Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)
BASIC INFORMATION

A. Basic Project Data

<table>
<thead>
<tr>
<th>Country</th>
<th>Project ID</th>
<th>Project Name</th>
<th>Parent Project ID (if any)</th>
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</thead>
<tbody>
<tr>
<td>Suriname</td>
<td>P165973</td>
<td>Saramacca Canal System Rehabilitation Project</td>
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<tr>
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<th>Estimated Board Date</th>
<th>Practice Area (Lead)</th>
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<table>
<thead>
<tr>
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<th>Borrower(s)</th>
<th>Implementing Agency</th>
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<tr>
<td>Investment Project Financing</td>
<td>Ministry of Finance (MoF)</td>
<td>Ministry of Public Works, Transport and Communication (MoPWTC)</td>
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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

- Improving the Drainage Infrastructure
- Strengthening the Saramacca Canal Water Management System
- Providing a Contingent Emergency Response
- Supporting the Project Management and Implementation Support

PROJECT FINANCING DATA (US$, Millions)

<table>
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<tbody>
<tr>
<td>Total Project Cost</td>
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<td>Total Financing</td>
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<tr>
<td>of which IBRD/IDA</td>
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<td>Financing Gap</td>
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DETAILS

World Bank Group Financing
B. Introduction and Context

Country Context

1. **Suriname was one of the Caribbean’s best performing economies over the last decade, but the economy contracted into a severe recession when global commodity prices fell, thereby maintaining high poverty levels, especially in the country’s interior areas.** Suriname, an upper-middle-income country with abundant natural resources, recorded 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, gross domestic product (GDP) contracted severely and income per capita fell to US$6,990 in 2016, raising poverty levels. There is no official measure of poverty, but estimates by independent researchers place the poverty rate between 26 percent and 31 percent. Analysis based on a multidimensional poverty index shows 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. The ethnically diverse population of about 558,000 occupies 164,000 km² land area; therefore, Suriname has one of the lowest population densities in the world, about 3.3 inhabitants per km², although density is higher in urban areas. Suriname’s economy is highly concentrated in the extractive industries (gold and oil), which play a dominant role in driving growth, employment, and government revenues but also exposes economic performance to commodity price fluctuations. Agriculture is also important in the economy. The sustainability of Suriname’s development progress is also highly vulnerable to climatic disasters, especially pluvial and coastal flooding, which have had high human costs and created financial pressures for households, private businesses, and public finances.

2. **Suriname is one of the countries most vulnerable 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 to this, 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

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386 km long coastal plain (around 67 percent in Paramaribo), and therefore, 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)\(^2\) showed that reducing coastal and pluvial flood risk in the greater Paramaribo area will require a mix of structural and nonstructural interventions.

3. **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 per decade, but that temperatures will increase by about 1.5°C by the 2090s. The tropical climate brings the potential for extreme rainfall, with 200 mm in 24 hours possible and intense downpours of up to 90 mm in 1 hour 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.\(^3\) 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 wetting and drying 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 m under the most extreme scenario by the 2090s.\(^4\) 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, salinization, and loss of biodiversity.

**Sectoral and Institutional Context**

4. **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 regions, which include 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)\(^5\) 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), affecting school attendance in the affected zones as well as food security throughout the country, including the poorer interior.

5. **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 and

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approximately 10 km from the Atlantic coast. The city has an area of 70 km² and a population of over 300,000 people. The area 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 became 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 westwards, southwards, 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 floodwaters can remain several weeks due to the incapacity of the drainage system to drain the water efficiently.

6. To develop mitigation strategies against flood risk, the Government of Suriname (GoS) commissioned various studies. The 2001 Master Plan for the Drainage of Greater Paramaribo⁶ and the 2010 Integrated Coastal Zone Management (ICZM)⁷ 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 to tackle 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.

7. The need to reduce flood risk is embodied in 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 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.⁸

8. 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 used to determine viable flood mitigation options. The

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⁸ Refer to footnote 2.
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.

9. **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 following existing creeks with open connections at both rivers. It was revamped into a canal with sluices at both ends in the early 1900s because of continuous sedimentation problems. The latest major rehabilitation was carried out in the 1950s to further stimulate vessel (water) transport inland and improve the drainage. Aside from its drainage function, the canal also has a major irrigation function for parts of Paramaribo, Wanica, and Saramacca. These multiple uses make optimizing water levels in the canal challenging.

10. **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 km², with approximately 70 km² from the more heavily urbanized city areas and 120 km² 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 will occur with inundation of roads and roadside properties. The relatively poor condition of the general canal network—primary (the Saramacca Canal), secondary, and tertiary level—that drains the city and surrounding area is also considered a major factor in determining the occurrence and severity of flooding, and the system requires maintenance and investment before it becomes inoperative. Solid waste is collected regularly and rarely finds its way into the drainage system. Finally, permeability of the soil is variable, but with extensive clay in the lower elevation areas, infiltration is generally poor and surface water ponding following heavy rainfall is common, made worse due to the lack of any significant gradient.

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

    (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).  

    (b) An inadequate and poorly maintained drainage system, particularly the Saramacca Canal, which is the primary 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.

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

   (a) Increase of 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.

To directly address these challenges and following 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**

13. **The main institution with a mandate to play a critical role in reducing flood risk is the Ministry of Public Works, Transport, and Communication (MoPWTC) because 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 system in greater Paramaribo and parts of nearby districts, with the remaining network falling under the auspices of the Ministry of Regional Development, Agriculture, Fisheries, and Livestock (MoRDAFL). The directorate also has the institutional mandate for the scientific investigation of matters related to drainage and soil properties, including the monitoring of water quality. 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 provides an advisory role in terms of flood risk, while 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. Finally, the Directorate for Development Projects, led by the Director of the Civil Engineering Directorate, is responsible for monitoring the various MoPWTC projects and for maintaining and developing a communication strategy with local stakeholders and for preparing spatial planning policy.

**C. Proposed Development Objective(s)**

Development Objective(s) (From PAD)

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10 38 percent current working capacity based on the average of: Suriname River side - (a) one working lock gate out of two (that is, 50 percent operational capacity) and (b) three working sluice gates out of five (that is, 60 percent operational capacity); Saramacca River side - (a) one working lock gate out of two at the Saramacca River (that is, 50 percent operational capacity) and (b) zero working sluice gates out of four at the Saramacca River (that is, 0 percent operational capacity).
The PDO is to reduce flood risk for the people and asset in the greater Paramaribo area and improve the operation of the Saramacca Canal System.

Key Results

14. 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 main expected results of the project are:

   (a) Number of people benefitting from reduced flood risk for a 10-year return period and
   (b) Strengthened operational management of the Saramacca Canal System.

15. The project intermediate results indicators are:

   (a) Improved capacity of the Saramacca Canal to discharge water into the Suriname and Saramacca Rivers
   (b) Area with increased drainage capacity for a 10-year return period
   (c) Improved functioning of the Saramacca Canal for navigation
   (d) Updated guidelines and recommendations for efficiently operating and managing the Saramacca Canal drainage system
   (e) Endorsement of the feasibility study towards the establishment of a Saramacca Canal System management platform (or similar mechanism responsible for the system sustainability)
   (f) Number of engaging information events on the implementation of the activities to improve the Saramacca Canal conveyance
   (g) Number of engaging information events on the implementation of the activities to improve the Saramacca Canal conveyance
   (h) Number of beneficiaries consulted on the proposed Project designs, associated environmental and social impacts and envisaged mitigation measures.

D. Project Description

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11 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.
16. **The project aims to finance structural and nonstructural measures to improve the resilience against flooding in the greater Paramaribo area for an amount of US$30 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’s capacity to manage and operate the Saramacca Canal drainage system as a whole. The project will finance four Components: Component 1 - Improving the Drainage Infrastructure, Component 2 - Strengthening the Saramacca Canal Water Management System, Component 3 - Providing a Contingent Emergency Response, and Component 4 - Supporting the Project Management and Implementation Support.

**Component 1: Improving the Drainage Infrastructure**

17. **Component 1 deals with structural flood management measures.** Structural measures will improve the conveyance of water to the Suriname and Saramacca Rivers from excess rainfall on the city of Paramaribo to significantly reduce the periods, areal extent, and intensity of flooding. In addition, this component will improve the navigation condition. This component will finance two main activities: (a) rehabilitation of the sluices and locks and increase of conveyance through re-profiling and clearing and (b) pilot interventions on the secondary and tertiary canals, with the utilization of green areas for flood management.

**Subcomponent 1.1: Rehabilitation of sluices and locks and canal re-profiling and clearing**

18. **Rehabilitation of sluices and locks.** The project will finance the rehabilitation of two ship locks, each at the outlets of the Saramacca and Suriname Rivers, as well as the five-door sluice gate at the outlet to Suriname River and the four-door sluice gate at the outlet to Saramacca River. These structures are the primary outlets of the Saramacca drainage system. Currently, the locks and gates are only partially operational, limiting the capacity to manage 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 complete failure of these structures will result in a dysfunctional drainage system with increased flooding and impact to the city of Paramaribo. This will be the first activity to be undertaken under Component 1 so that water levels in the canal can be adequately managed while the other work components are carried out.

19. **Increase conveyance and navigation through 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 the water from the secondary system into the primary. Maintaining the conveyance capacity at the Saramacca Canal is important for the future to ensure that the system will still be able to drain sufficient water toward the primary outlets, especially if more urban areas are developed in the system. This activity will also finance the establishment of one or more sediment disposal areas for the management of the dredged material. Non-polluted sediments will be processed for reuse, and polluted sediments will be disposed to a designated location in accordance with environmental safeguards procedures.
Subcomponent 1.2: Upgrading of selected critical secondary or tertiary urban sub-catchment areas with piloting of flood management solutions

20. Pilot structural and nonstructural interventions on critical areas prone to flooding in the secondary or tertiary sub-catchment drainage systems with possible utilization of green solutions for flood management. Sensitivity analyses of flood mitigation interventions have shown that the secondary and tertiary drainage systems are important elements of the urban drainage system but that several issues act to impede local drainage. During the project, one or two priority flood-prone sections of the urban secondary or tertiary drainage channels feeding the Saramacca Canal will be selected as pilot areas for trialing a selection of local flood management solutions with the aim of reducing local flood risk. 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 discard of solid waste away from the canals. Green solutions such as introducing flood retention areas (ponds or wetlands) with recreational amenity, establishing green corridor parks, introducing permeable paving to encourage infiltration or bioretention areas with enhanced vegetation and filtration to remove pollution may also be trialed.

21. A communication strategy will be developed to ensure that local stakeholders who are users and beneficiaries of the project are informed of project activities and are able to engage fully with the process. These measures will benefit specific communities affected by more frequent floods. These works can serve as an example for other best-practice interventions elsewhere on the drainage system. As investments to improve this part of the systems will be far beyond the financial means available now, pilot interventions at only one or two key areas particularly prone to flooding are envisioned during the project. 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.

Component 2: Strengthening the Saramacca Canal Water Management System

22. Component 2 deals with nonstructural flood management measures. This component will finance TA activities to improve the capacity of the GoS to manage and operate the Saramacca Canal System, including the Saramacca Canal’s water levels and hydraulic structure operations with the objective of reducing flood risk in the city of Paramaribo and facilitating navigation. This component will finance three main activities: (2.1) updating of norms and guidelines for drainage management, (2.2) drainage infrastructure asset management platform, and (2.3) institutional support toward a possible Saramacca Canal System Platform.

Subcomponent 2.1: Updating of norms and guidelines for drainage management

23. This subcomponent will update parts of the 2001 Drainage Master Plan and develop and update guidelines and recommendations for efficiently planning and managing the Saramacca Canal drainage area, 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 the activities financed by the Inter-American Development Bank (IDB) to develop a city-broad 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 also include the 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**

24. **TA, information technology equipment and software, and training to improve the operation, management, and surveillance of the drainage system.** 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 and 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.

25. **Although priority of the system will be allocated to drainage and flood control functions, 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 which 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 un-navigable state of the canal. After the project, navigation will be possible for all the daylight hours, about 12 hours (for safety reasons, the lock gates are not operated at night). The opening of the canal for navigation will contribute to 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, amount and type of vessel traffic, and one-way vessel traffic with passing points, the system will ensure efficient vessel transport over the daylight hours. Sufficient water will be maintained in the canal in the dry season to allow vessel transport and water extraction in the vicinity of the Saramacca River for irrigation purposes.

26. **To support the real-time management of the Saramacca Canal System for drainage and flood control, the hydromet data management system will be strengthened and a flood forecasting service developed.** Existing hydromet instrumentation will be expanded to provide real-time observations of weather variables and water levels in the Saramacca Canal and main secondary canals. Also, additional tidal gauges will be installed to monitor water levels of Suriname and Saramacca Rivers in the vicinity of 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 digitalized inventory of existing drainage and hydromet infrastructure. All available
data will be assimilated into a suitable data management platform and used to drive a real-time operational model for the Saramacca Canal.

**Subcomponent 2.3: Institutional support toward a possible Saramacca Canal System Platform**

27. **This subcomponent will finance a feasibility study for a possible Saramacca Canal System Platform composed of various stakeholders for the operational 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 made in 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 consider cost recovery mechanisms, which may include the introduction of navigation tariffs, ensuring the financial sustainability of the system.

28. **The MoPWTC, with some support of the MoRDAFL, is responsible for the operation and maintenance of the drainage system, but few other agencies also have related roles and responsibilities.** This subcomponent will therefore 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**

29. **This component will include a contingent emergency response component to respond rapidly at the Government’s request in the event of a natural disaster.** This component would finance the implementation of emergency works, rehabilitation, and associated assessments and will be available to respond rapidly at the Government’s request in the event of a natural disaster. In the project Operations Manual, a dedicated chapter would detail guidelines and instructions on how to trigger and use the funds of this component. In addition, a brief Environmental and Social Management Framework will be prepared for the potential types of activities likely to be financed under this component, providing a preliminary evaluation of potential risks and mitigation measures associated with them.

**Component 4: Supporting the Project Management and Implementation Support**

30. **This component will support the costs related to the overall project management and implementation support.** This will include the following:

   (a) Operating costs (including, for example, 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 finance reporting)

(d) Monitoring and evaluation (including collecting socioeconomic data and providing support for environmental and social safeguard supervision)

(e) Equipment (vehicles, furniture, and information and communication technology)

(f) Communication plan (including support for the development of a communications strategy for engaging with local communities and stakeholders)

E. Implementation

Institutional and Implementation Arrangements

31. **Overall project implementation will be the responsibility of the MoPWTC.** The MoPWTC has the institutional mandate for operation and maintenance of the drainage system. The MoPWTC has specific responsibility for managing and maintaining the primary and secondary drainage canals in the greater Paramaribo area, including the Saramacca Canal. A dedicated Project Implementation Unit (PIU) will be established within the MoPWTC, which will have overall responsibility for administering the project and reporting on fiduciary matters, safeguards, and overall project progress to the Ministry of Finance (MoF) and the World Bank. This PIU will directly respond to the Permanent Secretary and will be composed of MoPWTC staff dedicated to the unit and/or consultants hired by the MoPWTC.

32. **A Project Committee will be created 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 have regularly meetings for coordination and communication among the relevant agencies: the relevant structures of the MoPWTC, including the drainage, planning, and hydromet units; Ministry of Agriculture; Ministry of Regional Development; MoF, National Institute for Environment and Development (NIMOS), Civil Defense; the Paramaribo, Wanica, and Saramacca Districts; and community leaders, as needed. The detailed objective, structure, and function of the Project Committee will be outlined in the project’s Operations Manual.

F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The project will involve the 25 km long Saramacca Canal and drainage area in the Paramaribo, Wanica, and Saramacca Districts of Suriname, including urban and rural zones. The urban parcels along the canal are of medium to large size and the main constructions are located far from the canal. The project works include rehabilitation of the canal, including dredging and sediment removal, handling, transport, and deposition. Sediment quantity and quality have been established during the Environmental and Social Impact Assessment (ESIA) and not pollutants have been found. There are a couple of shrines built in land parcels
along the canal, which will require an appropriate communication approach if the rehabilitation works are carried out nearby.

G. Environmental and Social Safeguards Specialists on the Team

Paula Dias Pini, Social Specialist  
Francisco Xavier Geraldes Siragusa, Environmental Specialist

### SAFEGUARD POLICIES THAT MIGHT APPLY

<table>
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<th>Safeguard Policies</th>
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<th>Explanation (Optional)</th>
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<tr>
<td>Environmental Assessment OP/BP 4.01</td>
<td>Yes</td>
<td>The Project has been assigned category B for safeguard OP/BP 4.01 “Environmental Assessment”, given that impacts are site-specific, 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 management of potential environmental impacts, a Environmental and Social Impact Assessment and Environmental and Social Management Plan (ESIA/ESMP) were developed.</td>
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<td>Performance Standards for Private Sector Activities OP/BP 4.03</td>
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<td>Appropriate mitigation measures will be followed to limit the impact on flora and local terrestrial and aquatic faunal species (other than fish) reported to be present in the Saramacca Canal. Nevertheless, given the vast uninhabited areas in and around the canal, the localized and short-term works proposed for the project will not result in significant degradation or conversion of natural habitats since the works are limited to upgrading and rehabilitation of existing structures. Care will be taken to schedule civil works to avoid key breeding and nesting periods. All construction sites and embankments will</td>
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</tr>
<tr>
<td>OP/BP 4.11</td>
<td>Physical Cultural Resources</td>
<td>Yes</td>
</tr>
<tr>
<td>OP/BP 4.10</td>
<td>Indigenous Peoples</td>
<td>No</td>
</tr>
</tbody>
</table>
The canal rehabilitation works may affect some small structures located close to the canal borders, such as recreational and/or commercial boat docks, patios, and barbecues. Impacts to large buildings such as residences and industries are not anticipated given the large size of the land plots, low density, and reasonably well-planned land use patterns in place. Land acquisition is not anticipated nor is disruption of livelihoods or involuntary population resettlement. A Resettlement Policy Framework (RPF) has been prepared since the zone of impact is known but precise siting alignments cannot be determined during project preparation. This is because the technical studies (detailed construction designs) will be prepared during project implementation. Based on the visual perception provided by field visits, it can be inferred that some existent structures close to the canal might be affected. However, no conclusive decision can be made in the absence of technical designs.

The large size of the land plots and reasonably well-planned land use patterns indicate that no constructions — such as residences and industries — built on the boarders of the canal, or encroaching on the canal, were flagged.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Decision</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involuntary Resettlement OP/BP 4.12</td>
<td>Yes</td>
<td>The canal rehabilitation works may affect some small structures located close to the canal borders, such as recreational and/or commercial boat docks, patios, and barbecues. Impacts to large buildings such as residences and industries are not anticipated given the large size of the land plots, low density, and reasonably well-planned land use patterns in place. Land acquisition is not anticipated nor is disruption of livelihoods or involuntary population resettlement. A Resettlement Policy Framework (RPF) has been prepared since the zone of impact is known but precise siting alignments cannot be determined during project preparation. This is because the technical studies (detailed construction designs) will be prepared during project implementation. Based on the visual perception provided by field visits, it can be inferred that some existent structures close to the canal might be affected. However, no conclusive decision can be made in the absence of technical designs. The Saramacca canal rehabilitation works might affect small structures located close to the canal boarders, such as fences, patios, boat docks, barbecues. The large size of the land plots and reasonably well-planned land use patterns indicate that no constructions — such as residences and industries — built on the boarders of the canal, or encroaching on the canal, were flagged.</td>
</tr>
<tr>
<td>Safety of Dams OP/BP 4.37</td>
<td>No</td>
<td>There are no dams in the Saramacca Canal and the project will not finance the construction of any dam.</td>
</tr>
<tr>
<td>Projects on International Waterways OP/BP 7.50</td>
<td>No</td>
<td>The policy is not triggered as there are no international waterways under the project.</td>
</tr>
<tr>
<td>Projects in Disputed Areas OP/BP 7.60</td>
<td>No</td>
<td>The policy is not triggered as there are no disputed territories under the project.</td>
</tr>
</tbody>
</table>
KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:
   The project will involve the 25 km long Saramacca Canal and drainage area in the Paramaribo, Wanica, and Saramacca Districts of Suriname, including urban and rural zones. The urban parcels along the canal are of medium to large size and the main constructions are located far from the canal. The project works include rehabilitation of the canal, including dredging and sediment removal, handling, transport, and deposition. Sediment quantity and quality have been established during the Environmental and Social Impact Assessment (ESIA) and no pollutants have been found. There are a couple of shrines built in land parcels along the canal, which will require an appropriate communication approach if the rehabilitation works are carried out nearby.

   The Project triggers OP 4.12 because the construction works to improve the conveyance of the Saramacca canal may require the relocation of some minor structures (fences, docks for recreational boats, for washing clothes, or bathing) built on the canal boarders. Accurate information on the number of structures affected is not available during the Project preparation. It will be available during the elaboration of the engineering designs for improving the canal conveyance, to be carried out during the Project implementation. There is no potential large scale, significant and/or irreversible impacts associated with the Project.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:
   The anticipated future activities (construction works during the Project implementation stage) may cause indirect impacts such as noise due to heavy trucks traffic, which will be mitigated through environmental management procedures. No long-term adverse impacts have been identified.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.
   Technical alternatives were adopted by the Project in order to minimize the number of existent structures along the canal that may be affected by the construction works to improve the conveyance of the canal.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.
   The borrower has taken appropriate measures to address the Bank safeguard policy issues, such as: (i) considering technical alternatives that will reduce the numbers of structures that may be affected by the construction works to improve the canal conveyance; (ii) including provisions for implementing the Project that will ensure technical and financial capacity to properly and timely address the safeguard issues.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.
   The Project key stakeholders include representatives from the industries and residential neighborhoods in the proximity of the Saramacca canal. The safeguard instruments were presented and discussed with these representatives during the consultation event carried out on August 2018 and October 2018, including a public hearing in the project area. The final version of the safeguards instruments incorporates the comments from the consultation event. Some of the potentially affected people were present during the consultation event (those who have built structures on the canal boarders). During the consultations, it was explained that the information on which
structures will be affected would be known during the Project implementation, more specifically during the elaboration of the engineering designs for improving the canal conveyance. Also, that the Project will finance and rebuild any structure may be affected, during the execution of the construction works.

B. Disclosure Requirements

Environmental Assessment/Audit/Management Plan/Other

<table>
<thead>
<tr>
<th>Date of receipt by the Bank</th>
<th>Date of submission for disclosure</th>
<th>For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-Sep-2018</td>
<td>05-Nov-2018</td>
<td></td>
</tr>
</tbody>
</table>

"In country" Disclosure
Suriname
05-Nov-2018

Comments
The full draft of the ESIA, revised by the Bank, has been available before and after consultation on the Government website since October and two consultations, including a public hearing have been organized. A revised version of the ESIA will be disclosed including the outcome of the consultations.

Resettlement Action Plan/Framework/Policy Process

<table>
<thead>
<tr>
<th>Date of receipt by the Bank</th>
<th>Date of submission for disclosure</th>
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</thead>
<tbody>
<tr>
<td>21-Aug-2018</td>
<td>05-Nov-2018</td>
</tr>
</tbody>
</table>

"In country" Disclosure
Suriname
05-Nov-2018

Comments
The full draft of the RPF, revised by the Bank, has been available before and after consultation on the Government website since September. A revised version of the RPF will be disclosed including the outcome of the consultations.

C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting)

OP/BP/GP 4.01 - Environment Assessment

Does the project require a stand-alone EA (including EMP) report? Yes

If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?
No
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?
Yes

**OP/BP 4.04 - Natural Habitats**

Would the project result in any significant conversion or degradation of critical natural habitats?
No
If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?
NA

**OP/BP 4.11 - Physical Cultural Resources**

Does the EA include adequate measures related to cultural property?
Yes
Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?
NA

**OP/BP 4.12 - Involuntary Resettlement**

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?
Yes
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?
Yes

**The World Bank Policy on Disclosure of Information**

Have relevant safeguard policies documents been sent to the World Bank for disclosure?
No
Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?
Yes
All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?
Yes

Have costs related to safeguard policy measures been included in the project cost?
Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?
Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?
Yes

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APPROVAL

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24-Oct-2018

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29-Oct-2018