

## HURRICANE REHABILITATION AND DISASTER PREPAREDNESS

(BL0015)

## EXECUTIVE SUMMARY

<b>Borrower:</b>	Government of Belize			
<b>Guarantor:</b>	Government of Belize			
<b>Executing agency:</b>	Ministry of Budget Planning, Economic Development, Investment and Trade (MED)			
<b>Amount and Source:</b>	IDB:	(OC)	US\$	21.333 million
	CDB (parallel financing)		US\$	8.308 million
	Local:		US\$	2.581 million
	Total:		US\$	32.222 million
<b>Financial terms and conditions:</b>	Amortization Period:	25 years		
	Grace Period:	4 years		
	Disbursement Period:	4 years		
	Interest Rate:	variable		
	Supervision and Inspection:	1%		
	Credit Fee:	0.75%		
	Currency:	US dollars from the single currency facility of the Bank's ordinary capital.		
<b>Objectives:</b>	This operation will contribute to reduce the country's vulnerability and improve its response capacity to natural disasters. Specifically, the objectives are the prevention of deaths and injuries and the mitigation of material losses when events of this nature take place.			
<b>Description:</b>	The program is as a risk-mitigating operation that includes: (a) In the short-run, the <b>reduction of the vulnerability</b> of the country by the adoption of structural measures including: 1. Increasing the infrastructure safety network with the construction of regional shelters. 2. Reducing the vulnerability of local shelters by reinforcing their structures, 3. Reducing the hazard proneness in neighborhoods of Belize City by means of upgrading the drainage infrastructure. (b) In the medium-run, the <b>improvement of the institutional response capacity</b> focussed on the National Emergency Management Organization (NEMO) and on community			

organizations. These measures will include, among others, (i) the design, implementation and enforcement of building codes; (ii) hazard analysis and risk assessment; (iii) public awareness, education and training programs for local civil preparedness; (iv) plans for disaster management, and (v) analysis and design of measures to protect critical infrastructure and lifeline networks.

- (c) For the long-run, the program addresses the issue of **sustainability** of the different components through improvements in maintenance of the infrastructure. The program will provide the technical assistance to support the O&M departments of the institutions in charge of the works delivered by this program.

**Relationship of Project in Bank's country and sector strategy:**

The proposed program fits within the operational and policy guidelines of the Bank's program to assist member countries in taking appropriate measures to reduce or avoid losses from natural disasters (Emergencies Arising from Natural and Unexpected Disasters, GP-92-15 dated December 1, 1998). Further, this operation is fully in line with the chapter on the analysis for **Protecting the Poor Against Natural Disasters** that will be in the upcoming **Special Report on Social Protection and the Poor**. The report provides ample evidence that the poor are the prime victims of natural disasters.

**Parallel Financing:**

This operation will be complemented principally by parallel finance with the Caribbean Development Bank (CDB), which will fund some of the regional shelters and a facility for NEMO. Works and services to be financed by the CDB and the Bank will be independent from each other and each institution will follow its own procurement rules. This will provide a more agile mechanism of disbursements and help avoid unnecessary delays.

**Environmental/Social review:**

The environmental effects of the proposed works will be minimal and the social benefits to be obtained will outweigh these few negative impacts. Potential environmental impacts of the program and their mitigation measures are described in ¶ 4.3.

**Benefits:**

As indicated above, the poor are the prime victims of natural disasters. The structural measures provided by the program will benefit this ample sector of the population by mitigating the risks and vulnerability to which they are exposed. The institutional measures will improve the disaster preparedness and enhance the emergency management capacity of the country.

**Risks:**

There are two institutional issues that represent a risk for this operation: execution capacity and maintenance of works. At the municipal level, a strong technical assistance component has been

designed to effectively support project activities that the Belize City Council (BCC) will undertake. The support to be given will, in addition, help the city to improve the services it provides, including maintenance.

At the central government level, the MOW is in the process of designing a maintenance policy and the instruments for its implementation. The program will make available the financial resources to provide the technical support required to tackle the execution and maintenance issues.

**Special  
contractual  
clauses:**

The call for bids for the construction of the Regional Shelters – financed by the Bank– is conditioned on the selection of the sites based on the results of the study referred to in ¶ 2.13. In addition, the call for bids on local and regional shelters is conditioned on an agreement with the owner of the building or land (if the Government is not the owner) which establishes the owner's: (1) permission to carry out the construction or retrofitting; (2) obligation to: (a) maintain the structure and equipment, and (b) make the structure available for use as a shelter.

The Program Coordinator, the two Project Engineers, and the accountant shall be hired as a condition precedent to disbursements. Notwithstanding this, upon fulfillment of the general conditions precedent to first disbursement, up to US\$100,000 of the loan resources may be disbursed for the hiring of these four professionals. The PEUs should be fully staffed within 2 months after signature of the loan contract and within said period, the Government shall sign an agreement with the BCC establishing the BCC's obligation to support execution of the drainage infrastructure component and maintain the drainage works once they are upgraded.

The loan contract with the CDB should be signed as a condition precedent to disbursements.

The achievement of agreed benchmarks regarding, among other matters, the institutional structure and regulatory framework for disaster management, and a calendar for implementing maintenance recommendations, will be reviewed on an annual basis. If substantial deviations from the agreed benchmarks has occurred, the Bank may require the suspension of new calls for bids, requests for proposals and other forms of commitments to be financed with the loan resources.

**Poverty-targeting  
and social sector  
classification:**

This operation has PTI status using the head count criteria. It also qualifies as a social equity/poverty reduction project, as described in the indicative targets mandated by the Bank's Eight Replenishment.

<b>Exceptions to Bank policy:</b>	Government proposes to hire, with local resources, the firm already engaged in the preparation of drainage studies, to prepare final designs and supervise the construction (§ 3.15). Hiring of this firm will be without a new competitive selection procedure.
<b>Procurement:</b>	Except for the foregoing exception, international competitive bidding will be used to procure goods in excess of US\$250,000, consulting services in excess of US\$200,000 and works in excess of US\$1,000,000.
<b>Special Aspects:</b>	<b>Bank Exposure and Overall Indebtedness of the Country.</b> This operation will increase substantially the size of the Bank's portfolio in the country. An assessment made indicated that the Bank's ratios are well within standard limits, and do not represent a major concern at this time (see § 4.27 through 4.31).
<b>Retroactive Financing:</b>	<p>It is recommended that up to US\$2.0 million of expenses incurred before the approval of the loan, but after December 1, 1998 be eligible for reimbursement with the proceeds of the Loan as long as IDB procedures and policies have been followed (§ 3.23).</p> <p>In addition, it is recommended that up to US\$500,000 be recognized retroactively as counterpart resources (§ 3.24)</p>

## **I. BACKGROUND**

- 1.1 This program addresses the severe limitations, as presented in this section, at the institutional and organizational levels, and of infrastructure that Belize presently has to confront natural disasters. For each of the limitations identified, in Chapter II, the program proposes specific lines of activity, establishes their financing level, and identifies its sources. A viable institutional scheme –to achieve the goals with the established resource limitation– is proposed for the execution of this operation. Finally, the potential environmental impacts caused by the activities and the mitigation strategy to be followed are discussed.
- 1.2 Hurricane Mitch ravaged Central America in October 1998, killing thousands and causing untold millions in property and infrastructure damage. While the storm skirted Belize, it was a reminder of deadly hurricanes that destroyed Belize City in 1931, and again in 1961 (Hattie). The power, proximity, and projected landfall of Mitch's path terrorized the population.
- 1.3 At the height of the threat, an estimated 28,000 persons (13 percent of Belize's population) were evacuated inland into inadequate and overcrowded shelters, where they remained still at relative risk for their lives for several days until the crisis had subsided. No lives were reported lost, and property damage was relatively light.
- 1.4 Throughout Belize the damage was mostly the loss of docks, piers, a few seafront structures and beach erosion due to high waves. Along the coast the reef barrier protected the coastal areas, while the reef itself sustained only minor damage. In the wake of subsequent storms there was local flooding, mainly in low-lying areas of Belize City and other coastal towns.
- 1.5 At the institutional level, although the will of the agencies and individuals responsible for disaster management was commendable, the emergency pointed to the need for immediate improvements in the management of preparedness, relief and mitigation activities.
- 1.6 The Government of Belize, while seeking the support of the IDB for rehabilitation of damaged infrastructure<sup>1</sup> has, at the same time, requested assistance to enhance its preparedness to manage similar disasters in the future.
- 1.7 In response, the Bank funded with C & D resources a study of NEMO's present status, including the identification of remedial actions to be taken, and recommendations for updating and making Belize's National Disaster Plan more operational.
- 1.8 Following this, in May 1999, the Bank approved a US\$150,000 technical cooperation (ATN/CP-6491-BL) financed by the Canadian Fund to begin implementing essential technical support activities to NEMO during the 1999 hurricane season. The TC provides for ten person months of technical assistance, and will provide initial support to: (i) evaluate the contingency arrangements which exist in key ministries and disaster response agencies; (ii) develop multi-sector

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<sup>1</sup> The piers in San Pedro and Caye Caulker require repairs as a consequence of the damages suffered by Mitch. The costs of the repairs have been estimated at US\$150,000 and will be financed by the loan.

hazard plans, complementary programs, and policies; (iii) review existing emergency telecommunications arrangements, and advise on their adequacy, readiness and the requirements for improvement; (iv) undertake a comprehensive hazard and risk assessment and develop a strategy for the use of this information; and (v) review model disaster legislation and regulations, propose amendments, and a strategy for its enactment and adoption.

- 1.9 Despite these initial efforts many challenges remain. A comprehensive approach is needed to include not only government institutions, but the community and civil society as a whole. It is only with their participation that investments for preventive emergency systems will reduce the country's vulnerability to natural disasters.

#### **A. Current Challenges**

- 1.10 The current challenges for disaster management and mitigation losses in Belize can be grouped in two major components: (1) institutional, including community preparedness and networking, and (2) availability of infrastructure for the prevention of loss of lives and the mitigation of damages. In addition, (3) maintenance is vital for the long term sustainability of the infrastructure financed by this operation

#### **1. Institutional and Community Preparedness**

##### **a. The National Emergency Management Organization (NEMO)**

- 1.11 Prior to hurricane Mitch, disaster emergency management was handled in an ad hoc fashion from the Office of the Prime Minister. With the advent of Mitch, this group known as the National Emergency Management Organization (NEMO)<sup>2</sup> was activated and operated from makeshift headquarters in the office of the Prime Minister in Belmopan. Under the circumstances NEMO performed in a commendable manner, but this event clearly demonstrated that disaster preparedness faced four major challenges.
- 1.12 First, the **National Disaster Plan**, the main guideline for public and private sector action, is woefully inadequate to establish the needed welfare protection for Belizeans in time of disaster. This document attempts to detail the responsibilities and actions required by public agencies and non-governmental agencies in case of a hurricane. Although hurricanes are by far the major threat faced by the population, the Plan does not address other hazards. All indications are that the Disaster Plan is not well understood, is poorly structured, lacks logical consistency, is silent on its authority, and does not discuss the assumptions underlying its operation. It is, therefore, neither an administrative nor an operational document.

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<sup>2</sup> NEMO is comprised of :

1. The Cabinet, with the Prime Minister as the Chairperson (Ministers may bring technical advisors)
2. The Cabinet Secretary as Secretary.
3. NEMO Secretariat, comprised of: Chief Executive Officer, other relevant operational/office staff, Chairpersons of the Operational Committees; Red Cross; and Representative, Belize National Teachers Union.

- 1.13 One of the consequences of the foregoing is that evacuation plans are not yet available. Special attention is needed to prepare evacuation procedures of the cayes during the warning phase, and to identify what other activities must take place during that time.
- 1.14 Further, an assessment of the procedures for managing shelters, including the responsibility for opening, feeding of workers and victims, and hygiene/sanitation is required. Additionally, general guidelines for damage assessment need to be amplified, framed within a sound public sector strategy, integrated in the planning approach, and complemented by standard criteria for damage assessment.
- 1.15 Other aspects that need to be considered in the National Disaster Plan are the development of a list of critical personnel and the safeguarding of public records.
- 1.16 Second, the situation is compounded by the lack of **disaster legislation** which would establish, for instance, NEMO as a duly constituted authority, including its role and mandate, as well as the responsibilities of other public sector entities, in the context of a sound National Disaster Plan. As it stands, NEMO functions are limited to preparedness and response and there is little or no reference to mitigation or to recovery after an event.
- 1.17 All this raises many questions about the capacity of NEMO to access and coordinate preparedness and mitigation activities across the public sector. The consequences of the absence of disaster legislation or of enforcement, compounds issues related to land use zoning, building codes, forced evacuation, or injury to evacuees at shelters.
- 1.18 Third, the inadequacy of **technical resources and equipment** seriously limited NEMO's ability to quickly prepare for the emergency and attend to the needs of thousands of refugees scattered throughout the country.
- 1.19 Although to date the early warning systems have functioned fairly well, the communications network described in the current Disaster Plan is inadequate. It requires too many intermediaries to get messages to and from communities and shelters. The assessment of emergency communications strongly indicates that there is a need to reactivate and update the National Emergency Communications Plan.
- 1.20 Fourth, **hazard information and risk assessment** studies are needed. There is a shortage of reliable and sufficiently detailed information on local hazards, thus public and private investments have been taking place in an uncertain framework. This is particularly relevant in the case of critical infrastructure and lifeline networks.<sup>3</sup> There is the need, therefore, for a thorough understanding of the frequency, intensity, and possible impact of hazards. This information must be integrated into national environmental and land use legislation that will guide investments, the design of effective hazard mitigation measures, and the formulation

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<sup>3</sup> As an example, it is necessary to consider the evacuation of the Dangriga and Punta Gorda hospitals which were not built with sufficient elevation to be safe from the storm surges. Alternative temporary facilities will have to be provided for some time after a major hurricane, since all equipment left behind after the evacuation would be contaminated.

of disaster scenarios for preparedness and response. The latter should include contingency plans dealing with alternative income generation when a disaster occurs.

**b. Community Preparedness and Institutional Network**

- 1.21 Even in the case of an efficiently functioning NEMO, effective emergency management and mitigation would be difficult without strong participation of communities and a tight network of institutions of civil society.
- 1.22 Although NEMO identifies City, Town, Municipal and District Emergency Management officers, there is need for a sustained program of education and training, to ensure that they are able to undertake the functions expected of them in emergency situations. Some public education and awareness programs are in effect during hurricane season but they do not address other hazards that could affect the country or the question of mitigation and recovery.
- 1.23 The Government recognizes that it does not have many of the response resources required to effectively manage a hurricane disaster. These resources have to be identified and formalized through memoranda of understanding with appropriate support organizations (i.e., food supplies, aircraft for aerial reconnaissance and post-impact assessments, communication and broadcast equipment and services, training and programming inputs of NGOs, etc.).

**2. Infrastructure for the Mitigation of Losses**

**a. Existing shelter infrastructure**

- 1.24 Prior to hurricane Mitch the Government had designated (about 600 buildings) to be used as local shelters in case of emergency. These structures were schools, churches, public buildings, and community centers. A post-crisis analysis indicated that many local shelters did not meet the minimum standards to withstand hurricane winds nor the accompanying rainfall.
- 1.25 Regional shelters were non-existent and instead, as in the case of Belmopan, officials improvised by using government buildings as crowded refuge for the thousands of people evacuated from Belize City. These buildings had few sanitary facilities and no provisions for cooking. As a result, after just a few days of occupation, the damage to these buildings caused by the occupants was higher than that caused by the hurricane itself. Outside Belmopan, school buildings were also used as shelters. Lack of emergency preparedness and clear assignments on who should manage shelters created serious challenges in terms of management and coordination among conflicting mandates and authorities.

**Demand for Shelters**

- 1.26 The estimated demand for shelters is based on the records of persons that were accommodated in officially designated shelters across the country during the evacuation from Hurricane Mitch in October 1998. Many of the buildings, however, were not structurally suitable to be used for such purposes. Because the



official shelters were generally overcrowded, many persons were sheltered in private homes of relatives and acquaintances. Some of them accommodated up to 38 refugees.

- 1.27 Informed estimates were made of the number of refugees in private homes, of the catchment area for official shelters and of the need for almost total evacuation of coastal towns and villages to escape storm surges in the event of a Category 3 or higher hurricane. The counts of refugees seeking accommodation in official shelters were then adjusted to arrive at the total demand for shelter in each of the six districts, as well as in Belize City and the capital, Belmopan.
- 1.28 The selection of buildings to be retrofitted and used as shelters under the program was based on an inspection of all public facilities that were used during Hurricane Mitch. The buildings were inspected for structural soundness, adequacy of fixtures, exposure to flooding and storm surges, the availability and adequacy of basic amenities like water, lavatories and access to communication facilities and electricity. The technical feasibility and cost of refurbishing the building and repairing structural elements were assessed. Those facilities with major structural deficiencies, as well as those that are vulnerable to flooding or storm surges from Categories 1 and 2 hurricanes, and those that are owned by churches or otherwise deemed uneconomical to retrofit, were omitted.
- 1.29 The unmet demand (see Table 1) for shelters in each district is the difference between the estimated total demand for shelters and the number of refugees that can be accommodated in the buildings to be retrofitted. This unmet demand will be addressed by constructing regional shelters at strategic locations throughout the country. Retrofitting local shelters makes them suitable as shelters, but does not add new capacity to accommodate refugees.

**Table 1. Estimates of Shelter Space Available and Required**

<b>District/Area</b>	<b>Shelter Spaces Required</b>	<b>Available Space from Existing Shelters<sup>4</sup></b>	<b>Additional Spaces Required</b>
Belmopan & Las Flores	11400	2483	8917
Cayo <sup>5</sup>	6520	5740	780
Stann Creek	9350	2710	6640
Toledo	3600	3388	212
Belize City	5760	3760	2000
Belize (District)	3752	2101	1651
Orange Walk	7202	6333	869
Corozol	6500	4794	1706
<b>Total</b>	<b>54084</b>	<b>31309</b>	<b>22775</b>

- 1.30 It is not possible to satisfy all of the unmet demand in every district because of the high costs involved. However, given the population's increased awareness of the dangers of a hurricane, (thanks to Mitch) more people will accept responsibility to

<sup>4</sup> Retrofitting of these shelters to be financed by project.

<sup>5</sup> Excluding Belmopan & Las Flores.

make their own arrangements for the safety of their families. The extent and impact of overcrowding that will take place in the official shelters will be mitigated by improved coordination of emergencies countrywide and better management of shelter sites. This effort is presently being supported through the institutional strengthening of NEMO under a complementary technical assistance project (ATN/CP-6491).

- 1.31 In addition, overcrowding that likely will take place will be tolerable for a short while (3-5 days) until the hurricane passes. Where some of the homes are destroyed, local and regional shelters have the capacity to accommodate the affected population for longer periods.
- 1.32 All coastal towns and villages, including Belize City, Dangriga, Punta Gorda and Corozal, are vulnerable to storm surges, and certain rural communities may be cut off from potential shelter sites by flooding. New regional shelters should therefore be strategically located in cities or areas where there is reliable (all-weather) access and where they are sufficiently elevated to be safe from storm surges.

#### **b. Drainage Infrastructure**

- 1.33 During Mitch, storm surges were the greatest threat to the coastal areas especially Belize City. Historically, ninety percent of the fatalities resulting from a hurricane are due to drowning caused by a storm surge. Belize City has a flat and low-lying topography, and some areas are below mean sea level, characteristics that make it a particularly vulnerable and hazard-prone area. To address the recurrent flood problems of Belize City, between 1994 and 1998, a city-wide network of drainage works were undertaken under the World Bank-financed Belize City Infrastructure Project (BCIP). In the short run, these works proved to be successful in alleviating urban flood problems. However, the continued development of the city, increased population density, and lack of regular drainage maintenance has resulted in the need to upgrade and repair the present network.

### **3. Maintenance**

- 1.34 This issue is not specific to this operation, but rather a systemic limitation observed throughout the public sector. At the local government level, the physical sustainability of the drainage works depends crucially on a high level of maintenance, given the very flat slopes and low flushing velocities of the city canals. At the central government level, the issue resides in efficiently allocating very scarce financial resources for the needed maintenance activities.
- 1.35 To summarize, Belize's recent experience exposed the fragile and limited state of preparedness to manage natural disasters, and underscored the urgent need to strengthen the country's disaster management capacity, examine existing emergency plans, update disaster response systems and procedures, and upgrade supporting infrastructure.

**B. Strategy and Rationale for Involvement**

- 1.36 The challenges faced by the current emergency management and mitigation systems organization in Belize are numerous and cumbersome. This operation will be a first step towards putting in place essential instruments upon which to build a sound national capacity for dealing with emergency preparedness and management.
- 1.37 The proposed program fits within the operational and policy guidelines of the Bank's program to assist member countries in taking appropriate measures to reduce or avoid losses from natural disasters (Emergencies Arising from Natural and Unexpected Disasters, GP-92-15 dated December 1, 1998). Since 1998, the Bank has mobilized over US\$ 1 billion in financing for countries affected by these events. Operations under these guidelines were approved for Argentina, Colombia, Honduras, Nicaragua, Guatemala, El Salvador, Peru, and Paraguay. Based on these experiences, the IDB is uniquely qualified to prepare and finance an operation of this nature.
- 1.38 Further, this operation is fully in line with the recently developed analysis for **Protecting the Poor Against Natural Disasters** (authored by SDS) that will be reported in the upcoming **Special Report on Social Protection and the Poor**. The report provides ample evidence that the poor are the prime victims of natural disasters.

## **II. THE PROGRAM**

### **A. Program overview**

- 2.1 The infrastructure financed by this program is an initial attempt to provide the citizens of Belize with means to help mitigate fatalities and injuries in the event of occurrence of a hurricane or major flooding. Approximately 85 percent of the proceeds of the loan will be used in the financing of this component, with an additional five percent programmed for the acquisition of equipment. The institutional measures being addressed by the loan (accounting for the remaining ten percent of the resources provided by the Bank) are designed to provide the country with the ability to efficiently coordinate resources at the local, national, and international levels in a broad range of disaster events.
- 2.2 In the case of the regional shelters, at the request of the GOB, CDB will focus its operation in the Belmopan area financing the construction of four multi-purpose structures. The Bank, on the other hand, will finance the construction of the new regional shelters, outside of Belmopan, and the improvements needed to strengthen the local shelters. It is expected that after full implementation of this program, a network of local shelters will be available for approximately 31,000 persons, while the regional shelters financed by the Bank will accommodate about 2,300 additional persons.
- 2.3 Dredging, lining, and cleaning of canals and creeks in Belize City will also be activities delivered by this project (about 4,500m. of new canals and improvements in another 4,000m.). This is done in an effort to reduce the flood hazard proneness of the city, particularly in some of the poorest sections. It will also improve the environmental conditions of the areas surrounding the works, and will improve the flushing efficiency of the drainage system.
- 2.4 The program will provide the technical support, facilities, and equipment needed by NEMO to carry out its emergency management activities in an efficient and timely manner. In a parallel fashion, the CDB will finance the institution's operating center. The program will, also, deliver financial support to implement those activities leading to the preparedness and improvement of the response capacity of the community, supporting agencies, and NGOs.
- 2.5 Financing will be provided for technical assistance to the Belize City Council in the areas of maintenance management, physical development planning, and human resource management, as well as support the Ministry of Housing in enforcing building codes and training in proper construction practices in the building industry. The Ministry of Works will also be strengthened to improve its maintenance capacity.

### **B. Objectives**

- 2.6 In general, this operation will contribute to reducing the country's socio-economic vulnerability to natural disasters. Specifically, the objective is to improve the infrastructure capacity of the country to prevent deaths and injuries from hurricane winds and, in Belize City, the mitigation of material losses due to flooding when events of this nature take place.

### **C. Program Components**

2.7 The program has been conceived to have three components, each of which will be supported by a group of activities, as described below:

- 1) a structural component that will address, in the short-run, the measures needed to reduce the vulnerability of the country to damages from winds and, in addition, for the particular case of Belize City, to damages from rain and storm surge;
- 2) an institutional component that addresses, in the medium term, improvements of the community and institutional response capacity;
- 3) a third component was incorporated to improve the institutional capacity to deal with the long-term sustainability of the infrastructure procured by the program

#### **1. Mitigating vulnerability: Structural measures**

2.8 This component includes the adoption of structural measures along three main lines of activities:

- a. Reducing the vulnerability of local shelters by reinforcing their structures,
- b. Increasing the infrastructure safety network with the construction of regional shelters, and
- c. Reducing the water hazard proneness in neighborhoods of Belize City by means of upgrading the drainage infrastructure. Specifically:

#### **a. Reducing Vulnerability of Existing Local Shelters.** (US\$ 6.13m. IDB, US\$0.61m. GOB)

2.9 Under the proposed project, a web of existing local shelters will be structurally reinforced. These buildings will be complementary to the larger regional structures and will provide prompt access to neighboring residents. These are schools and community buildings that will be brought up to desired construction standards.

2.10 Each of the designated shelters has been assessed separately, and the needed repairs have been noted and placed in order of priority. The greatest expected damage to these shelters would be the loss of the roof which, for the most part, is not adequately constructed to resist hurricane winds. A general design of a roof truss that can meet all needs of the various buildings has been produced to replace all those considered unsuitable. The project will finance the proposed improvements. However, those buildings in the low coastal plain and especially those with high retrofit costs were eliminated from the established list of hurricane shelters.

2.11 **It will be required, though, that all residents in the villages adjacent to the sea would need to be evacuated in the event of a hurricane of category 3 or greater.<sup>6</sup>**

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<sup>6</sup> On the Saffir-Simpson hurricane scale, a category 3 will have winds of 110-130 mph and storm surge of 9-12 ft above normal. In these conditions, winds will destroy mobile homes and produce structural damage

**b. Increasing the Infrastructure Safety Network: Regional Shelters**  
(US\$5.00m. IDB; US\$ 5.23m. CDB, US\$0.50m. GOB)

- 2.12 To effectively provide refuge, a system of regional shelters will be designed, located, and constructed to withstand hurricane grade 5 winds and storm surge. These buildings will be provided with basic sanitary and cooking facilities. It is planned that these shelters will be strategically located to provide refuge for the populations of Punta Gorda, Dangriga, Belize City, Orange Walk and Corozal.
- 2.13 A study is being financed to determine the best location of the regional shelters according to site selection criteria. The latter would include: (i) all-weather road access; (ii) out of reach from storm surges in a Category 5 hurricane; (iii) adequate transportation services; (iv) infrastructure for basic utilities, and other factors emerging from the studies to be carried out under the institutional component. To make efficient use of these installations they will also be designed to serve as multipurpose buildings and will be placed in and maintained by existing educational institutions.
- 2.14 The execution of the construction in this sub-component will be contingent upon the aforementioned study (¶ 2.13) and as soon as the needs to protect the critical infrastructure and lifeline network (serving the location) have been identified and implemented (see ¶ 2.25). Provision for this activity would help mitigate the risks that the benefits from the new investment in shelters would be partially or fully lost for lack of prevention in the ancillary works.
- 2.15 Preliminary engineering designs have been completed. While final designs are not yet available, preliminary cost estimates are a reliable basis for the Bank's financing of this component.
- 2.16 In addition, the GOB and the CDB have agreed upon building another four shelters. All of them will be located in Belmopan

**c. Reducing the Hazard Proneness of Belize City: Upgrading of the Drainage Infrastructure.** (US\$3.27m. IDB, US\$0.80m. GOB).

- 2.17 The purpose of this sub-component is to mitigate losses from floods in sections of Belize City, home to a quarter of the country's population. This operation will finance those activities that will maintain or improve the efficiency of water evacuation of the city streets, a condition most likely to occur in the event of a hurricane.<sup>7</sup> There are two other important mechanical side benefits derived from the

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to small homes. Along the coast, flooding will damage larger structures. Extensive inland flooding will occur in topography that is less than 5 ft. above sea level.

<sup>7</sup> Four options for the collection and discharge of urban surface water drainage were considered:

- Open channels – normally dry
- Open channels – normally wet
- Pipes or culverts flowing by gravity
- Pipes flowing by gravity to sumps that are discharged through a rising main.

These options are arranged in order of increasing costs. The prime considerations for choosing the most adequate of these were the construction costs, and the cleaning and desilting costs of the canals.

upgrading of the present works: improvement of the flushing flow in the system, and reduction of future siltation problems. Both side benefits have substantial relevance in the environmental (see ¶ 4.3) and economic (see ¶ 4.19 through 4.23) aspects related to the works.

- 2.18 Although not a part of the objectives of disaster preparedness sought by this operation, these works will enhance environmental conditions of the surrounding areas. In recent years, low-income families have occupied new areas, particularly, on the western side of the city, but suffer from frequent flooding that make them unsuitable for human living. Works from this component will help to substantially upgrade the environmental conditions for these inhabitants, and minimize future hazards. It will also have a positive effect on other infrastructure such as roads and side streets by reducing the incidence of potholes due to standing water.
- 2.19 The type of activities that may be financed under this component are: (i) dredging, bank stabilization, lining, desilting, cleaning of open canals; (ii) construction of lined and covered sections of certain canals; (iii) construction of a gated barrier on the sea outfall of a canal.

**2. Improving the Response Capacity: Institutional Measures (US\$1.00m IDB, US\$0.85m CDB, US\$0.27m. GOB)**

- 2.20 Although a relatively small share of the total program, institutional strengthening of NEMO is a central component of this operation and builds on the technical assistance provided to NEMO under the “bridge” TC (¶ 1.8). The institutional measures to be financed address the present legal, institutional, operational and programmatic constraints of NEMO and strengthen the participation of civil society in disaster planning and preparedness. The technical assistance provided with this loan will support the development of the overall national management emergency system. In particular, this component will transform NEMO from an ad hoc organization to an apex institution in charge of all aspects of disaster management. Technical support will also be provided to the other participating institutions. Specifically, this component will finance the following lines of activities:

**a. Institutional Strengthening of NEMO**

- 2.21 The program will address the limitations faced by NEMO by means of two instruments: technical assistance and investments in equipment. In the first case, this line of activity will review and seek to implement recommendations for the development of the **Disaster Management Plan**, including the Sector/Agency contingency plans. A detailed review of existing emergency plans and procedures, will be undertaken and followed by a reformulation. It will include detailed procedures for evacuation, a plan for managing shelters, damage assessment guidelines, measures for safeguarding public records, identification of critical resources, mutual aid agreements and personnel. In addition, the activities contemplated will involve the stakeholders (public sector and civil society) in a series of workshops and exercises designed to test the elements of the Plan.

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Piped systems can only be inspected and cleaned with difficulty. The costs of construction, maintenance and disruption would have been far too high to be justified by the benefits. They were, therefore, excluded from the options.

- 2.22 Also, technical support will be provided to review model **disaster legislation** and for the proposal of a legal framework for this institution. It will also:
- (i) provide recommendations for a new internal organization, mandate, and increased manpower with job descriptions and equipment;
  - (ii) design and establish a National Emergency Operation Center (NEOC);<sup>8</sup>
  - (iii) develop legislation and mechanisms for community and civil society participation in disaster preparedness and management;
  - (iv) conduct readiness exercises; and
  - (v) prepare NEMO's Standing Operating Manual.
- 2.23 The investment support will be directed to overcome **limitations of equipment and physical facilities**. The investment in equipment will be complemented by a technical assistance component that will include the review of the emergency telecommunications arrangements, the inspection of equipment, sites, facilities, and determination of their operating status. The technical assistance will also identify the needs for upgrading of existing equipment, acquisition of new equipment, and systems development. Finally, in consultation with Government, a draft for the National Emergency Communications Plan will be prepared. Based on this assessment, the program will acquire the needed communications equipment.
- 2.24 Other acquisitions of equipment included in the program are computers, tape recorders, monitors, digital cameras, etc. In addition, CDB will finance the building of a new facility to be used on a permanent basis for the offices of NEMO and which will serve as its operation center in case of disaster.
- 2.25 Finally, **Hazard Analysis and Risk Assessment** studies will be conducted. Without a doubt this activity constitutes the heart of the disaster preparedness and risk mitigation efforts. Resources will be allocated to prepare a comprehensive study of national and local hazards, establishing an inventory of hazard and risk maps. An analysis will be made of the risk to critical economic centers and populations and recommend a contingency plan, to address disaster-related loss of income or employment. Information obtained from this activity will be key to supporting public and private investment decisions and, therefore, to mitigating potential losses from hazard prone sites. Availability of this information is particularly important when determining the optimal location for regional shelters.
- 2.26 The GOB has placed first priority on providing structural facilities to minimize loss of life during the critical stages of a natural disaster. Nonetheless, to minimize losses due to second round effects, it is vital to protect critical infrastructure (such as water, telecommunications, and electricity) and lifeline networks.
- 2.27 The program will provide technical assistance to identify the necessary steps, activities, and investments that must accompany/precede the construction of

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<sup>8</sup> The CDB will finance the building of a new facility that will be used on a permanent basis for the offices of NEMO and will serve for the operation of NEOC in case of a natural disaster.



regional shelters. In order not to delay the provision of works, activities regarding hazard and risk analysis, and protection of critical infrastructure and lifeline networks should be completed as soon as possible.

**b. Community Preparedness**

- 2.28** This group of activities will support the selection, review, design, organization, and execution of training programs to provide the local capability necessary to manage and maintain an effective disaster management program. Community participation will be sought and encouraged in the preparedness and awareness campaigns needed for disaster management.
- 2.29** Other institutional measures which could be financed by the program are: study, review, and updating of building codes, training for local builders, and technical assistance for building code enforcement.

**3. Support to Long Term Sustainability (US\$0.28 IDB)**

- 2.30** Sustainability of this operation is largely dependent on the capacity of the organizations involved to provide the needed maintenance to the infrastructure delivered by the program, and to keep current the emergency protocols to be followed —by institutions as well as by the community— in case of an emergency. All this translates into having the financial resources and the technical expertise to perform/supervise the needed works and activities. A brief explanation of how the program foresees the participation and performance of the institutions involved is presented below.
- 2.31 Maintenance of Drainage Works.** The BCC is the authority in charge of works, services, and maintenance within the city limits. However, limited delegation of power from central government, inadequately trained personnel, and very constrained financial resources have, in the past, seriously impaired the performance of the services they provide.
- 2.32** The City Council has made significant advances towards the improvement of the local government administration and finances. Additionally, implementation of a comprehensive plan to improve the financial and administrative situation of the City is having positive results. Revenues have increased substantially and property tax collections will be almost double the previous year's total.
- 2.33** As a sign of increased revenues, city works and services have been enhanced. Maintenance of canals has improved and pollution from solid discharge into the drainage system is being substantially reduced. In addition, the creation and implementation of an effective land planning system would be justified for the maintenance of an efficient drainage system, even if all other important benefits were disregarded.
- 2.34** To summarize, while the BCC has enormous challenges ahead, it is also well poised to tackle them. The present operation will provide the needed technical assistance to fill some of the existing voids. Support from the project will be given to improve and develop management and human resources, develop a land zoning plan for the city and, most importantly, transfer the technical knowledge needed for a successful maintenance and procurement program.

- 2.35 **Maintenance of Shelters.** This is an issue of primary importance to the Government. A mixture of public and private ownership characterizes the local shelters. The procedure adopted by the Government will be to finance the needed upgrade or construction. In exchange, it requires from each owner an agreement that the structure will be made available in case of need and that it will be properly maintained. This agreement will be required prior to the calls for bids for retrofitting of local shelters or construction of regional shelters (if the Government is not the owner of the building or land in question). NEMO, with technical assistance from the MOW will conduct annual inspections of all shelters to monitor maintenance and produce a report on its findings. If NEMO finds maintenance violations it can raise the issue and require the shelter sponsor to comply with the maintenance provisions of the contract. The degree of enforcement capability that this institution will have is still an unknown and, therefore, maintenance of the infrastructure remains an issue.
- 2.36 For this reason, the Government has requested the Bank's technical support to explore the establishment of a Works Supervision and Maintenance Unit in MOW. In addition, the assistance should explore alternative instruments to provide the Ministry with the needed resources for an appropriate maintenance program. As part of this program, the needed technical support will be financed by the loan,

#### D. Costs and Financing

- 2.37 A detailed account of the program costs by component is provided in Table 2. As shown, 66 percent of the financing of the program correspond to the Bank, while the counterpart resources (34 percent) will be shared between the CDB and the GOB.

**Table 2. Program Costs by Components and Sources of Financing**

(Values in US\$1,000)	IDB	CDB	GOB	TOTAL
<b>Program Components</b>				
<b>I. Mitigating Vulnerability: Structural Measures</b>	<b>14,586</b>	<b>5,431</b>	<b>1,913</b>	<b>22,150</b>
<i>a. Reducing Vulnerability of Local Shelters</i>	6,131	0	613	6,744
Retrofit Works	5,518	0	613	6,131
Design & Supervision	613	0	0	613
<i>b. Increasing the Infrastructure Safety Network: Regional Shelters</i>	5,005	5,231	500	10,736
Construction Works	4,550	5,231	0	9,781
Equipment	0	0	500	500
Design & Supervision	455	0	0	455
<i>c. Reducing the Hazard Proneness of Belize City: Upgrading of Drainage Infrastructure</i>	3,270	0	800	4,070
Dredging, lining, & cleaning of canals	3,150	0	0	3,150
Institutional Support	120	0	0	120
Design and Supervision	0	0	800	800
<b>Other</b>	<b>150</b>	<b>450</b>	<b>0</b>	<b>600</b>

Repairs to piers	150	0	0	150
Water and sanitation	0	450	0	450
<b>2. Improving the Response Capacity: Institutional Measures</b>	<b>1,000</b>	<b>850</b>	<b>273</b>	<b>2,123</b>
<b>a. NEMO</b>	<b>730</b>	<b>850</b>	<b>273</b>	<b>1,853</b>
Institutional Strengthening & Community Development	430	0	0	430
Telecommunications & Equipment	300	0	0	300
Building	0	850	0	850
Local Staff	0	0	180	180
Supplies	0	0	93	93
<b>b. Other</b>	<b>270</b>	<b>0</b>	<b>0</b>	<b>270</b>
Protecting critical infrastructure and lifeline networks	60	0	0	60
Other studies	210	0	0	210
<b>3. Support to Long Term Sustainability</b>	<b>280</b>	<b>0</b>	<b>0</b>	<b>280</b>
BCC: Maintenance and Procurement	130	0	0	130
MOW: Maintenance Study	150	0	0	150
<b>Program Executing Units</b>	<b>701</b>	<b>70</b>	<b>163</b>	<b>934</b>
Program Coordinating Unit (MED/PCU)	288	0	34	322
Project Execution Unit (MOW/PEU)	221	0	96	317
Project Execution Unit (BCC/PEU)	182	0	34	216
Vehicles and Equipment	0	70	0	70
Other	10	0	0	10
<b>TOTAL COMPONENTS</b>	<b>16,537</b>	<b>6,601</b>	<b>2,149</b>	<b>25,488</b>
Unallocated Costs	1,654	1,149	0	2,803
<b>PROGRAM COSTS</b>	<b>18,191</b>	<b>7,750</b>	<b>2,149</b>	<b>28,290</b>
<b>FINANCING COSTS</b>	<b>3,342</b>	<b>538</b>	<b>232</b>	<b>3,932</b>
Interest	2,929	510	0	3,439
Credit Commission	0	48	232	280
Inspection & Supervision	213	0	0	213
<b>TOTAL COST OF PROGRAM</b>	<b>21,533</b>	<b>8,288</b>	<b>2,381</b>	<b>32,222</b>
Percent of Total Cost	66.21%	25.78%	8.01%	100.00%

### **III. PROGRAM EXECUTION**

#### **A. Overview of the Program's Execution Mechanisms**

- 3.1 The MED will be the coordinating institution directly responsible to the Bank. This institution will draw technical and financial management support from the two primary institutions which will participate in the program: MOW and BCC.
- 3.2 The MOW and the BCC will each have an executing unit supported by a consulting firm, while NEMO will rely on support from MED for the implementation of its activities.

#### **B. The Program Coordinating Unit (PCU)**

- 3.3 **MED/PCU.** The MED will host a PCU having overall responsibility for loan administration on behalf of the Government, and coordination of the program's execution. It will also be in charge of monitoring, evaluation, contracting, and financial management, along with the preparation of reports and submission of disbursement requests.
- 3.4 MED will appoint the Project Coordinator and support staff who will oversee the day to day administrative operations for the whole program. In addition, the Coordinator will be the instance of last resort to mediate when conflicts arise during the execution of the project. The unit will provide administrative and financial management services to NEMO. The PCU will consist of a Project Coordinator assisted by an accountant and a secretary.

#### **C. Project Executing Units (EU)**

- 3.5 Two main executing units will be created to support the activities of the program:
- 3.6 **MOW/PEU.**<sup>9</sup> An EU hosted by MOW will supervise the construction activities at the regional and local shelters. For the local shelters, with resources of the loan, the program will hire a Project Director, an accounting clerk, two technicians, and a secretary. The PEU will divide the work to be done –on the local shelters– into several geographic packages of roughly equal value and issue requests for expression of interest from supervisory engineering firms. The firm selected will provide needed technical assistance and supervision. For some of the shelters, though, only supervision will be needed since the works to be done constitute minor repairs and do not require designs. For the others, however, sketches and preliminary plans have already been prepared for some, but most require technical assistance for the preparation of working drawings. The complete list of the shelters to be retrofitted, and detailed work needed, is available in the technical files of the program.<sup>10</sup>

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<sup>9</sup> As with the shelters, the PEU in the MOW will be responsible for supervising consulting and contracting services for repairs and reconstruction of the piers.

<sup>10</sup> In preparation for the present hurricane season, in June 1999 Government allocated US\$300,000 and signed contracts with two supervisory engineering firms. The firms were to select subcontractors who will initiate repairs on the most critical local shelters. It is proposed that this expense will be eligible for reimbursement under the project's retroactive financing provisions.

- 3.7 The regional shelters component will be executed by the same unit and under similar arrangements. At present, a standard modular design has been developed to preliminary design stage for buildings. These will serve as regional shelters but will also be used as classrooms. A sketch design for a multipurpose building has also been prepared. Initiation of construction of these works, however, will be conditioned on the results from a study to determine their location, risks, and hazards (see ¶ 2.13 and 2.25).
- 3.8 **BCC/PEU.** The Belize City Council is the institution in charge of the works and maintenance in Belize City. As expressed previously (from ¶ 2.31 on) the Council is strongly committed to improving the efficiency and quality of its operations, including maintenance works, and it has taken decisive steps towards improving the management of its resources.
- 3.9 The PEU within the BCC will be staffed with a project manager, a technician, and an accounting clerk. Within two months of signature of the loan contract, the PEU shall be fully staffed and the Government shall have signed an agreement with the BCC. The agreement will establish BCC's obligation to support execution of the drainage works component and to maintain such infrastructure once upgraded. The PEU, similar to the one in MOW, will retain the services of a consulting firm, contracted to provide the technical assistance and managerial capacity to oversee the drainage works.
- 3.10 The consulting firm will prepare final designs and bidding documents. Private firm(s) selected through the Bank's procedures for international public bidding will execute the upgrading of the drainage network. The list of drainage sections is included in the technical files of the program.
- 3.11 **NEMO/PEU.** This institution has only two full time staff members, and thus very limited executing capacity. The NEMO coordinator will be responsible for the implementation of the activities programmed for institutional strengthening. To maximize economies of scale, all these activities will be put together into a package to be delivered by a single consulting firm. Executing the procurement needs for this component, although small, will require the administrative capacity that NEMO does not have at the present time. Based on these considerations, it was decided that the administrative support will be provided by the Coordinating unit at MED.
- 3.12 Remuneration for the Project Coordinator, the two Project Managers, and the accountant will be financed from loan resources, and they will be hired as a condition precedent to first disbursement. Each executing unit should be fully staffed within two months of the date of signature of the loan contract.
- 3.13 Each executing unit will collate and present the required accounting documents and periodic reports to the PCU, which in turn will submit disbursement requests and other reports to the Bank.

#### **D. Procurement**

- 3.14 The GOB will procure goods and services according to the Bank's policies and procedures outlined in Annexes B and C of the loan contract. The schedule for procurement and bidding is in Annex 2 of this document. The thresholds

established for international public bidding are US\$250,000 for goods, US\$200,000 for consulting services, and US\$1,000,000 for physical works.

- 3.15 With respect to Belize City drains, with counterpart resources, the Government proposes to hire the consulting firm already engaged in the preparation of preliminary studies. The firm will prepare final designs and supervise the construction. The British firm Halcrow Group Limited, is a large international consulting firm with ample experience and expertise. The firm was chosen following competitive selection procedures and was responsible for the design and construction supervision of the BCIP works financed by the World Bank. The firm received high marks for its technical performance. Likewise, Halcrow has been instrumental in the design and preparation of the drainage component of this program, and it is expected to perform equally well in future activities related to this program. Direct hiring of this firm is proposed with Government financing, without a new competitive selection procedure.
- 3.16 With the exception of the foregoing, procurement will in all cases conform to the standard rules and regulations of the Bank. Due to the small works that are needed in each of the retrofitted shelters, they will be packaged into approximately six contracts. Bids will be open to international competition, with awards being made for one or more contracts, based on a minimum cost criteria. However, due to the nature of these individually small works and their geographical dispersion, only local firms will be expected to participate in the bidding of this component. The new shelters and drainage works will also be submitted for international bidding.
- 3.17 Works and services to be financed by the CDB and the Bank will be independent from each other and each institution will follow its own procurement rules. This will provide a more agile mechanism of disbursements and help avoid unnecessary delays.
- 3.18 The call for tenders and bidding documents must be presented to the Bank first for its no objection. MOW and BCC will be responsible for presenting the relevant technical, financial, administrative, and environmental reports for each of their projects to the Coordinating Unit.

**E. Additional Technical Support**

- 3.19 RE2 and LRN will proceed to support this effort with a series of workshops in order to have the units ready to lead the start up and implementation of the program. The GOB has expressed its commitment to the rapid deployment of these units and will provide an appropriate level for its financing.
- 3.20 The Project Team will have a project launch workshop immediately after the loan is signed, and will follow up with annual meetings to review progress and to provide any needed support at that time.

**F. Disbursement Schedule**

- 3.21 The resources allocated to the project will be disbursed to the Government of Belize according to Bank procedures. In addition to the standard conditions, special

conditions prior to disbursements shall require the program to hire the Program Coordinator, the two Project Engineers, and an Accountant.

- 3.22 The program will be executed in four years. A preliminary flow of disbursement is presented below, and will be subject to review in each semester report.

**Table 3. Disbursement Schedule (Millions of US dollars)**

<b>Year</b>	<b>IDB</b>	<b>CDB</b>	<b>GOB</b>	<b>TOTAL</b>	<b>Percent</b>
1	3.31	1.32	0.47	5.10	20.00
2	3.31	1.32	0.47	5.10	20.00
3	4.96	1.98	0.70	7.64	30.00
4	4.96	1.98	0.70	7.64	30.00
<b>TOTAL</b>	<b>16.54</b>	<b>6.60</b>	<b>2.34</b>	<b>25.48</b>	<b>100.00</b>

#### **G. Retroactive Financing and Recognition.**

- 3.23 To prepare for the current hurricane season, the GOB has already provided financing for some of the most needed activities. These included fees for consultants –used in the evaluation of the structural status of local shelters, preparation of preliminary and final designs for the regional and local shelters, and studies for the location of the regional shelters. In addition, the GOB has financed simple retrofit works of some of the shelters that did not need the preparation of designs. The Government has requested that the Bank retroactively finance up to US\$2.0 million of such expenditures.
- 3.24 Likewise, the GOB is seeking recognition –against counterpart resources– of up to US\$500,000 for the hiring of a consulting firm to do the preliminary studies, final designs, and supervision on the drainage component.
- 3.25 In both cases, expenses must have been incurred subsequent to December 1, 1998 and the applicable procedures and policies required by the IDB must have been followed.

#### **H. Monitoring and Evaluation**

- 3.26 The Bank will supervise the progress and execution of the project, through its Country Office in Belize (COF/CBL), by means of periodic inspections and formal reviews. The updated 6-month work plans will be consistent with the project outputs as listed in the Logical Framework, which also sets out the primary benchmarks for measuring execution progress. The achievement of agreed benchmarks regarding, among other matters, the institutional structure and regulatory framework for disaster management, and a calendar for implementing maintenance recommendations, will be reviewed on an annual basis. If substantial deviations from the agreed benchmarks has occurred, the Bank may require the suspension of new calls for bids, requests for proposals and other forms of commitments to be financed with the loan resources.
- 3.27 In addition to the standard semi-annual reports, the PCU, in collaboration with the MOW and the BCC, will hold quarterly meetings during the first 18 months of the project. This will serve as a basis for formal progress review meetings –between the

Country Office and the MED– for the identification of problems and adjustments that need to be made.<sup>11</sup>

**I. External Auditing**

- 3.28 In accordance with the General Conditions, a firm of independent auditors will be engaged to audit annually the financial statements of the project and the use of the project funds, ensuring the executing agency's compliance with all Bank requirements. Financial statements will be submitted by the executing agency within 120 days after the close of each fiscal year, beginning with the fiscal year when project execution is initiated, and during program execution.

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<sup>11</sup> Through C&D action plan, the MED is being strengthened to improve its capacity to monitor all capital projects.



#### IV. ENVIRONMENTAL IMPACT, BENEFITS AND RISKS

4.1 The infrastructure shelter and drainage components do not present technical difficulties and the country has the capacity to execute them. Therefore, provided additional staff support, there should not be an inordinate risk for the implementation of these components. Similarly, the institutional component consists of technical assistance and its implementation, except for some coordination and timing aspects, is not expected to require undue attention.

4.2 All local shelters already exist –only minor work is needed to bring them to hurricane construction specifications– and the regional shelters will be built in established institutions. None of these construction works will require special mitigation measures, beyond those that are commonly observed and ruled by local legislation.

##### A. Environmental Impact of the Program

4.3 The concerns for environmental impacts were raised regarding the possible disruptions of the area's ecology resulting from the construction, upgrading and cleaning of the canals. Table 4 reflects these potential impacts, their causes, and mitigation activities:<sup>12</sup>

**Table 4. Potential Impacts, Causes, and Mitigation Measures for Drainage Works**

Potential impact	Causes	Comments	Mitigation
Loss of biodiversity	Dredging and removal of vegetation in and around canals	Removal of vegetation will lead to temporary disturbance of aquatic fauna. Recovery is expected. Much of the aquatic fauna depends on free flow of water and will thus benefit from maintenance clearing. Cleaning of canals could possibly lead to reduction of shelter for crocodiles. This is seen as a desirable outcome since they are considered a nuisance within Belize City boundaries.	None
	Cleaning of St. John's College canal with resulting damage to mangrove	This canal is lined with Black Mangrove which adds to the aesthetics and biodiversity of the area. Dredging could lead to damage of this mangrove.	Dredge canal only. Leave vegetation on bank intact.
	Construction of North Creek Canal	Black Mangrove stand will need to be cleared in order to facilitate construction of the canal.	None practical at this stage. Clearing is, however, limited to less than 600m. Proper zoning should have excluded this area from development.
	Drainage of wetlands as a result of improved drainage	Improved drainage around the North Creek Canal area will lead to less unhealthy conditions for human living.	None. See previous comment.
Pollution	Transportation/dumping of dredged sludge	Dredged sludge will be transported to the Belize City contaminated landfill site. Spillage of sludge will lead to dirty roads	Monitoring of transport and cleaning of spills when required.

<sup>12</sup> A more extensive and detailed explanation of the environmental aspects can be found in the technical files of the program.

Potential impact	Causes	Comments	Mitigation
		with associated economic and social dangers. Leaching of sludge at dumpsite may lead to pollution of surrounding areas.	
	Dumping of sewage	South-western sections of the project area do not have sewerage connections and may use the canals for dumping sewage.	Installation of proper sewerage facilities. This mitigating activity is beyond the scope of this project.
Effects on Manatee population	Increased nutrient load in the marine environment	Increased flushing action of the city canals may lead to increased nutrient load in the marine environment just outside the City. Organisms growing on leaf blades (epiphytes) of sea grass will be the first recipients of these nutrients and respond with increased growth. Possibly resulting in the smothering of sea grass which in turn will lead to food shortage for the Manatee population.	Installation/improvement of sewage collection and treatment. Increased capacity for City Council to collect water borne garbage.

## 1. Conservation Aspects

4.4 Most of the plant and animal species in the affected area are common and not endangered. There are, however, three exceptions:

- i. All Mangrove species (Red, Black, and White) are subject to protection established by the "Forests (Protection of Mangroves) Regulations of 1989." Under certain development needs there are regulations that establish permit procedures.
- ii. The West-Indian Manatee (*Trichechus manatus*) is listed as a threatened species. The mouth of the Belize River is the most important habitat within Belize.
- iii. The Morelet's Crocodile (*Crocodylus moreletii*) is also listed as threatened, but the Belizean population appears to be healthy.

## 2. Mitigation

4.5 Some of the impacts would be better served by the "no-project" alternative. Specifically, the case of the mangrove in the North Creek Canal area is a good example. This area is not suitable for the expansion of the city and doing so will lead to some habitat destruction, high development costs, and some environmental encroachment. Since informal occupation has and continues to occur, there is no other alternative but to do the works as addressed by this project. The magnitude of the potential negative impacts is, however, very limited. Construction of the North Creek Canal is limited to less than 600m.

4.6 Despite the alluded damages to the ecology of the area, the **overall conclusion is that the environmental effects of the proposed works will be localized and minimal, and that the social benefits to be obtained will outweigh the few negative effects.**

### **3. Social aspects**

- 4.7 A simple household survey was carried out to assess the views of local residents on the nature and extent of the problems that they face related to surface water drainage and their perception of appropriate priorities for the drainage works. The survey was carried out in early July 1999 in a period when there were showers or heavy rains every second or third day.
- 4.8 The perception of the people consulted supports the proposed drainage works. The residents want the reduced flood disruption and better street conditions that will be provided through drainage improvements. They also want reduced odors from the canal system and they perceive that inadequate coverage of the sewage treatment and disposal system results in health problems that they would like to see reduced.
- 4.9 No involuntary resettlement is contemplated in the project.

#### **B. Institutional Viability**

- 4.10 **MOW.** By law, the MOW is the overall technical advisory body responsible to the Government for all civil engineering and mechanical works. The MOW is responsible for the formulation and implementation of policies on matters concerning public works, including construction and maintenance of roads, public buildings, coastal protection works, streets, and drains in villages. It has a permanent staff of 170 employees with an additional 441 contract and part-time employees located mostly in the country's six regions. While generally receiving high marks for performance, the MOW is thinly staffed with only five executive and eleven professional positions.
- 4.11 Overcoming the limitations of professional staff, and given the relatively simple technical demands for the shelter components, the MOW could effectively and efficiently support the construction activities of the program.
- 4.12 The MOW is aware of the limited maintenance program that exists. At present it is analyzing alternatives to approach the subject, but it is requesting the technical support of the Bank to study the problem and recommend future lines of action.
- 4.13 **BCC.** Important changes have taken place during recent years that will positively affect the performance of the City Council. First, the national government is providing local governments with a greater degree of autonomy than previously. This has contributed to develop ownership of the activities and works procured for the City.
- 4.14 Second, the City Council has taken decisive steps to improve the efficiency and quality of its operations and, by the same token, City revenues are being substantially increased. This is being achieved mostly through the collection of property taxes. These revenues are expected to increase even more beginning in 2001, as a result of the central government transferring responsibility for property valuation to the City Council.
- 4.15 Notwithstanding these major improvements, the City Council needs further technical support. Maintenance has been a problem for many years. Management of the city is committed to change the situation. A proper cost budgeting and increased revenues are the first steps in the process. The former has helped in

transparency and improved allocation of the resources. For example, in the past it has been the practice to find unallocated financial resources with which to make support payments to people claiming to be in a state of destitution. This practice has been discontinued and the funds thus released are being used to employ such persons in the sanitation and works departments.

- 4.16 With adequate support in areas of maintenance and procurement, physical development planning of the city, and human resource development, the local government could do a fine job in providing the services that the city needs and the maintenance that the drainage investments demand.

#### **C. Benefits**

- 4.17 It is expected that the products delivered by this operation will contribute to the preparedness of the country to confront natural disasters, and thereby reduce the possible loss of human life and the incidence of suffering. In the case of Belize City, the drainage works are being designed to expedite water evacuation from streets.
- 4.18 As a side benefit, upgrading of the drainage works will positively contribute to improving living conditions. Construction, cleaning, and upgrading of canals will benefit low-income families that live in areas that are continuously being flooded. Increase in the flushing efficiency of the system will also have a beneficial effect on the incidence of water-borne diseases and will alleviate the unsightliness and odors from standing waters.

#### **D. Economic analysis**

- 4.19 In the case of shelters, due to the large fluctuation that could be placed on the monetary value of life and suffering, it was concluded that a traditional economic analysis of benefits and costs would not be productive. Instead, a minimum cost methodology was followed to decide upon the alternatives to provide shelter.
- 4.20 For the drainage activities, the benefits and costs of the project were evaluated. The latter consisted of the capital costs incurred in the construction, lining, upgrading, and cleaning of the canals, and from minor drain cleaning costs. The costs of the institutional strengthening components were included, as well, in the costs of the project. The investment was assumed to take place within the first two years of the program.
- 4.21 In the case of benefits, these were made up of –principally– those resulting from desiltation cost savings, road maintenance cost savings, and improvements in property values. The latter are the result of increased awareness that improvements in stormwater drainage includes a reduction in flooding and hence damages from flooding, reduction in illnesses from waterborne vectors, and the improved appearance of the canals and drains. It was assumed that increases in property values would be realized over four years, after completion of construction. This was assumed to reflect lagged changes in perceptions of land and property prices. Estimates of the increases in values were accomplished by comparison with average values of properties with the improvements already incorporated.

- 4.22 A fourth source of benefit considered was the travel time saved by pedestrians. The construction of covered drains and canals is likely to reduce pedestrian travel time for the residents in the study areas. Users would not have to negotiate past deleterious open canals with contaminated waters.
- 4.23 The project will, also, have impacts that are not readily quantifiable in physical and monetary terms. In addition to the non-quantified health and environmental benefits mentioned, the project will generate benefits such as reduced foul odors, unsightly debris, improved sanitary conditions, and enhanced townscape.
- 4.24 The analysis of the benefits and costs of the project resulted in an IRR higher than 20%. These results were robust. A number of sensitivity tests were undertaken, either increasing costs or decreasing benefits, the results consistently showing IRRs above 12%. Even when benefits from travel time saved by pedestrians were excluded the resulting IRR was above the value established by the Bank..

#### **E. Risks and Issues**

- 4.25 **Institutional Capacity.** The administrative and managerial capabilities of the units, which will participate in the execution of the program, do carry a degree of risk. However, provisions have been made to allocate the needed financial and technical resources for their adequate performance. In addition, the GOB and the Project Team will embark, immediately, on the formation and training of these units. It is expected that by the time this operation is approved by the Board, the EUs will be uniquely qualified and poised to support the execution of the Program.
- 4.26 **Maintenance.** Long term sustainability of the program is dependent on an appropriate policy and the extent to which financial resources will be made available. At the local level, BCC is committed to making available the needed resources and has started a program to provide the services needed by the city. With the projections of future revenue, the financial resources required for maintenance of the investments made in the program appear to be properly dimensioned. The technical assistance package included should reinforce the adequate management of said resources.
- 4.27 At the national level, although the risk is not yet fully resolved, it will be impractical to burden this project with such a resolution. The program is facilitating the MOW with technical assistance to study the issue and make recommendations for future plans of action. At the very least, the assistance provided should use this project as a pilot to implement the recommendations made.
- 4.28 **Bank Exposure and Overall Indebtedness of the Country.** The approval of this operation will result in a significant increase in the size of the Bank's country portfolio. However, as most standard ratios suggest, it will not have a major impact on the Bank's exposure to the country.
- 4.29 IDB's **exposure** to Belize is currently less than 1%, and expected to remain – through 2003–well below the 18% maximum. The IDB's **Debt Service/Exports of GNFS** ratio is currently less than 1% and is expected to remain at that low level for the next five years. Likewise, the IDB **Debt Service/Total Debt Service** ratio

currently stands at some 0.3%, but is expected to climb to 4.9% by 2003 – again, a level well below the 30% maximum.

- 4.30 Notwithstanding these ratios, the country's overall indebtedness and payment capacity has been of concern throughout the preparation of this program. Specifically, the change of the VAT for a sales tax was expected to have negative repercussions in revenue collections. Although no statistical evidence has yet been obtained, preliminary evidence and informed opinions indicate that Government collections have kept pace with the initial forecasts. It is further expected that, for the rest of the year, sales tax collections will remain or surpass the levels estimated.
- 4.31 Regarding the country's overall indebtedness, an increased reliance on multilateral and bilateral sources of financing should have a positive impact on the country's fiscal and external accounts, given their more favorable terms and conditions. However, such an increase should be accompanied by a reduction in commercial borrowing.
- 4.32 Under the assumption that commercial borrowing keeps pace with the indebtedness rate of the last three years, the External Debt/GDP ratio could have a net increase of 10% (to 56%) by year 2003. This situation demands to be continuously monitored in the near future.
- 4.33 OD4 has already taken the steps necessary to address the need for an in-depth study of the future financial robustness of the government's accounts. Outputs from this study will be completed no later than December 1999.

## HURRICANE REHABILITATION AND DISASTER PREPAREDNESS (BL-0015)

### LOGICAL FRAMEWORK

NARRATIVE SUMMARY OF THE PROGRAM	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<p>Reduce or lessen the social and economic losses due to natural disasters</p> <p>Reduce the vulnerability of the country to hurricanes</p>	<p>By year 2004:</p> <ul style="list-style-type: none"> <li>33,300 people have access to proper shelters.</li> <li>9 Km2 of Belize City properly drained.</li> <li>Institutional response time, in the event of a disaster, is reduced to less than xx hrs</li> <li>Local populations are able to take refuge within xx hrs. of notice of an imminent natural threat.</li> </ul>	<ul style="list-style-type: none"> <li>Physical inspection.</li> <li>Drill exercise.</li> </ul>	
<p>Reduce Vulnerability: Structural Measures. In the short-term, the immediate impacts of adverse effects caused by hurricanes mitigated.</p>	<ul style="list-style-type: none"> <li>Approximately 370 local shelters inspected, selected, structurally reinforced, and provided with needed amenities, in 4 years</li> <li>Up to five regional shelters built, with IDB financing, and delivered to institutions in 4 years</li> <li>4,500m of new canals and 4,000m of improved drainage infrastructure, delivered in 4 years</li> </ul>	<ul style="list-style-type: none"> <li>Physical inspection</li> </ul>	<ul style="list-style-type: none"> <li>At risk populations take heed of warnings and reach the shelters.</li> <li>Drainage infrastructure and shelters are properly maintained.</li> <li>Local counterpart resources are available and on time</li> <li>CDB program approval occurs on time</li> </ul>
<p>Improve the Response Capacity: Institutional Measures. In the medium-run, the response capacity of the country to confront natural disaster events is increased.</p>	<ul style="list-style-type: none"> <li>Draft legislation enacted by July 2000.</li> <li>Education and training programs approved and operational by July 2000.</li> <li>Hazard and Risk assessment study and implementation stages delivered by October 2000.</li> <li>Emergency warning equipment and communications equipment delivered by December 2000</li> <li>Disaster Management Plan and Sector/Contingency Plan completed and approved by December 2000.</li> <li>Enforceable building code legislation approved by December 2001.</li> <li>NEOC ready and operating at full capacity by March 2001.</li> </ul>	<ul style="list-style-type: none"> <li>Drill exercises..</li> <li>Registry of Parliament</li> <li>Report on readiness exercises</li> <li>Program reports</li> </ul>	<ul style="list-style-type: none"> <li>NEMO has the technical capacity.</li> <li>CDB financing for NEMO's building available and works executed</li> <li>Education and training for the community kept updated and properly organized</li> </ul>

NARRATIVE SUMMARY OF THE PROGRAM	INDICATORS <sup>4</sup>	MEANS OF VERIFICATION	ASSUMPTIONS
Support to Long Term Sustainability. BCC and MOW's technical support for improved maintenance is delivered.	By December 2000: <ul style="list-style-type: none"> <li>• Xx personnel trained in procurement and maintenance.</li> <li>• Master Plan for physical development of Belize City completed.</li> <li>• Xx personnel trained in management and human resource development.</li> <li>• Study on maintenance policy completed. Schedule for the implementation of the results is defined.</li> </ul>	<ul style="list-style-type: none"> <li>• BCC maintenance budget</li> <li>• Physical inspection</li> <li>• Study report</li> </ul>	<ul style="list-style-type: none"> <li>• City and central government revenue sources are sufficient and properly managed to attend maintenance needs.</li> </ul>

Qualitative values of all indicators to be completed in the Initial Report.



**BL-0015**  
**Hurricane Preparedness Project**  
**Schedule of Procurement and Bidding**

	Source of Financing (%)		Method	Pre-qualification Required	Publication Date in Development Business
	IDB	Local			
<b>Bidding and Civil Works</b>					
Profit Local Shelters in Six Districts	100		ICB	Yes	I/2000
Profit Local Shelters "minor works"	100		LB	Yes	III/1999
Regional Shelters	100		ICB	Yes	III/1999
Belize City Drains	100		ICB	Yes	II/2000
Rehabilitation of Piers San Pedro and Caye Caulker	100		LB	No	
<b>Consulting Services</b>					
Consulting Firm; Final designs & supervision – local shelters		100	ICB	Yes	III/1999
Consulting Firm; Final designs & supervision – Regional shelters		100	ICB	Yes	III/1999
Consulting Firm; Final designs & supervision - Belize City drains		100	DIG	No	
for Institutional strengthening of Belize City Council	100			(P.S.)	
Individual consultants for strengthening of NEMO	100		LB		
Individual consultants for location of regional shelters	100		LB		
Maintenance planning	100		LB		
<b>Procurement of Goods</b>					
Equipment and Furniture for NEMO	100		PQ	No	
Communication Equipment	100		PQ	No	

Prescreening  
Direct Hiring by Government  
Price Quotations  
Internal Competition Bidding  
Local Bidding

PROPOSED RESOLUTION

BELIZE. LOAN \_\_\_/OC-BL TO BELIZE  
(Hurricane Rehabilitation and Disaster Preparedness)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with Belize, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a program of Hurricane Rehabilitation and Disaster Preparedness. Such financing will be for the amount of up to US\$21,333,000, from the resources of the Single Currency Facility of the Bank's Ordinary Capital, and will be subject to the "Financial Terms and Conditions" and the "Special Contractual Conditions" of the Executive Summary of the Loan Proposal.