

**PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE**

Report No.: PIDA5671

Project Name	GY Flood Risk Management (P147250)
Region	LATIN AMERICA AND CARIBBEAN
Country	Guyana
Sector(s)	Flood protection (100%)
Theme(s)	Urban planning and housing policy (60%), Climate change (20%), Water resource management (20%)
Lending Instrument	Investment Project Financing
Project ID	P147250
Borrower(s)	Cooperative Republic of Guyana
Implementing Agency	Agriculture Sector Development Unit (ASDU), Ministry of Agriculture
Environmental Category	B-Partial Assessment
Date PID Prepared/Updated	11-Apr-2014
Date PID Approved/Disclosed	12-Apr-2014
Estimated Date of Appraisal Completion	01-Apr-2014
Estimated Date of Board Approval	20-May-2014
Decision	

I. Project Context

Country Context

Guyana has a land area of approximately 215,000 square kilometers and a low population density, with ninety percent of its 762,300 inhabitants (National Statistic Authority 2013 data) living on the narrow coastal plain, which represents ten percent of the country's area. The narrow coastal plain is an area of reclaimed lands, much of which lies below sea level. These reclaimed lands are crucial to the economy of the country as they host the majority of the population including the nation's capital, Georgetown, and include agricultural areas that account for approximately 27 percent of the nation's GDP.

In addition to hosting the majority of the population and providing land for most of the country's agricultural activities, the narrow coastal plain is flood-prone, making the national economy susceptible to the impacts of the country's high seasonal rainfall and storm events. In January 2005 extreme rainfall caused widespread flooding in the coastal lowlands resulting in an estimated US \$465 million in damages, which amounted to 59 percent of Guyana's GDP at the time. Other more recent severe rainfall events (e.g. February 2006, December 2008; January 2009; February 2011; January 2012) have caused economic and livelihood loss, which further highlighted the importance

of reducing Guyana's vulnerability to flooding to foster shared prosperity as an engine for equitable economic growth, job creation and poverty reduction.

Sectoral and institutional Context

The Guyana Flood Risk Management Project focuses on the coastal reclaimed lands in the East Demerara, where most of Guyana's Region 4 (1,843 square kilometers) population is located. The East Demerara area is bound to the north by the Atlantic Ocean, to the west by the Demerara River and to the east by the Mahaica River and Region 5. The coastal reclaimed lands in the East Demerara are protected from flooding by a seawall along the Atlantic Ocean that prevents the sea from inundating the area, and an inland water reservoir that is dammed on three sides. The reservoir dam parallels the Mahaica River, the Atlantic Ocean and the Demerara River and prevents storm water from the inland area from entering the East Demerara coastal reclaimed lands.

The reservoir - referred to as the East Demerara Water Conservancy (EDWC) - is a large, shallow water storage system with a catchment area of 571 square kilometers. In addition to flood control, the EDWC provides agricultural lands (rice and sugar production especially, which represent 4.3 and 3.8 percent of the country's GDP respectively – Guyana Bureau of Statistics 2013 data) and urban areas with irrigation and drinking water.

Region 4 experiences two wet seasons. During the primary wet season, between May and July, it experiences between 250 and 450 mm per month of rainfall and during the secondary wet season, between November and January, it experiences between 150 and 300 mm per month. During rainfall events, flood protection in Region 4 is dependent upon both the integrity of the EDWC dams and effective drainage in the coastal areas. A series of drainage canals controlled by sluices reduce water levels by draining the EDWC and avoid stressing the dam and increasing the risk of structural failure. A separate network of drainage and irrigation canals and pumps drains water from this area into the Demerara and Mahaica Rivers and the Atlantic Ocean to prevent and reduce the risk of flooding that would occur due to rainfall and runoff of storm water.

The National Drainage and Irrigation Authority (NDIA) in the Ministry of Agriculture (MoA) is responsible for drainage and irrigation in Guyana, including management of conservancies such as the EDWC. NDIA responsibilities cover strategic planning, investment, operation, maintenance and monitoring. In the decades leading up to the 2005 and 2006 floods, the operational capacities of the EDWC and coastal drainage systems declined due to insufficient physical investments and inadequate disaster preparation and management capacity. Following the floods, the Government of Guyana (GoG) reemphasized the importance of flood risk management to Guyana's economic, social and political well-being, increasing budget for NDIA to undertake investments, maintenance and future planning.

EDWC and Dam: Significant improvements have been made to the EDWC dams since 2005; however, they have structural deficiencies and are under stress due to high water levels in the EDWC during heavy rains. The 2005 and 2006 floods left the EDWC dam in a weakened state, in need of maintenance and re-enforcement, and highlighted the fact that the EDWC did not have adequate drainage capacity to protect the dams during storm events. Since that time, GoG has repaired sections of the dams damaged during the flood and some areas are found to have marginal stability. Additionally, significant investments - a combination of GoG, World Bank and Japanese International Cooperation Agency (JICA) funds - were undertaken to improve water flow within the

EDWC; rehabilitate several drainage relief canals and sluices; and purchase equipment for maintenance and repair. These investments have improved the stability of the dams and improved the ability of the EDWC system to protect the dams against high operating water levels. However the dams remain vulnerable to catastrophic breaching as they still operate above safe operating levels during high rainfall events nearly every year and structurally is marginally stable in areas, experiencing periodic slips and small breaches. GoG is undertaking additional investments to increase drainage from the EDWC including the construction of a Northern Drainage Relief Channel and the rehabilitation of the Cunha Canal. When operational these two canals are estimated to limit the need to operate above safe operating levels during storm events with return periods less than 50 years. In addition to these investments, complementary investments to strengthen the dams and establish systems for operation, monitoring and maintenance are needed to upgrade the structural stability and improve the long term maintenance of the dams.

Coastal Drainage Infrastructure: Similarly, the coastal drainage system has been upgraded since 2005 but is inadequate, resulting in annual flooding in Region 4. The poor performance of the coastal drainage system in 2005 led to catastrophic flooding lasting from 1 to over 3 weeks in some areas, the loss of 34 lives, a disease outbreak, population displacement and infrastructure damage. Since 2005, GoG with assistance from the Inter-American Development Bank (IDB) and JICA has been investing in the drainage systems in Region 4 that includes constructing, maintaining and rehabilitating drains, canals, pump stations and intake and outfall structures. However, the system currently has inadequate drainage, pump and channel capacity, and compromised efficiency since it is combined with agricultural drainage. Investments in infrastructure to improve drainage capacity and efficiency are needed to reduce the impacts of floods in Region 4.

Planning: Following the 2005 and 2006 floods, GoG recognized the long-term need for flood prevention by increasing the annual budget allocated to investment and operation and maintenance of the system and investing in tools for medium- and long-term planning. The planning tools were developed under the Conservancy Adaptation Project (CAP) using financing from the Global Environment Facility (GEF) Special Climate Change Fund (SCCF). The intention was to improve the understanding of the behavior of the EDWC and of the coastal drainage systems for the planning of investments and operation. GoG improved the baseline monitoring and information system of the EDWC, by installing systems to monitor weather, water levels and water flow and collecting topographic and land use data in the coastal area. These systems were used to simulate the behavior of the EDWC and of the coastal drainage system under different storm events. They helped identify priority interventions in the EDWC and the dam, and the coastal drainage system. These interventions are included in the GoG short and mid-term development plans, specifically in the Ministry of Agriculture's Master Drainage and Irrigation Plan for the period 2014-2030, now being finalized and its ongoing 2013-2020 Strategic Plan.

Since the 2005 floods, GoG has demonstrated its political and financial commitment to address flood risk management needs. At the same time the financial resources from GoG alone are not sufficient to undertake larger investments and long term planning. With the exception of the Northern Relief Channel, activities outside of donor funding have focused on smaller short-term investments and maintenance activities that NDIA can undertake using their existing resources. Financial support from donors such as Japanese International Cooperation Agency (JICA), the Inter-American Development Bank (IDB), European Union (EU) and the World Bank thus provides an important source of financing to undertake the larger investments and knowledge to undertake strategic planning activities that otherwise would not be completed.

II. Proposed Development Objectives

The objective of the project is to reduce the risk of flooding in the low-lying areas of the East Demerara.

III. Project Description

Component Name

Priority Works for Flood Risk Reduction

Comments (optional)

This component will include the EDWC dam rehabilitation works, the purchase of heavy equipment to facilitate the upgrade and reconstruction of critical parts of the northeast dam and key improvements to the East Coast Demerara drainage system. The dam rehabilitation works will comprise the contracting of works for the rehabilitation of the northeast dam and the purchase of heavy equipment to upgrade and maintain the dam. Investment in the East Coast Demerara drainage area will focus on improvements within a portion of the six priority drainage areas.

Component Name

Institutional Strengthening for Flood Risk Reduction

Comments (optional)

This component will support MoA in developing their capacity for flood risk reduction and dam safety. In particular, the component will finance institutional strengthening to improve dam construction, maintenance and management, including the development of a construction quality management plan; updating operation and maintenance procedures; instrumentation for surveillance of dam behavior and condition; and, emergency preparedness procedures in case of a dam breach. It will also finance hydrologic monitoring equipment to enhance the existing network to cover upper watersheds and technical assistance to support flood modelling and forecasting. Funding for project communication and dissemination activities will also be provided.

Component Name

Project Management and Implementation Support

Comments (optional)

This component will finance the provision of support to the Project Implementation Unit (PIU) under the Agriculture Sector Development Unit (ASDU), including hiring of specialized staff; preparation of designs and tender documents; monitoring and evaluation; contract supervision; reporting and auditing; environmental and social safeguards and training.

IV. Financing (in USD Million)

Total Project Cost:	11.89	Total Bank Financing:	11.89
Financing Gap:	0.00		
For Loans/Credits/Others			Amount
BORROWER/RECIPIENT			0.00
International Development Association (IDA)			11.89
Total			11.89

V. Implementation

A. Institutional and Implementation Arrangements

Ministry of Agriculture (MoA): MoA is the lead implementing agency for the project and will have overall responsibility for reporting on fiduciary matters and overall project progress to the Ministry of Finance (MoF) and the World Bank. Within the MoA, the ASDU will be the PIU that will manage the fiduciary, safeguards and administrative aspects, including issuance of the tenders, undertaking financial reporting and making payments to contractors. Technical oversight of drainage and dam works will be provided by the ASDU. The project will also finance construction supervision. Once these works are complete, the NDIA will take over operations and maintenance in accordance with their mandate. NDIA will participate in Project Coordination Committee (PCC), and bi-monthly meetings with contractors.

Ministry of Public Works and Communications (MoPWC): In some cases the works will affect or require upgrading of roads or sea defenses which are under the responsibility of the MoPWC. In these cases, ASDU will manage the fiduciary, safeguards and administrative tasks and the MoPWC will provide technical oversight, including construction design approval. Supervision will be undertaken jointly with ASDU. Once the works are complete, MoPWC will take over operations and maintenance in accordance with their mandate.

A Project Coordination Committee (PCC) is to be created to coordinate on drainage and flood protection activities with government agencies and provide strategic leadership and direction for the Project. The Committee will be chaired by the Minister of Agriculture and will have statutory, quarterly meetings for the purpose of communication and coordination among the relevant agencies (MoA, MoF, Civil Defense Commission (CDC), MoPWC, Sea and River Defense Unit in the MoPWC, Environmental Protection Agency (EPA), and the Hydromet Office).

The institutional arrangements are similar to those under the CAP. The shortcomings under the CAP included the challenges of coordination among agencies and capacity constraints in ASDU. These are being addressed under the Project through improved coordination mechanisms (via the Project Coordination Committee and communications program), by providing funding for project management in ASDU directly under the project, and providing continuous technical supervision and training.

A Project Operations Manual (OM) will be developed for the project to describe the operations of the Project. The purpose of the OM is to provide an ordered set of instructions on the organization, procedures, and resources dedicated to the efficient and effective achievement of the aims of the Project.

B. Results Monitoring and Evaluation

ASDU will have overall responsibility for monitoring and evaluation of the Project. It will consolidate all reports and report to the Bank on performance indicators, on the project's progress and execution, quality control and environmental and social safeguards. Project monitoring will be undertaken by ASDU as part of their daily activities and maintenance of records. They will provide quarterly financial reporting, semi-annual project progress reporting and annual audits.

VI. Safeguard Policies (including public consultation)

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

Comments (optional)

VII. Contact point

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