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R2019-0019/1

January 28, 2019

Closing Date: Thursday, February 14, 2019 at 6:00 p.m.

FROM: Vice President and Corporate Secretary

Suriname - Saramacca Canal System Rehabilitation Project

Project Appraisal Document

Attached is the Project Appraisal Document regarding a proposed loan to Suriname for the Saramacca Canal System Rehabilitation Project (R2019-0019), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC, and MIGA

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Report No: PAD3030

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$35 MILLION

TO THE

REPUBLIC OF SURINAME

FOR A

SARAMACCA CANAL SYSTEM REHABILITATION PROJECT

January 17, 2019

Social, Urban, Rural, and Resilience Global Practice
Latin America and Caribbean Region

CURRENCY EQUIVALENTS

Exchange Rate Effective January 11, 2019

Currency Unit =	Surinamese Dollar (SR$)
SR$7.45=	US$1
SR$1 =	US$0.13

FISCAL YEAR
January 1 – December 31

Regional Vice President:	Jorge Familiar Calderon
Country Director:	Tahseen Sayed Khan
Senior Global Practice Director:	Ede Jorge Ijjasz-Vasquez
Practice Manager:	Ming Zhang
Task Team Leader:	Sergio Dell'Anna

ABBREVIATIONS AND ACRONYMS

ACP-EU	African, Caribbean, and Pacific-European Union
AOI	Area of Influence
CPF	Country Partnership Framework
DA	Designated Account
DRM	Disaster Risk Management
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
FM	Financial Management
FRA	Flood Risk Assessment
FY	Financial Year
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GoS	Government of Suriname
GRS	Grievance Redress Service
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IFR	Interim Financial Report
MoF	Ministry of Finance
MoPWTC	Ministry of Public Works, Transport, and Communication
MoRD	Ministry of Regional Development
MoAAHF	Ministry of Agriculture, Animal Husbandry and Fisheries
PDO	Project Development Objective
PLR	Performance and Learning Review
PPSD	Project Procurement Strategy for Development
QCBS	Quality- and Cost-Based Selection
RPF	Resettlement Policy Framework
SCS	Saramacca Canal System
SCU	Saramacca Canal Unit
STEP	Systematic Tracking and Exchanges in Procurement
TA	Technical Assistance

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Suriname	Saramacca Canal System Rehabilitation Project	
Project ID	**Financing Instrument**	**Environmental Assessment Category**
P165973	Investment Project Financing	B-Partial Assessment

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-linked Indicators (DLIs)	[✓] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
14-Feb-2019	31-Dec-2024

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The PDO is to reduce flood risk for the people and assets in the greater Paramaribo area and improve the operation of the Saramacca Canal System.

Components

Component Name	Cost (US$, millions)
Improving the Drainage Infrastructure	29.00
Strengthening the Saramacca Canal System	3.00
Providing a Contingent Emergency Response	0.41
Supporting Project Management and Implementation	2.50

Organizations

Borrower:	Ministry of Finance (MoF)
Implementing Agency:	Ministry of Public Works, Transport and Communication (MoPWTC)

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	35.00
Total Financing	35.00
of which IBRD/IDA	35.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	35.00

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2019	2020	2021	2022	2023	2024
Annual	0.00	1.50	4.00	7.00	10.50	12.00
Cumulative	0.00	1.50	5.50	12.50	23.00	35.00

INSTITUTIONAL DATA

Practice Area (Lead)

Social, Urban, Rural and Resilience Global Practice

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?	
a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF	No
b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment	No
c. Include Indicators in results framework to monitor outcomes from actions identified in (b)	No

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	High
7. Environment and Social	Substantial
8. Stakeholders	Moderate
9. Other	Moderate
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03		✓
Natural Habitats OP/BP 4.04	✓	
Forests OP/BP 4.36		✓
Pest Management OP 4.09		✓
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50		✓
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Schedule 2, Section I, A,1: Institutional Arrangements: The Borrower, through the MoPWTC, shall establish, not later than two (2) months after the Effective Date, and thereafter operate and maintain at all times during Project implementation, a Project implementation unit (the “Saramacca Canal Unit”) with a structure, functions, responsibilities, staff and adequate resources, all satisfactory to the Bank.

Sections and Description

Schedule 2, Section I, A, 2: Institutional Arrangements: Not later than one year after the Effective Date, the Borrower, through the MoPWTC, shall: (a) establish, and thereafter operate and maintain throughout the implementation of
the Project, a Project Committee to be in charge of coordinating Project activities among the Borrower’s agencies and administrative authorities, and to inform stakeholders on Project activities and overall progress, with terms of

reference satisfactory to the Bank; and (b) organize the first meeting of the Project Committee.

Conditions

Type	Description
Effectiveness	The Borrower shall have adopted the Operations Manual in a form and manner acceptable to the Bank.

I. STRATEGIC CONTEXT

A. Country Context

1. **Suriname is an upper-middle-income country with a population of 542,000.**[1] It has abundant natural resources; however, as a Caribbean small state it has limited capacity. Suriname's economy is highly concentrated in the extractive industries (gold, oil, and bauxite), which play a dominant role in driving growth, employment, and government revenues while also exposing economic performance to commodity price fluctuations.[2] Historically, extractive industries have accounted for around 30 percent of gross domestic product (GDP) and as much as 90 percent of exports. Agriculture is also important in the economy, accounting for around 10 percent of GDP. GDP is projected to increase steadily during 2018–2020 due to steady expansion in the mining sector. Increasing diversification, especially in these two sectors, remains essential for Suriname to catalyze economic activity and increase resilience to exogenous shocks. Suriname recorded an average growth of 4.4 percent for 2000–2012. The per capita income rose to nearly US$9,350 in 2014, and poverty rates declined. However, when global commodity prices fell through the end of 2015, GDP contracted severely and income per capita fell to US$6,990 in 2016, raising poverty levels.

2. **There is no official measure of poverty, but estimates place the poverty rate around 26 percent in 2011**[3]**.** Analysis based on a multidimensional poverty index shows that rural dwellers in the interior of the country suffer much higher levels of deprivation of material goods and social services. There are also spatial and gender dimensions to poverty, which generally disfavor indigenous minorities and women. Suriname has an ethnically diverse population and one of the lowest population densities in the world, about 3.3 inhabitants per km^2 (although density is higher in urban areas).

3. **Suriname is one of the most vulnerable countries in the world to the impact of flooding.** Around 30 percent of Suriname is within a few meters above mean sea level. The country is prone to periodic flooding due to heavy rainfall, especially when combined with spring tides. Flooding is exacerbated by poor drainage in the relatively highly populated urban areas on the coast, such as the capital city of Paramaribo. In addition, the coastal zone is also susceptible to erosion and some parts are prone to coastal flooding as well. Approximately 87 percent of Suriname's population lives along the 386 km long coastal plain (around 67 percent in Paramaribo), and flooding affects most of the population and an estimated 90 percent of human activities. Reducing the country's vulnerability to both pluvial and coastal flooding is paramount to improving the country's economic sustainability and macro stability. A 2017 World Bank Technical Assistance (TA)[4] showed that reducing coastal and pluvial flood risk in the greater Paramaribo area will require a mix of structural and nonstructural interventions.

4. **Suriname's main disaster risks have been intensified by climate change.** Observed climate trends show that average annual temperatures have increased by 0.2°C since 1960 (an average rate of 0.05°C

[1] 2012 census.
[2] Country Partnership Framework (CPF) FY2015–2019 - Report No: 91238-SR and Performance and Learning Review (PLR) of the Country Partnership Strategy for FY15–FY19.
[3] Estimate based on Inter-American Development Bank (IDB) with Electricity Company of Suriname, the Central Bank of Suriname, and other partners who conducted a Survey of Living Conditions in 2016/2017.
[4] World Bank Paramaribo Strategic Flood Risk Assessment, November 2017, 154 pages, and World Bank Paramaribo Coastal Resilience Assessment, December 2017, 115 pages.

per decade) but will increase by about 1.5°C by the 2090s. The tropical climate brings the potential for extreme rainfall, and 200 mm of rain in 24 hours and intense downpours of up to 90 mm in one hour have been recorded. Flooding is therefore a frequent consequence of heavy rainfall. Long-term observed rainfall trends are unclear, with climate change projections for the 2090s varying between +40 percent and −65 percent.[5] However, although uncertainties exist due to the lack of data, climate change is likely to have a significant impact on Suriname, especially if the hydrological cycle intensifies, leading to more intense wet and dry periods. Estimates indicate that the sea level has risen about 10 cm since 1993, with climate model projections simulating sea level rises of up to 1 meter by the 2090s under the most extreme scenario.[6] Sea and river level rise and changes in wind pattern and intensity result in intensified wave impact on the shoreline, land loss due to inundation and flooding, salinity, and loss of biodiversity.

5. After a hiatus of nearly 30 years, the World Bank has established a renewed relationship with Suriname, with this project being Suriname's first Investment Project Financing Loan aimed at building Suriname's long-term resilience to shocks while meeting urgent financing needs.

B. Sectoral and Institutional Context

Sectoral Context

6. **The socioeconomic impact of past floods in Suriname has been significant.** The major floods that afflicted Suriname in 2006 and 2008 highlighted the population's vulnerability to adverse natural shocks. In both instances, flooding severely affected the coastal region, which includes Paramaribo, where the bulk of Suriname's population lives and where most of the country's physical assets are concentrated. An assessment of the socioeconomic impact of the May 2006 floods (carried out by the United Nations Economic Commission for Latin America and the Caribbean [ECLAC])[7] shows that in a few days 2.3 percent of GDP was lost due to the floods, with the largest proportion of damage reported in the education and agricultural sectors (45 percent and 39 percent, respectively).

7. **Flooding in the Paramaribo area is a frequent occurrence, associated with heavy rainfall and inadequate drainage.** Although it is less frequent, coastal flooding linked with high tides and strong winds is increasing. Paramaribo is located on a low-lying coastal plain next to the Suriname River, approximately 10 km from the Atlantic coast. The city is generally flat, ranging from less than 1 m to 2 m above sea level. The old historic part of the city developed along higher sandy areas close to the river, while the surrounding lower land was occupied by plantations and was drained using a network of canals and sluices. Since then, constrained by the Suriname River to the East, the city has expanded westward, southward, and to the north, occupying land formerly used for agriculture. The majority of greater Paramaribo therefore relies on an extensive network of canals for stormwater drainage, which was not designed for urban use. These canals drain the central and southern parts of the city toward the Saramacca Canal, a large historic navigation waterway that runs from east to west joining the Suriname River to the Saramacca River, while the northern part has a series of canals draining stormwater directly to the ocean. Localized flooding occurs across the greater Paramaribo area several times per year and

[5] McSweeney, C., M. New, and G. Lizcano. 2010. *UNDP Climate Change Country Profiles: Suriname*. http://country-profiles.geog.ox.ac.uk/.
[6] Dasgupta, S., B. Laplante, C. Meisner, D. Wheeler, and J. Yan. 2009. "The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis." *Climate Change* 93: 379–388. doi:10.1007/s10584-008-9499-5.
[7] ECLAC. 2007. *Suriname: The Impact of the Floods on Sustainable Livelihoods*.

floodwaters can remain for several weeks due to the lack of capacity of the drainage system to drain the water efficiently.

8. **The Government of Suriname (GoS) commissioned various studies to develop mitigation strategies against flood risk.** The 2001 Master Plan for the Drainage of Greater Paramaribo[8] and the 2010 Integrated Coastal Zone Management (ICZM)[9] plan recommended various physical interventions and institutional and regulatory actions to reduce flood risk. These identified coastal erosion and protection, destruction of mangroves, unplanned or inappropriate spatial development, and inadequate drainage of residential areas as the most urgent problems along the coast. Recommendations included developing a national disaster risk management (DRM) policy to address climate change adaptation, developing an early warning system, carrying out a flood risk reduction assessment, and instituting an emergency response plan. However, neither plan has yet been systematically or fully implemented, due in part to lack of funding.

9. **The need to reduce flood risk is embodied in the national strategy.** Suriname's 2012–2016 National Development Plan includes an investment plan for each of the country's five national priorities (good governance, economic diversification, social development, education, and natural resource management). One of the specific objectives of the plan is to strengthen DRM and catastrophe risk insurance to lessen the impact of floods and other climatic shocks. The World Bank has supported the Government in its efforts to better understand the risk of flooding and to undertake informed risk reduction measures. Between 2016 and 2017, a World Bank TA, supported by the African, Caribbean, and Pacific-European Union (ACP-EU) Natural Disaster Risk Reduction Program, in partnership with the Global Facility for Disaster Reduction and Recovery (GFDRR) and the GoS, conducted a Strategic Flood Risk Assessment (FRA) for the greater Paramaribo area and a Coastal Resilience Assessment.[10]

10. **The FRA supported the GoS to prioritize targeted flood risk reduction interventions.** Strategic flood hazard modeling was carried out to assess flood depth and extent for a range of rainfall and tidal scenarios in the greater Paramaribo area, and a high-level options appraisal was undertaken for evaluating mitigation proposals. Exposure and vulnerability were quantified using annual average damages and a cost-benefit analysis was then carried out to determine viable flood mitigation options. These studies led to the development of an evidence-based, prioritized list of targeted flood reduction investments comprising 14 structural and nonstructural flood risk interventions to reduce pluvial flooding in the greater Paramaribo area. The preliminary cost-benefit analysis found that the most beneficial, strategic, and sustainable flood mitigation options included improvements to the Saramacca Canal, a key element of the drainage system for the central and western areas of Paramaribo.

11. **The 25 km long Saramacca Canal links the Suriname River to the Saramacca River.** The use of this transport route dates back several centuries and it was originally used by small vessels traveling on existing creeks with open connections at both rivers. Because of continuous sedimentation problems, it was revamped in the early 1900s into a canal with sluices at both ends. The most recent major rehabilitation was carried out in the 1950s to further stimulate vessel (water) transport inland and improve drainage. Aside from its drainage function, the canal also has a major irrigation function for parts

[8] Executive Summary, *Masterplan Ontwatering Groot Paramaribo, Ministrie van Openbare Werken*, Project UPO 08 - SR/002214 prepared by DHV-WLDelft-AMI-Sunecon, June 15, 2001.
[9] ICZM Plan Suriname: Coastal Morphodynamics Report prepared by Lievense Deltares, October 2009.
[10] World Bank Paramaribo Strategic Flood Risk Assessment, November 2017, 154 pages, and World Bank Paramaribo Coastal Resilience Assessment, December 2017, 115 pages.

of Paramaribo, Wanica, and Saramacca. These multiple uses make optimizing water levels in the canal challenging.

12. **As the city has grown over the last century, the role of the Saramacca Canal has become ever more important in the drainage of rainwater from an area of approximately 190 km^2, with approximately 70 km^2 from the more heavily urbanized city areas and 120 km^2 from the less densely populated or rural areas.** The majority of the network drains under gravity through the interconnected canal system that runs along the side of most roads; however, during a significant rainfall event, this network capacity can be overwhelmed, and flooding occurs with inundation of roads and roadside properties. The relatively poor condition of the general canal network—primary (the Saramacca Canal), secondary, and tertiary levels—that drains the city and the surrounding area is also considered a major factor in determining the occurrence and severity of flooding, and the system requires maintenance and investment. Solid waste is collected regularly and rarely finds its way into the drainage system.

13. **The results of the FRA have shown that flood risk has been increased by several factors**. The most relevant issues are as follows:

(a) Expansion of the urban area from its original historic center on relatively elevated land to low-lying formerly agricultural land throughout the last century (drainage of this land has always been poor but was generally considered acceptable for the intended agricultural purposes).[11]

(b) An inadequate and poorly maintained drainage system, particularly the Saramacca Canal, and the secondary and tertiary canals. These canals are gradually silting up and becoming less efficient and are therefore prevented from operating as a fully integrated system.

14. **Unplanned urban growth could contribute to the creation of future flood risk.** A preliminary review of the current urbanization patterns toward the south and west of Paramaribo indicates that the Saramacca Canal System (SCS) would quickly run out of capacity, if the new urban expansion had to be drained through Saramacca Canal. The current unplanned model of urban expansion consists of (a) unplanned incremental low-density sprawl in low-lying areas, with land parcels that follow the original agricultural subdivision of paddy fields; (b) lack of integrated planning of the drainage system for the new urban areas and the addition of secondary and tertiary canals, as well as stormwater drains, as an afterthought; and (c) unclear/uncodified classification of some types of small canals that are not maintained by any agency.

15. **Critical infrastructure, particularly the sluices and locks on both sides of the Saramacca Canal, has deteriorated.** These allow drainage of water into the Suriname and Saramacca Rivers twice a day (in low tide condition only for about a few hours) but are functioning only at around 40 percent of their capacity.[12] There is a high risk that they will not be functioning at all in a few years because of the following:

[11] *Masterplan Ontwatering Groot Paramaribo, Ministrie van Openbare Werken*, Project UPO 08 - SR/002214 prepared by DHV-WLDelft-AMI-Sunecon, June 15, 2001.

[12] Only 38 percent current working capacity based on the average of (a) Suriname River side (i) one working lock gate out of two (that is, 50 percent operational capacity) and (ii) three working sluice gates out of five (that is, 60 percent operational capacity) and (b) Saramacca River side (i) one working lock gate out of two (that is, 50 percent operational capacity) and (ii) zero working

(a) Increase in extreme and intense rainfall. The flood hazard mechanism associated with extreme rainfall is principally attributed to the intensity of the rainfall, the largely clayey soils restricting infiltration, and the lack of gradient causing ponding of water.

(b) Lack of a flood forecasting and warning system compounds the risk of severe flooding in the greater Paramaribo area.

16. To directly address these challenges and based on the recommendations of the FRA, this project will upgrade specific critical drainage infrastructure, improve drainage in the Saramacca Canal and targeted secondary or tertiary systems, and develop an asset management platform.

Institutional Context

17. **Suriname is a small state with limited institutional capacity.** The project is Suriname's first investment project financed by the World Bank in over 30 years and the implementing agency, the Ministry of Public Works, Transport, and Communication (MoPWTC), has not implemented projects of this size and complexity previously so there is limited knowledge and capacity for project implementation, including procurement, financial management (FM), safeguards, monitoring and evaluation. Nevertheless, the MoPWTC has demonstrated its commitment to the project by enthusiastically participating in project preparation and committing its own funds for key investigation areas. The World Bank has committed to support the MoPWTC throughout the project in particular helping build capacity and ensure the project is carried out within the agreed time frame and parameters.

18. **The MoPWTC is the main institution with a mandate to play a role in reducing flood risk.** It has the responsibility for the operation and maintenance of the drainage system, the hydrological service, and the meteorological service. The MoPWTC consists of four directorates: (a) Civil Engineering, (b) Construction Works and Spatial Planning, (c) Public Green Spaces, and (d) Development Projects. The Civil Engineering Directorate deals with the maintenance and repair of the primary, secondary, and tertiary drainage systems in greater Paramaribo and parts of nearby districts. The remainder of the network falls under the auspices of the Ministry of Regional Development (MoRD) and the Ministry of Agriculture, Animal Husbandry and Fisheries (MoAAHF). The MoPWTC also has the institutional mandate for scientific investigation of matters related to drainage and soil properties, including the monitoring of water quality. Its additional duties include the construction, maintenance, and repair of all drainage structures, roads, bridges, and traffic infrastructure. The Directorate for Construction Works and Spatial Planning carries out construction work for other ministries and has an advisory role in terms of flood risk. The Directorate for Public Green Spaces deals with environmental management, including the maintenance and development of public green areas and the cleaning of drainage systems. The Directorate for Development Projects, led by the Director of the Civil Engineering Directorate, is responsible for monitoring the various MoPWTC projects, maintaining and developing a communication strategy with local stakeholders, and preparing the spatial planning policy.

19. **The MoRD is charged with regional governance, decentralization, and the development of the interior.** In particular, it handles the improvement of water management systems in agricultural areas through a targeted water board policy and is responsible for secondary and tertiary drainage systems throughout Suriname, with the exception of the areas covered by MoPWTC. The emergency assistance

sluice gates out of four (that is, 0 percent operational capacity).

service is coordinated by the National Coordination Center for Disaster Preparedness under the auspices of the Office of the President.

C. Relevance to Higher Level Objectives

20. **The proposed project is aligned with the World Bank Group's Country Partnership Framework (CPF) for Suriname for FY2015–2019[13] and the Performance and Learning Review (PLR) of the Country Partnership Strategy (CPS) for FY15–FY19.[14]** Recognizing the country's priority areas of improving the investment climate and building protection from floods, the World Bank Group developed in FY15 the very first CPS for Suriname after a hiatus of almost 30 years aiming to promote a more sustainable, inclusive, and diversified growth model by: (a) creating a conducive environment for private sector development; and (b) supporting better flood risk management to minimize related human, economic, and financial losses and reduce the vulnerability to climate change. Following the serious economic downturn of 2015, the lending program was reassessed, and a Development Policy Lending program was developed with an emphasis on improving fiscal management and investment climate. However, as the economy began to stabilize by 2017, the flood risk management lending program noted in the CPS again became a Government priority and the CPS was extended to 2021. The project is therefore Suriname's first Investment Project Financing with the World Bank following the 30-year hiatus. The proposed flood risk management project is fully consistent with the current CPF, which identifies reduction in vulnerability to climate change-related floods as one of its two pillars and the improvement of flood risk management in Paramaribo as the main associated result.

21. **The World Bank Group's twin goals of ending extreme poverty and promoting shared prosperity are closely related to the targets of the GoS for reducing flood risks.** Floods directly affect and worsen the socioeconomic conditions of all communities and citizens, particularly those who are more vulnerable and exposed. Poorer communities are often more vulnerable, and therefore their assets (houses or small businesses) are more likely to be affected by a disaster, particularly floods, for an extended period. This compromises their capacity to recover after a disaster and their opportunities for a more resilient and sustainable growth. On a larger scale, building more resilient communities allows the Government to shift resources from response to sustainable development.

22. **The proposed project supports the GoS' DRM objectives, in particular those related to enhancing resilience through flood risk management and climate change priorities.** Both the current[15] and previous Suriname Development Plans focus on adaptation, and a task force has been established within the Office of the President to inform adaptation strategies.[16] One of the specific objectives of the plan is to strengthen DRM and catastrophe risk insurance to lessen the impact of floods and other climate shocks. The project is fully in line with the recommendations of the 2001 Master Plan for the Drainage of greater Paramaribo[17] and the 2010 ICZM.[18] It directly implements the results of the recent World Bank TA

[13] April 27, 2015: World Bank's Country Partnership Framework (CPF) FY2015–2019 - Report No: 91238-SR and Performance and Learning Review (PLR) of the Country Partnership Strategy for FY15–FY19.
[14] October 22, 2018: World Bank's Performance and Learning Review of the Country Partnership Strategy for Suriname FY2015–2019 - Report No: 129919-SR.
[15] Republic of Suriname Development Plan (Ontwikkelingsplan) 2012–2016 (February 2012).
[16] Suriname Second National Communication to the United Nations Framework Convention on Climate Change, February 2013.
[17] Executive Summary, *Masterplan Ontwatering Groot Paramaribo, Ministrie van Openbare Werken*, Project UPO 08 - SR/002214 prepared by DHV-WLDelft-AMI-Sunecon, June 15, 2001.
[18] ICZM Plan Suriname: Coastal Morphodynamics Report prepared by Lievense Deltares, October 2009.

and will help in reducing exposure to flood hazards and improve flood risk management interventions. The proposed project also supports the GoS' current strategy to restrict heavy load road usage and encourage water transport and navigation.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

23. The Project Development Objective (PDO) is to reduce flood risk for the people and assets in the greater Paramaribo area and improve the operation of the Saramacca Canal System.

PDO-Level Indicators

24. **The project area that will benefit from reduced flood risk (the greater Paramaribo area) comprises the Saramacca Canal drainage area, including some areas of the Paramaribo, Wanica, and Saramacca Districts.** The PDO-level indicators to measure the achievement of the PDO are as follows:

(a) Number of people benefitting from reduced flood risk for a 10-year[19] return period, disaggregated by gender

(b) Introduction of a risk-based maintenance system for the drainage of the Saramacca Canal System

(c) Increased flood forecast lead time for the Saramacca Canal System

25. Section VI contains the complete Results Framework, including PDO-level indicators and intermediate results indicators by component, along with the corresponding baselines, intermediate, and end-of-project targets.

B. Project Components

26. **The project aims to finance structural and nonstructural measures to improve the resilience against flooding in the greater Paramaribo area at a total cost of US$35 million.** The structural measures will primarily improve the ability of the Saramacca Canal to discharge water efficiently and safely while allowing and improving vessel transport. The nonstructural measures will strengthen the GoS' capacity to manage and operate the Saramacca Canal drainage system as a whole. The project will finance four components.

[19] A 10-year return period has been selected as this represents a relatively frequent event often used for this analysis and the people will therefore be more aware of the benefits of the intervention.

Component 1: Improving the Drainage Infrastructure (US$29.0 million)

27. **Component 1 deals with structural flood management measures.** This component will finance (a) rehabilitation of the sluices and locks and canal re-profiling and clearing and (b) pilot interventions on selected critical secondary and tertiary canals.

Subcomponent 1.1: Rehabilitation of Sluices and Locks and Canal Re-profiling and Clearing (US$21.5 million)

28. **Rehabilitation of sluices and locks.** The project will finance the rehabilitation of two ship locks at the outlets of the Saramacca and Suriname Rivers, as well as the five-door sluice gate at the outlet to the Suriname River and the four-door sluice gate at the outlet to the Saramacca River. These structures, which are the primary outlets of the Saramacca Canal drainage system, are only partially operational. They limit the capacity to manage the water level in the Saramacca Canal, a problem compounded by inadequate closure of the sluices causing leakage of salt water from the adjoining Suriname River into the Saramacca Canal. Further deterioration of the locks and gates, and ultimately the complete failure of these structures, will result in a dysfunctional drainage system with increased flooding and impact on the city of Paramaribo.

29. **Canal re-profiling and clearing.** The Saramacca Canal will be re-profiled and cleared to remove the earth fill and to increase the navigation capacity of the canal and eliminate hydraulic restrictions. This will not include widening of the canal beyond the space currently available; however, sediment will be cleared from the outlets of the secondary canals where they join the Saramacca Canal (up to an approximate distance of 250 m) to improve conveyance of water from the secondary system into the primary. This will help ensure that in future the system will still be able to drain sufficient water toward the primary outlets, especially if more urban areas are developed within the system. This activity will also finance the establishment of one or more sediment disposal areas for management of the dredged material. Nonpolluted sediments will be processed for reuse, and polluted sediments will be disposed of to a designated location in accordance with environmental safeguards procedures.

Subcomponent 1.2: Pilot Interventions on Selected Critical Secondary and Tertiary Canals (US$7.5 million)

30. Sensitivity analyses of flood mitigation interventions have shown that the secondary and tertiary drainage systems are important elements of the urban drainage system, but several issues act to impede local drainage. The project will select one or two priority flood-prone sections of the urban secondary or tertiary drainage channels feeding the Saramacca Canal as pilot areas to trial a selection of local flood management solutions. The pilot areas will be identified using a set of selection criteria (such as flood duration, frequency, or impact) that will be defined during the project implementation.

31. The pilot interventions may be structural (such as removing or relocating hydraulic restrictions or building additional drainage channels) or nonstructural (such as introducing regular canal clearing schedules monitored by the community, promoting cleaning campaigns, or encouraging the removal of solid waste from the canals). Green solutions may also be trialed to remove pollution, such as introducing flood retention areas (ponds or wetlands) with recreational amenities, establishing green corridor parks, and introducing permeable paving to encourage infiltration or bioretention areas with enhanced

vegetation and filtration. These works can serve as an example for other best practice interventions elsewhere in the drainage system.

32. **A communication strategy will be developed to ensure that local stakeholders—users and beneficiaries of the project—are informed of project activities and are able to engage fully with the process.** Several public information events will be held to disseminate information to stakeholders on the status of the works and to receive feedback.

Component 2: Strengthening the Saramacca Canal System (US$3.0 million)

33. **Component 2 deals with nonstructural flood management measures.** This component will finance TA for updating of norms and guidelines for drainage management, drainage infrastructure asset management platform, and institutional support for a possible SCS platform.

Subcomponent 2.1: Updating of norms and guidelines for drainage management (US$1.3 million)

34. **This subcomponent will update parts of the 2001 Drainage Master Plan and develop and update guidelines and recommendations for planning and managing the Saramacca Canal drainage area efficiently, including drainage design standards and norms/regulations.** The Drainage Management Plan will be based on and update parts of the 2001 Drainage Master Plan to include recent infrastructure and urban developments. It will also contribute to activities financed by the IDB to develop a city-level plan to build climate resilience in the city in line with a long-term adaptation process (Urban Investments for the Resilience of Paramaribo Project). It will include an infrastructure and management plan that addresses flood control/property protection, with consideration for nature-based flood management solutions, river and canal habitat, water quality, and potential for recreational/public uses. Flood risk, hazard maps, and other data will be shared with relevant ministries to inform land use planning strategies within the greater Paramaribo area.

Subcomponent 2.2: Drainage Infrastructure Asset Management Platform (US$1.5 million)

35. An asset management platform for operational management of the Saramacca Canal will be established to ensure optimization of the canal water levels for flood control, navigation, and irrigation purposes during the day-to-day operation of the system, taking into account short-lived, intense rainfall events and longer-term seasonal wet and dry cycles. The operational management and monitoring platform will ensure prioritization of functions (flood control, navigation, and irrigation) based on a flood and drought forecasting system. The platform will also define regular monitoring and maintenance activities such as ‘flushing’ of the canal, whereby water is accumulated in the channel and is allowed to disperse rapidly out of the sluices at low tide, clearing floating vegetation and accumulated sediment to allow obstruction-free navigation.

36. **Priority will be given to drainage and flood control functions; however, the system will also be optimized to allow navigation.** Currently, navigation is only possible for about two hours per day due to the partial functioning of the two ship locks, and only industries that line the Saramacca Canal to the east near the Suriname River use the canal for navigation. Sand, gravel, and timber industries transport their goods using barges from the Suriname River a few kilometers inland to their docks on the Saramacca Canal but are restricted from carrying goods further by the non-navigable state of the canal. After the project, navigation will be possible during daylight hours; however, for safety reasons the lock gates will not be

operated at night. The opening of the canal for navigation will also reestablish this part of the inland water route from Paramaribo to Nickerie (at the border with Guyana), allowing vessel and goods transport along the entire length of the canal, thereby potentially increasing vessel transport. Taking into account tidal data, the amount and type of vessel traffic, and one-way vessel traffic with passing points, the system will ensure efficient vessel transport over daylight hours. Sufficient water will be maintained in the canal in the dry season to allow vessel transport and water extraction near the Saramacca River for irrigation purposes.

37. **To support the real-time management of the SCS for drainage and flood control, the hydromet data management system will be strengthened and a flood forecasting service will be developed.** The existing hydromet instrumentation will be expanded to provide real-time observations of weather variables and water levels in the Saramacca Canal and the main secondary canals. Additional tidal gauges will be installed to monitor the water levels of Suriname and Saramacca Rivers near the Saramacca Canal. A flood forecasting system for Paramaribo and the surrounding areas will be developed, which will be driven by the existing weather radar, coupled with the existing and proposed automated rain gauge network, and new and existing tide and water-level gauges, based on a digitized inventory of existing drainage and hydromet infrastructure. All available data will be assimilated into a suitable data management platform and used to develop a real-time operational model for the Saramacca Canal.

Subcomponent 2.3: Institutional Support for a Possible Saramacca Canal System Platform (US$0.2 million)

38. **This subcomponent will finance a feasibility study for a possible SCS platform, composed of various stakeholders for the operation and sustainability of the canal.** The study will review the requirements for managing the drainage infrastructure asset management system set up under Subcomponent 2.1, explore options for setting up and running a steering committee or management platform, and review the recommendations of the 2001 Master Plan for the establishment of a drainage authority. The platform (or similar institution) will be responsible for ensuring the sustainability of the drainage system and the day-to-day operational management of the Saramacca Canal. This subcomponent will also explore cost recovery mechanisms, which may include the introduction of navigation tariffs to ensure the financial sustainability of the system.

39. **The MoPWTC, with support from the MoRD and MoAFL, is responsible for the operation and maintenance of the drainage system, but a few other agencies also have related roles and responsibilities.** Therefore, this subcomponent will also review organizational roles and responsibilities related to drainage and irrigation in the greater Paramaribo area and the communication and cooperation procedures between the various agencies.

Component 3: Providing a Contingent Emergency Response (US$0.41 million)

40. **This component will finance the implementation of emergency works, rehabilitation, and associated assessments in the event of a natural disaster.** The project Operations Manual will include a dedicated chapter with detailed guidelines and instructions to trigger an emergency and the use of funds. In addition, in the Environmental and Social Management Plan (ESMP), a screening framework will be prepared for the potential types of activities likely to be financed under this component along with a preliminary evaluation of the potential risks and corresponding mitigation measures.

Component 4: Supporting Project Management and Implementation (US$2.5 million)

41. This component will finance the costs related to the overall project management and implementation support, including (a) Operating costs (including staff costs and support for training on areas such as procurement, safeguards, monitoring and evaluation, technical and financial management); (b) Individual experts (including hiring specialized staff for project implementation as needed); (c) Project audit (including financial reporting); (d) Monitoring and evaluation (including the collection of socioeconomic data and support for environmental and social safeguard supervision); (e) Equipment (vehicles, furniture, and information and communication technology); and (f) Communication plan (including support for the development of a communications strategy for engaging with local communities and stakeholders).

Table 1. Project Components and Amounts, US$

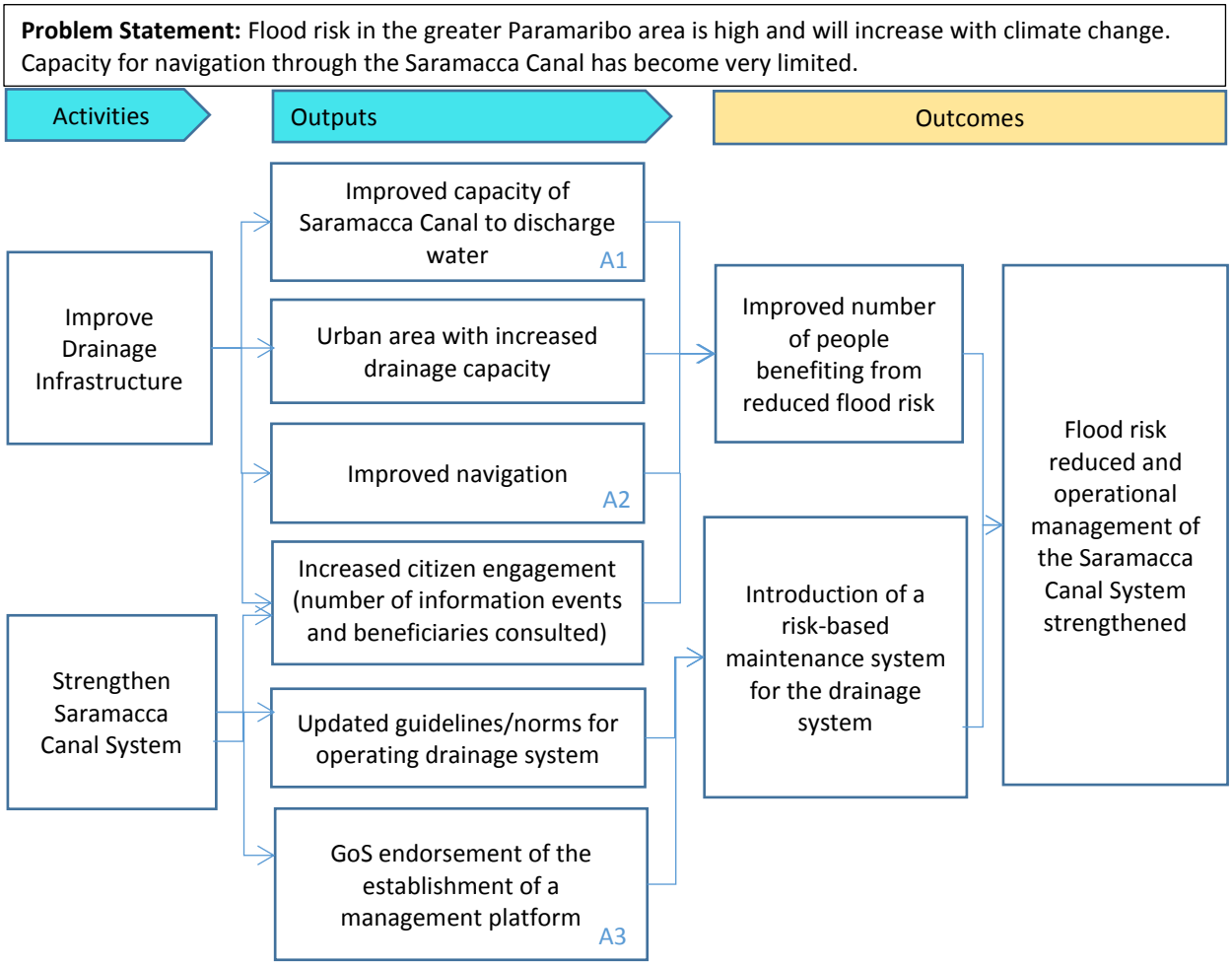
Component Name	Component Amount (US$)
Improving the Drainage Infrastructure	29,000,000
Strengthening the Saramacca Canal System	3,000,000
Providing a Contingent Emergency Response	412,500
Supporting Project Management and Implementation	2,500,000
Front-End Fee out of the loan proceeds (capitalized)	87,500
Total Loan Amount	**35,000,000**

C. Project Beneficiaries

42. **Project beneficiaries are estimated at 357,000, of which 178,500 are women; 57,000 people for the structural interventions (Component 1), of which 50 percent are women; and 300,000 for the nonstructural measures (Component 2), of which 50 percent are women.** The project will reduce flood risk for the majority of the population of Suriname who reside in the greater Paramaribo area and will benefit home owners, industries, businesses, and road users. Clearing the outlets of the secondary canals will ensure that poorer local communities living in vulnerable settlements in the more central and western areas of the canal also benefit from reduced flood risk. The pilot interventions for flood risk reduction in areas along the secondary or tertiary drainage system will particularly benefit local urban communities by reducing the amount of time flood waters inundate property and businesses and restrict access.

43. **Clearing and re-profiling the Saramacca Canal will reopen the canal for navigation and allow small and large (8 m wide) vessel transport throughout the 25 km length of the canal** and will particularly benefit existing industries lining the canal in the east (mostly sand, gravel, and timber, and fish-processing and chemical industries).

D. Results Chain



Critical Assumptions:

- A1 - Saramacca Canal is, and continues to be, a key element of the drainage system.
- A2 - Navigation is wanted/needed.
- A3 - The Government supports the concept of a management platform.

E. Rationale for Bank Involvement and Role of Partners

44. **After a 30-year hiatus, the GoS and the World Bank have established a renewed relationship.** The Strategic FRA for the greater Paramaribo area, prepared under a World Bank-GFDRR TA, supported by the ACP-EU in partnership with the GoS, identified the causes of flooding in Paramaribo, both pluvial and coastal flooding, and formulated an evidence-based, prioritized list of targeted flood reduction investments comprising 14 structural and nonstructural flood risk interventions. The proposed project builds on the foundation established under the TA. A new World Bank ACP-EU TA—the Paramaribo Climate Resilience Flood Management TA—has been initiated in 2018 in partnership with the GFDRR to support the GoS' efforts to implement and initiate new investments in flood mitigation focusing on the Saramacca Canal, identified as one of the priorities by the Paramaribo Strategic FRA study.

45. Based on its experience worldwide (see section below) the World Bank has a comparative advantage in sharing lessons and good practices in flood management and institutional strengthening. The project will provide adequate focus for financing structural and nonstructural measures, including operations and maintenance arrangements on completion. The World Bank safeguards policies will ensure that social and environmental aspects are addressed appropriately before and during implementation and thereafter during operation.

46. **The project is consistent with and complements the objectives of various DRM projects and initiatives in Suriname funded by other development partners.** The proposed project is in line with the Joint European Union (EU)-Caribbean Partnership Strategy (2012), which commits to foster cooperation in a number of areas, including climate change and natural disasters. It supports the EU-funded US$3 million Suriname Global Climate Change Alliance+ Project implemented by the United Nations Development Programme, which aims to mainstream climate change into poverty reduction development strategies and supports adaptation building and the design of the National Adaptation Programs of Action. The IDB, with financing from the Adaptation Fund, is preparing an investment for US$9 million, the Urban Investments for the Resilience of Paramaribo, to be implemented by the MoPWTC. The proposed IDB-financed project will be complementary to this World Bank-supported project and will cover an area outside of the catchment area of the Saramacca Canal.

F. Lessons Learned and Reflected in the Project Design

47. This project builds on the TA activities conducted by the World Bank since 2016 and on global experience. It incorporates lessons learned from flood risk management investments in Georgetown, Guyana; Metro Colombo, Sri Lanka; and Dar es Salaam, Tanzania, among others.

48. **Sound flood risk management data and information is essential to ensure the quality of flood management infrastructure, as well as overall monitoring, planning, and sustainability of the drainage system.** Detailed aerial surveys of the project area will be conducted, using LiDAR technology and orthophotography, as part of the project to produce a high-resolution terrain elevation model and topographic maps necessary to further understand the Saramacca Canal drainage system. The project will also make use of hydrological monitoring instruments in the Saramacca Canal to conduct ground-based surveys necessary for the design of flood management infrastructure works, as well as the development of the overall monitoring system.

49. **An overarching lesson learned from cities around the world is that flood management considerations should inform urban planning to prevent the creation of future risk.** International experience shows that urban sprawl is seen as a low-cost or even profitable option at first, as it utilizes the least valuable land for urban expansion and/or generates revenues through sale/lease of public land. However, urban sprawl also creates future costs for service provision, including for drainage, particularly if sprawl occurs organically. Given the flood-prone location and climate characteristics of Paramaribo, it is imperative that drainage and flood management are planned ahead of urban expansion to inform/lead urban development and land use, rather than the other way around. For example, in a similar project in Colombo (Sri Lanka)[20] the drainage master plan included the protection of urban wetlands as an integral element of the flood management system. Coordination with the Ministry of Spatial Planning would ensure that future master plans for Paramaribo embed flood management measures, including nature-based and green drainage solutions, which have proven to be international best practice to provide multiple co-benefits in addition to flood management, for example, conservation of biodiversity, recreation and tourism, climate change mitigation, and livelihood support.

50. **Many urban flood risk management projects focus only on infrastructure; however, infrastructure alone is insufficient to reduce flood risk in a sustainable manner.** For this reason, the project emphasizes monitoring, planning, and maintenance. In addition to infrastructure investments, the project will finance nonstructural measures: (a) the updating of norms and guidelines for drainage management; and (b) the development of a drainage infrastructure asset management platform, which includes flood forecasting and the strengthening of the hydromet data management system.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

51. **Project implementation will be the responsibility of the MoPWTC, which is responsible for managing and maintaining the primary and secondary drainage canals in the greater Paramaribo area, including the Saramacca Canal.** A dedicated Saramacca Canal Unit (SCU) will be established within the MoPWTC to administer the project and report on fiduciary matters, safeguards, and overall project progress to the Ministry of Finance (MoF) and the World Bank. The SCU will respond directly to the Permanent Secretary and will comprise a combination of MoPWTC staff dedicated to the unit, supported by consultants hired by the MoPWTC to perform specialized functions, such as procurement.

52. **A Project Committee will be created at the beginning of implementation to coordinate project activities among government agencies and administrative authorities as well as to inform stakeholders on project activities and overall progress.** The committee will be chaired by the MoPWTC and will meet regularly for coordination and communication among relevant agencies. These include the relevant structures of the MoPWTC, including the drainage, planning, and hydromet units; MoAAHF; MoRD; MoF; Ministry of Natural Resources; Civil Defense; and the districts of Paramaribo, Wanica, and Saramacca. The objectives, structure, and functions of the Project Committee are outlined in the project's Operations Manual.

[20] Metro Colombo Urban Development Project (P122735)

B. Results Monitoring and Evaluation Arrangements

53. **The GoS will prepare biannual progress reports in accordance with the format outlined in the Operations Manual.** The progress report will cover (a) physical and financial progress achieved against agreed indicators (presented in section VI); (b) issues and problem areas, including remedial actions; and (c) work programs and cost estimates for the coming year, including revised estimates for the current period. The SCU will be responsible for overall monitoring, including the implementation and impact of various components and environmental and social safeguards.

C. Sustainability

54. **Regular maintenance of the system is indispensable to ensure long-term sustainability of the rehabilitated sluices and locks on the Saramacca Canal.** Project investments will initially reduce the annual contingent liability posed by flooding and thereby reduce the fiscal burden on the GoS. However, maintenance costs will increase during the lifetime of the investments and grow over time. The GoS will explore if the annual budget for maintenance can be spent more effectively through the development of a risk-based maintenance program; the development of a risk-based maintenance program for the rehabilitated sluices and locks is a part of Subcomponent 1.1. A secondary (new) revenue source is the feasibility of introducing tariffs for navigation, which can then be utilized for the maintenance of the system. The detailed operational management for vessel transport between the Suriname and Saramacca Rivers and revenue-raising activities are part of Subcomponent 2.3.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic, and Financial Analysis

Technical

55. **The proposed flood risk reduction investments and the nonstructural measures proposed under the project build on the results from a series of technical and hydrological studies and plans** developed by the GoS[21] and more recent World Bank studies, including the strategy-level FRA. As part of project preparation, an additional, more focused hydrological analysis was conducted to explore the sensitivity of the Saramacca Canal drainage system to different scenarios. These include detailed hydrological and hydrodynamic modeling, which was carried out with an upgraded one-dimensional model from the 2001 Master Plan Study and reflects the physical characteristics and operational rules of the Saramacca Canal drainage system, and analysis of rainfall events with different return periods for with-project and without-project scenarios. These results have been converted into two-dimensional flood maps, using a Digital Elevation Model of the city, and have then been applied to define the impact on the affected population and economic damage.

56. **Detailed modeling supports the project's primary structural works.** The hydrological and hydraulic modeling analyses show that the current bottlenecks of the drainage system during a rainfall event are a potential failure of the two sluice and gate systems located at either end of the Saramacca Canal and the limited capacity of the secondary and tertiary drainage system to store and drain water

[21] The 2001 Master Plan for the Drainage of Greater Paramaribo and the 2010 ICZM.

efficiently. The capacity of the Saramacca Canal itself appears to be of secondary importance with respect to flooding issues. Re-profiling and clearing is required to enhance the navigational capacity of the canal. The analysis shows that the overall expected impact of the proposed project interventions is a reduction in flood depth and a reduction of flood occurrence in the Saramacca Canal drainage system area.

57. **Options for investing in selected critical secondary or tertiary urban sub-catchment pilot areas will be designed based on technology and methods that are well known in the sector and from other World Bank flood risk management projects.** Urban flood management pilot interventions will be designed to correspond to local conditions and are being identified based on on-site visits, stakeholder discussions, multicriteria analysis, and modeling. Institutional strengthening activities under Component 2 are based on the capacity, data, and modeling needs of the MoPWTC that were identified during project preparation.

58. **Climate change co-benefits.** Climate change adaptation considerations are explicitly integrated in all activities of the project, representing an estimated 52 percent climate change co-benefits. Infrastructure investments and institutional strengthening activities such as the rehabilitation of the Saramacca Canal sluices and locks and canal re-profiling and clearing, pilot interventions on selected critical secondary and tertiary canals, technical assistance for updating of norms and guidelines for drainage management, a drainage infrastructure asset management platform are aimed at building resilience to disasters, thus directly enhancing the country's capacity to adapt to climate change.

Economic and Financial Analysis

59. **The project will have a positive impact on economic development in the greater Paramaribo area.** The results of the economic analysis show that the expected benefits justify the estimated costs. A cost-benefit analysis was carried out under the averted damage approach to measure the benefits and the net impact on the economic development of the greater Paramaribo area. The analysis compared with-project and without-project scenarios. The flow of costs and benefits was discounted for a period of 15 years at 6 percent discount rate. The primary sources of information were the hydraulic model developed during project preparation, the 2017 FRA[22] conducted by the World Bank for greater Paramaribo, the knowledge and experience of national and international team members, and statistics published by the GoS.

60. **The results of the economic analysis show that the project would generate benefits of about twice its costs.** The net benefit is expected to be US$29.6 million, with an economic rate of return of 16 percent. Sensitivity analysis shows that the project would still show positive results with either cost overruns of up to 90 percent or project delays of as much as five years. Given the uncertainty of the occurrence of flood events and associated damages, a Monte Carlo simulation was conducted to confirm that the calculation of the rate of return was robust. The results of the Monte Carlo simulation indicate an expected economic internal rate of return of the planned interventions to be 9.6 percent and an expected net present value of about US$11 million. Overall, the probability that the project is economically viable is 91 percent.

[22] World Bank Paramaribo Strategic Flood Risk Assessment, November 2017, 154 pages.

61. **The soft component, which includes flood forecasting and strengthening of the hydromet data management system, was evaluated using the benchmarking technique.** Results show that benefits would be between US$0.1 million and US$11 million with a return of investment from 7 percent to 119 percent.

62. **Rationale for public sector provision/financing.** Flood risk in the greater Paramaribo area is currently absorbed by the GoS at high costs. Increasing the country's resilience to flooding and strengthening institutional capabilities to manage risks is an effective and efficient way to use public funds. Public financing will help strengthen and rehabilitate infrastructure crucial to improve the economic and social welfare of the population.

B. Fiduciary

(i) Financial Management

63. An FM assessment of the project was conducted in accordance with the Bank Policy on Investment Project Financing and the Financial Management Manual for World Bank IPF Operations (OPCS5.05-DIR.01, issued February 10, 2017). The main FM risks are due to the GoS' lack of experience in implementing the World Bank-financed projects. To mitigate the FM risks, experienced accounting and finance professionals will be assigned to the project by the MoPWTC, so that appropriate internal controls can be applied throughout project implementation. Such controls are included in the Operations Manual agreed with the World Bank. The World Bank will provide training to the project FM staff. FM risks and compliance will be monitored during the World Bank's six-monthly implementation support missions as well as through annual external audits. With the implementation of these measures, the MoPWTC will have in place an FM system that should be able to provide, with reasonable assurance, accurate and timely information on the status of the funds as required by the World Bank. More details on FM and disbursement are provided in annex 1.

(ii) Procurement

64. Procurement under the project will be carried out in accordance with 'World Bank Procurement Regulations for IPF Borrowers' dated July 2016 and revised in November 2017 and August 2018 ('Procurement Regulations'). The World Bank's Systematic Tracking and Exchanges in Procurement (STEP) system will be used to prepare, clear, and update the Procurement Plans and conduct procurement transactions for the project. All procurement methods and procedures are required to be consistent with the World Bank's Core Procurement Principles and ensure that the World Bank's Anti-Corruption Guidelines and Sanctions Framework and contractual remedies set out in its Legal Agreement are adhered to.

65. A Procurement Capacity Assessment and Project Procurement Strategy for Development (PPSD) were completed during project preparation. The following procurement risks were identified: (a) the MoPWTC's lack of experience with donor-funded projects, and in particular with the implementation of World Bank procurement policies and procedures; (b) procurement processing within the ministry is scattered and involves several departments; and (c) the requirement to obtain approval from the Board of Ministers for all contracts above a defined ceiling, which could cause delays in procurement processing. The SCU will be responsible for all procurement activities under the project and a Procurement Specialist with relevant experience in donor-funded procurement, particularly in World Bank or IDB procurement

rules and procedures, will be appointed in the SCU. The Procurement Specialist will be provided training on the World Bank Procurement Regulations. More details on procurement are provided in annex 1.

C. Safeguards

(i) Environmental Safeguards

66. **The project has been assigned Category B under World Bank OP/BP 4.01 'Environmental Assessment', given that impacts are site specific and reversible and mitigatory measures can be readily designed to address such impacts.** The positive impacts of the project include reducing vulnerability to flooding and improving navigational use of the canal to enhance commercial trade. Potential negative environmental impacts are associated with canal rehabilitation works. To address the management of potential environmental impacts, an Environmental and Social Impact Assessment (ESIA), including an ESMP, has been developed.

67. **The ESIA/ESMP includes approaches to mitigate the impacts of project activities in line with national and World Bank environmental safeguard policies, including Natural Habitats Policy (OP/BP 4.04) and Physical Cultural Resources Policy (OP/BP 4.11).** The Natural Habitats Policy (OP/BP 4.04) was triggered as aquatic fauna (non-fish)—whose presence has been reported—could be potentially affected. In addition, some forest land could be considered for use as temporary sediment deposits. The Physical Cultural Resources Policy (OP/BP 4.11) has been triggered as places of workship and religious sites, as well as other culture-related infrastructure, were found near the canal shoreline. However, these sites are not expected to be affected by project activities.

68. **The ESIA describes the legal, regulatory, and policy framework in Suriname and World Bank safeguard policies.** The project's area of influence (AOI) is tied to a corridor 200 m wide on both sides of the canal. The AOI will be revised once the activities and geographic boundaries are designated for Subcomponent 1.2. An environmental baseline provides essential descriptions of the project AOI across several biophysical themes. The general water quality and sediment characteristics have been assessed and described. An aquatic biological survey provides an overview of major vegetative communities and key aquatic living resources, such as fish and amphibians. No unique or rare species were found during the survey. Religious shrines and other culture-related infrastructures have been identified and mapped.

69. **The ESMP contains provisions to minimize potential environmental impacts and risks.** Specific provisions include a Worker's Health and Safety Plan, Noise and Air Pollution Management Plan, Traffic Safety Plan, Navigation Use Plan for Canal Works and Dredging, and Community Outreach and Communication Plan (tied to the grievance redress mechanism). Based on the sediment survey results, it was concluded that a designated disposal site will be identified to ensure proper management and disposal of these materials. A Sediment Management Plan will be developed for safe disposal (for example, proper lining, separation, and fencing of the dumping site). Environmental clauses and a Code of Environmental Conduct are also included in the ESMP. The ESMP also describes the institutional roles and arrangements for implementing the ESMP as well as capacity building needs.

70. **Two consultations were conducted in-country on the preliminary ESIA and ESMP, and these documents were also disclosed on the National Public Information, MoPWTC and World Bank websites on November 5, 2018.** The ESIA/ESMP contains information based on the preliminary civil works description of the Saramacca Canal cleaning and re-profiling and rehabilitation of sluice gates and locks.

The ESIA/ESMP will be updated once the final detailed engineering designs are prepared during the project implementation. Details of upgrading of selected critical secondary or tertiary urban sub-catchment areas under Subcomponent 1.2 are still to be defined, as are activities that may be financed under Component 3 (Contingent Emergency Response). Appropriate environmental mitigation measures for these activities will be included in the revised ESIA/ESMP, once the details are known.

(ii) Social Safeguards

71. **Construction works proposed to be financed by the project are not expected to require land acquisition or population displacement.** Preliminary technical assessments have confirmed that canal widening is not required, dredging will be limited to sections of the canal, and existing structures on the borders of the canal are mainly fences and docks used for leisure boats, washing clothes, or bathing. During the preparation of engineering designs and the elaboration of construction plans, alternatives will be considered to avoid not only impacts on the existing structures but also impacts affecting the use of the canal for transportation. Supervision measures will be in place during construction to ensure that these preventive actions are properly followed.

72. **A Resettlement Policy Framework (RPF) has been prepared to respond to the occurrence of any unanticipated adverse impacts that are covered under OP 4.12 and were disclosed on the National Public Information, MoPWTC and World Bank websites on November 5, 2018.** The RPF includes provisions to ensure that any structure that is temporarily removed is replaced by the project. The engineering designs contract will include procedures for communication and information dissemination to ensure that the community near the canal and as the owners of structures expected to be affected by the construction works are fully informed in a timely manner.

73. **Citizen engagement.** The project will (a) engage in a proactive communication strategy to explain the benefits of the project to beneficiary communities and the public at large, (b) develop robust information request and grievance redress measures for project activities, and (c) support the engagement of project beneficiaries in the preparation, implementation, and monitoring of all project activities. To reflect this approach, the project includes a citizen engagement indicator in the Results Framework “number of beneficiaries consulted on the proposed Project designs, associated environmental and social impacts and envisaged mitigation measures”.

74. **Two consultation events were conducted by the MoPWTC to address the ESIA findings and the provisions set forth in the RPF with key stakeholders, beneficiaries, and potentially affected people.** The consultations took place in August and October 2018 and comments received have been incorporated in the safeguards documents. Additional citizen engagement events will be held during project implementation. These events will provide the appropriate fora for discussing specific details and timelines of proposed measures to mitigate any adverse impacts associated with improving the functioning of the canal. The Social and Environmental Specialists of the SCU will be responsible for organizing the citizen engagement events and will be supported as needed by consultants with appropriate communication skills. Project funds are available to finance the costs associated with preparing and carrying out these events.

75. **Gender.** The project incorporates gender considerations and is commited to ensuring that 50 percent of beneficiaries are women. Studies have shown that natural disasters, including floods, disproportionately affect women and girls, but their concerns are least likely to be addressed by decision

makers. The project will ensure that participatory activities and consultative processes are held in venues with formats that are suitable and possible for women to attend. The planned citizen engagement events and communication campaigns will incorporate a gender approach. The preparation of events and campaigns will consider venues, timing, and discussion dynamics that effectively enable the participation of both women and men. Given the diversity of the origins of Suriname's citizens, the approach will also be mindful of the needed adjustments to encourage participation of people from all backgrounds. A gender indicator is included in the Results Framework to track the number of female beneficiaries who were consulted on the proposed project designs, associated environmental and social impacts, and envisaged mitigation measures.

76. **Grievance redress.** A comprehensive mechanism for grievance redress will be created for the project. This feature will be made available by the MoPWTC, and its creation falls under the responsibility of the SCU. The protocol defining the features of the online tool as well as the procedures to ensure appropriate and timely communication, follow-up, and registration are detailed in the project's Operations Manual. An SCU staff will be responsible for tending to the entire communication process. An easily accessible project office, located close to the construction works, will serve as a facility for information access and registering grievances. Project representatives will be available at this office to offer information, receive complaints, carry out follow-up procedures, and ensure that appropriate information and feedback requested are provided on time.

(iii) Grievance Redress Mechanisms

77. **Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank's Grievance Redress Service (GRS).** The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate GRS, please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service.
For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

V. KEY RISKS

78. **Political and governance.** The political and governance risk rating is Substantial because the run-up to the 2020 elections and their aftermath could negatively affect government programs, including project implementation. To mitigate these risks, the MoPWTC/SCU will continue the broad-based consultations with all stakeholders that were initiated during project design through the establishment of the Project Committee, with representation from government agencies as well as other stakeholders, briefing on project progress and seeking guidance on key issues.

79. **Macroeconomic.** Despite the fact that Suriname is recovering from the deep recession of 2015–2016 and country authorities are taking some important steps to strengthen the fiscal framework, the

macroeconomic risk is rated Substantial, in particular because of a further need to improve public financial management, including budget planning and execution. To improve budget planning and execution, the authorities have introduced a new public financial management law to the National Assembly. Besides upgrading the legal framework, the MoF intends to improve its business model for budget planning, bolster the medium-term fiscal framework, strengthen treasury operations, and improve internal controls.

80. **Institutional capacity for implementation and sustainability.** The Institutional capacity risk rating is High because the project is Suriname's first investment project financed by the World Bank in over 30 years and the MoPWTC has not implemented projects of this size and complexity. The project will strengthen the operational capacity of the MoPWTC for project planning, design, supervision, and asset management through extensive TA and capacity-building activities. To minimize risks, the SCU will employ experienced specialists from outside of the MoPWTC, including national or international engineers, who will mentor MoPWTC staff, ensuring that capacity is built within the unit and that the project activities are carried out to a suitable standard. In addition, an experienced Environmental Specialist and a Community and Social Specialist will be employed to ensure compliance with safeguards, including the ESMP, the RPF, the grievance redress mechanism and citizen engagement activities. The World Bank will also support the project by providing regular supervision missions and assistance and provide extensive training and hands-on support on areas such as procurement, safeguards, monitoring and evaluation, and FM to all SCU staff.

81. **Fiduciary.** The fiduciary risk rating is High mainly due to lack of experience in implementing World Bank-financed projects and the risks associated with the construction activities. To mitigate the fiduciary risks, experienced accounting and finance professionals will be assigned to the project by the MoPWTC, so that appropriate internal controls can be applied throughout project implementation. FM risks and compliance will be monitored during the World Bank's six-monthly implementation support missions as well as through annual external audits. In addition, the MoPWTC will recruit an experienced Procurement Specialist from outside of the MoPWTC with experience in World Bank Procurement Regulations. Procurement risks will also be mitigated by World Bank prior review of the first three packages for each procurement category (goods, works, and consulting services) and for all the contracts above defined ceilings (as detailed in the table 1.1.: Thresholds for Procurement Methods and Prior Review).

82. **Environment and social.** The safeguards risk rating is Substantial given the project finances works for rehabilitation of the canal, including dredging and sediment removal, handling, transport, and deposition. In particular, the environment risk is substantial, given the impacts are site-specific, reversible and mitigatory measures can be implemented during the construction works. The social safeguards risk is moderate because the project will not have negative impacts on people and no resettlements are foreseen for implementing the works. All the environment and social risks have been assessed in the ESIA, including sampling the water quality and sediment characteristics and composition. To mitigate those risks, an ESMP and a RPF were developed and consulted. The main mitigation measures include provisions to minimize the potential environmental impacts and risks, including safe sediment disposal, health and safety measures for workers, noise and air pollution management, traffic safety plan, and community outreach and communication plan, linked to the grievance redress mechanism.

VI. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Suriname

Saramacca Canal System Rehabilitation Project

Project Development Objectives(s)

The PDO is to reduce flood risk for the people and assets in the greater Paramaribo area and improve the operation of the Saramacca Canal System.

Project Development Objective Indicators

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Reduce flood risk for the people living in the Greater Paramaribo area								
Number of people benefitting from reduced flood risk for a 10-year return period. (Number)		0.00	0.00	0.00	0.00	0.00	0.00	57,000.00
Number of female beneficiaries benefitting from reduced flood risk for a 10-year return period. (Percentage)		0.00	0.00	0.00	0.00	0.00	0.00	50.00
Improve the operation of the Saramacca Canal System for flood risk management and navigation								
Introduction of a risk-based maintenance system for the drainage of the Saramacca Canal System (Yes/No)		No	No	No	Yes	Yes	Yes	Yes
Increased flood forecast lead time for the Saramacca		-12.00	-12.00	-12.00	-12.00	4.00	4.00	4.00

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Canal System (Hours)								

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Improving the Drainage Infrastructure								
Engineering design completed for the works for the improved capacity of the Saramacca Canal to discharge water into the Suriname and Saramacca Rivers (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes
Improved capacity of the Saramacca Canal to discharge water into the Suriname and Saramacca Rivers (Percentage)		38.00	38.00	38.00	38.00	50.00	70.00	100.00
Improved functioning of the Saramacca Canal for navigation (Hours)		2.00	2.00	2.00	2.00	4.00	4.00	12.00
Area with increased drainage capacity for a 10-year return period (Square kilometer(km2))		0.00	0.00	0.00	0.00	0.00	0.00	70.00
Number of engaging information events on the implementation of the		0.00	1.00	2.00	3.00	4.00	5.00	5.00

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
activities to improve the Saramacca Canal conveyance (Number)								
Number of beneficiaries consulted on the proposed project designs, associated environmental and social impacts, and envisaged mitigation measures (Number)		0.00	40.00	80.00	120.00	160.00	200.00	200.00
Number of female beneficiaries consulted on the proposed project designs (Percentage)		0.00	20.00	30.00	30.00	40.00	40.00	50.00
Secondary and Tertiary canal system baseline and prioritization for pilot works developed (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes
Interventions for the selected pilot works to improve localized drainage completed (Yes/No)		No	No	No	No	Yes	Yes	Yes
Strengthening the Saramacca Canal Water Management System								
Updated guidelines and operational procedures for managing flood control and navigation of the Saramacca Canal drainage system (Yes/No)		No	No	No	Yes	Yes	Yes	Yes
Endorsement of the feasibility study toward the establishment of a		No	No	No	No	Yes	Yes	Yes

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Saramacca Canal System management platform (or similar mechanism responsible) for the system sustainability (Yes/No)								

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Number of people benefitting from reduced flood risk for a 10-year return period.	Number of people benefiting from reduced flood risk in relation to the number of working flood gates for a specific return period (10-year return period).	Bi-annual	Ministry of Public Works - Implementing Agency	Assessing the site and the correct functioning of the infrastructure once works are completed	Ministry of Public Works - Implementing Agency
Number of female beneficiaries benefitting from reduced flood risk for a 10-year return period.					
Introduction of a risk-based maintenance system for the drainage of the Saramacca Canal System	Baseline: Non-integrated, mechanical, partially operational system.	Bi-annual	Ministry of Public Works - Implementing Agency	Progress Technical Report	Ministry of Public Works - Implementing Agency

Increased flood forecast lead time for the Saramacca Canal System	Just-in-time or post-flood event management with a delay of up to 12 hours for release of water due to nonfunctioning gate and sluice operation and tidal conditions	Bi-annual	Ministry of Public Works - Implementing Agency	Operation and use of flood-forecast system to produce flood warnings ahead of time	Ministry of Public Works - Implementing Agency

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Engineering design completed for the works for the improved capacity of the Saramacca Canal to discharge water into the Suriname and Saramacca Rivers	The engineering design, including the bill of quantities and the bidding documents, for the improvements of the main infrastructure of the Saramacca canal are finalized	Bi-annual	Ministry of Public Works - Implementing Agency	Progress Technical Report, including submitting all the final report for the Design	Ministry of Public Works - Implementation Agency
Improved capacity of the Saramacca Canal to discharge water into the Suriname and Saramacca Rivers	Baseline is 38 percent: Based on the average of Suriname River side -(a) one working lock gate out of two (50 percent operational capacity) and (b) three working sluice gates out of five (60 percent operational capacity); Saramacca River side -(a) one working lock gate out of	Bi-annual	Ministry of Public Works - Implementing Agency	The target will be re-assessed using the hydraulic modeling with the final works completed	Ministry of Public Works - Implementation Agency

	two (50 percent operational capacity) and (b) zero working sluice gates out of four (0 percent operational capacity).				
Improved functioning of the Saramacca Canal for navigation	Number of hours that the canal operates for navigation	Bi-annual	Ministry of Public Works - Implementing Agency	Analysis of the ship lock logbook with details of the hours of operations and vessel transit	Ministry of Public Works - Implementation Agency
Area with increased drainage capacity for a 10-year return period	Number of square kilometers with increased drainage capacity for a 10-year return period in the Saramacca Canal catchment area	Bi-annual	Ministry of Public Works - Implementing Agency	The target will be reassessed using the hydraulic modeling with the final works completed	Ministry of Public Works - Implementation Agency
Number of engaging information events on the implementation of the activities to improve the Saramacca Canal conveyance	The preparation of the events and campaigns will considerer venues, timing, and discussion dynamics that effectively enable the participation of both women and men. Given the ample diversity of Suriname's citizens' origin, the approach will also be mindful of the needed adjustments to encourage participation from all backgrounds.	Bi-annual	Ministry of Public Works - Implementing Agency	Progress Technical Report	Ministry of Public Works - Implementing Agency

Number of beneficiaries consulted on the proposed project designs, associated environmental and social impacts, and envisaged mitigation measures	The preparation of the events and campaigns will considerer venues, timing, and discussion dynamics that effectively enable the participation of both women and men. Given the ample diversity of Suriname's citizens' origin, the approach will also be mindful of the needed adjustments to encourage participation from all backgrounds.	Bi-annual	Ministry of Public Works - Implementing Agency	Progress Technical Report	Ministry of Public Works - Implementing Agency
Number of female beneficiaries consulted on the proposed project designs					
Secondary and Tertiary canal system baseline and prioritization for pilot works developed	Secondary and Tertiary canal system baseline and prioritization criteria for pilot works are collected and defined	Bi-annual	Ministry of Public Works - Implementing Agency	Progress Technical Report	Ministry of Public Works - Implementation Agency
Interventions for the selected pilot works to improve localized drainage completed	Interventions for the selected pilot works to improve localized drainage are completed based on the prioritization criteria defined	Bi-annual	Ministry of Public Works - Implementing Agency	Progress Technical Report	Ministry of Public Works - Implementation Agency
Updated guidelines and operational procedures for managing flood control and navigation of the Saramacca Canal	Guidelines and operational procedures for managing the Saramacca Canal	Bi-annual	Ministry of Public Works -	Progress technical report	Ministry of Public Works - Implementing Agency

drainage system	drainage system will be updated reflecting the overall improvements of project financed infrastructure and capacity for flood control and navigation		Implementing Agency		
Endorsement of the feasibility study toward the establishment of a Saramacca Canal System management platform (or similar mechanism responsible) for the system sustainability	Feasibility study toward the establishment of a Saramacca Canal System management platform (or similar mechanism responsible) for the system sustainability	Bi-annual	Ministry of Public Works - Implementing Agency	Progress technical report	Ministry of Public Works - Implementing Agency

ANNEX 1: Implementation Arrangements and Support Plan

Project Institutional and Implementation Arrangements

1. **Overall project implementation will be the responsibility of the MoPWTC.** A dedicated SCU will be established within the MoPWTC to administer the project and report on fiduciary matters, safeguards, and overall project progress to the MoF and the World Bank. More specifically, the SCU's functions and responsibilities will be (a) carrying out, monitoring, coordination, and supervision of project activities and (b) the fiduciary, procurement, safeguards, and administrative aspects of the project (including but not limited to issuing the tenders, undertaking financial reporting for the project, and making payments to contractors). Technical oversight of works will be provided by the SCU and the project will also finance construction supervision. Once works are complete, the MoPWTC's drainage unit will take over operations and maintenance in accordance with its mandate. This SCU will respond directly to the Permanent Secretary and will comprise MoPWTC staff dedicated to the unit and consultants hired by the MoPWTC.

2. **A Project Committee will be established to coordinate project activities among government agencies and administrative authorities as well as to inform stakeholders on project activities and overall progress.** The committee will be chaired by the MoPWTC and will meet quarterly for coordination and communication among the relevant agencies: the relevant structures of the MoPWTC, including the drainage, planning, and hydromet units; MoAAHF; MoRD; MoF; National Institute for Environment and Development; National Coordination Center For Disaster Relief; the districts commissioners of Paramaribo, Wanica, and Saramacca; and community leaders (as needed for communication purposes). The objectives, structure, and functions of the Project Committee are outlined in the project's Operations Manual.

3. **A project Operations Manual will describe the operational details for the implementation of the project.** The purpose of the Operations Manual is to provide an ordered set of instructions on the organization, procedures, and resources dedicated to the efficient and effective achievement of the objectives of the project.

4. **The GoS will prepare biannual progress reports, in accordance with the formats outlined in the Operations Manual.** The progress reports will cover (a) physical and financial progress achieved against agreed indicators (presented in section VI); (b) issues and problem areas, including remedial actions; and (c) work programs and cost estimates for the coming year, including revised estimates for the current period. The SCU will be responsible for monitoring and supervision of implementation and the impact of various components. It will also supervise the implementation of environmental and social safeguards and review and monitor the specific social and environmental management plans and supervise their implementation.

Financial Management and Disbursement

5. An FM assessment of the project was conducted in accordance with the Bank Policy on Investment Project Financing and the Financial Management Manual for World Bank IPF Operations (OPCS5.05-DIR.01, issued February 10, 2017). The main FM risks are due to the GoS' lack of experience in implementing the World Bank-financed projects. To mitigate the FM risks, experienced accounting and finance professionals will be assigned to the project by the MoPWTC so that appropriate internal controls

can be applied throughout project implementation. Such controls are included in the Operations Manual agreed with the World Bank. The World Bank will provide training to the project FM staff. FM risks and compliance will be monitored during the World Bank's six-monthly implementation support missions as well as through annual external audits. With the implementation of these measures, the MoPWTC will have in place an FM system that should be able to provide, with reasonable assurance, accurate and timely information on the status of the funds as required by the World Bank.

6. **Planning and budgeting.** Currently, departments within the MoPWTC each have their own Finance Departments. Two finance staff will be nominated to work on the FM of the project. A budget for the life of the project will be prepared by the MoPWTC. It will be revisited periodically and updated as needed to reflect implementation progress. An annual work plan will be derived from this master budget, which will be approved and included in the GoS estimates of revenue and expenditures and reflected under the MoPWTC's allocation.

7. **Funds flow.** Disbursement methods available to the project will be Advance, Reimbursement, and Direct Payment. Advances will be disbursed by the World Bank to a segregated Designated Account (DA) opened at the Central Bank of Suriname and maintained by the MoF. The DA will be used to finance U.S. dollar currency expenditures. Funds will be periodically transferred from the DA to a segregated local currency operating account to finance local currency expenditures.

8. **Accounting and internal controls.** Project transactions will be accounted and reported on using the cash basis of accounting. The project account will be created in QuickBooks (an off-the-shelf accounting software) with the chart of accounts designed to capture the transactions by categories, components, subcomponents, and activities. FM tasks and activities will be guided by the project's Operations Manual, which will include established FM procedures and processes. The Operations Manual will be updated, as needed, to reflect the current procedures and processes.

9. **Reporting.** Advances will be disbursed to the project based on a six-monthly cash forecast and quarterly unaudited financial reports (called interim financial reports, IFRs) will be submitted to the World Bank within 45 days after each calendar quarter. Quarterly variance analysis (actual versus budgeted expenditures) would be included in the IFR. The World Bank will document expenditures from the IFRs, which will also include additional requests for funds.

10. **External audit.** Annual financial statements will be produced for the project, covering each GoS financial year ending December 31. These will be audited by external auditors as per terms of reference agreed with the World Bank. The Audit Report, along with the Audited Financial Statements and the Management Letter, will be submitted to the World Bank no later than six months after the close of the financial year. The project budget will include the estimated audit fees.

11. **Disbursement.** The overall disbursement arrangements will follow standard disbursement policies and procedures included in the Disbursement and Financial Information Letter and as established in the Disbursement Guidelines for Investment Project Financing, dated February 2017. The minimum application size for Direct Payments and Reimbursements are indicated in the Disbursement and Financial Information Letter.

Procurement

12. **Procurement will be carried out in accordance with the Procurement Regulations.** The World Bank's STEP system will be used to prepare, clear, and update the Procurement Plans and conduct procurement transactions for the project. This textual part, along with the Procurement Plan tables in STEP, constitute the Procurement Plan for the project.

13. **The World Bank's standard procurement documents will be used for all contracts** that are subject to international competitive procurement.

14. **When approaching the national market, GoS procurement procedures may be used in accordance with the National Procurement Arrangements (paragraph 5.3) of the Procurement Regulations.** This will be specified in the Procurement Plan tables in STEP. When the GoS uses its own national open competitive procurement arrangements, as set forth in the Procurement Act of 2003, such arrangements will be subject to paragraph 5.4 of the Procurement Regulations and the conditions included in the Loan Agreement. When national procurement arrangements other than national open competitive procurement arrangements are applied by the GoS, such arrangements will be subject to paragraph 5.5 of the Procurement Regulations.

15. **Procurement capability assessment.** An assessment of the SCU, conducted for the preparation of the project and PPSD, identified the following procurement risks: (a) the MoPWTC lacks experience with donor-funded projects, particularly with the implementation of World Bank procurement procedures; (b) procurement processing within the ministry is scattered and involves several departments, which can be time-consuming; and (c) the requirement to obtain approval from the Board of Ministers for all contracts above a defined ceiling could cause delays in procurement processing (although this ceiling should apply only for Government-financed contracts). To address these risks, the SCU will be responsible for all procurement activities within the project. A Procurement Specialist with relevant experience in donor-funded procurement, particularly in World Bank or IDB procurement rules and procedures, will be appointed in the SCU. The Procurement Specialist will receive training on the World Bank Procurement Regulations.

16. Thresholds for procurement methods and prior review are shown in table 1.1.

Table 1.1. Thresholds for Procurement Methods and Prior Review

Expenditure Category	Contract Value (Threshold) (US$, thousands)	Procurement Method	Market Approach	World Bank Prior Review or as Indicated in the Procurement Plan
1. Works	>3,000	Request for bids	Open, limited, international, single stage	All
	200–3,000	Request for bids	Open, limited, national, single stage	First three contracts
	<200	Request for quotations	Open, limited, national, single stage	
	Regardless of value	DC	Direct, single stage	All
2. Goods	>500	Request for bids Request for	Open, limited, international, single	All

Expenditure Category	Contract Value (Threshold) (US$, thousands)	Procurement Method	Market Approach	World Bank Prior Review or as Indicated in the Procurement Plan
		proposal	stage	
	100–500	Request for bids Request for proposal	Open, limited, national, single stage	First three contracts
	<100	Request for quotations	Open, limited, international national, single stage	
	Regardless of value	DC	Direct, single stage	All
3. Consultant Services	>300	QCBS	Open, International, short list	All
	<300	QCBS, QBS, CQS, FBS, LCS (according to Procurement Plan)	Open, national, short list	All terms of reference; first three contracts; selection process yearly (ex post)
	Regardless of value	Direct Selection	Direct	All
	Regardless of value	IC	Open, limited	All terms of reference; first three contracts; selection process yearly (ex post)
	Regardless of value	Direct Selection	Direct	All

Note: CQS = Selection Based on the Consultants' Qualifications; DC = Direct Contracting; FBS = Selection under a Fixed Budget; IC = Individual Consultant; LCS = Least-Cost Selection; QBS = Quality-Based Selection; QCBS = Quality- and Cost-Based Selection.

II. Implementation Support Plan

Strategy and Approach for Implementation Support

17. **The strategy for implementation support draws on the risk profile of the proposed project and aims to enhance the delivery of the proposed interventions.** As such, implementation support would focus on institutional capacity for implementation and sustainability, fiduciary aspects, environmental and social safeguards, and political and governance.

18. The World Bank would undertake implementation support missions two to three times a year until the midterm review. During this period, the World Bank may also undertake short technical missions and keep in regular contact through telephone and videoconferencing. The frequency of missions thereafter would be determined by the status of implementation and need for World Bank support.

19. **The World Bank will support the MoPWTC in the preparation of environmental and social documents and their implementation, including consultations associated with the safeguard instruments.** This support would continue throughout project implementation in particular to ensure the effective application of these instruments.

20. World Bank FM and Procurement Specialists would provide timely, targeted training to the MoPWTC and the MoF through periodic supervision missions. These specialists would help enhance the MoPWTC/MoF's knowledge and understanding of World Bank requirements and support the MoPWTC in building its overall FM and procurement capacity. Supervision of the FM arrangements would be conducted semiannually and, as needed, in response to project needs. Procurement supervision would also be carried out semiannually, preferably jointly with the regularly scheduled World Bank implementation support missions. The support would focus primarily on contract management and on improving proficiency and efficiency in procurement implementation.

Implementation Support Plan and Resource Requirements

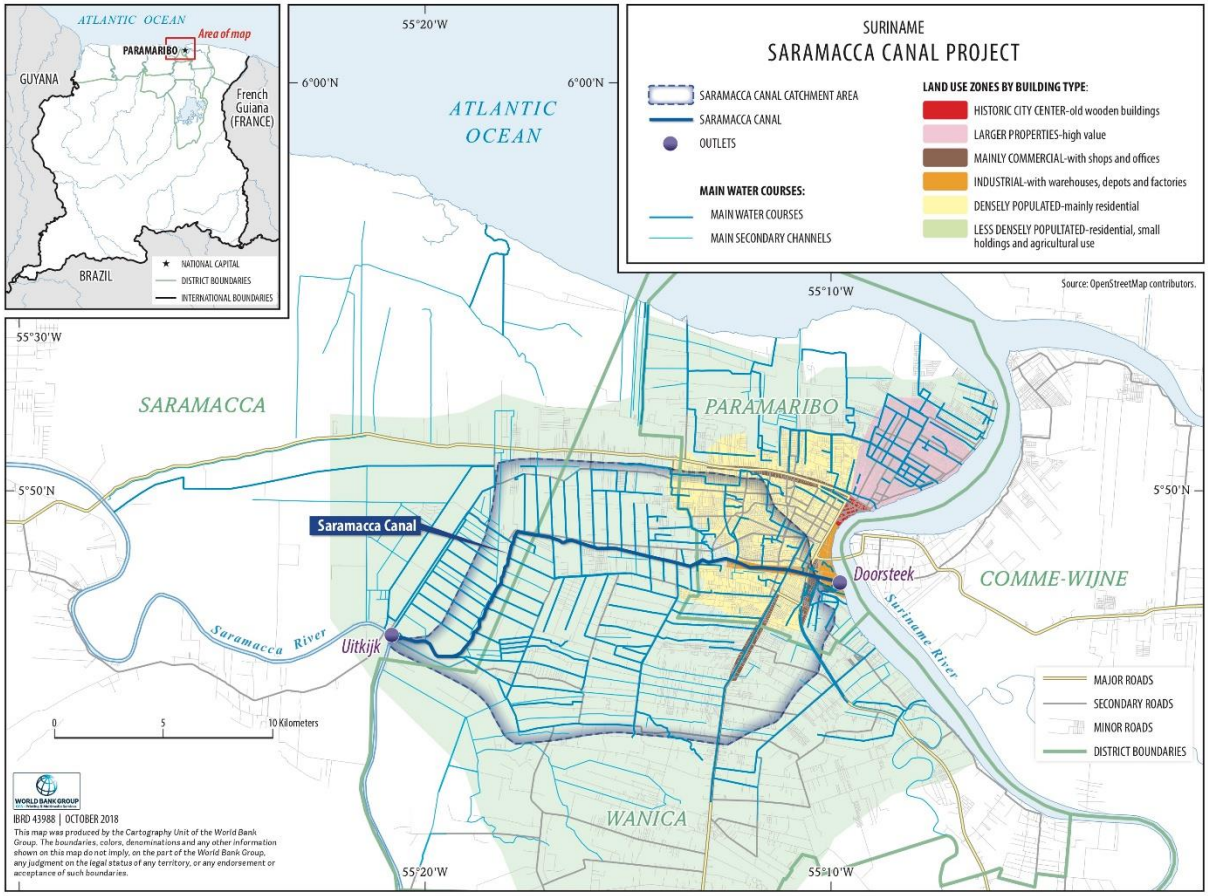
21. The skills mix, resources, and needs are as estimated in table 1.2.

Table 1.2. Implementation Support Plan and Resource Requirements

Time	Focus	Skills Needed
First 12 months	Procurement of flood risk management works, including technical designs, and start of capacity-building activities.	Task team leader, hydrologist, hydraulic engineer, DRM specialist, urban planning specialist, procurement, FM, safeguards, monitoring and evaluation, GIS/data management
Until midterm review (year 2–3)	Support to implementation of works, and TA to support the design of asset management platform, capacity building, and support to the identification of second phase of hot spot intervention.	Task team leader, hydrologist, hydraulic engineer, DRM specialist, urban planning specialist, procurement, FM, safeguards, monitoring and evaluation, geographic information system /data management
Midterm review (year 3)	Midterm review	Task team leader, hydrologist, hydraulic engineer, DRM specialist, urban planning specialist, procurement, FM, safeguards, monitoring and evaluation
Following midterm review (year 4–5)	Continued support to implementation of works, capacity building.	Task team leader, hydrologist, hydraulic engineer, DRM specialist, urban planning specialist, procurement, FM, safeguards, monitoring and evaluation

ANNEX 2: Maps


ATLANTIC OCEAN
WANICA
PARAMARIBO
PARAMARIBO
Nieuw Nickerie
Totness
Wageningen
Boskamp
Jenny
Groningen
Nieuw Amsterdam
Lelydorp
Onverwacht
Paranam
Zanderij
NICKERIE
CORONIE
SARAMACCA
COMMEWIJNE
MAROWIJNE
Moengo
Albina
PARA
GUYANA
Apoera
Bitagron
Brownsweg
Brokopondo
BROKOPONDO
W.J. Van Blommestein Meer
Bakhuis
Bakhuis Mts.
Pokigron
French Guiana (FRANCE)
SIPALIWINI
Lely Mts.
Kajana
Wilhelmina Mts.
Juliana Top (1286 m)
Cottica
Benzdorp
Apetina
Anapaike
Orange Mts.
Kayser Mts.
Pelelu Tepu
Kwamalasamutu
BRAZIL
0 20 40 60 80 Kilometers
0 20 40 60 Miles
SEPTEMBER 2012


ATLANTIC OCEAN
Area of map
PARAMARIBO
GUYANA
French Guiana (FRANCE)
BRAZIL
NATIONAL CAPITAL
DISTRICT BOUNDARIES
INTERNATIONAL BOUNDARIES
SURINAME
SARAMACCA CANAL PROJECT
SARAMACCA CANAL CATCHMENT AREA
SARAMACCA CANAL
OUTLETS
MAIN WATER COURSES:
MAIN WATER COURSES
MAIN SECONDARY CHANNELS
LAND USE ZONES BY BUILDING TYPE:
HISTORIC CITY CENTER-old wooden buildings
LARGER PROPERTIES-high value
MAINLY COMMERCIAL-with shops and offices
INDUSTRIAL-with warehouses, depots and factories
DENSELY POPULATED-mainly residential
LESS DENSELY POPULTATED-residential, small holdings and agricultural use
Source: OpenStreetMap contributors.
55°20'W
6°00'N
55°30'W
55°10'W
5°50'N
SARAMACCA
PARAMARIBO
COMME-WIJNE
WANICA
Saramacca Canal
Doorsteek
Uitkijk
Saramacca River
Suriname River
0
5
10 Kilometers
MAJOR ROADS
SECONDARY ROADS
MINOR ROADS
DISTRICT BOUNDARIES
IBRD 43988 | OCTOBER 2018
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