

Guyana REDD+ Investment Fund

PROJECT CONCEPT NOTE

Cunha Canal Rehabilitation Project

Proposed Grant Amount: US\$1.91 million

Date of Draft Concept Note: December 28, 2011

Preparation Budget Requested to the Steering Committee: US\$73,000

Partner Entity: World Bank

Managing Unit: Urban, Water and Disaster Management Sector Unit, Latin America and Caribbean Region

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Cunha Canal Rehabilitation Project

I. Introduction and Context

A. Country Context

1. Guyana is a low-lying country with a population of 750,000 and one of the lowest population densities in the world. Ninety percent of the inhabitants live on the narrow coastal plain, which represents 10 percent of the country's area. This area of reclaimed lands, much of which lies below sea level, is crucial to the economy of the country, supporting the majority of the population including nation's capital, Georgetown, and a large part of Guyana's agrarian economy.

B. Sectoral and Institutional Context

2. This populated coastal zone is transected by a dense network of drainage and irrigation canals. This network of canals links up with the East Demerara Water Conservancy (EDWC), a water storage system that provides regional agricultural lands with irrigation water and urban areas with drinking water. In addition, during times of heavy rainfall this system provides regional drainage and flood control.

3. Drainage during rainfall events has been managed through the use of a gravity-based system augmented with pumps. This system is under increasing stress, suffering from the impacts of sea level rise and from the age of the coastal drainage and irrigation system which was initially constructed 150 years ago. Upgrading the system is of crucial importance to increasing its ability to release water during storm events and to avoiding overtopping and breaching of the system's levees which would directly impact a large portion of the population of the country.

4. The floods of 2005 and 2006 highlighted the significance of the risks posed by the weakened containment and drainage capacities of the EDWC system and with flooding re-occurring the following year, the Government of Guyana (GoG) and the international community recognized flood management to be crucial to Guyana's economic, social and political well-being. In response to these needs, the GoG requested the World Bank to develop the Conservancy Adaptation Project (CAP), which underwent technical, safeguards, fiduciary and procurement appraisal and was approved by the World Bank's Board in October 11, 2007 with financing from the Global Environment Facility Special Climate Change Fund. (See Annex II the CAP Project Description).

5. The CAP project is financing the development of the technical foundation for a master plan of future interventions within the EDWC and lowland drainage systems, as well as specific short term upgrading works and operational improvements. To date under the Project, targeted improvements for conservancy infrastructure have been completed and the data collection phase, involving aerial photography and LiDAR imaging, for the modeling exercise that will form the basis for the master plan has also been completed. It is anticipated the initial results of the modeling exercise will be available in the first half of 2012. In addition to the works already completed, the upgrading of the Cunha Canal is an important piece of infrastructure which was identified for implementation as part of the CAP project. The investment was chosen for inclusion in the project due to its a high immediate impact on the EDWC, as it will increase the real time drainage capacity of the Conservancy by up to 30 percent.

6. While the GEF grant for the CAP project provides financing for the design and environmental assessment, the actual works on the Cunha Canal are to be co-financed by the GoG using resources outside of the GEF Grant. The draft design and Environmental Assessment have now been completed and GoG has requested that the co-financing for these works be provided through the Guyana REDD+ Investment Fund (GRIF) with the World Bank as the partner entity.

7. Using the GRIF as a co-financing mechanism for the Cunha Canal works provides a good opportunity to undertake a high impact investment that is driven by GoG priorities and that will reduce vulnerability to climate change as intended under the Low Carbon Development Strategy (LCDS). It also provides an example project and financing mechanism which might be used to finance and execute the larger package of similar complementary works and activities expected to be identified under the CAP project master plan.

C. Relationship to Guyana's Low Carbon Development Strategy

8. In June 2009, the GOG launched its Low Carbon Development Strategy (LCDS) which sets out Guyana's approach to transition to a green economy. Its stated aim is to combat climate change while simultaneously promoting economic growth and development. It sets out how Guyana's economy can be realigned along a low carbon development path, by investing payments received for avoided deforestation into strategic low carbon sectors. These payments will catalyze Guyana's efforts to diversify its economy and provide new economic opportunities, employment and more efficient use of resources, while maintaining a valuable forest ecosystem.

9. The key focus areas of the LCDS investments are: low carbon economic infrastructure; high potential low carbon sectors; climate change adaptation; and those that create economic opportunities for all Guyanese. The Cunha Canal Rehabilitation Project is an important intervention addressing the focus area of adapting to climate change. The works will improve the ability of the Government Guyana to manage water resources in the EDWC and protect Georgetown and surrounding areas from the impacts of climate change.

D. Relationship to World Bank's Country Assistance Strategy

10. The CAP, including the Cunha Canal works, is part of Guyana's current Country Assistance Strategy (CAS) (2009-2012). One of the two main pillars defined in the CAS includes "strengthening environmental resilience and sustainability". The CAS also states that the GoG will continue to execute major infrastructure works to mitigate the country's vulnerability to climate change, and identifies the following priority focal areas: i) protecting the environment and managing natural resources with simultaneous sustainable social and economic development, and ii) managing the impacts from sea level rise and changes in rainfall patterns through disaster mitigation.

II. Proposed PDO/Results

A. Proposed Development Objective(s)

11. The objective of the Cunha Canal Rehabilitation project is to reduce the vulnerability of catastrophic flooding in Guyana's low-lying coastal area.

B. Key Results

12. The proposed co-financing will contribute to the project development goal by improving drainage in the EDWC through: a) rehabilitation and widening of the current drainage channel to allow for increased flow into the Demerara River; b) building a new sluice to prevent inflow of river water during high tides; and c) construction of a bridge across the canal on the nearby public road.

13. The key output indicators for the rehabilitation of the Cunha Canal, are: (i) Percentage of the canal widened, in compliance with national and project level environmental and safety requirements; and (ii) Percentage increase in discharge capacity to the Demerara River.

III. Project Concept

A. Description

14. The Cunha Canal is located on the western side of the EDWC and discharges into the Demerara River. Around 1990, the canal was diverted from its original alignment to a smaller discharge channel. This diversion reduced the discharge capacity of the canal and went into disuse soon afterwards. The discharge through the canal was reestablished during the 2005 flood but with a limited capacity as it is affected by circuitous routing, structural limitations and development between the East Bank Demerara (EBD) Public Road and the Demerara River. Rehabilitation of the canal will result in a more efficient functioning of the discharge system.

15. The proposed US \$1.91 million GRIF financed grant will finance the following physical works to rehabilitate the Cunha Canal.

Rehabilitation of the drainage channel. The channel will be re-routed, widened and excavated to remove the build-up of sediments and weeds and allow for a straight flow into the Demerara River that eliminates hydraulic restrictions. The canal will be widened to 66.6 ft with a total right of way of 101.2 ft including embankments.

Building of a new sluice to prevent inflow of river water during high tides. This sluice will be used to control the discharge of water and to prevent river water from entering the canal during high tide.

Construction of a bridge on the EBD Public Road. A new bridge will be constructed at the point where the canal will intercept the EBD Public Road to allow vehicular traffic to traverse the area.

B. Key Project Preparation Issues

16. The works to be funded by the proposed co-financing involve manageable social, environmental and technical risks. These proposed works are common in Guyana and well within the experience and capacity of the implementing agencies.

17. *Technical:* The technical design of the three components was completed in 2010 but is being updated to incorporate adjustments in the size of the bridge and changes in the alignment of the canal being made to avoid impacts on the productive activities of the Barama Lumber Company. The proposed alignment is shown in Annex IV. As the project is linked to dam in the EDWC. A study under the CAP project is recommending approaches to improve the safety of the dam in accordance with the World Bank policy on safety of dams.

18. *Environmental:* The project is considered a category B investment under World Bank Operational Policy 4.01, as impacts to the biophysical and socio-economic environments are expected to be localized, insignificant and short-term and relate mainly to construction of a bridge and to excavation activities in the project area. A draft Environmental and Social Assessment Report was completed by GoG in 2010 with CAP funding. This document will be updated as part of project preparation. Although not anticipated, the Environmental Assessment will include an assessment of potential impacts on natural habitats.

19. *Social:* The rehabilitation of the Cunha Canal triggers the Involuntary Resettlement (OP/BP 4.12) policy as some land acquisition from a lumber company will be necessary to expand the right of way for the Cunha Canal rehabilitation and the arrangements for the transfer and any impacts will be reviewed as part of the due diligence under the project. An MoU has been signed with the Barama Lumber Company giving their support for implementation of the project. The alignment of the Canal is being adjusted to minimize use of the lumber company's land. An Abbreviated Resettlement Plan (ARP) will be prepared consistent with OP 4.12 policy requirements that describes the valuation of affected assets and income sources, consultations with the Barama company over acceptable design and compensation alternatives, institutional arrangements for preparing and implementing the RP, compensation to be provided, and a timetable and budget. This Abbreviated Resettlement Plan will be implemented before

commencing any civil works that require acquisition of land and/or associated assets.

IV. Implementation arrangements

20. The project will follow the same implementing arrangements outlined for works under the CAP. Specifically:

21. *Ministry of Agriculture:* The implementing agency for the CAP, including the Cunha Canal works to be financed through this proposed co-financing, is the Agriculture Sector Development Unit (ASDU) within the Ministry of Agriculture (MoA). The ASDU will also manage the fiduciary, safeguards and administrative aspects of the project and the procurement process, including issuance of the tenders, undertaking financial reporting for the project, and making payments to contractors. Construction of the new sluice and rehabilitation will fall under the responsibility of the ASDU while operation and maintenance of the Cunha Canal and sluice will also fall under the responsibility of the National Drainage and Irrigation Authority (NDIA) which is under the MoA and is the national authority responsible for management and maintenance of drainage and irrigation canals. Once works on the Cunha Canal and sluice are complete; the NDIA will take over operations and maintenance in accordance with their mandate. Operation and maintenance costs will be funded through regular government appropriations for these types of activities.

22. *Ministry of Public Works and Communications:* Similarly, the ASDU will manage the construction and related fiduciary, procurement and contract management responsibilities for the bridge, while the Ministry of Public Works and Communications (MoPWC) will assume management and maintenance responsibility of the completed structure. The MoA and the MoPWC have signed an MoU outlining the arrangements for the construction design approval and supervision, maintenance and operation of the proposed works. Under the MoA, the MoPWC will be responsible for providing approvals for the final design of the bridge works to assure it is consistent with national requirements. Upon completion of the works, the ownership of the bridge will be transferred to MoPWC who will maintain the bridge after construction is complete through funding from regular government appropriations for these types of activities.

23. *GRIF Oversight:* The works under the proposed co-financing will receive strategic direction and guidance from the technical unit and designated representative of the GoG for the GRIF and the GRIF Steering Committee .

V Monitoring and evaluation arrangements

24. Monitoring and evaluation for this co-financing will follow the arrangements set up under the CAP and will be conducted for project implementation and impact monitoring. The ASDU produces semi-annual Progress Reports of CAP implementation that are sent to the Bank for review, and these will henceforth also report on progress of the Cunha Canal rehabilitation. A final evaluation will be conducted in the last semester of the CAP's execution. The essentially technical nature of the co-financing activities and the fact that the relevant indicators are easily

measurable, contributes to the simplicity of corresponding M&E arrangements.

25. As partner entity to the GRIF, the World Bank will comply with reporting requirements set out in the GRIF Operational Manual, notably to report annually to the Steering Committee, through the Secretariat i) on the progress of implementation of its activities and results achieved compared to planned results, and ii) on its contribution to the achievement of the planned results of the GRIF as such and the financial status of project activities under its responsibility. The Bank will provide the Steering Committee with a final report within six months of the project's completion date. The Secretariat will post progress reports, annual reports and non-audit quality reports on financial disbursements and results of audits on the GRIF web site, as received they are from partner entities.

VI. Project Stakeholder Engagement

26. The stakeholders directly impacted by the works under the proposed co-financing are the Barama Lumber Company through whose property the canal will traverse and the users of the public road that will experience delays during construction. An MoU has been signed with the Barama Lumber Company giving their support for implementation of the project. In addition to consultation on these issues as part of the preparation of the project, the impacts on these groups will be assessed, minimized and mitigated or compensated through the environmental assessment and application of the resettlement policy.

27. Other stakeholders in Guyana are also important in the broader context of the CAP project. These include the coastal communities in the project area that will directly benefit from the project through an improved ability to manage the Conservancy for flood protection and irrigation. Stakeholders also comprise the various donors involved in financing, and government agencies involved in the management of the conservancy, irrigation and flood prevention and in climate change adaptation and low carbon development in the country.

28. The project team will implement a communications strategy to coordinate and regularly inform these stakeholders of the progress of this project and the CAP, largely. This will include communication amongst agencies and donors as well as to the general public.

29. Finally, as per GRIF procedures, this Project Concept Note and the full project proposal will be posted on the GRIF website for public comment.

Annex I
Preparation Schedule and Resources

Preparation Schedule

Project Concept Approval	January 15, 2012
Full Project Document approval	February 15, 2012
Project implementation	June 2012- March 2013

Budget

Estimate of GRIF Resources Required by the World Bank for preparation	\$73,000
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Annex II

Description of the Conservancy Adaptation Project (CAP)

1. The GEF Conservation Adaptation Project (CAP) is financing the development of the technical foundation for a master plan of future interventions within the EDWC and lowland drainage systems, as well as specific upgrading works and operational improvements aimed at enhancing the flood control capacity of the EDWC. The tools developed under the analytical component of the CAP will be used by the GoG and donor agencies to guide future investments.

2. ***Component 1 - Pre-investment studies for engineering design of works (US\$2.0 mil from GEF)***: The objective of this component is to provide the hydrologic baseline necessary for contemplating rational interventions aimed at increasing the current discharge capacity of the flood control system. This objective is being achieved through:

- *Detailed topographic and land use mapping*
- *Hydrologic modeling of coastal lowlands*
- *Assessment of EDWC system integrity*
- *ED WC hydraulic modeling*
- *Pre-feasibility studies for coastal lowland interventions*
- *Operational capacity building*

3. The key outcome of these pre-investment studies is a high resolution topographic model of the inhabited coastal plain to be used as the basis for hydrologic analysis of the region under current and projected climate scenarios. The results from this component will pinpoint key areas where interventions will improve the system discharge capacity critical for flood zone management. Pre-engineering designs will be completed for a set of prioritized interventions. Specialized staff within the following agencies will be trained in the application of the analytical tools produced: NDIA, the Lands and Surveys Commission, the Ministry of Works' River and Sea Defense Division, the Guyana Environmental Protection Agency and the Civil Defense Commission.

4. ***Component 2 - Investments in specific adaptation measures (US\$2.9 mil - US\$1.7 mil from GEF and \$1.9 million Government of Guyana)***: The objective of this component is to counteract the effects of sea level rise, which has decreased the GoG's ability to manage water levels of the EDWC system. The investments are intended to improve the ability of the Government to manage water levels behind the EDWC dam during heavy rains by improving internal water flows in the EDWC and increasing EDWC drainage relief capacity to the Demerara River and eventually the Atlantic Ocean. Based on analytical outputs, additional upgrading of water control structures will also be undertaken. This objective is being achieved through:

- *Widening of key drainage relief canals*
- *Improvement of waterflow system within EDWC*
- *Upgrading of water control structures*
- *Selected equipment purchase and installation*

5. By the end of project, activities under this component should result in an increased drainage capacity of the EDWC to the Demerara River. The GoG, through the NDIA, will direct additional investments in the strengthening of drainage and irrigation infrastructure based on the engineering foundation to be developed under Component 1.

6. Within the infrastructure works under Component 2, rehabilitation of key drainage relief canals is defined as an activity under the Project, to be financed outside of Project funds. The economic analysis carried out during Project preparation considered five civil works alternatives for decreasing the likelihood of EDWC collapse, and Cunha Canal was selected from these based on least cost, maximum improvement in discharge capacity, and ease of implementation. It was agreed during preparation the actual site of works would be selected for the re-opening of the Cunha Canal during Project development.

7. ***Component 3 - Institutional Strengthening and Project Management (US\$0.1 mil from GEF)***: The objective of this component is to strengthen the institutional framework for flood control within the context of the national emergency management sector headed by the Civil Defense Commission. The project is also supporting an institutional consolidation of flood control in Guyana to help create consensus around a medium and long term intervention strategy to help the country adapt to sea level rise. This work centers around specific products, including:

- *Contingency plan for flood events*
- *Consolidation of flood control actors*
- *Monitoring and evaluation of project progress*
- *Project management*

8. Through this component, the Government will be better positioned to respond to flood emergencies. Moreover, through the Implementation Secretariat, flood control work will begin to be consolidated in the country, which is expected to lead to greater information sharing and institutional memory throughout the government.

9. Safeguards

10. ***Environmental Assessment (OP/BOP 4.01)*** As defined by the environmental assessment framework for the Project, environmental management includes three basic activities: (i) for the small maintenance related works, the environmental requirements are applied in the form of contract clauses; (ii) as a result of the analysis of regional hydrologic conditions, the project includes the design of a series of engineering interventions to optimize the drainage and flood control system of the coastal lowlands; and (iii) for rehabilitation of key drainage relief canals under Component 2, an Environmental Assessment (EA) of the works under consideration will be produced as part of the engineering process and its findings incorporated into final designs. The engineering firm contracted to carry out this analytical work is responsible for developing site specific environmental assessments for the widening of outlet canals and improvement in water flows behind the EDWC. Additionally, their work program includes a separate report on the possible environmental impacts of future drainage sector improvements.

11. *Natural Habitats (OP/BP 4.04)* A portion of the project takes place within the East Demerara Water Conservancy. This is a man made structure that is considered a natural habitat. No adverse impacts to the conservancy are envisioned under the project. At the same time, by improving the drainage capacity of the EDWC and assessing the weak portion of the EDWC Dam, the project aims to ensure that this natural habitat remains intact.
12. *Physical Cultural Resources (OP/BP 4.11)*: While activities to be carried out under the project are not expected to impact any known cultural heritage sites, technical specifications for works in the Operation Manual will include "chance find procedures" to be followed in the event that culturally significant materials are discovered during the execution of civil works.
13. *Forests (OP/BP 4.36)*: The southern portion of the East Demerara Water Conservancy is bordered by a forest. No physical work is envisioned within 10 miles of this forest and no adverse impacts to the forest are envisioned under the project. Moreover, improvements in water flows within the EDWC are expected to have no impact on the bordering forest.
14. *Safety of Dams (OP/BP 4.37)*: The EDWC is bordered to the north by a 30 mile long earthen dam constructed some 150 years ago. The dam has been heavily stressed particularly during the past two flood events (2004-5, 2005-6). While no civil works are to be conducted on the dam, a detailed engineering assessment of the dam and its associated drainage structures is to be completed under the project. This will provide the engineering and safety guidance to the GoG for the design and development of any dam strengthening programs.
15. The engineering analysis developed under the present project will provide the technical basis for the Government to fulfill the requirements for an expert assessment of the weakened portion of the EDWC Dam provided under this safeguard. Upon receipt of the dam safety assessment, and as part of implementation of the project, the World Bank will contract independent experts to assess and to validate the quality of the report.

Annex III

Map of East Demarara Water Conservancy



