



## **SUMMARY OF IMPACT OF HURRICANE "DEAN" ON CDERA PARTICIPATING STATES**

### **Response Actions, Recovery and Rehabilitation Needs** *Report Prepared by the* **Coordinating Unit of the Caribbean Disaster Emergency Response Agency (CDERA)** **August 22, 2007**

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#### **1.0 THE EVENT**

Hurricane Dean impacted several of CDERA Participating States during the period Friday August 17 to Tuesday August 21, 2007. Dean's passage through the Eastern Caribbean was as a Category 2 Hurricane, strengthening to a Category 4 as it moved across Jamaica and reaching the level of Category 5 as it impacted Belize.

During the passage of Dean through the islands of the Lesser Antilles, maximum sustained winds were near 100 mph (169 km/hr) with higher gusts. Hurricane force winds extended outward up to 25 miles (35 km) from the centre and Tropical force winds extended outward up to 140 miles (220 km).

On Sunday August 19, 2007 during its passage across southern Jamaica, Dean's maximum sustained winds were near 145 mph (230 km/hr). However, before Dean made landfall on the Yucatan Peninsula it strengthened to a Category 5 hurricane with sustained winds of 165 mph (265 km/hr), hurricane force winds extending outward up to 65 miles (105km) from the centre and Tropical force winds extended outward up to 205 miles (330 km).

#### **1.1 Participating States Affected**

The following CDERA Participating States activated their response systems:

- Saint Lucia
- Dominica
- Jamaica
- Belize
- Barbados
- Saint Vincent & the Grenadines
- Grenada

Belize, Dominica, Jamaica and Saint Lucia were affected by the hurricane. Barbados, Saint Vincent & the Grenadines and Grenada experienced conditions of high winds, rains and rough seas associated with the system. Whilst they were not directly impacted by Hurricane Dean, they were able to activate their National Response Plans and test some of their procedures.

Haiti and Martinique were affected by Dean but are not members of CDERA and would therefore not be directly involved in CDERA's response.

## **2.0 REGIONAL RESPONSE ACTIONS**

The Regional Response Mechanism (RRM) comprises of plans, procedures, organizations, and agencies which orchestrate the response to an event in any of CDERA'S Participating States. These include the CDERA Coordinating Unit (CDERA CU), Regional Coordination Plan, the Regional Response Plan, the Regional Telecommunications Plan, the Regional Security System, the CARICOM Disaster Relief Unit, the Eastern Caribbean Donor Group, the North Western Caribbean Donor Group and the National Disaster Coordinators.

### **2.1 Pre-Impact**

- The Regional Response Mechanism was placed on "Standby" on Tuesday 14 August 2007. This was within the 48 – 72 hours time period before impact of one of CDERA'S Participating States as specified in the Regional Response Plan.
- The National Disaster Committees in each of the threatened states met to review preparedness and response plans and to initiate Increased Readiness Actions.
- CDERA Coordinating Unit contacted the National Disaster Coordinator and other senior government officials of each threatened state to ascertain status of preparedness.
- The Eastern Caribbean Donor Group convened meetings on 16 and 17 August 2007 under the Chair of the Resident Representative United Nations Development Programme Barbados as per the Eastern Caribbean Donor Group Operations Order.
- The North Western Caribbean Donor Group also held a meeting in Jamaica on Friday 17 August 2007 under the Chair of the United Nations Development Programme Representative.
- Contact was made with other regional and international agencies and notified of our actions.
- CDERA CU Developed an Operational Plan for "Worst Case Scenarios" for both impact on Jamaica and Belize by Hurricane Dean.

### **2.2 Post-Impact**

Based on the preliminary damage assessment and needs analysis reports received from the impacted states of Dominica, Saint Lucia, Jamaica and Belize, CDERA has initiated a Level Two response.

A Level Two response means that the event is being managed at the country level with regional assistance being limited to the provision of requested technical support as identified by the country and facilitating access to resources which may be required.

- CDERA deployed a Technical Support Team to both Jamaica and Dominica on 21 and 22 August respectively. The teams were to provide support for the National Emergency Operations Centre and assist with the development of the Damage

Assessment and Needs Analysis Reports among other tasks. Technical personnel came from: CDERA Coordinating Unit, and the National Disaster Offices of Barbados, Montserrat and Grenada.

### **3.0 INTERNATIONAL RESPONSE ACTIONS**

#### **3.1 Eastern Caribbean Donor Group**

The Eastern Caribbean Donor Group chaired by UNDP-Barbados and comprising Donor agencies based in Barbados held 2 meetings to assess the situation in Dominica and Saint Lucia in order to coordinate the efforts of members.

The Group had 3 Rapid Assessment Teams on Standby for quick deployment. However, they were Stood Down on Friday 17 August.

#### **3.2 Pan American Health Organizations (PAHO)**

PAHO had teams pre-deployed to Jamaica, Saint Lucia and Dominica in order to assess the public health needs in the impacted states. The (Medical) Priority Needs Lists for Jamaica was sent to them for review and recommendation on Tuesday 21 August 2007.

#### **3.3 US Office of Foreign Disaster Assistance (USAID/OFDA)**

An OFDA team was deployed to Jamaica and an OFDA Consultant is resident in Dominica.

### **4.0 SUMMARY OF DAMAGE (Details provided at Appendix 1)**

Dean caused the deaths of two persons in Dominica, one in Saint Lucia and four in Jamaica. The damage to the islands of the Lesser Antilles was minimal except for Dominica and Saint Lucia which reported wind damage to roofs, flooding and landslides in several areas and extensive damage to the Banana industry. The preliminary damage estimate (to infrastructure only) in Dominica is \$US36.51 Million.

Jamaica has reported severe wind damage to buildings, utility poles and trees; and significant flooding from storm surges in several of the southern parishes. In addition, a number of blocked roads, electricity and telephone problems reported in the southern and eastern parishes. No value of damage has been provided to date.

Preliminary reports from Belize indicate coastal damage, collapsed buildings and roof loss affecting primarily the northern Districts of Belize, Ambergris Caye and Caye Caulker. The Government of Belize has declared disaster areas in the entire Corozal District and parts of the Orange Walk District. The preliminary damage estimate from Belize is \$US 53.975 Million.

All information has been extracted from national damage assessment reports and preliminary needs lists.

**NOTE: Saint Lucia's Initial Damage Assessment Report has been withdrawn.**

## 5.0 SUMMARY OF ASSISTANCE PROVIDED OR PLEDGED FOR HURRICANE DEAN

The following is based on information currently available to CDERA and is being updated as information becomes available.

DONOR	ASSISTANCE PLEDGED/PROVIDED
<b>CDERA PARTICIPATING STATES</b>	
CDERA Coordinating Unit	Coordination of Two (2) man teams - dispatched to both Dominica and Jamaica support the assessment and coordination efforts at the National Level.
Barbados (Verbal communication)	<p>One (1) technical support person dispatched to assist coordination efforts at the national level in Dominica</p> <p>Government of Barbados has indicated that a Grant between US5,000 – US100,000 is feasible for affected states</p> <p>Government of Barbados has also indicated its willingness to open an account for public donations.</p>
Grenada	One (1) technical support person dispatched to assist coordination efforts at the national level in Jamaica
Montserrat	One (1) technical support person dispatched to assist coordination efforts at the national level in Dominica
<b>GOVERNMENTS OF NON – CDERA PARTICIPATING STATES</b>	
Government of Canada	Canada is offering up to \$2 million in immediate aid for relief and recovery efforts in countries hit by this devastating hurricane. The support will help international aid agencies and non-governmental organizations meet the urgent needs of people severely affected. Canada also stands ready to provide additional help where needed to assist with relief and reconstruction.
Government of Venezuela	Provided a relief package to Dominica which includes: 500 blankets; 500 sheets; 3 large tents; water; 120 units of tarpaulin and medical supplies
<b>MULTILATERAL AGENCIES</b>	
Caribbean Development Bank (CDB)	CDERA is seeking to access the Emergency Relief Grant of up to US \$100,000. This is outlined under the CDB Strategy and Operational Guidelines for Natural Disaster Management

## **6.0 ISSUES AND RECOMMENDATIONS FOR CONSIDERATION**

### **6.1 *General***

The impact of hurricane Dean on the region reflects the vulnerability of our region to hazard events. It highlights the need to continuously assess our development planning approaches and the critical need to incorporate mitigation considerations into our development planning and decision making and for a truly comprehensive approach to economic, social and physical planning.

### **6.2 *Required Response Level May Be Misleading Re: Actual Impact***

Impacts felt by CDERA Participating States have reflected the need for a Level 2 response. A Level Two response means that the event is being managed at the country level with regional assistance being limited to the provision of requested technical support as identified by the country and facilitating access to resources which may be required. This however may not be a good indicator of the extent of damage at the national level since significant damage has been experienced in the productive sectors and there has been some loss of livelihoods.

Recommendation:

UNECLAC Macro-Socio-Economic Assessments be carried out in Dominica, Belize and Jamaica and possibly Saint Lucia to provide a more accurate assessment of the macro and recovery and financing implications of Hurricane Dean on the economies.

### **6.3 *Damage Assessment & Needs Analysis***

The mechanisms in Participating States for Damage Assessment and Needs Analysis are at varying levels. This has implications for the accuracy and timeliness in the generation of initial reports which are crucial for triggering emergency response mechanisms. The link between damage information, humanitarian and recovery needs is still weak. The CDERA model Recovery Plan is being utilized in only a few States.

Recommendations:

- (i) Evaluation of Assistance in context of need*  
Governments will need to link Damage Assessment to needs articulation and evaluate assistance being provided in the context of need
- (ii) Strengthen national Damage and Needs Assessment systems as appropriate. Review national DANA and Recovery Planning Mechanisms informed by CDERA Model Plan and UNECLAC Methodology.*

## **6.4 Post-Disaster as an opportunity to Integrate Mitigation Measures**

### *Addressing Building Construction and Design Issues*

Technical measures alone such as building regulations are inadequate if the attention of the most vulnerable is not considered also.

Recommendations:

- (i) Utilization of guidelines for retrofitting partially damaged structures for critical disaster types;
- (ii) Execute audit of damage profiles and prepare results for distribution to the diversity of affected publics involved in design, construction, repair and ownership of buildings;
- (iii) Allocate a percentage of disaster assistance to institutional capacity building and mitigation.
- (iv) Enhance self-help and local coping mechanisms.
- (v) Develop improved procedures for assessing and categorizing structures and infrastructure according to the degree of damage and mitigation potential.
- (vi) Examine the conditions attached to reconstruction assistance to ensure that they are clear, can be executed by the benefiting agency.

## **6.5 Incorporation of Mitigation Considerations into Development Planning**

The need to reflect mitigation related recommendations emerging at the national programming level into national plans and actions remains essential. To achieve this, there will be the need for regular and sustained interagency consultation on programme planning to maximize the limited available resources. The Comprehensive Disaster Management Strategy, revised and enhanced in 2007 provides a useful blue print for advancing this.

### *Recommendations*

- (i) Island states and territories in the region must take a longer term comprehensive and integrated approach to risk mitigation.
- (ii) There is a need to identify a management strategy to balance current action with losses from future disaster events.
- (iii) Mitigation activities to reduce the long-term risk to human life and property from natural and technological hazards must include land use regulation, building and safety codes and disaster insurance programmes.

## **6.6 National Warehouses**

The national relief supplies that are being kept bear little relation to the population size and operational needs.

Recommendation:

- (i) Review adequacy of national emergency supplies.

## **6.7 Shelter Management**

- (i) Shelter Management systems are highly variable on effectiveness in CDERA Participating States

Recommendation:

- (i) Implement CDERA guidelines for shelter policy and programme
- (ii) Review annual facility assessment mechanisms.

## **6.8 Rehabilitation and Reconstruction**

Following the impact of Hurricane Georges in 1998, CDERA with the support of UNDP developed guidelines for National Recovery Planning. These were used successfully by Belize following the impact of Hurricane Iris using the inputs of the UNECLAC methodology. Governments will have to organize themselves to address the national rehabilitation and reconstruction efforts.

Recommendations:

- (i) *Reconstruction Priorities and Schedule*  
To guide the rehabilitation efforts, Governments will need to establish clear priorities and a reconstruction schedule by sector to guide the process.
- (ii) *External Assistance to Reflect National Needs*  
Offers of external assistance may often comprise various technical assistance teams. Scope of works and arrangements for accepting such assistance will need to be clearly articulated.

## **7.0 MEDIUM/LONG TERM ISSUES**

### **Emergency Financing Mechanisms**

The Caribbean region will have to examine how it can be more self sufficient in financing emergency needs. The following should be considered:

1. *Increasing CDERA Emergency Assistance Fund.*

The increase should provide adequate funds to mobilize support for impacted countries that can make a significant difference in the event of a catastrophic event.

2. *Review and enhancement of resources for the CDERA Coordinating Unit, Regional Security System (RSS) and the Caribbean Disaster Relief Unit (CDRU).*

This will decrease dependency on external parties for their deployment, operations in the field, provision of emergency communications and logistics equipment.

**APPENDIX 1 – COUNTRY DAMAGE ASSESSMENT SUMMARIES**

<b>SUMMARY OF DAMAGE DOMINICA</b>				
<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage \$USM</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
<b>GENERAL</b>				
<b>Affected Population</b>	An estimated 1000 persons are in approximately 100 shelters	Not provided to date	Not identified to date	-
<b>Casualties</b>	2 deaths	-	-	-
<b>SOCIAL SECTORS</b>				
<b>Housing</b>	A total of 771 buildings affected 183 - roofs completely damaged 205 -roofs partially damaged 43 - houses completely damaged 115 - houses partially damaged 225 – other damage	Not provided to date	Not identified to date	-
<b>Health</b>	No information provided to date	-	-	-
<b>Education and Culture</b>	No information provided to date	-	-	-
<b>Public Buildings</b>	No information provided to date	-	-	-
<b>PRODUCTIVE SECTORS</b>				
<b>Agriculture</b>	95% damage sustained by the agriculture sector.	Not provided to date		Needs to be detailed
<b>Tourism</b>	No information provided to date	-	-	-
<b>Commerce</b>	No information provided to date	-	-	-

**SUMMARY OF DAMAGE  
DOMINICA**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage \$USM</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>	
<b>Manufacturing</b>	No information provided to date	-	-	-	
<b>INFRASTRUCTURE</b>					
<b>Water</b>	No information provided to date	-	-	Damage to utilities is being assessed.	
<b>Electricity</b>	No information provided to date	-	-		
<b>Telecommuni-cations</b>	No information provided to date	-	--		
<b>Public Works (Roads, Bridges etc.)</b>	Damage to Main Roads	5.77	36.51	Not identified to date	-
	Damage to Other Roads	0.74			
	Bridges	5.55			
	Sea Walls	5.74			
	River Walls	17.96			
	Other walls	0.74			
<b>Air and Sea Ports</b>	No information provided to date	-	-	-	
<b>Environment</b>	No information provided to date	-	-	-	

**JAMAICA**

**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 2**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
<b>GENERAL</b>				
<b>Affected Population</b>	109 Communities in 12 parishes (reported) to date affected. Landslide                    3 Storm surge                    8 Wind                                76 Flood & wind                    1 Wind and Landslide        17 Wind and storm surge    3 2,493 shelterees in 76 shelters opened across the island. Figures reflect figures gathered as at the time of collation of report. 15,000 families in need – likely to be without proper roofing for extended period	Not provided to date	Water 8000 5 Gallon containers 1700X7 1l bottled water Storage tanks 26 - 1000 gal with fittings; 10 – 800gal with fittings 8 – 400 gal with fittings Hygiene kits - 7500	Most severely impacted communities – Bull Bay; Caribbean Terrace; Old Harbour Bay; Rocky Point; Portland Cottage. Registration Centres established in Kingston & St. Andrew for affected persons. Updates anticipated – some damage assessment teams still in the field.
<b>Casualties</b>	4 confirmed deaths	-	-	As of Aug 22 <sup>nd</sup>
<b>SOCIAL SECTORS</b>				
<b>Housing</b>	1584 houses sustained Level 1 (minor) to Level 4 (destroyed) damage 56% of these located in Clarendon; 30% in St. Catherine, and 14% in Kingston & St. Andrew	Not provided to date	Roofing; Tarpaulins, Aluminum sheeting, Building material, plywood, nails, housing units, hurricane rafter	Detail at Appendix 3. Assessment ongoing, figures expected to increase as data becomes available.

**JAMAICA**

**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 2**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
			straps, Detail in Appendix 2: Jamaica Needs List	
<b>Health</b>	Minor damage reported at hospitals across the islands such as flooding in medical wards of Kingston Public Hospital and roof damage.	Not provided to date	Epidemiologist required and provided. Vector Control identified as priority (Detailed list Tables 2 & 3 Appendix 2 )	Ministry of Health continues to monitor health sector across island.
<b>Education and Culture</b>	Roof damage to some schools	Not provided to date	-	-
<b>Public Buildings</b>	No information provided to date	-	-	-
<b>PRODUCTIVE SECTORS</b>				
<b>Agriculture</b>	Indicated as extensive	Not provided to date	-	-
<b>Tourism</b>	No major damage reported. Damage reports in Montego Bay were mainly from craft markets 3 or 4 Hotels in New Kingston suffered some damage, generally minor	-	-	-
<b>Commerce</b>	No information provided to date	-	-	-
<b>Manufacturing</b>	No information provided to date	-	-	-

**JAMAICA**  
**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 2**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
<b>INFRASTRUCTURE</b>				
<b>Water</b>	All systems affected in varying degrees. Major systems affected include: Bogue Water Treatment (St. Ann) Roaring River Water Treatment Plant Bluefields Water supply System	Not provided to date	-	Water supply continues to be hampered by the lack of electricity to National Water Commission's pumping station by JPS.
<b>Electricity</b>	JPS, after 2 days assessment and restoration activity, reporting more significant damage to its power delivery system than expected. Specifically in eastern and southern parishes – St. Catherine, Manchester, Clarendon, St. Elizabeth, St. Thomas and Portland.  Severe damage to transmission and distribution lines on the East and South Coast.  Widespread damage but less severe damage to power distribution infrastructure on the West and North Coast.  Significant damage to on the South Coast 69KV transmission line.	Not provided to date	Not identified to date	Phased restoration has commenced. Essential services prioritized.  75% check of power Plants completed as of August 20.  Progress being made in restoring power to customers in sections Kingston & St. Andrew, St. James, Hanover, Westmoreland and St. Ann.
<b>Telecommunications</b>	Cellular communication system was affected. Cellular communications remain down in sections of St. Elizabeth, Manchester, Clarendon,	Not provided to date	Not identified to date	Work is continuing on restoring service to affected communities.

**JAMAICA**

**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 2**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
	Trelawney and St. Thomas. Digicel has reported 70% network coverage island wide.			
<b>Public Works (Roads, Bridges etc.)</b>	269 roads affected – Blocked or flooded	Not provided to date	Not identified to date	208 reopened to date Eastern parishes especially affected
<b>Air and Sea Ports</b>	Status: Norman Manley and Sangster International airports are now operational.	-	-	-
<b>ENVIRONMENT</b>				
	Downed trees widespread	Not provided to date	Not identified to date	-

**BELIZE**

**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 3**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage \$US</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
<b>GENERAL</b>				
<b>Affected Population</b>	Shelterees in districts: Belize District 2,978 Orange Walk District 1,323 Corozal District 5,200 Cayo District 8,133 Benque 1,878	-	Food supplies and potable water; Bulk – rice ,beans, flour, powdered milk, can foods, cooking oil bedding - 500 Blankets 500 Sheets; 1,000 Pillows; 10 ft Canvas	-
<b>Casualties</b>	None reported to date	-	-	August 22,2007
<b>SOCIAL SECTORS</b>				
<b>Housing</b>	Corozal District most affected; Damage also in Orange Walk and minor damage in San Pedro, Ambergris Caye and Caye Caulker. 318 Houses destroyed 491 houses damaged	10.0	Building materials - 2,000 Zinc sheeting (8ft); 2,000 Zinc sheeting (10ft) 2,000 Rubber Rye 2000 sheets plywood ( ½"); 1000 lbs roofing nails; 1000 lbs 2" nails 500 lbs 1" nails; 2000 2" x 4" (8 ft); Equipment and tools - 20 Chainsaws; 20 Axes; 20 Hand saws; 20 Shovels; 50 Hammers	-

**BELIZE**

**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 3**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage \$US</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
<b>Health</b>	No information provided to date	Not provided to date	Medical supplies Detailed Needs List Appendix 3	-
<b>Education and Culture</b>	No information provided to date	Not provided to date	Not identified to date	-
<b>Public Buildings</b>	No information provided to date	Not provided to date	Not identified to date	-
<b>PRODUCTIVE SECTORS</b>				
<b>Agriculture</b>	Corozal and Orange Walk Districts affected; Vegetable and tree crops significantly damaged; 50 acres of pasture damaged inundated	42.575	Seeds and agrochemical supplies	-
	Cattle	0.025		-
	Papaya industry suffered 95% crop losses; 1500 acres of papaya lost due to wind damage	11.25		Estimated export losses to June 2008 BEL\$40M
	Sugar cane crops and exports – 10% fields damaged by wind (dislodged); 5% inundated; 6000 acres affected	8.8		Estimated net effect on production will be a loss of 10% -15%. Foreign exchange loss estimated at BEL\$15M
	Grains	1.5		Damage to grains to be verified through further field assessments

**BELIZE**

**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 3**

Type / Sector	Summary of Damage		Estimated Cost of Damage \$US	Recovery and Rehabilitation Needs	Additional Information /Remarks
	Domestic crops: Damage to vegetables, hot peppers, fruits, watermelon and bee keeping; Plantain plantations completely destroyed	1.0			
<b>Tourism</b>	San Pedro Authorities reported 3000 tourists evacuated from San Pedro and Caye Caulker		2.9	Not identified to date	Sector anticipates cancellations and decrease in arrivals
<b>Commerce</b>	No information provided to date		Not provided to date	Not identified to date	
<b>Fishing</b>	Fishing sector in San Pedro, Ambergris Caye, Caye Caulker and Corozal district damaged.		Not provided to date	Not identified to date	Value of damage to be established in consultation with fishing cooperatives.
<b>Manufacturing</b>	No information provided to date		Not provided to date	Not identified to date	
<b>Infrastructure</b>					
<b>Water</b>	No information provided to date		Not provided to date	Not identified to date	-
<b>Electricity</b>	No information provided to date		Not provided to date	Not identified to date	-
<b>Telecommunications</b>	No information provided to date		Not provided to date	Not identified to date	-
<b>Public Works (Roads, Bridges)</b>	Surface damage to major northern highway, rural and feeder roads; Culvert replacement and		6.0	Road unit support: Grader, bulldozer, 2 tipper truck, front end	-

**BELIZE**

**SUMMARY OF DAMAGE (Information updated August 22, 2007); Summary Needs List at Appendix 3**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Estimated Cost of Damage \$US</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Additional Information /Remarks</b>
etc.)	spot patching of streets and roads required		loader	
<b>Air and Sea Ports</b>	Pier damage concentrated in San Pedro Town, Ambergris Caye – moderate to heavy damage Caye Caulker – minor to moderate damage	2.5	-	-
<b>Environment</b>				
<b>Coastal Erosion</b>	Noted in San Pedro, Caye Caulker and Corozal;	Not provided to date	Not identified to date	-
<b>Vegetative Cover</b>	Reported in all areas	Not provided to date	Not identified to date	-
<b>Improper Effluents</b>	Contamination from improper discharge of effluents east of San Mateo and San Pedro Town	Not provided to date	Not identified to date	-
<b>Debris</b>	Poses an environmental hazard primarily in urban areas	Not provided to date	Not identified to date	-
<b>TOTAL</b>		<b>53.975</b>		

## APPENDIX 2: JAMAICA NEEDS ASSESSMENT

**TABLE 1: GENERAL NEEDS LIST**

Needs have been derived based on data gathered from the field and projected needs.

<b>Needs</b>	<b>Items</b>	<b>Description</b>	<b>Quantity</b>	<b>Projected needs</b>
<b>Water</b>				
	5 gal Containers	8000		
	1 liter Bottled water	1700 x 7	11,900	29, 750
	Storage Tanks 1000 gal 800 gal 400 gal	26 with fittings 10 with fittings 8 with fittings		52 20 16
<b>Roofing</b>				
	Tauplins	16 x18 12 x14 8 x10	175 200 300	350 400 600
	Aluminum sheeting	9 x 3	16,000	32,000
	Building material	2 x 4 x 18 2 x 6 x 18 1 x 10 x 18	15,000 pieces 1000 pieces 2000 pieces	30,000 2000 4000
	Plywood	3/8 6 sheets per house	6000 sheets	12,000
	Nails	3 inch nails  4 inch  Galvanize nails or screws	7000 lbs  3000 lbs  5000 lbs	14,000  6000  10,000
	Housing units	700 housing solutions		1400
	Hurricane rafter straps	18 per unit	18 ,000	36,000
<b>Hygiene Kits</b>	Per person	7500		15,000

**TABLE 2: MINISTRY OF HEALTH, JAMAICA**

**PRIORITY NEEDS LIST – AUGUST 20, 2007**

<b>QUANTITY</b>	<b>ITEM</b>	<b>REMARKS</b>
50 drums	Malathion 95%	
25,000 litres	Anvil 2+2 (Synthetic pyrethroid)	
200 bags	Abate - 100 bags 5% skeeter - 100 bags 2% skeeter	
50	Fogging Machines	
50	Spray Pumps (hand operated, pressurized, 14 litres up)	
5	ULV Machines	
50 bags	Altosid (methoprene) 20 – 30 kilos	
100	Comparators	
300 pails	Rodenticide 10kg	
30	Flaming Lamps	
100	Coliform Kits	
50	Portable turbidity meters	
50	Portable pH conductivity meters	
50	DPD Free Chlorine Reagent	
2,000	Collapsible water tanks (5 – 10 gallons)	
10,000 bottles – 1 qt 5,000 bottles – 1 gallon	Bleach - 1 qt / 1 gal	
	Public Education programme - Community and Mass Media	Estimate – J\$6.0m

### APPENDIX 3: BELIZE CRITICAL NEEDS LIST

**Table 1: Critical Needs list**

<b>Needs</b>	<b>Description</b>	<b>Agency requesting assistance</b>
Food supplies and potable water	Bulk – rice ,beans, flour, powdered milk, can foods, cooking oil	
Health/Medical Supplies	Chlorine tablets, vector control chem.	
Health Supplies		
Building Materials	2,000 Zinc sheeting (8ft) 2,000 Zinc sheeting (10ft) 2,000 Rubber Rye 2000 sheets plywood ( 1/2") 1000 lbs roofing nails 1000 lbs 2" nails 500 lbs 1" nails 2000 2" x 4" (8 ft)	Corozal DEC
Bedding	500 Blankets 500 Sheets 1,000 Pillows 10 ft Canvas	
Equipments/tools	20 Chainsaws 20 Axes 20 Hand saws 20 Shovels 50 Hammers	BDF
Seeds and agrochemical supplies		
3 Road Unit Support	Grader, bulldozer, 2 tipper truck, front end loader	MOW

Sources: Ministry of Health and the Belize Defence Force

**Table 2: BELIZE Post Hurricane Dean Health Needs**

<b>Item</b>	<b>Amount</b>	<b>Comment</b>	<b>Estimated Cost per unit (US \$)</b>	<b>Total Cost (US \$)</b>
Mechanized Backpack Sprayers	12	Brand: Domina or Solo Agent: Prosser	- 1,200.	14,400.
Portable Thermal Foggers	7	Agent: Prosser Brand: Swingfog	- 1,800	12,600.
Mobilstar ULV Sprayer	8	Agent: Prosser Vehicle mounted ULV fogger	- 18,000	144,000
Liquid temephos (Abate)	50 containers	Each containers has 2.5 gallons of concentrated liquid Agent: Commerce Ltd. # 60 Cleghorn Street	- 600.	30,000
Tetanus toxoide	1,000 multidose vials			
Anti-venum	600 vials	Multidose vials		
Benadryl syrup	3,000	250 ml bottles		
Oral Rehydration Salts	10,000 packets			
Ventolin aerosol sprayers	2,000			
Asthma Nebulizers	50			

Source: Ministry of Health

**APPENDIX 4  
EMERGENCY FACILITIES AVAILABLE THROUGH  
MULTI-LATERAL FINANCING AGENCIES**

<b>Agency and Facility</b>	<b>DESCRIPTION</b>
<p style="text-align: center;">CDB</p> <p><i>Natural Disaster Management for BMCs</i></p>	<ol style="list-style-type: none"> <li>1. In the aftermath of a disaster, declared officially by the Government of the affected country, CDB will make a US \$100,000 grant available through CDERA.</li> <li>2. Emergency loan not exceeding US \$500,000.00 to cover expenses for the clearing and cleaning of affected areas and for emergency restoration of services is also available. The loan will be at a concessionary rate.</li> </ol> <p><a href="http://www.caribank.org/Policies.nsf/Disaster?OpenPage">http://www.caribank.org/Policies.nsf/Disaster?OpenPage</a></p>
<p style="text-align: center;">World Bank</p> <p><i>Emergency Recovery Assistance</i></p>	<p>A country may request assistance from the Bank when it is struck by an emergency that seriously dislocates its economy and calls for a quick response from the government and the Bank.</p> <p>The main objectives of emergency recovery assistance are to restore assets and production levels in the disrupted economy. The Bank finances investment and productive activities, rather than relief or consumption, and focuses on areas of its comparative advantage.</p> <p>Bank emergency assistance may take the form of</p> <ol style="list-style-type: none"> <li>I. immediate support in assessing the emergency's impact and developing a recovery strategy;</li> <li>II. restructuring of the Bank's existing portfolio for the country, to support recovery activities;</li> <li>III. redesign of projects not yet approved, to include recovery activities; and</li> <li>IV. Provision of an emergency recovery loan (ERL).</li> </ol> <p><a href="http://wbIn0018.worldbank.org/Institutional/Manuals/OpManual.nsf/0/b9f01860581ca2d78525672c007d077e?OpenDocument">http://wbIn0018.worldbank.org/Institutional/Manuals/OpManual.nsf/0/b9f01860581ca2d78525672c007d077e?OpenDocument</a></p> <p>Up to US \$5M can be released from the ERDMP-APL Floating Tranche. The only condition is that a state of natural disaster is declared.</p>

<p style="text-align: center;">IDB</p> <p style="text-align: center;"><i>Natural and Unexpected Disasters: Sectoral Operational Policy</i></p>	<p>Humanitarian assistance with Bank funding may be granted only if a state of emergency or disaster has been officially declared by the government. This funding will be provided only through emergency technical cooperations, to be implemented during or immediately after a disaster. The resources should be administered by international or local aid organizations specialized in humanitarian assistance.</p> <p>When economically feasible, and not in conflict with the revised development priorities resulting from the impact of a disaster, the financing of rehabilitation operations may be covered by:</p> <ol style="list-style-type: none"> <li>I. A loan from the Emergency Reconstruction Facility;</li> <li>II. The redirection of undisbursed balances within the same sector or across sectors;</li> <li>III. New emergency operations when the redirection of funds is not possible.</li> </ol> <p><a href="http://www.iadb.org/exr/pic/VII/OP_704.cfm">http://www.iadb.org/exr/pic/VII/OP_704.cfm</a></p>
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