income for transport businesses and workers;
- Loss of view of the water (i.e., visual impacts);
- Disproportionate impacts on vulnerable groups;
- Decreased pedestrian and traffic safety;
- Increased traffic congestion and disruption;
- Decreased access to critical facilities, shopping, bus stops etc., resulting in the decrease of tourism;
- Loss of cultural heritage site authenticity and site value; and
- Damage to undiscovered archaeological sites.

97. In summary, the ESIA determined that the Proposed Project would likely result in some environmental and social impacts, but these impacts could be readily mitigated and managed, and the Proposed Project should ensure the actions identified in the ESMP are effectively implemented. In addition to implementing measures to minimize or avoid the potential adverse impacts of the Proposed Project, measures to enhance the positive effects of Project activities, as described in the ESMP, could be implemented (e.g., maximizing local construction jobs, increased intergovernmental coordination and institutional strengthening, etc.) to maximize the short- and long-term benefits of the Project. Ultimately, implementation of the Proposed Project would result in positive environmental and social outcomes because the Project components would address the significant flood and climate-change related risks that the historic city of Paramaribo and its residents face and this, in turn, would improve environmental and social conditions in the area. Table 11 summarizes the ESIA.

Table 11: ESIA Summary - Paramaribo Climate Change Adaptation Fund Project

Impact Significant Ratings

Negligible
Minor
Moderate
Major
Positive

Resource/ Receptor and Impact	Project Phase	Pre-Mitigation Impact Significance	Mitigation Measures	Residual Impact Significance
Air Quality				
Emissions from construction vehicles and equipment	Construction	Minor	<ul style="list-style-type: none"> Maintain all construction equipment in accordance with manufacturer's specifications. Suppress dust as needed in unpaved areas. Avoid burning non-vegetative wastes (refuse, etc.) at construction sites. Avoid unnecessary idling of construction equipment or delivery trucks when not in use. 	Negligible
Noise				
Noise generated by construction equipment and activities	Construction	Minor	<ul style="list-style-type: none"> Maintain all construction equipment in accordance with manufacturer's specifications. Schedule construction and rehabilitation work during daylight hours when increased noise levels are more tolerable. Schedule construction and rehabilitation work to minimize activity during peak periods of tourism and recreation (weekends, holidays, etc.). Develop and implement a Construction Communications Plan to inform adjacent receptors (e.g., commercial businesses, churches, and tourists) of construction activities. Use vibratory or press-in piling instead of impact piling during shore- 	Negligible

Resource/ Receptor and Impact	Project Phase	Pre-Mitigation Impact Significance	Mitigation Measures	Residual Impact Significance
			based construction activities to avoid generating impulsive noise and vibrations.	
Waste				
Waste generated by construction equipment and activities	Construction	Minor	<ul style="list-style-type: none"> Provide appropriate waste bins, type, volume and service frequency to accommodate anticipated waste streams. All loads arriving or leaving the site will be appropriately secured. Provide information regarding waste management in site specific inductions, including waste separation and importance of securing vehicle loads. Ensure licensed contractors are used to collect controlled wastes 	Negligible
Biodiversity				
Loss or disturbance of vegetation	Construction	Minor	<ul style="list-style-type: none"> When designing and planning work elements, minimize temporary and permanent construction footprints Demarcate work area with fencing to minimize disturbance or removal of natural vegetation 	Negligible
Wildlife injury or mortality	Construction	Minor	<ul style="list-style-type: none"> Proper disposal of dredged material to avoid wildlife exposure 	Negligible
Disturbance and/or displacement of wildlife	Construction	Moderate	<ul style="list-style-type: none"> Conducting canal- and mangrove-related works outside the waterbird breeding season (April – Sept) Minimize lighting Implement above measures to minimize noise and air pollution 	Negligible
Habitat alteration – mangroves	Construction Operation	Positive	<ul style="list-style-type: none"> Seasonal restriction (work to be done outside of bird breeding season which occurs from April-September) 	Positive
Habitat alteration – aquatic	Construction Operation	Positive	<ul style="list-style-type: none"> Implement sediment control procedures during in-water works to minimize the release of fine 	Positive

Resource/ Receptor and Impact	Project Phase	Pre-Mitigation Impact Significance	Mitigation Measures	Residual Impact Significance
			sediments to downstream waterways, particularly the Suriname River	
Social				
Loss of income for transport businesses.	Construction	Moderate	<ul style="list-style-type: none"> Execute construction activities from the water side to reduce impacts on land-based businesses. Temporarily relocate land and water-based businesses to adjacent locations in the immediate Project Area. Develop and implement a Traffic Management Plan (see Appendix H of the ESIA in Annex E). Develop and implement a Livelihood Restoration Plan (see Appendix D of the ESIA in Annex E) for potentially Affected Persons. Continue stakeholder engagement through Project implementation through the use of the Stakeholder Engagement and Communications Plan (see Appendix A of the ESIA in Annex E). Implement a Grievance Mechanims to receive and respond to grievances (see Appendix A of the ESIA in Annex E). 	Minor
Loss of view of the water (i.e., visual impacts)	Construction	Negligible	<ul style="list-style-type: none"> Develop and implement a Stakeholder Engagement and Communications Plan to keep stakeholders informed of Project-related activities (see Appendix A of the ESIA in Annex E). 	Negligible
Loss of tourism	Construction	Negligible	<ul style="list-style-type: none"> Develop and implement a Stakeholder Engagement and Communications Plan to keep stakeholders informed of Project-related activities (see Appendix A of 	Negligible

Resource/ Receptor and Impact	Project Phase	Pre-Mitigation Impact Significance	Mitigation Measures	Residual Impact Significance
			the ESIA in Annex E).	
Impacts on Vulnerable groups, including women patrons and a disabled patron	Construction	Negligible	<ul style="list-style-type: none"> Implement a Grievance Mechanims to receive and respond to grievances (see Appendix D of the ESIA in Annex E). Install proper lighting in the Project Area for early-morning and late-evening commuting; Ensure safe conditions for mooring, including boardwalk with railings; Ensure adequate ground surfaces for patron mobility (e.g., high heels and crutches); and Conduct Gender Awareness Training for contractors and their staff. 	Negligible
Boost to the local economy through provision of jobs to local companies and workers and locally sourced materials	Construction	Positive	<ul style="list-style-type: none"> Implement job quotas for local employment and sourcing requirements for construction contractors based on the size and scope of the Project 	Positive
Traffic				
Decreased pedestrian and traffic safety	Construction	Minor	<ul style="list-style-type: none"> Implement Traffic Management Plan to include early notification of road closures, detour signage, and safety programs and measures for pedestrians and bicyclists (see Appendix H of the ESIA in Annex E). 	Negligible
Increased traffic congestion and disruption	Construction	Minor	<ul style="list-style-type: none"> Incorporate public transportation alternatives (e.g., pedestrian and bus) into Traffic Management Plan 	Negligible
Decreased access to critical facilities, shopping, bus stops etc.	Construction	Minor	<ul style="list-style-type: none"> Implement Access Management Plan to maintain continuous access through careful staging and sequencing of construction activities and provision of alternatives where needed 	Negligible

Resource/ Receptor and Impact	Project Phase	Pre-Mitigation Impact Significance	Mitigation Measures	Residual Impact Significance
Cultural Resources				
Loss of cultural heritage site authenticity due to construction of Project	Construction Operation	Minor	<ul style="list-style-type: none"> Consult with the relevant cultural heritage stakeholders and develop management plans and measures to avoid or minimize short-term and permanent Project impacts to the Paramaribo WHS. 	Negligible
Loss of cultural heritage site value due to Project components changing the historic landscape of the Paramaribo WHS and diminished site view from historic buildings	Construction Operation	Minor	<ul style="list-style-type: none"> Consult with the relevant cultural heritage stakeholders and develop management plans and measures to avoid or minimize short-term and permanent Project impacts to the Paramaribo WHS. 	Negligible
Damage to undiscovered archaeological sites due to construction of subsurface Project components	Construction	Minor	<ul style="list-style-type: none"> Implement a Project Chance Finds Procedure during all Project ground work (see Appendix F of the ESIA in Annex E). 	Negligible
Health and Safety				
Impacts on health and safety of workers and public	Construction	Minor	<ul style="list-style-type: none"> Develop and implement a Construction Health and Safety Plan (see Appendix E of the ESIA in Annex E). 	Negligible
Disaster Risk				
Flood risk due to current layout of locality and also projections for future changes in climate	Operation	Moderate	<ul style="list-style-type: none"> Implementation of the Project itself. 	Positive

98. Specific to vulnerable communities and vulnerable groups within communities, the ESIA includes a social impact assessment on potential social receptors including the following:
- Loss of income for businesses in the transport industry in the Project Area during construction;
 - Loss of view of the water (i.e., visual impacts);
 - Loss of tourism;
 - Adverse and disproportionate impacts on vulnerable groups;
 - Negative health and safety consequences;
 - Reduced flooding; and
 - Job creation.
99. As described in the ESIA, the significance of potential social impacts was evaluated by determining the magnitude of each change, including considerations of the type (direct, indirect, induced, or cumulative), nature of change, extent and scale (size of the change), and duration (temporary, short term, long term, or permanent) of each potential impact, and the sensitivity of the social receptor. These are summarized below.
100. Loss of Income for Transportation Businesses: The construction of a new flood protection wall, which is expected to last between 4 to 8 months, could directly impact businesses in the transport and hospitality industries in the Project Area. Although Waterkant Street will remain open, land-based transportation businesses limited to the two bus lines—PG and LIJN—and taxicabs would not be able to continue loading/unloading/parking immediately in front of the existing flood protection wall due to safety concerns during construction. Similarly, water-based transportation businesses (i.e., water taxis) would not be able to continue loading/unloading/docking at their current dock due to the same safety concerns. Riverside Bar/Terrace, the only identified restaurant in the hospitality industry in the Project Area, would be able to remain open and operational. Given the concentration of and the short duration of the potential impact, the magnitude has been determined to be small to medium
101. A small portion of the potentially Affected Persons identified in the census/socio-economic survey whose income could be impacted have low annual income levels (e.g., water taxis), an attribute associated with medium to high vulnerability. However, other Affected Persons far exceed the minimum wage in Suriname and have low vulnerability. In order to minimize the impacts to minor to moderate, the mitigations that follow below are recommended. It is important to note that these mitigations measures were developed taking into account the results of the stakeholder engagement activities carried out from November 2017 to May 2018. They were further consulted in three meaningful stakeholder engagements conducted in July 2018 to engage in two-way exchange on specific Project information and the planned mitigation measures.
102. The majority of construction activities will be executed from the water side. Buses that park along Waterkant Street remain in the general area and be temporarily relocated to the Bus Terminal, which is expected to remain open, 200 meters west of their existing location and 100 to 200 meters east and west along Knuffelsgracht Street. Water taxis will remain in the general area and be temporarily relocated to the “old steel jetty” 100 meters east of their existing location, and the old pier’s current condition be improved in order to be of equal or better quality than their existing location. A Traffic Management Plan will be developed and

implemented to help facilitate busing routes and alternative stops in the immediate study area as appropriate. In addition, a Livelihood Restoration Plan (LRP) has been developed and implemented for any stakeholder that is potentially impacted during construction in order to make them whole, although this is not expected after implementing the other mitigation measures.

103. A Stakeholder Engagement and Communication Plan has also been developed and will continue to be implemented, in addition to a Grievance Mechanism. This mechanism is designed to receive, facilitate investigation, and respond to grievances from Project stakeholders and Affected Persons; and it will be managed by designated personnel (e.g., Community and Social Coordinator for the GoS).
104. After construction, both land- and water-based businesses in the transport industry are expected to return to their preconstruction locations as proposed by each respective stakeholder group.
105. Loss of Water View: The new flood protection wall along Waterkant Street may temporarily obstruct residents and tourists' view of the water during construction as a result of equipment, vehicles and construction fencing. This impact is concentrated between Knuffelsgracht Street and SMS Pier along Waterkant Street and there will remain water views outside of this small area. The disruption will be temporary in duration (i.e., 4 to 8 months); therefore, the magnitude has been determined to be negligible. This impact would equally and discriminatorily affect residents and tourists of ranging vulnerabilities.
106. After construction, and based on engineering plans, the new flood protection wall will be comparable to the existing flood protection wall north of the Site; and it will not impede residents or tourists' view. The location of the floodwall extension is also at a lower elevation than its surroundings, hence the reason for continual flooding. This impact is determined to be negligible and no mitigations are necessary.
107. Vulnerable Groups: As part of the census, a total of four individuals self-identified as Maroon or Indigenous, both of which can be labeled as Indigenous People in accordance with the IDB's policy OP-765. These Indigenous People are fully integrated into urban life in Paramaribo as identified in the baseline. The Project does not disproportionately impact them as a result of their identity, exclude them from participation, impede on their rights or claims to territorial or culturally significant lands, or prevent them from fulfilling traditional ways of life. As such, it is expected they will enjoy equal access to the Project's overall benefits, and that the Project's mitigation measures and ESMP will extend to them without discrimination.
108. Similarly, only two women were identified in the census and occupy roles in the transport industry similar to men. However, with relation to transport patrons, at a ratio of approximately 3:2, more women than men take water taxis and buses in the Project Area. It is important to highlight that women will not be disproportionately adversely impacted. Finally, only one patron in the Project Area was identified as having a physical disability at the time of baseline studies, but he had physical mobility and could load/offload the water taxis without assistance. Despite not expecting disproportionate impacts for these groups, the Project will include the following measures to ensure that any potential risks are fully mitigated:

- Proper lighting in the Project Area for early-morning and late-evening commuting;
 - Adequate ground surfaces to ensure patrons have ease of mobility (e.g., high heels or crutches); and
 - Gender Awareness Training for contractors and their staff.
109. No additional mitigations are necessary. Vulnerable groups will have equal access to the Project and associated safeguards (e.g., entitlements as part of the LRP, grievance mechanism as defined in the Stakeholder Engagement and Communications Plan).
110. Reduced Flooding: Presently, flooding is a severe problem during rainfall and high tide in the Project Area, especially near and around Knuffelsgracht Street. The Project, as a result of the three selected components will reduce flooding, thereby improving hygiene, safety, and accessibility. This is consequently a positive impact.
111. Job Creation: Construction activities for all three components will likely provide jobs to local construction companies and workers, and the Project would likely source some materials from the local economy. This would have a positive impact on the Suriname economy.
112. The positive impact will be enhanced in the following ways:
- Adopt preferential contracting for local companies with capacity.
 - Require international contractors to partner with local engineering firms.
 - Require contractors to source locally where possible.
113. It is estimated that the construction of the project will utilize approximately 12 local laborers on average day and approximately 20 local laborers on peak periods.

B. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

114. As summarised in paragraphs 55 and 56, and in Figure 29, a detailed benefit cost analysis (BCA) has been undertaken. The detail behind the BCA is contained in the full **Benefit Cost Analysis report (dated July 2018) is contained in Annex C**. The BCA demonstrated that the selected projects had the largest positive value against the options considered and yielded good cost-effectiveness.

C. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

115. This project is fully aligned with Suriname's Multi-Annual Development Plan (Nationaal Ontwikkelingsplan) of 2017-2021, more specifically its fourth pillar "Utilization and Protection of the Environment", which calls for action to address the negative impacts of climate

change and prioritizes sustainable maintenance, repair and the protection of Suriname's vulnerable coastal zone and river banks from sea level rise through the effective implementation of adaptation measures, as highlighted in Suriname's Second National Communication to the United Nations Framework Convention on Climate Change the Climate Action Plan for the Coastal Zone of Suriname and the Integrated Coastal Zone Management Plan (ICZM). Proposed actions are also in line with priorities set forth in the National Climate Change Policy, Strategy and Action Plan and Suriname's Intended National Determined Contribution (INDC) to the UNFCCC process (2015).

116. As previously emphasized, downtown adaptation measures will directly reduce flooding in Paramaribo's historical center (due to rising sea level). In addition, the project will enhance the GoS' capacity to properly identify and prepare climate change adaptation projects compatible with the Multi-Annual Development Plan.

D. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

117. The Proposed Project will fully comply with the following applicable standards:
- Relevant Suriname legislation and policies as described and presented in the ESIA in Annex E;
 - The IDB's social and environmental policies; and
 - The Adaptation Fund's Environmental and Social Policy Statement.
118. Specific to the Adaptation Fund's Policy, Table 12 provides a summary of alignment.

Table 12: Project Compliance with Applicable Adaptation Fund Policies and Safeguards

Principle	Requirements for Funding	Applicability to the Paramaribo Project
1 - Compliance with the Law	Projects shall be in compliance with all applicable domestic and international law.	This Project would be conducted in compliance with all applicable local Surinamese regulations, international agreements, and IDB safeguards and policies as discussed previously in this Section.
2 - Access and Equity	Projects shall provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights.	This Project is an infrastructure project designed to protect and enhance downtown Paramaribo by reducing flood risk and vulnerability to climate change. Its benefits are distributed across all users of the area equally and once construction activities are finalized, it would not negatively impact any of the stakeholders in the Area of Influence (see Section 5 of the ESIA).

Principle	Requirements for Funding	Applicability to the Paramaribo Project
3 - Marginalized and Vulnerable Groups	Projects shall avoid imposing any disproportionate adverse impacts on marginalized and vulnerable groups.	This ESIA analyzes Project-related impacts in relations to Indigenous People and women; however, neither group is expected to be disproportionately impacted in any way due to the magnitude of impacts. Preventative measures have been proposed to address any issues (e.g., Grievance Mechanism) as part of the Project's ESMP (see Section 6 of the ESIA).
4 - Human Rights	Projects shall respect and where applicable promote international human rights.	This Project is an infrastructure project designed to protect and enhance downtown Paramaribo by reducing flood risk and vulnerability to climate change. Human rights issues are not anticipated as a result of this Project.
5 - Gender Equality and Women's Empowerment	Projects shall be designed and implemented in such a way that both women and men 1) have equal opportunities to participate as per the Fund gender policy; 2) receive comparable social and economic benefits; and 3) do not suffer disproportionate adverse effects during the development process.	This ESIA analyzes Project-related impacts in relations to Indigenous People and women; however, neither group is expected to be disproportionately impacted in any way due to the magnitude of impacts. Preventative measures have been proposed to address any issues (e.g., Grievance Mechanism) as part of the Project's ESMP (see Section 6 of the ESIA).
6 - Core Labor Rights	Projects shall meet the core labor standards as identified by the International Labor Organization.	ILO's Core Conventions deal with freedom of association and right of collective bargaining (No. 87 and 98), forced labor (No. 29 and 105), child labor (No. 138 and 182), and equal remuneration (No. 100 and 111). Suriname has ratified all of these Conventions and has domestic laws to uphold such labor principles. The Project will incorporate contractual language to ensure Contractors meet this requirements and this will be monitored.

Principle	Requirements for Funding	Applicability to the Paramaribo Project
7 - Indigenous Peoples	Projects shall be consistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples.	This ESIA analyzes Project-related impacts in relations to Indigenous People and women; however, neither group is expected to be disproportionately impacted in any way due to the magnitude of impacts. Preventative measures have been proposed to address any issues (e.g., Grievance Mechanism) as part of the Project's ESMP (see Section 6 of the ESIA).
8 - Involuntary Resettlement	Projects shall be designed and implemented in a way that avoids or minimizes the need for involuntary resettlement.	No involuntary physical resettlement would occur as a result of the implementation of this Project. The Project could result in economic displacement of those in the transport and hospitality industries in the immediate Project Area; however, this risk has been mitigated by the Project's ESMP and related Livelihood Restoration Plan contained in the ESIA.
9 - Protection of Natural Habitats	The Fund shall not support projects that would involve unjustified conversion or degradation of critical natural habitats.	There are no critical natural habitats in the Area of Influence of the Project. Biological resources impacts and mitigation measures are discussed in Sections 5 and 6 of the ESIA.
10 - Conservation of Biological Diversity	Projects shall be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.	No significant adverse impact to biodiversity would occur as a result of implementation of this Project, as discussed in Sections 5 and 6 of the ESIA.
11 - Climate Change	Projects shall not result in any significant or unjustified increase in greenhouse gas emissions (GHGs) or other drivers of climate change.	Project activities are only expected to result in insignificant increases to GHGs during the construction phase. Relevant mitigation measures are discussed in Sections 5 and 6 of the ESIA.

Principle	Requirements for Funding	Applicability to the Paramaribo Project
12 - Pollution Prevention and Resource Efficiency	Projects shall be designed and implemented in a way that meets applicable international standards for maximizing energy efficiency and minimizing material resource use, the production of wastes, and the release of pollutants.	The Project's ESMP and related plans provide mechanisms to ensure Project conformance with this policy. (see Section 6 of the ESIA).
13 - Public Health	Projects shall be designed and implemented in a way that avoids potentially significant negative impacts on public health.	As with Policy 2 above, this Project is an infrastructure project designed to protect and enhance downtown Paramaribo and once construction activities are finalized, would not negatively impact any of the stakeholders in the Area of nfluence (see Sections 5 and 6 of the ESIA).
14 - Physical and Cultural Heritage	Projects shall be designed and implemented in a way that avoids the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level.	Because downtown Paramaribo is a WHS, Cultural Heritage is thoroughly discussed in Sections 4 and 5 of the ESIA. Mitigation measures relative to cultural resources are presented in Section 6 of the ESIA.
15 - Lands and Soil Conservation	Projects shall be designed and implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.	This Project will take place in the highly developed landscape of downtown Suriname. Soil conservation and land conservation are not applicable to this Project.

E. Describe if there is duplication of project / programme with other funding sources, if any.

119. There is no duplication of projects with other funding sources. There is one complementary project; IDB's Paramaribo Urban Rehabilitation Program (SU-L1046) which has been approved January 25, 2017. The Urban Rehabilitation Program aims to revitalize the city center and proposes the renovation of public spaces, restoration and rehabilitation of heritage buildings, creation of new housing projects

to promote mixed-use, and the development of new business strategies with private sector participation. Parts of these interventions are located along the waterfront as is the Proposed Project. The urban interventions in this Proposed Project will protect the city center, its users and residents from flooding and the effects of climate change while the Urban Rehabilitation Program focuses on spatial interventions and the reuse of heritage buildings. Close collaboration between IDB's teams responsible for the Proposed Project and the Urban Rehabilitation Program will prevent overlapping of the projects. Additionally, there are 3 IDB members participating in both teams to assure that the projects are complementary.

120. In addition, the World Bank is currently preparing the Saramacca Canal System Rehabilitation Project (SCSRP), aimed at reducing flood risk for the people living in the Greater Paramaribo area and improve the operation of the Saramacca Canal System for flood risk management and navigation. The Saramacca canal is located in an adjacent watershed to the proposed project to the Adaptation Fund. The expected results of the SCSRP are: (a) Improved capacity of the Saramacca Canal to discharge water efficiently into the Suriname and Saramacca Rivers; and (b) Establishment of a functioning monitoring, forecasting, and operational management system for the overall Saramacca drainage system. This makes it complementary to this proposed project by reducing the flood risk of Paramaribo.

F. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

121. A Knowledge Management Plan will be developed to capture information, data and lessons learned. This Plan will ensure that this information is:
- Appropriately managed and stored so that it is readily accessible and understandable;
 - Appropriately shared among stakeholders; and
 - Reviewed and evaluated to ensure the data management process is working effectively and also evolving as the data and information sets develop.
122. In addition, training to technical and managerial staff on adaptation planning and management will be delivered via technical workshops. Special emphasis will be made to ensure a gender balance participation in the workshops. Training plans and materials for key stakeholders in Paramaribo in adaptation planning and management will also be delivered.

G. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

123. The GoS and the IDB have undertaken a series of consultation exercises to assess the potential impacts, gain views and insights from stakeholders and also to get technical inputs on the likely adaptation measures. These consultation events have included:

- Workshops with Government and non-Government stakeholders on hazards and risks and the potential impacts of climate change;
- A livelihoods survey of all businesses and traders in the waterfront area;
- Focused engagements and meetings with potentially affected parties through end of 2017 to June 2018; and
- Public consultation exercises.

Appendix A of the ESIA contained in Annex E contains the project's Stakeholder Engagement and Communications Plan. This plan details the consultation activities that have been undertaken over the last 2 years. Further consultations will be carried out during preparation stages associated with this project to guarantee that selected adaptation measures are approved by the benefited communities.

H. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

124. As previously highlighted, Paramaribo is susceptible to natural disasters exacerbated by climate change. One of main areas that get affected by these events is its city center including the historic inner city. The historic center was designated by the UNESCO as a World Heritage Site in 2002 and accommodates currently mainly governmental offices and institutes, banks, educational facilities and tourist attractions. However, the area has been undergoing physical, social, and economic deterioration, which has been a growing source of concern for the GoS, given that this area concentrates historical and cultural heritage buildings, monuments, and urban sites. In addition to the deterioration of the WHS, the area gets frequently flooded which also contributes to the decay of historic buildings, public spaces and exacerbates the accessibility from and to the city center. People residing, working in or traveling through this area experience mayor difficulties. On the latter, it's important to underline that the city center of Paramaribo is the city's mayor public transport hub.

125. As a result, the GoS asked for IDB's support to address some of these challenges and is currently executing a US\$20 million grant –approved in early 2017-- to contribute to the revitalization of the area by means of (i) renewal of urban spaces and restoration of key heritage buildings; (ii) improvement in urban mobility; (iii) promotion of economic and residential activities; and (iv) strengthening the institutional framework for managing the area's sustainable development.

126. Therefore, funding for the adaptation measures included in this proposal is critical, as it would help deliver complementary interventions to those set forth in the IDB's Urban

Rehabilitation Program for Paramaribo. In absence of funding from the Adaptation Fund, the GoS, which is currently under macro-fiscal stress, would need to resort to other sources of funding to invest in climate change adaptation in the downtown area.

I. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

127. Sustainability of the Proposed Project has been a core element of the development of the project. The ESIA has assessed both the risks and benefits of the Proposed Project, and the fact the project itself focuses on climate adaptation, it naturally builds resilience when implemented. The main identified actions that need to be enforced during project preparation and execution to guarantee sustainability of project outcomes are:

- *Build capacity across the GoS stakeholders:* The Proposed Project will allow the GoS stakeholders responsible for decision making in Paramaribo to develop capacity to design, implement and monitor climate change adaptation measures. This build capacity will also allow the ownership of the project by GoS and local communities. Long term sustainability of project outcomes is guaranteed as long as these are aligned with current and planned strategies to urban development plans prepared for Paramaribo metropolitan area.
- *Prevent floods:* The Proposed Project will minimize and, in some cases eliminate flooding risk areas within the waterfront representing reductions in economic losses and create resilience against natural hazards and climate change. Also, the proposed project will improve the existing physical conditions of the west bank of the Suriname River and the Sommeldijkse drainage canal. The proposed project includes the incorporation of green infrastructure that will make the hard measures being more sympathetic and preserve its sustainable balance.
- *Contribute to different sectors in Paramaribo.* The Proposed Project will develop a more detailed picture of the vulnerabilities to floods of the different socio-economic sectors in Paramaribo urban area, particularly within the waterfront area. It also contributes to the national climate change policy and raise awareness of the issue of climate change among policy makers and the general public.
- *Maintenance of infrastructure (drainage and protection):* The central GoS has a maintenance program that provides resources to the Ministries. The Ministry of Public Works is responsible for the maintenance of the waterways, the dikes and river protection structures. A part of the team of the Ministry of Public Works in charge of maintenance will be trained and the Ministry will be equipped with the required machinery if special maintenance is needed.
- *The involvement of the local communities:* The GoS is responsible for informing and consulting the inhabitants that could be affected by large (infrastructural) constructions. Workshops, information sessions and consultation meetings are commonly used to gain ownership by the community. These events will be organized by the GoS during the preparation, design and implementation phase of the Proposed Project.

J. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

128. The environmental and social impacts and risks of the project have been presented in the previous sections. The following Table 13 presents the environmental and social impacts and risks of the project.

Table 13: Project Environmental and Social Impacts and Risks

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>	Will be compliant	n/a
<i>Access and Equity</i>	Will be fair and equitable and respectful of marginalized/vulnerable groups, human rights and gender	The potential impacts are deemed to be at worst minor and at best positive. The Project's ESMP, including a Stakeholder and Engagement and Consultation Plan and a LRP will ensure any potentially affected party has due recourse
<i>Marginalized and Vulnerable Groups</i>		
<i>Human Rights</i>		
<i>Gender Equity and Women's Empowerment</i>		
<i>Core Labour Rights</i>	Will be compliant	n/a
<i>Indigenous Peoples</i>	No significant impacts on Indigenous Peoples	The potential impacts on indigenous peoples is deemed negligible. The Project's ESMP, including a Stakeholder and Engagement and Consultation Plan and an LRP will ensure any potentially affected party has due recourse
<i>Involuntary Resettlement</i>	No physical resettlement will occur; however some temporary relocation of businesses will happen	The Livelihoods Restoration Plan drafted by the IDB includes a mechanism for ensuring that for the unavoidable temporary relocation of some businesses and potential associated economic displacement, due process is observed so that affected persons shall be informed of their rights, consulted on their options, and offered technically, economically, and socially feasible temporary resettlement alternatives or fair and adequate compensation

<i>Protection of Natural Habitats</i>	The Proposed Project will not involve unjustified conversion or degradation of critical natural habitats, and through the adoption of green solutions as part of the flood protection measures, it is the intent to enhance the biodiversity benefit of the Proposed Project	Biodiversity impacts have been assessed as negligible, and through the proposed mangrove restoration, positive benefits will accrue.
<i>Conservation of Biological Diversity</i>	No further assessments required	Biodiversity impacts have been assessed as negligible, and through the proposed mangrove restoration, positive benefits will accrue.
<i>Water resources</i>	Design and implement Environmental and Management Plans (ESMPs)	The Proposed Project will develop a Soil Erosion and Sediment Control Plan, including erosion controls such as minimizing the extent of disturbed areas and stabilizing/revegetating disturbed areas as soon as possible, and sediment controls such as hay bales, silt fences. Develop a Waste Management Plan that identifies acceptable methods for handling and disposing of solid and hazardous wastes, including any contaminated soils. Provide designated areas for fuelling and maintenance that have containment and spill control capabilities
<i>Climate Change</i>	No significant GHG emissions are expected	n/a
<i>Pollution Prevention and Resource Efficiency</i>	The project will have a net benefit through the drainage improvement measures. No impacts are expected	n/a
<i>Public Health</i>	The project will have a net benefit through the drainage improvement measures. No impacts are expected	n/a
<i>Physical and Cultural Heritage</i>	The project will have a net benefit on cultural heritage. No impacts are expected	Implementation of the Project's Cultural Heritage Management Plan

<i>Lands and Soil Conservation</i>	Design and implement Environmental and Management Plans (ESMPs)	Develop a Soil Erosion and Sediment Control Plan, including erosion controls such as minimizing the extent of disturbed areas and stabilizing/revegetating disturbed areas as soon as possible, and sediment controls such as hay bales, silt fences. Develop a Waste Management Plan that identifies acceptable methods for handling and disposing of solid and hazardous wastes, including any contaminated soils. Provide designated areas for fuelling and maintenance that have containment and spill control capabilities
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PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

Summary of Implementation Arrangements

129. Project Execution. The beneficiary will be the Republic of Suriname. The Ministry of Public Works, Transport and Communication (MPW) through the Department of Civil Water Works (DCWW) will be responsible for the execution. The specific implementation arrangements will be as follows:

130. A Program Implementation Unit (PIU) will be established within the existing institutional structure of the DCWW. To this end, the DCWW will be strengthened through the hiring of qualified and specialized personnel dedicated to the program, including, inter alia, a program coordinator and specialists in procurement, financial management, social, and environmental, which will be financed with resources from the grant. Considering that the entire program will be executed through a reduced number of contracts to be carried out during the first two years of execution, all specialists will be hired on a part-time basis, except the program coordinator who will be on a full-time contract.

131. The PIU will be responsible for carrying out all the operational and fiduciary obligations (including procurement, financial management and social and environmental safeguards) necessary for program execution and for maintaining all formal communication with the Bank. Among other responsibilities, the PIU will be: (i) performing technical and operational coordination of the program; (ii) programming, approving and financing all projects and activities; (iii) supervising the formulation, execution, and evaluation all interventions; (iv) preparing and updating the Pluri-annual Execution Plan (PEP), Annual Operational Plan (AOP), Procurement Plan (PA), Risk Matrix (RM), and the Progress Monitoring Report (PMR); (v) submitting disbursement requests and preparing financial statements; and (vi) contracting and supervising the program's mid-term and final evaluation. The detailed responsibilities of the PIU

will be presented in the POM, which will define the rules, eligibility criteria, procedures and responsibilities during execution.

132. The establishment of the Project Implementation Unit (PIU), including the selection or appointment of the specialized personnel, namely, project coordinator, financial management officer, procurement specialist, social specialist and environmental specialist; and the approval and entry into effective of the Program Operations Manual (POM), in the terms previously agreed with the Bank, is a special contractual clause prior to the first disbursement.

133. The undertaking of activities of Component I and III (related to development of the Adaptation Management Plan and Capacity Building, respectively) will be carried out with the support of the National Environmental Unit (NEU). To that end, at least one member of its technical personnel will be assigned to provide the necessary technical support to the PIU in matters concerning the effective implementation of such Components. In its capacity as the advisory body to the government to formulate and enforce a National Environmental Policy, the NEU will be also responsible for convening other government institutions and ministries in matters related to the plan development and capacity building activities. The signing of a collaboration agreement between the Ministry of Public Works, Transport and Communication and the National Environmental Unit, establishing their responsibilities during project execution is a special contractual clause prior to the disbursement of Component I and III.

134. Given the nature of the construction works to be executed in Component II (including the new flood wall located immediately east of the Knuffelsgracht Street and Waterfront), external supervision will be contracted. The fulfilment of conditions related to social and environmental matters, which will be detailed in the ESMR; and the evidence of non-objection on the part of UNESCO, or one of its designated advisory bodies, to the corresponding project's final designs, is a special contractual clause prior to the bidding of works in Component II.

135. Procurement and contracting. It will follow the Policies for the procurement of works and goods financed by the Bank (GN-2349-9), and the Policies for selection and contracting of consultants financed by the Bank (GN-2350-9), as well as the fiduciary arrangements included in Annex III.

136. Disbursement and financial management. The disbursement period is four years. The Bank will make disbursements in accordance with program liquidity needs as evidenced by its current and anticipated commitments and obligations following the advance of funds methodology. These advances, which will cover liquidity needs for a period not exceeding six months, will be calculated based on the semi-annual cash flow projections for the period. Subsequent advances may be disbursed once 80% of the total accumulated balance pending justification has been submitted and accepted by the Bank.

The external audit of the program will be performed by an independent audit firm acceptable to the Bank. Audits will be performed in accordance with the Bank's guidelines for financial reporting and external audit. The PIU will be responsible for contracting of an eligible auditing firm to perform the program audit as follows: (i) annual financial audit reports to be submitted within 120 days of the end of each fiscal year; and (ii) one final financial audit report to be submitted within 120 days after the date of last disbursement.

B. Summary of Arrangements for Monitoring Results

The program's monitoring is based on the standard Bank instruments: (i) the PEP and AOP; (ii) the PA; (iii) the Results Matrix and Monitoring Plan (MP); and (iv) the PMR. Semi-annual progress reports will be presented within thirty (30) days after the end of the corresponding semester and should include the outcomes and outputs achieved in the corresponding execution period according to the Annual Operation Plan (AOP), the Procurement Plan, the Results Matrix, a description of the status of compliance of the environmental and social obligations, all according to the terms and conditions of the ESMM and this Contract. The PIU will maintain an administrative information system to register all relevant events in program implementation. This system will furnish all the required information for completing the financial and administrative reports and will be a key instrument for program monitoring.

Evaluation. Two evaluations will be performed: a midterm and a final evaluation. The midterm report will include: (i) the outcomes of the physical-financial execution; (ii) the degree of fulfillment of targets in the Results Matrix; (iii) the degree of fulfillment of environmental requirements; (iv) a summary of the results of the audits and of the improvement plans; and (v) a summary of the main lessons learned.

The final evaluation will adopt a reflexive approach, comparing the status of indicators in the Results Matrix before and after the program's interventions. In addition, an ex post economic analysis will be conducted to verify whether the program actually achieved the economic rates of return estimated ex ante (See Monitoring and Evaluation Arrangements).

B. Describe the measures for financial and project / programme risk management.

137. Following table presents project's identified risks and proposed mitigation activities for those classified as medium.

Table 14: Project Environmental and Social Risks and Mitigation Activities

Expanded Risk Assessment for the project ⁴						
Type of Risk *	Risk	Probability Classification	Impact Classification	Risk Classification (High, Medium or Low)	Means of Mitigation ⁵	Compliance Indicator
Environmental and Social Sustainability	Civil works may be delayed, so it increases concerns raised by residents, business owners and public transport users during the construction phase.	2	2	Medium	The project will finance Livelihood Rehabilitation, Disaster Risk Management and Stakeholder Engagement and Consultation Plans, designed to improve both communication with stakeholders and reduction of risks in the historical center area. Additionally, mitigation measures have been included in the Environmental and Social Management Plan to reduce expected impacts to public transport users during construction phase	1. (i) Livelihood Rehabilitation Plan prepared; (ii) Disaster Risk Management Plan prepared; (iii) Stakeholder Engagement and Consultation Plan prepared; (iv) Communication seminars executed; (v) Mitigation measures included at the ESMP to reduce expected impacts to users executed. 2. (vi) Hiring a Social Specialist is part of the conditions for first disbursement, (vii) Compliance of the estimated timing for the construction works (from 6 to 12 months).
Environmental and Social Sustainability	Infrastructure investments could be affected by long-term flooding given that the area of intervention is a low-lying territory, vulnerable to climate-	1	3	Medium	The interventions of this project form part of a series of interventions that the Government of Suriname is executing with different sources of financing, i.a. own resources and World	(i) City-level Adaptation Plan developed; and (ii) World Bank project approved.

⁴ Summary from the expanded risk assessment in accordance with the GRP procedures guide

⁵ The principal means of mitigation defined with the Client will be included.

Expanded Risk Assessment for the project ⁴						
Type of Risk *	Risk	Probability Classification	Impact Classification	Risk Classification (High, Medium or Low)	Means of Mitigation ⁵	Compliance Indicator
	related risks. The project may not be able to fully address flooding in the area.				Bank. These investments will be part of the City-level Adaptation Plan that will be financed with this project.	
Management and Governance	The poor administrative organization system of the Ministry of Public Works, Transport and Communication may influence the internal governance controls in relation to the independency of specific functions and corresponding separation and delegation of authority and responsibilities.	2	2	Medium	A Project Implementation Unit will be created to implement the project and is a condition prior to first disbursement. A Project Operations Manual will be adopted where the organizational structure, responsibilities and authorities will be presented emphasizing on the chain of command, span of control and lines of communication.	(i) Project Implementation Unit created; and (ii) Project Operations Manual approved.
Fiduciary	The Ministry of Public Works, Transport and Communication current staffing levels and capacity may be insufficient to efficiently manage the infrastructure works and provide proper oversight on	2	2	Medium	A Project Implementation Unit will be created that consists of i.a. a Financial Management Specialist. A Project Operations Manual will be developed with clear financial management procedures considering the project's fiscal space, separation of	(i) Project Implementation Unit created; and (ii) Project Operations Manual approved.

Expanded Risk Assessment for the project ⁴						
Type of Risk *	Risk	Probability Classification	Impact Classification	Risk Classification (High, Medium or Low)	Means of Mitigation ⁵	Compliance Indicator
	fiduciary responsibilities.				duties, cash management, bank reconciliation, accounts payable, threshold signing rights, authorized signatures on bank accounts etc. Also, an accounting software complying with the Bank's policies will be procured. Additionally, staff of the execution unit will be trained in the Bank's financial management procedures and policies and reporting requirements.	
Monitoring and Accountability	The existing internal control system related to monitoring and evaluation and communication and social engagement of the Ministry of Public Works, Transport and Communication may be not sufficient for a critical success of the execution and management of the project	2	2	Medium	The project will incorporate a monitoring and evaluation plan that will be developed and managed by the Project Coordinator. Also, a strategic and pragmatic stakeholder communication and engagement strategy will be developed and deployed by the Social Specialist.	(i) Project Implementation Unit created that consists of i.a. a Project Coordinator and a Social Specialist; (ii) Monitoring and Evaluation Plan approve; (iii) ESMR and Livelihood Rehabilitation Plan approved.

* Development; Public Management and Governance; Macroeconomic and Fiscal Sustainability; Environmental and Social Sustainability (According to IDB Policies OP-703; OP-704; OP-710; OP-765; and GN-2531-10); Reputation; Monitoring and Accountability; Fiduciary.

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

138. The ESIA in Annex E contains a detailed assessment of the potential environmental and social risks, and Table 15 (which is taken from the ESIA) summarizes the approach that the Project proponent and other involved parties (e.g., local contractors) would follow to manage, mitigate, and monitor the potential impacts of the Project. It includes the Project commitments and mitigation measures as identified in the ESIA, and also references a series of relevant management plans that have been prepared and are contained in the appendices.

Table 15: ESMP Measures and Related Management Plan and Monitoring Recommendations

Resource/Receptor and Impact	Project Phase	Mitigation Measures	Execution Responsibility	Means of Verification	Monitoring and Reporting
<i>Air Quality</i>					
Emissions from construction vehicles and equipment	Construction	See Appendix C for a Construction Environmental Management Plan, which includes the following: <ul style="list-style-type: none"> • Maintain all construction equipment in accordance with manufacturer's specifications. • Suppress dust as needed in unpaved areas. • Avoid burning non-vegetative wastes (refuse, etc.) at construction sites. • Avoid unnecessary idling of construction equipment or delivery trucks when not in use. 	Construction contractor	Site inspection during construction	Monthly progress reports during construction
<i>Noise</i>					
Noise generated by construction equipment and activities	Construction	See Appendix C for a Construction Environmental Management Plan, which includes the following: <ul style="list-style-type: none"> • Maintain all construction equipment in accordance with manufacturer's specifications. • Schedule construction and rehabilitation work during 	Construction contractor	Site inspection during construction	Monthly progress reports during construction

Resource/Receptor and Impact	Project Phase	Mitigation Measures	Execution Responsibility	Means of Verification	Monitoring and Reporting
		<p>daylight hours and to minimize activity during peak periods of tourism and recreation (weekends, holidays, etc.).</p> <ul style="list-style-type: none"> • Develop and implement a Construction Communications Plan to inform adjacent receptors (e.g., commercial businesses, churches, and tourists) of construction activities. • Use vibratory or press-in piling instead of impact piling during shore-based construction to avoid generating impulsive noise and vibrations. • Limit construction noise levels to applicable standards such as BS 5228-1:2009+a1:2014 (British Standards Institution 2014), or FTA-VA-90-1003-06 (U.S. Federal Transportation Authority (FTA)) 			
Waste					
Waste generated by construction activities	Construction	<p>See Appendix C for a Construction Environmental Management Plan, which includes the following:</p> <ul style="list-style-type: none"> • Provide appropriate waste bins, type, volume and service frequency to accommodate anticipated waste streams. • All loads arriving or leaving the site will be appropriately secured. • Provide information regarding waste management in site specific inductions, including waste separation and importance of securing vehicle loads. • Ensure licensed contractors are used to collect controlled wastes 	Construction contractor	Site inspection during construction	Monthly progress reports during construction
Biodiversity					

Resource/Receptor and Impact	Project Phase	Mitigation Measures	Execution Responsibility	Means of Verification	Monitoring and Reporting
Biodiversity management in general including the items below	Construction	See Appendix C for a Construction Environmental Management Plan, which includes the mitigation measures below.	Construction contractor	Site inspection during construction	Monthly progress reports during construction
Loss or disturbance of vegetation	Construction	<ul style="list-style-type: none"> When designing and planning work elements, minimize temporary and permanent construction footprints Demarcate work area with fencing to minimize disturbance or removal of natural vegetation 	Construction contractor	Site inspection during construction	Monthly progress reports during construction
Wildlife injury or mortality	Construction	Proper disposal of dredged material to avoid wildlife exposure	Construction contractor	Site inspection during construction	Monthly progress reports during construction
Disturbance and/or displacement of wildlife	Construction	<ul style="list-style-type: none"> Conducting canal- and mangrove-related works outside the waterbird breeding season (April - Sept) Minimize lighting Implement above measures to minimize noise and air pollution 	Construction contractor	Site inspection and interview of construction contractor	Monthly progress reports during construction
Habitat alteration - mangroves	Construction Operation	Seasonal restriction (work to be done outside of bird breeding season which occurs from April-September)	Construction contractor	Site inspection	Monthly progress reports during construction
Habitat alteration - aquatic	Construction Operation	Implement sediment control procedures during in-water works to minimize the release of fine sediments to downstream waterways, particularly the Suriname River	Construction contractor	Site inspection	Monthly progress reports during construction
Social					
Loss of income for transport businesses	Construction	<ul style="list-style-type: none"> Execute construction activities from the water side to reduce impacts on land-based businesses. Temporarily relocate land and 	Construction Contractor - Community Liaison Officer	Interviews with construction contractor and affected parties	Monthly progress reports during construction

Resource/Receptor and Impact	Project Phase	Mitigation Measures	Execution Responsibility	Means of Verification	Monitoring and Reporting
		<p>water-based businesses to adjacent locations in the immediate Project Area.</p> <ul style="list-style-type: none"> • Develop and implement a Traffic and Pedestrian Management Plan (Appendix H). • Develop and implement a Livelihood Restoration Plan (see Appendix D) for potentially Affected Persons. • Continue stakeholder engagement through Project implementation through the use of the Stakeholder Engagement and Communications Plan (see Appendix A). • Implement a Grievance Mechanisms to receive and respond to grievances (see in Appendix A). 			
Loss of water view	Construction	<ul style="list-style-type: none"> • See mitigations for “loss of income for transport businesses.” No additional mitigations are necessary. 	Construction Contractor - Community Liaison Officer	Interviews with construction contractor and affected parties	Monthly progress reports during construction
Loss of tourism	Construction	<ul style="list-style-type: none"> • See mitigations for “loss of income for transport businesses.” No additional mitigations are necessary. 	Construction Contractor - Community Liaison Officer	Interviews with construction contractor and affected parties	Monthly progress reports during construction
Provision of construction jobs to local companies and materials sourced from the local economy	Construction	Implement job quotas for local employment and sourcing requirements for construction contractors based on the size and scope of the Project	Construction contractor	Records review and interview of construction contractor	Monthly progress reports
Potential vulnerable groups (gender or disability related)	Construction Operation	<ul style="list-style-type: none"> • Install proper lighting in the Project Area for early-morning and late-evening commuting; • Ensure adequate ground surfaces and associated infrastructure (such as ramps) for patron mobility (e.g., high heels and crutches) at both 	Construction contractor	Records review and interview of construction contractor	Monthly progress reports

Resource/Receptor and Impact	Project Phase	Mitigation Measures	Execution Responsibility	Means of Verification	Monitoring and Reporting
		<p>the temporary unloading dock and the rehabilitated location post construction; and</p> <ul style="list-style-type: none"> Conduct Gender Awareness Training for contractors and their staff. 			
<i>Traffic</i>					
Decreased pedestrian and traffic safety	Construction	Implement Traffic and Pedestrian Management Plan to include early notification of road closures, detour signage, and safety programs and measures for pedestrians and bicyclists (Appendix H).	Construction contractor	Site inspection during construction	Monthly progress reports
Increased traffic congestion and disruption	Construction	Incorporate public transportation alternatives (e.g., pedestrian and bus) into Traffic and Pedestrian Management Plan (Appendix H)	Construction contractor	Site inspection during construction	Monthly progress reports
Decreased access to critical facilities, shopping, bus stops etc.	Construction	Implement Traffic and Pedestrian Management Plan to maintain continuous access through careful staging and sequencing of construction activities and provision of alternatives where needed (Appendix H)	Construction contractor	Site inspection during construction	Monthly progress reports
<i>Cultural Resources</i>					
Loss of cultural heritage site authenticity due to Project implementation	Construction Operation	Consult with the relevant cultural heritage stakeholders and develop and implement Cultural Heritage Management Plan (see Appendix F) to avoid or minimize short-term and permanent Project impacts to the Paramaribo WHS.	Construction contractor	Interviews with relevant stakeholders, site inspection	Monthly progress reports
Loss of cultural heritage site value due to Project changing the historic landscape of the Paramaribo WHS and diminished site view from historic buildings	Construction Operation	Consult with the relevant cultural heritage stakeholders and develop management plans and measures to avoid or minimize short-term and permanent Project impacts to the Paramaribo WHS (see Cultural Heritage Management Plan in Appendix F).	Construction contractor	Interviews with relevant stakeholders, site inspection	Monthly progress reports
Damage to undiscovered archaeological sites due to construction	Construction	Implement a Project Chance Finds Procedure (CFP) during all Project ground work (see Cultural Heritage Management Plan in Appendix F).	Construction contractor	Interviews with construction workers, site	Monthly progress reports

Resource/Receptor and Impact	Project Phase	Mitigation Measures	Execution Responsibility	Means of Verification	Monitoring and Reporting
of subsurface Project components				inspection	
Health and Safety					
Management of health and safety of both construction workers and the public	Construction	Develop and implement a Construction Health and Safety Plan (see Appendix E)	Construction contractor	Records review and interview of construction contractor	Monthly progress reports
Climate Change and Natural Hazards					
Climate change and natural hazards	Construction Operation	Implement a Construction Environmental Management Plan and a Health and Safety Plan	Construction contractor	Interviews with construction workers, site inspection	Monthly progress reports

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

I. Monitoring

139. The purpose of monitoring activities is to follow up program progress in achieving the expected results, as expressed in the Results Matrix (RM) and identify issues and problems during execution that can be corrected in due time. The monitoring program will be based on the RM, on the of activities described in the Annual Operating Plan (AOP), on the Multiyear Execution Plan (PEP), in the detail of the physical and financial performance of the products contained in the semiannual progress reports, and on the procurement, procedures contained in the Procurement Plan (PP). The beneficiary will submit semiannual progress reports to the Bank. The beneficiary agreed to use the RM and the activities defined in the Program Monitoring Report (PMR), as the basis to monitor the program's implementation. Monitoring activities include also annual financial audits to verify the compliance with financial and administrative procedures required by the Bank.

A. Indicators

140. Monitoring activities will be guided by the indicators expressed in the program's Results Matrix, specifically those classified as output indicators. The following table includes these indicators, frequency of measurement and source of verification.

Table 16: Output Indicators

Indicator	Unit of measure	Frequency of Measurement	Means of Verification
Component 1 - City-level Adaptation Framework and Plan			
City-wide Adaptation Plan for	Plan	Annually, Year 2 - 3	Acceptance by

Indicator	Unit of measure	Frequency of Measurement	Means of Verification
Paramaribo developed			Program Implementation Unit (PIU). Final version of the Adaptation Plan available on the web page of the MPW
Dissemination Strategy designed	Strategy	Annually, Year 3 – 4	Acceptance by PIU. Final version of the Dissemination Strategy and copies of the training materials available on the web page of the MPW.
Component 2 - Downtown Adaptation Measures			
Flood protection wall from Knuffelsgracht Street to SMS Pier with roadside drainage improvements, built	mts.	Annually, Year 3 – 4	Acceptance of Work (AW) by PIU Field reports from external supervision activities.
Van Sommelsdijck pumping station rehabilitated	Pumping station	Annually, Year 3 – 4	AW by PIU. Field reports from external supervision activities.
Mangroves restored in the outlet of Van Sommelsdijck canal	Ha.	Annually, Year 2 -3	AW by PIU. Field reports from external supervision activities.
Drainage Management Plan for urban Paramaribo, designed and implemented	Plan	Annually, Year 3 – 4	AW by PIU. Field reports from external supervision activities.
Component 3 - Capacity Building and implementation of a learning and management Plan			
Knowledge Management Plan developed	Plan	End of Year 1	Acceptance by PIU. On-line training modules operational.
Capacity Building Plan on adaptation planning and management developed and implemented.	Training	Annually, Year 2- 3 – 4	AW by PIU. Workshops' list of participants.

Table 17: Output Annual Costs (in US\$000)

Output	Year 1	Cost	Year 2	Cost	Year 3	Cost	Year 4	Cost	End of project	Cost
City-wide Adaptation Plan for Paramaribo developed			1	275					1	275
Dissemination Strategy designed							1	275	1	275

Output	Year 1	Cost	Year 2	Cost	Year 3	Cost	Year 4	Cost	End of project	Cost
Flood protection wall from Knuffelsgracht Street to SMS Pier with roadside drainage improvements, built					250	3,964			250	3,964
Van Sommelsdijck pumping station rehabilitated					1	2,741.5			1	2,741.5
Mangroves restored in the outlet of Van Sommelsdijck canal			0.16	290.5					0.16	290.5
Drainage Management Plan for urban Paramaribo, designed and implemented					1	576			1	576
Knowledge Management Plan developed	1	150							1	150
Training to technical and managerial staff on adaptation planning and management carried out.			1	77	1	77	1	76	3	230

B. Data Collection Instruments

141. The data on the program outputs will be collected as indicated in the Table 18. The Coordinator of the PIU, that will also be responsible for the planning and monitoring activities of the program, will prepare a Program Monitoring Plan (PMP) that will detail the source of information, data, indicators, statistics and methodology to be used for the supervision of each one of the activities of the program. It will also prepare semiannual progress reports for review by the Bank. The information for monitoring program progress will be provided to the Bank following the formats and indicators included in the Results Matrix (RM), Acquisitions Plan (AP), Multiyear Execution Plan (PEP) and Annual Operative Plan (AOP).
142. Most information will be generated by either: (a) acceptance of works documents presented by contractors to the PIU; (b) direct inspection visits by PIU personnel; and (c) certification of field reports from external supervision activities presented by consultants to the PIU for their corresponding payment. This information will be consolidated by the PIU in the program's MP and reported semi-annually to the Bank. Annually, the information will be included in the AOP presentation and discussion process with the Bank. This will allow periodic evaluations to compare progress in achieving RM goals, including explanations whenever any distortion is identified.

143. The expected cost for data collection is \$USD98.000⁶, covered by the Program.

Table 18: Data Collection Activities and Schedule

Monitoring Activities	Year 1				Year 2				Year 3				Year 4				Responsible
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Collection of Indicators																	PIU
City-wide Adaptation Plan for Paramaribo developed ⁷																	PIU
Dissemination Strategy designed ⁸																	PIU
Flood protection wall from Knuffelsgracht Street to SMS Pier, with roadside drainage improvements. constructed																	PIU
Van Sommelsdijck pumping station rehabilitated																	PIU
Mangroves restored in the outlet of Van Sommelsdijck canal																	PIU
Drainage Management Plan for urban Paramaribo, designed and implemented																	PIU
Knowledge Management Plan developed																	PIU
Trainings on adaptation planning and management implemented.																	PIU

C. Progress Reporting

144. The PIU will present periodic monitoring reports, based on consolidated information gleaned from the program's Administrative Information System. Reports based on this information will be used to update the Semi-Annual Progress Report and the Bank's Program Monitoring Report (PMR). A midterm evaluation will be undertaken. It will include: (i) the outcomes of the physical-financial execution; (ii) the degree of fulfillment of targets in the results matrix; (iii) the degree of fulfillment of environmental requirements and works maintenance; (iv) a summary of the results of the audits and of the improvement plans; (v) a summary of the main lessons learned. The midterm evaluation will be conducted in the second six months of the second year of implementation. The costs of preparing these products are included in the Program Administration Costs, used to pay for PIU personnel, auditing and program evaluation.

145. The beneficiary shall submit to the Bank annual Audited Financial Statements (EFA) within 120 days of the close of each fiscal year, duly audited by an independent auditing firm and semiannual progress reports prepared by the auditing firm hired.

⁶ This is the estimated costs for the Program Coordinator who will also be responsible for the planning and monitoring activities of the program.

⁷ This will include the development of a survey before the formulation of the Plan, with the aim to identify and include the concerns of the population in the Adaptation Plan (\$25,000).

⁸ This will include the development of a survey after the dissemination process to verify if the main concerns raised during the consultations with the population have been included to the Plan (\$25,000).

146. The PIU will prepare and send to the Bank a final evaluation report which will serve as input for the Completion Report Project (Project Completion Report-PCR), 90 days counted from the date 90% of the grant has been disbursed.

D. Coordination and Monitoring Work plan

147. The MPW will hire a systems operations and program monitoring specialist as program coordinator, who will be responsible for monitoring program activities, which include: (i) to develop, maintain and update the data regarding monitoring indicators; (ii) coordinate the collection and processing of information on program actions and prepare semiannual progress reports; (iii) identify problems, delays and external factors affecting the program proposing, where appropriate, remedial measures; and (iv) support monitoring internal meetings and program evaluation and supervision missions and evaluation of the Bank.

148. The Bank and the PIU will hold meetings twice a year to monitor jointly the progress in implementing the operation. Also, the PIU, in conjunction with the Bank, will hold official inspection visits at least twice a year to assess the progress of the program.

149. When inspection visits identify delays in physical and financial implementation, appropriate measures will be established to identify: (i) the main difficulties in implementation, (ii) actions to overcome the difficulties; and (iii) the time and costs thereof.

Table 19: Monitoring Work Plan

Monitoring Activities	Year 1				Year 2				Year 3				Year 4				Responsible	Source Cost (US\$000)
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Program Monitoring Plan (PMP) is established																	PIU Coordinator	Program/ US\$100.8 ⁹
Information Collection and updating of the PMP																	PIU	
Inspection Visits to ongoing works by PIU personnel																	PIU	
Consolidation of Information and presentation of semi-annual reports																	PIU	
Annual Operation Plan discussion with IDB Staff																	PIU/IDB	
Meeting with IDB staff																	PIU/IDB	
Survey before the formulation of the Adaptation Plan for																	PIU	Program/ US\$25 ¹⁰

⁹ Corresponds to the Program Coordinator's remuneration. Included in the Personnel costs.

¹⁰ Included in the Activity 1.1; Component 1, budget.

Monitoring Activities	Year 1				Year 2				Year 3				Year 4				Responsible	Source Cost (US\$000)
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Paramaribo, with the aim to identify and include the concerns of the population in the Adaptation Plan																		
Survey after the dissemination process to verify if the main concerns raised during the consultations with the population have been included to the Adaptation Plan																	PIU	Program/ US\$25 ¹¹
Financial Audits																	PIU/ consultancies	Program/ US\$100
Total Costs																		Program/ US\$250.8

II. Evaluation

150. The evaluation of the program will be done once the program has been completed in order to determine if its objectives have been achieved. The questions the evaluation will answer are listed below.

A. Evaluation Questions

151. The evaluation will answer the following questions:

- Did awareness of the Paramaribo citizens related to predicted adverse impacts of climate change on flooding increased after program completion?
- Was there significant participation on women in consultation activities of the City-wide Adaptation Plan?
- Was the modeled expected coastal and inland inundation area in the Paramaribo Historic center reduced after the interventions?
- Were the modeled expected annual economic losses from flooding in the waterfront area reduced after the interventions?

¹¹ Included in the Activity 1.2; Component 1, budget.

- Did the selected institutions increased their capacity to minimize exposure to climate change from flooding in the historic area of Paramaribo?
- Was there significant completion of trainings from women (technical and managerial staff) across GoS stakeholders?

B. Evaluation's Outcome Indicators.

152. The following indicators are used for the evaluation:

Table 20: Outcome Indicators

Indicator	Unit	Frequency	Means of Verification
Paramaribo citizens living or working in the historic area aware of predicted adverse impacts of climate change on flooding, and of appropriate responses over the number of unaware citizens.	Surveyed citizens with appropriate responses / Surveyed citizens	End of year 1 and 4	Results of baseline and end of project surveys available on the Web page of the MPW. Acceptance by PIU
Women participating in consultation activities of the City-wide Adaptation Plan over number of total participants.	Female participants / Total participants	End of year 1 and end of project	Gender participation lists of consultation activities
Reduction in modeled expected coastal and inland inundation area in the Paramaribo Historic area.	Square meters	End of year 1 and end of project	Model developed for the project will be run using a specialized software package to assess flooding risks.
Reduction in modeled expected annual economic losses from flooding per square meter in the waterfront area.	Surinamese Dollar (2018) per square meter	Model developed for the project will be run using a specialized software package to assess flooding risks.	Model developed for the project will be run using a specialized software package to assess flooding risks.
Institutions with increased capacity to minimize exposure to climate change induced flooding in the historic area of Paramaribo	Number of Institutions	Years 2, 3 and 4.	List of institutions participants Acceptance by PIU
Number of female technical and managerial staff across GoS stakeholders that completed the trainings over number of total training participants.	Female participants that completed the trainings / Total participants that completed the trainings	End of project.	Lists of participants by gender Acceptance by PIU

153. The program's evaluation will determine if the program's objectives were achieved by answering the evaluation questions. This will be done by analyzing if the outcome indicators in the results matrix achieved their expected targets. In addition, an economic ex post cost-benefit analysis will be carried out at the end of the program, to determine the actual economic rate of return of the program and establish whether the program generated more benefits than costs to Suriname.
154. In order for the survey to measure the results indicator 1 (awareness), the sample size (n) should be at of at least 384 effective surveys. This sample size was estimated using a 95 percent confidence level and a 5 percent sample error (e):

$$n = \frac{Z_{\alpha}^2 N p (1 - p)}{e^2 (N - 1) + Z_{\alpha}^2 p (1 - p)}$$

Where:

N: 250.000 (Paramaribo's population)

Z: 1.96

p: 0.5

e: 0.05

C. Reflexive Evaluation:

155. A reflexive evaluation will be undertaken to answer the evaluation questions and thus if the program achieved its development objectives. This will be done by comparing the outcome indicator before and after the program and determining whether each outcome reached their expected targets. The data on the outcome indicators will be collected as specified in table above.
156. The outcome indicators related to awareness of climate associated risks require a survey of Paramaribo citizens at the end of the project. The survey will the level of awareness of predicted adverse impacts of climate change on flooding after the program and compare it to the time prior to the program intervention.
157. The reduction for both inundation area and annual economic losses will be derives from flood risks models, which will be updated with the end of project delivered downtown adaptation measures and complemented with an ex-post economic analysis (see ex-ante economic analysis in the following link).

D. Economic Ex Post Evaluation

158. The aim of the ex post evaluation is to verify if the estimated economic rate of return (ERR) and the Net Present Value (NPV) as well as the assumptions used in the ex-ante cost benefit analysis were robust and accrued after program implementation. The results of the ex-ante analysis yielded the following: Using a discount rate of 12%, the program generated a Net Present Value (NPV) of US\$25.8 million.
159. The ex post cost benefit analysis will use the same methodology employed in the ex-ante analysis and is described below. For the ex-post cost-benefit analysis, a new ERR and NPV will be calculated using the investment costs and maintenance costs incurred. Likewise, the

economic benefit will be the property value differential that accrued in the historic city center after the program interventions were completed.

E. Coordination and Evaluation Work Plan

160. The final evaluation will be conducted in the final six months of program implementation. It will combine the ex post economic analysis and the evaluation of the results indicators of the Results Matrix. These evaluations will be contracted to an independent consultant who may hire a research team to conduct specific data collection activities related to the mobility component and to the property valuation data.
161. The evaluation activities by the consultant will be carried out in direct coordination with the Bank and the PIU and will include:
- Collect the information on the outcome indicators included in the results matrix.
 - Collect all information necessary to answer the evaluation questions and undertake the ex-post cost benefit analysis.
 - Undertake the cost-benefit economic analysis of the program following the methodology used in the ex-ante analysis and presented above.
 - Write an evaluation report that answers the evaluation questions substantiated by data and presents the ex post cost benefit analysis of the program.
 - Hold meetings with Bank / PIU and the main actors involved in the design and execution of the operation to obtain the necessary information to carry out the evaluation and to keep them informed of the its progress, results and findings.

F. Data Collection and Evaluation

162. The information will be compiled based on the Results Matrix and the ex-ante Economic Analysis. Table 21 presents the evaluation activities schedule.

Table 21: Evaluation Activities and Schedule

Activities	Year 1				Year 2				Year 3				Year 4				Responsibilities/ Cost
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Hiring of Consultant to undertake midterm evaluation																	PIU/ US\$20.000
Hiring of Consultant to undertake final evaluation including data collection.																	PIU/ US\$25.000
Hiring of Consultant to undertake PCR (includes CBA ex post)																	PIU/ US\$35.000
Total																	US\$80.000

G. Presentation of Evaluation Reports

163. The PIU will prepare and submit to the Bank an evaluation report based on the two (2) assessment methodologies at the end of the program. Once they have been accepted by the Bank, these two evaluation reports will be made available to the public through the websites of the PIU. These evaluations will be conducted by consulting firms, which will be hired by the PIU and financed with investment grant proceeds.
164. The beneficiary has agreed with the methodologies for all the evaluations and ex post economic evaluation. The budget of US\$80,000 is included in the program as part of the program administrative costs.
165. The budgeted M&E plan is presented in table 22 down below. The break-down of how the Implementing Entity's fees will be utilized in the supervision of the M&E function is included in Part III Section G.

Table 22: Summarized M&E activities

#	Type of M&E activity	Responsible party	Budget (US\$)	Time frame
1	Kickoff workshop	Ministry of Public Works, Transport and Communication Coordination Environment IDB	9,000 (IDB staff travel costs to be charged to implementing entity fees)	Within the first 2 months after the project eligibility ¹² .
2	Final RM, AP, PEP and AOP	PIU – Project Coordinator	None	Within the first 2 months after the kickoff workshop.
3	Survey prior to formulation of the Adaptation Plan to identify and include population's concerns in the Plan.	PIU External consultants	25,000 (to be charged to project activity costs)	Within the first 9 months after project eligibility
4	Program Monitoring Plan (PMP)	PIU – Project Coordinator	None	Within the first year after the project eligibility.
5	Annual Operation	PIU – Project	None	Annually

¹² Project implementation starts when eligibility is reached, this occurs when the following conditions prior are completed: (i) establishment of the Project Implementation Unit; (ii) approval and entry into effective of the Program Operations Manual; and (iii) signing of a collaboration agreement between the Ministry of Public Works, Transport and Communication and the Coordination Environment.

	Plan (AOP)	Coordinator		
6	Semi Annual Progress Reports	PIU – Project Coordinator	None	Within 30 days after the end of the corresponding semester
7	Mid-term evaluation	PIU – Project Coordinator External consultants	20,000 (to hire a consultant to perform evaluation to be charged to project execution costs) 15,000 (Travel costs associated to IDB staff participation in the mid-term evaluation mission to be charged to implementing entity fees)	In the second 6 months of the second year of implementation.
8	Audited Financial Statements (EFA)	PIU Independent audit firm	100,000 (to be charged to project execution costs)	Within 120 days of the close of each fiscal year.
9	Inspection visits to ongoing works	PIU	None	During execution of works
10	Supervision and monitoring visits by IDB staff	PIU IDB	120,000 (travel costs to be charged from implementing entity fee)	2 visits of 5 specialist per year
11	Inspection ex-post financial management and procurement visits to PIU by IDB staff	PIU IDB	20,000 (to be charged from implementing entity fee)	2 visits per year
12	Survey after the dissemination process to verify if the main concerns raised during the consultations with	PIU External consultants	25,000 (to be charged to project activity costs)	In the last 6 months of the project execution.

	the population have been included to the Adaptation Plan			
13	Final evaluation report	PIU External consultants	60,000 (to be charged from project execution costs) 15,000 (Travel costs associated to IDB staff participation in the final evaluation mission to be charged to implementing entity fees)	90 days from the date 90% of the grant is disbursed.
14	Closure of project workshop	Ministry of Public Works, Transport and Communication Coordination Environment IDB	9,000 (IDB staff travel costs to be charged to implementing entity fees)	Within the last 2 months of the project execution.
15	Project Completion Report	IDB	30,000	Within 6 months after project finalization.

E. Include a results framework for the project proposal, including milestones, targets and indicators.

166. Table 23 presents a results matrix for the project.

Table 23: Results Matrix

Results Matrix									
Project objective	The main objective of the project is to contribute to increasing the adaptive capacity of communities living in Paramaribo city and in particular historic downtown vulnerable areas to cope with observed and anticipated impacts of climate change on floods and sea level rise.								
OUTCOMES									
Component 1: City-level Adaptation Framework and Plan									
Outcome 1: Strengthened awareness of climate associated risks and ownership of adaptation process by Paramaribo citizens including the metropolitan area									
Indicator	Unit of measure	Baseline	Baseline year	Year 1	Year 2	Year 3	Year 4	End of project	Comments/ Means of verification
Paramaribo citizens living or working in the historic area aware of predicted adverse impacts of climate change on flooding, and of appropriate responses over the number of unaware citizens.	Surveyed citizens with appropriate responses / Surveyed citizens	TBD	2018						<p>Comments: (i) Aware citizens will be those that understand flooding inundation hazard and risk maps for the historical area and are able to use this information to recognize critical levels of risks; (ii) baseline data will be obtained through a survey before starting project implementation. At the end of the project a second survey will be carried out together with a simple test. (iii) Country official population data for the historic area will be used to estimate targeted population.</p> <p><u>Means of verification:</u> Results of baseline and end of project surveys.</p>
Women participating in consultation activities of the City-wide Adaptation Plan over number of total participants.	Female participants / Total participants	0.0	2018	40	0.0	0.0	0.0	40	<p>Comments: (i) The Adaptation Plan (AP) will cover all the city of Paramaribo and its metropolitan area. (ii) the AP is a dynamic document that will need to be revised periodically and should be connected to the national priorities established in the country's National Determined Contribution (NDC) and the National Adaptation Plan; (iii) At least 40% of women participation is considered to be a "gender-balanced" for UN/EU.</p>

										Means of verification: Participation lists of consultation activities.
Component 2: Downtown adaptation hard measures										
Outcome 2: Population and businesses serving historic downtown Paramaribo reduce their exposure to flood events										
Indicator	Unit of measure	Baseline	Baseline year	Year 1	Year 2	Year 3	Year 4	End of project	Comments/ Means of verification	
Reduction in modeled expected coastal and inland inundation area in the Paramaribo Historic area.	Square meters	473,472	2018			471,584		470,472	<p><u>Comments:</u> (i) Results from flood risk models, considering the effect of project mitigation work at the waterfront area using historical storms data but also including future storms and hydrographs with data extracted from the RCP 6.0 climate change scenario. (ii) Paramaribo Historic area refers to protected areas within the historic center adjacent to the waterfront and the Sommelsdijck Canal.</p> <p><u>Means of Verification:</u> Model developed for the project will be run using a specialized software package to assess flooding risks.</p>	
Reduction in modeled expected annual economic losses from flooding per square meter in the waterfront area.	U.S. Dollars (2018) per square meter	330	2018					343 (347 expected without project)	<p><u>Comment:</u> (i) Results from flood risk models, considering the effect of project mitigation work at the waterfront area using historical storms data but also including future storms and hydrographs with data extracted from the RCP 6.0 climate change scenario. (ii) Habitants and business projections will be concentrated to the areas adjacent to the waterfront and Sommelsdijck Canal.</p> <p><u>Means of Verification:</u> Model developed for the project will be run using a specialized software package to assess flooding risks.</p>	
Outcome 3: Strengthened GoS institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses caused by flooding and sea level rise.										
Institutions with increased capacity to minimize exposure to climate change induced flooding	Number of Institutions	0.0	2018	0.0	1.0	0.0	2.0	3.0	<p><u>Comments:</u> (i) Priority will be given to the Ministry of Public Works given its key leading role during implementation; (ii)</p>	

in the historic area of Paramaribo										Increased capacity is understood as participants completing the training; <u>Means of verification:</u> Lists of participants.
Number of female technical and managerial staff across GoS stakeholders that completed the trainings over number of total training participants.	Female participants that completed the trainings / Total participants that completed the trainings	0.0	2018	0.0	0.0	0.0	0.0	40	40	<u>Comments:</u> (i) Main objective of training activities will be to build capacity across the GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan; (ii) Trainings will be customized to the types of users and their needs for what a Knowledge Management Plan will be developed. <u>Means of verification:</u> List of participants that completed the trainings.

Products

Component 1: City-level Adaptation Framework and Plan

Product	Unit of measure	Associated results	Cost (US\$)	Baseline	Year 1	Year 2	Year 3	Year 4	End of project	Comments/ Verification means
City-wide Adaptation Plan for Paramaribo developed	Plan	1	275.000	0.0	0.0	1.0	0.0	0.0	1.0	<u>Comments:</u> (i) "Developed" means that there is a written version that has been consulted and is ready for major's consideration for approval and further dissemination. (ii) The Adaptation Plan will provide a framework for managing, prioritizing and implementing adaptation and resilience measures along with a standardized approach. It will be socialized with local vulnerable communities and shall be endorsed by city major before it is presented for approval to the ministries' council. (iii) It will also include a participatory process with consultation to civil society. <u>Means of Verification:</u> Final version of the Adaptation Plan
Dissemination Strategy of Adaptation Plan and knowledge generated by its development designed	Strategy	1	275.000	0.0	0.0	0.0	1.0	0.0	1.0	<u>Comments:</u> (i) The dissemination strategy will include different means to share lessons learned from the development and implementation of the Adaptation Plan such as brochures, videos, technical notes, workshops, among others; (ii) The workshops will have a focus on gender-

										equality and local vulnerable communities in the metropolitan area. <u>Means of verification:</u> Final version of the Strategy and copies of the training materials.
Component 2: Downtown Adaptation measures										
Flood protection wall from Knuffelsgracht Street to SMS Pier with roadside drainage improvements, built	mts	2	3.964.000	0.0	0.0	0.0	250	0.0	250	<u>Comments:</u> (1) Wall made from steel sheet piles with coverage of bricks or concrete. Use of stone in the embankment to avoid debris accumulation. (2) Includes: walkway of 2- 4 meters and road side drainage and add trees/green. (3) Historic landing for small boats to be rehabilitated. (4) Old steel jetty to be used by boat taxis during execution to be rehabilitated. <u>Means of Verification:</u> Field report
Van Sommelsdijck pumping station rehabilitated	Pumping station	2	2.741.500	0.0	0.0	0.0	1.0	0.0	1.0	<u>Comments:</u> (i) The rehabilitation of the Van Sommelsdijck pumping station entails: 1) the acquisition of a new 4.5 m ³ /seg pump; 2) the repair of two existing pumps that are not currently operational; 3) Sluice gates rehabilitated and automate control in operational condition; 4) restoration of the basin upstream of the canal before entering the pumping station. Activities to restore the basin are aimed at increasing existing water storage capacity to act as a buffer area. <u>Means of Verification:</u> Field Report
Mangroves restored in the outlet of Van Sommelsdijck canal	Ha	2	290.500	0.0	0.0	0.16	0.0	0.0	0.16	<u>Comments:</u> (i) Restoration activities relates to those that aim at assisting the recovery of resilience and adaptive capacity of ecosystems that have been degraded, damaged or destroyed; (ii) Mangroves to act as a buffer area and to catch sediments; (ii) restoration activities will include also the planting of new plants and sediments catchment. <u>Means of Verification:</u> Field reports from supervision activities.
Drainage Management Plan for urban Paramaribo, designed and implemented	Plan	2	576.000	0.0	0.0	0.0	1.0	0.0	1.0	<u>Comments:</u> (i) The design of the plan will cover all the city, but the implementation will cover only the historic center; (ii) The Plan will include roles, responsibilities and

										frequency of actions; (iii) It must be synchronized with existing and future urban development plans and storm and water management activities and plans conducted by the Ministry of Public Works. <u>Means of Verification:</u> Final version of the Plan and field reports.
Component 3: Capacity Building and implementation of a Learning and Knowledge Management Plan										
Knowledge Management Plan developed	Plan	3	150.000	0.0	1.0	0.0	0.0	0.0	1.0	<p><u>Comments:</u> (i) "Developed" means that the document is ready to be used and contains the following sections: definition of target audience, identification of K&L needs and organization and prioritization of those needs; (ii) The Knowledge Plan (KMP) will help customize training modules so that they respond to the needs of identified main users of climate risk and adaptation information as well as lessons learned from the implementation of this project; (iii) In addition, the KMP will also include an Institutional Capacity Assessment which is aimed at identifying specific actions to enhance the GoS capacity to mainstream climate change adaptation into policies, regulations and development planning at the city level.</p> <p><u>Means of verification:</u> On-line training modules operational.</p>
Training to technical and managerial staff on adaptation planning and management carried out.	Training	3	230.000	0.0	0.0	1.0	1.0	1.0	3.0	<p><u>Comments:</u> (i) Based upon the final structure of the Paramaribo Adaptation Plan, the Knowledge Management Plan and the Institutional Evaluation, the key need for capacity building within the GoS will be identified; (ii) Special emphasis will be made to ensure a gender balance participation in the workshops; (iii) It is envisioned that the training will include among other topics, data and information of climate change projections and expected impacts for Suriname, flood hazard and risk maps, methods and tools to assess flooding risks among others.</p> <p><u>Means of verification:</u> Trainings' list of participants.</p>

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F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

167. Table 24 below also provides relevant commentary against the Adaptation Fund's results matrix.

Table 24: Adaptation Fund Results Matrix

Project Objective(s) ¹³	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
City-level Adaptation Framework and Plan	City-wide Adaptation Plan for Paramaribo developed	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	275,000
	Dissemination Strategy of Adaptation Plan and knowledge generated by its development designed and implemented	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1.1 No. and type of risk reduction actions or strategies introduced at local level	275,000
Downtown Adaptation measures	Flood protection wall from Knuffelsgracht Street to SMS Pier, with roadside drainage improvements. constructed	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset types)	3,964,000
	Van Sommelsdijck pumping station rehabilitated	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	2,741.5
	Mangroves restored in the outlet of Van Sommelsdijck	Outcome 5: Increased	5.1. No. and type of natural resource	290,500

¹³ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

	canal	ecosystem resilience in response to climate change and variability-induced stress	assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	
	Drainage Management Plan for urban Paramaribo, designed and implemented	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	576,000
Capacity Building	Knowledge Management Plan developed	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1.2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	150,000
	Trainings on adaptation planning and management implemented	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events	230,000
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 1. Strengthened awareness of climate associated risks and ownership of adaptation process by Paramaribo	Paramaribo citizens living or working in the historic area aware of predicted adverse impacts of climate change on flooding, and of appropriate responses over the number of unaware citizens.	Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 No. and type of risk reduction actions or strategies introduced at local level	500,000
	Women participating in			

citizens including the metropolitan area.	consultation activities of the City-wide Adaptation Plan over number of total participants.			
Outcome 2. Population and businesses serving historic downtown Paramaribo reduce their exposure to flood events	Reduction in modeled expected coastal and inland inundation area in the Paramaribo Historic area.	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1. No. and type of adaptation assets (physical as well as knowledge) created in support of individual or community-livelihood strategies	
	Reduction in modeled expected annual economic losses from flooding per square meter in the waterfront area.			
Outcome 3. Strengthened GoS institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses caused by flooding and sea level rise.	Institutions with increased capacity to minimize exposure to climate change induced flooding in the historic area of Paramaribo	Output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events	
	Number of female technical and managerial staff across GoS stakeholders that completed the trainings over number of total training participants.	Output 2.2: Targeted population groups covered by adequate risk reduction systems	2.1.2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	

168. The following tables show project alignment to AF core impact indicators and respective targets.

Adaptation Fund Core Impact Indicator “Number of Beneficiaries”				
Date of Report	3 September 2018			
Project Title	Urban Investments for the Resilience of Paramaribo: Building adaptive capacity of Paramaribo communities to climate change-related floods and sea level rise through strategic urban planning and sustainable infrastructure investments.			
Country	Suriname			
Implementing Agency	Inter-American Development Bank			
Project Duration	4 years			
	Baseline <i>(absolute number)</i>	Target at project approval <i>(absolute number)</i>	Adjusted target first year of implementation <i>(absolute number)</i>	Actual at completion <i>(absolute number)</i>
Direct beneficiaries supported by the project	0	10 <i>(estimated number assuming that the core team at the EE Ministry of Public Works receives direct capacity building)</i>		
Female direct beneficiaries	0	5 <i>(assumes intent for gender equality in the implementation team)</i>		
Youth direct beneficiaries	0	Not applicable		
Indirect beneficiaries supported by the project	0	(i) 115 of identified waterfront affected persons <i>(comprised of the identified water taxi operators, the bus owners and operators, taxicab drivers and local bar and restaurant)</i> (ii) Plus 100 through capacity building efforts <i>(represents targeted stakeholders to be</i>		

		supported through broader capacity building efforts)		
		(iii) More broadly, adaptation measures proposed could benefit 10,000+ other indirect people if the waterfront visitors, users of the water taxis and buses etc are included		
Female indirect beneficiaries	0	(i) 2 females in the Waterfront affected group (ii) 40 for capacity building assuming 40% (iii) 5,000+ for the general population		
Youth indirect beneficiaries	0	(i) Not applicable (ii) Not applicable (iii) 2,500+ (assuming a proportion of population that benefits is youth		

Adaptation Fund Core Impact Indicator "Assets Produced, Developed, Improved, or Strengthened"				
Date of Report	3 September 2018			
Project Title	Urban Investments for the Resilience of Paramaribo: Building adaptive capacity of Paramaribo communities to climate change-related floods and sea level rise through strategic urban planning and sustainable infrastructure investments.			
Country	Suriname			
Implementing Agency	Inter-American Development Bank			
Project Duration	4 years			
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion
Sector (identify)	Flood management			
Targeted Asset 1) Health and Social	1) None	1) City-wide Adaptation Plan		

Infrastructure (developed/improved) 2) Physical asset (produced/improved/strengthened)	2) Floodwall and pump station already exist, but they were not actively managed/maintained)	and associated Capacity Building 2) Two (Construction of a new flood protection wall along the Waterfront and Sommelsdijck Canal pump station and sluice gates rehabilitation)		
Changes in Asset (Quantitative or qualitative depending on the asset)	n/a	1) 100 Participants in in consultation activities of the City-wide Adaptation Plan and associated Capacity Building 2) Reduction in modeled expected coastal and inland inundation area in the Paramaribo Historic area to 470,472 square meters by the end of the project		

Adaptation Fund Core Impact Indicator "Natural Assets Protected or Rehabilitated"				
Date of Report	3 September 2018			
Project Title	Urban Investments for the Resilience of Paramaribo: Building adaptive capacity of Paramaribo communities to climate change-related floods and sea level rise through strategic urban planning and sustainable infrastructure investments.			
Country	Suriname			
Implementing Agency	Inter-American Development Bank			
Project Duration	4 years			
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion
Natural Asset or Ecosystem (type)	Mangrove			
Change in state	n/a	0.16 hectares of		

<i>Ha or km Protected/ rehabilitated, or</i>		mangrove		
<i>Effectiveness of protection/ rehabilitation - Scale (1-5)</i>				
Total number of natural assets or ecosystems protected/ rehabilitated		1 - mangrove area		

G. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

169. Table 25 presents the budget details for the proposed Project.

Table 25 – Project Budget summary

Project Components	Cost
1. City-Level Adaptation Framework and Plan	USD 550,000.00
2. Downtown Adaptation Measures	USD 7,572,000.00
3. Capacity Building	USD 380,000.00
4. Project Administration	USD 400,000.00
Auditing costs	USD 100,000.00
Monitoring and evaluation	USD 80,000.00
Project Cycle Management Fee	USD 768,000.00
Total	USD 9,850,000.00

Table 26 – Detailed Project Budget

Objectives / Outcomes / Outputs		Budget	Note
1. CITY-LEVEL ADAPTATION FRAMEWORK AND PLAN		\$ 550,000	
Objective 1. Establish a framework for managing knowledge and disseminating lessons learned that could be used in future resilience programs for the city of Paramaribo and that could be part of a city-level Adaptation Plan.			
Outcome 1. Strengthened awareness of climate associated risks and ownership of adaptation process by Paramaribo citizens including the metropolitan area.			
Output 1.1 Development of a city-broad Adaptation Plan to build climate resilience	Consultants	\$ 235,000	Contract for the consulting firm to carry out this activity Travel costs to Suriname and carry out site visits, workshops and meetings Workshops and meetings to support the development of this output.
	Travel	\$ 25,000	
	Workshops and meetings	\$ 15,000	
	Sub total	\$ 275,000	
Output 1.2. Dissemination Strategy of Adaptation Plan and knowledge generated by its development designed and implemented	Consultants	\$ 215,000	Contract for the consulting firm to carry out this activity Travel costs to Suriname and carry out site visits, workshops and meetings Development of user friendly material for the workshops, seminars etc. required for this activity
	Travel	\$ 25,000	
	Dissemination material	\$ 10,000	

	Workshops and meetings	\$ 25,000	Workshops, seminars and meetings to support the development of this output
	Sub total	\$ 275,000	
<u>2. DOWNTOWN ADAPTATION MEASURES</u>			
Objective 2. Implement a group of strategic and cost-effective adaptation hard measures in the historic downtown area of Paramaribo that illustrate the benefits of building climate resilience as part of a long-term planning strategy for the city and its metropolitan area.		\$ 7,572,000	
Outcome 2. Population and businesses serving historic downtown Paramaribo reduce their exposure to flood events.			
Output 2.1 Flood protection wall from Knuffelsgracht Street to SMS Pier with roadside drainage improvements built	Consultants - ESIA	\$ 37,500	Contract for firm to carry out the Environmental and Social Impact Assessment (ESIA) of all works and installations under this Outcome 2
	Workshops and meetings	\$ 2,500	Workshops and meetings to support the development of the ESIA
	Consultants - Design	\$ 265,000	Contract for firm to prepare the executive designs for this output
	Travel	\$ 10,000	Travel costs to Suriname by consulting firm preparing the designs and carry out site visits and meetings
	Supervision	\$ 404,000	Contract for consulting firm to supervise the works
	Contractor - works	\$ 250,000	Hiring third party to execute the works
	Material and equipment	\$ 2,500,000	Supply steel sheet piles, rip-rap/stone, concrete/brick cap, drainage outlets, storm water drainage system, boats etc.
	Contingencies	\$ 495,000	

	Sub total	\$ 3,964,000	
Output 2.2 Van Sommeldijck pumping station rehabilitated	Consultants - Design	\$ 255,000	Contract for firm(s) to prepare the executive designs for the enhancement of the basin at the pump and the rehabilitation needs of the pump
	Travel	\$ 15,000	Travel costs to Suriname by consulting firm(s) preparing the designs and carry out site visits and meetings
	Supervision	\$ 281,500	Contract for consulting firm to supervise the works and installation
	Contractor - works and installation	\$ 200,000	Hiring third party to execute the works and installation
	Material and equipment	\$ 1,600,000	Supply one sluice gate, two pumps, supporting control system, pumping station, dredging boats for improvement of water basin, grass
	Contingencies	\$ 390,000	
	Sub total	\$ 2,741,500	
Output 2.3 Mangroves restored in the outlet of Van Sommeldijck canal	Consultants - Design	\$ 27,500	Contract for firm(s) to prepare the executive designs for this output
	Travel	\$ 2,500	Travel costs to carry out site visits and meetings
	Supervision	\$ 29,500	Contract for consulting firm to supervise the works
	Contractor - works and installation	\$ 20,000	Hiring third party to execute the works
	Material and equipment	\$ 180,000	Supply sediment trapping units, bamboo, boats
	Contingencies	\$ 31,000	
	Sub total	\$ 290,500	
Output 2.4 Drainage Management Plan for urban Paramaribo, designed and implemented	Consultants - Design	\$ 72,500	Contract for firm to prepare the Drainage Maintenance Plan
	Travel	\$ 2,500	Travel costs to carry out site visits and meetings
	Supervision	\$ 45,000	Contract for consulting firm to supervise the works

	Contractor - works	\$ 50,000	Hiring third party to execute maintenance plan in the city center: 20km sewers
	Equipment	\$ 310,000	Supply vacuum/high pressure trucks including maintenance
	Training	\$ 40,000	Training for government contractors to use the new equipment and maintain drainage in Paramaribo
	Contingencies	\$ 56,000	
	Sub total	\$ 576,000	
3. CAPACITY BUILDING			
Objective 3. Build capacity across local communities and GoS stakeholders responsible for decision making in Paramaribo to ensure strong implementation and enforcement of the Adaptation Plan.		\$ 380,000	
Outcome 3. Strengthened GoS institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses caused by flooding and sea level rise.			
Output 3.1 Knowledge Management Plan developed	Consultants	\$ 130,000	Contract for the consulting firm to carry out this activity
	Travel	\$ 12,000	Travel costs to Suriname and carry out site visits, workshop and meetings
	Workshops and meetings	\$ 8,000	Workshop and meetings to support the development of this output
	Sub total	\$ 150,000	
Output 3.2 Training to technical and managerial staff on adaptation planning and management carried out	Consultants	\$ 110,000	Contract for the consulting firm to carry out this activity
	Travel	\$ 36,000	Travel costs to Suriname and carry out site visits, workshops, training and meetings
	Dissemination material	\$ 14,000	Development of user friendly material to use for the training to government officials required for this activity

	Training, workshops and meetings	\$ 70,000	Workshops, seminars and meetings to support the development of this output
	Sub total	\$ 230,000	
4.PROJECT ADMINISTRATION			
Objective 4. Ensure there is a robust plan and implementation structure to allow the Proposed Project to be implemented, monitored, evaluated and lessons learned disseminated.		\$ 580,000.00	
4.1 Personnel and other recurrent costs	Personnel	\$ 331,200.00	Program Coordinator, Financial Specialist, Procurement Specialist, Community Relations Specialist, EHS Specialist
	Recurrent costs	\$ 28,800.00	Petty cash
	Sub total	\$ 360,000.00	
4.2 Utilities and office supplies		\$ 40,000.00	This may include office furniture, hardware and software and other office supplies
4.3 Auditing costs	Consultants	\$ 100,000.00	Contract for an independent audit firm
4.4 Monitoring and evaluation activities	Consultants	\$ 80,000.00	Contract for firm(s) to carry out the mid-term and final evaluation.
Project Cycle Management Fee		\$ 768,000.00	See Table 26 for more detailed information
Total budget		\$ 9,850,000	

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Table 27 – Project Cycle Management Fee in the M&E function

Description project stage	IDB services	Estimated cost of IDB services (US\$)	%
Project preparation	<ul style="list-style-type: none"> • Supervision and technical overview of project feasibility studies • Coordination and collaboration with the Government of Suriname to comply with IDB and the Adaptation Fund's requirements to complete the project proposal. • Preparatory missions to Suriname to formulate the Project documents and annexes 	45,000	5.9%
Implementation and supervision	<ul style="list-style-type: none"> • Carry out a kick-off workshop with IDB's Project Management for Results methodology (PM4R). • Provide financial management and procurement training to key PIU personnel. • Provide project management training sessions to key PIU personnel. • Provide technical support to the counterparts and the PIU when requested and participate when necessary during project activities. Collaborate in planning activities, conduct field visits when required, and keep continuous dialogue with the executing agency, relevant stakeholders, the Adaptation Fund and other key IDB departments. • Perform quality control review of planning documents such as Annual Operation Plans (POA), Procurement Plans (PP), Financial Plans (FP), disbursement requests. • Supervise IDB internal monitoring tools during project execution, such as the Progress Monitoring Reports (PMR) ensuring accuracy, clarity and consistency. • Oversight and monitoring of Adaptation Fund funds. • Review procurement bidding documents and consultant contracts to ensure conformity with IDB and Adaptation Fund policies. • Support the preparation of and review terms of reference to ensure that project activities are consistent with procurement and annual operating plans. • Verification of compliance of products and 	643,000	83.7%

	<p>services with agreed standards and prepare draft communications to the executing agency accordingly.</p> <ul style="list-style-type: none"> • Review disbursement requests, validate eligibility of expenses, set up disbursements and other financial transactions related to the project and supervise budget transfers. • Monitor disbursement projections in close coordination with the PIU key personnel. • Carry out financial management and procurement inspection ex-post visits. • Carry out supervision and monitoring visits. • Report to the Adaptation Fund regarding the project physical and financial progress. 		
Final evaluation and closing	<ul style="list-style-type: none"> • Facilitate the closure of project workshop and disseminate technical findings. • Review the final evaluation report for quality assurance. • Prepare Project Completion Report for internal review (internal process that looks into execution performance, complements project evaluation). 	80,000	10.4%
Total		768,000	100%

H. Include a disbursement schedule with time-bound milestones.

170. The Project Execution Plan which details the disbursement schedule as well as the time-bound milestones is included as Annex F. A recap of the disbursement is provided in the table below.

Table 27 – Disbursement Schedule

TOTAL PER YEAR		
YEAR 1	\$660,500	
<i>disbursement 1</i>		<i>\$112,500</i>
<i>disbursement 2</i>		<i>\$548,000</i>
YEAR 2	\$4,936,400	
<i>disbursement 3</i>		<i>\$1,796,300</i>
<i>disbursement 4</i>		<i>\$3,140,100</i>
YEAR 3	\$3,140,100	
<i>disbursement 5</i>		<i>\$2,773,400</i>
<i>disbursement 6</i>		<i>\$366,700</i>
YEAR 4	\$345,000	

<i>disbursement 7</i>		<i>\$130,000</i>
<i>disbursement 8</i>		<i>\$215,000</i>
Total (excluding Project Cycle Management Fee)		\$9,082,000

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government¹⁴ *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

<i>Winston G. Lackin, Designated Authority of Suriname, Member of the High Council of Advisors to the President of the Republic of Suriname</i>	Date:
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B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

<p>I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans: National Climate Change Policy, Strategy and Action Plan of 2015, Multi-annual Development Plan 2012-2016 and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>
<p><i>Name & Signature</i></p>

⁶ Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Implementing Entity Coordinator	
Date:	Tel. and email:
Project Contact Person:	
Tel. And Email:	

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