

# **SUMMARY OF IMPACT OF HURRICANE "LUIS" ON CDERA PARTICIPATING STATES Response Actions, Recovery and Rehabilitation Needs**

*Prepared for the Meeting of Regional Organizations  
Hilton Hotel, Trinidad (October 6, 1995)*

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## **1.0 THE EVENT**

Hurricane Luis affected the Leeward and Northern Windward Islands between 4th and 6th September 1995. At the time of making landfall in Antigua on 5th September, the hurricane was classified as Category IV on the Saffir/Simpson scale, with maximum sustained winds of 140 miles per hour. This was the most powerful tropical system to have developed this season and the worst to affect the Caribbean since Hurricane Hugo in 1989.

### **1.1 Participating States Affected**

The following CDERA Participating States were affected by the hurricane:

- Antigua/Barbuda
- British Virgin Islands
- Dominica
- Montserrat
- St Kitts/Nevis

Anguilla and St Maarten were also affected. These states however are not members of CDERA and would therefore not be directly involved in the CDERA response. Given Anguilla's close historical relationship with the rest of the English-speaking Caribbean however, the Agency has closely monitored the situation in that island. A brief situation report on Anguilla is attached as Appendix A.

## **2.0 REGIONAL RESPONSE ACTIONS**

### **2.1 Pre-Impact**

- I. The Regional Response Mechanism (including National Disaster Coordinators, RSS, CDRU, Eastern Caribbean Donor Group) and other interested international agencies was placed on full alert, 36 hours before impact.

- II. National Disaster Committees in each of the threatened states met to review preparedness and response plans and to initiate Increased Readiness Actions.
- III. CDERA Coordinating Unit contacted the National Disaster Coordinator of each threatened state to ascertain status of preparedness.
- IV. Meeting of Eastern Caribbean Donor Group convened by UNDP-Barbados as per Operations Order.

## 2.2 Post-Impact

The extent of the damage in Antigua has made it necessary to mount a Level III response according to the *Regional Coordination Plan*. The Regional Response Mechanism was fully activated.

- I. A Caribbean Disaster Relief Unit (CDRU) reconnaissance team left from Barbados on the afternoon of 6th September after the airport in Antigua was reopened. This assessment team included military, UNDP, PAHO and CDERA personnel.
- II. A contingent of regional military, police and other relief personnel were flown to Antigua on the afternoon of 6th September to assist in relief operations.
- III. Further assessment missions to affected islands were launched from Barbados and from Antigua.
- IV. CDERA has provided personnel for EOC support and assistance with Shelter Management and Relief Distribution.
- V. The Caribbean News Agency (CANA) in collaboration with UNDP-Barbados held a live regional "radiothon" on 11th September during which callers pledged donations totalling approximately US \$50,000.
- VI. Pledges of cash and in-kind were received from the Government of Barbados, the British Virgin Islands, Bahamas, Trinidad & Tobago, Jamaica and Belize within 72 hours of the impact of the event.
- VII. Immediate private sector response came from LIAT, Carib Express and Air Caribbean through the provision of transportation services to move personnel and emergency supplies to the affected areas.
- VIII. Subsequent private sector, through CDERA, has come from Shell Antilles and Guianas Limited and BRC Limited. Others are still

examining the options available to them.

### **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, has been holding regular meetings to assess the situation and to coordinate the efforts of members.

The Group sent Rapid Assessment Teams to Dominica, Antigua/Barbuda, St Kitts/Nevis, Montserrat and Anguilla during the period 8-11 September.

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

PAHO has assessed the public health needs in Antigua/Barbuda and St Kitts/Nevis and is providing material and technical assistance to meet the needs identified in these countries. It has also provided emergency communications equipment as well as relief supply management personnel.

#### **3.3 International Federation of Red Cross and Red Crescent Societies (IFRCS)**

The Geneva-based IFRCS has launched an international appeal for 1,420,000 Swiss Francs to assist affected families and fishermen in the affected countries. Two delegates are being sent to the region to provide support for National Societies in the affected countries.

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

OFDA has provided personnel, transportation, emergency food supplies, shelter materials and other relief supplies to Antigua/Barbuda and St Kitts/Nevis to meet the most immediate needs. This included assistance to Holberton Hospital in Antigua.

#### **3.5 International Maritime Satellite Organisation (Inmarsat)**

INMARSAT has provided (on loan to CDERA) an "Inmarsat-M" portable satellite telephone system for relief communication in Antigua/Barbuda. It has also asked CDERA to coordinate with the local telecommunications company in Antigua for satellite access under the "FreeSpace" policy.

#### **4.0 SUMMARY OF DAMAGE**

Preliminary Damage Assessments have been carried out in all affected states by the respective governments. In all except the British Virgin Islands, assessments have also been carried out by external personnel. Most of the countries are now in the process of conducting detailed sectoral assessments and developing plans for reconstruction and rehabilitation.

A summary of the impact of the System on each territory follows. This includes a summary of damage by sector as well as the recovery needs where this information is available. The summary is based primarily on information provided to CDERA by the governments of the affected countries, assessments by CDERA personnel and from assessment teams from the Eastern Caribbean Donor Group. Estimates of value of damage are from government reports.

**SUMMARY OF DAMAGE  
ANTIGUA AND BARBUDA**

Type / Sector	Summary of Damage	Recovery and Rehabilitation Needs	Additional Information /Remarks
<b>General</b>	Worst hit of CDERA Participating States.		
<b>Casualties</b>	2 deaths, 2 serious injuries and 165 injuries reported in Antigua. No deaths in Barbuda.		
<b>Health</b>	Holberton Hospital lost part of its roof and suffered structural and equipment damage. Number of available beds reduced from 156 to 134. 6 other health centers suffered serious damage. Roof of storeroom of Barbuda hospital removed.	Reconstruction of damaged sections of Holberton (estimated at US \$250,000) and Mental hospitals. Repair of St Johns Health Centre (estimated at US \$30,000) and other clinics. Health specialists (biomedical and civil engineers, vector control specialists). Epidemiological surveillance system.	
<b>Housing</b>	90% of estimated 20,000 units sustained some damage incl. 40% seriously damaged and up to 15-25% seriously destroyed. (Assessments have confirmed 207 units completely destroyed and 320 without roof and 272 with other damage). Approximately 2,000 in shelters at 10/Sept., 700 at 15/Sept.	4 million sq ft metal and 0.62 million sq ft shingle roofing material. 3 million sq ft plywood for decking. Other accessories (nails, capping, rafters, etc.) <sup>1</sup>	
<b>Water</b>	Water supply lost because of disruption of electricity. Minor damage to mains. No damage to reservoirs. 80% restoration projected by September 11. Target date for restoration to critical areas: 30/Sep/95. Full restoration: 31/Dec/95	Repair of facilities.	
<b>Electricity</b>	Plants and distribution network severely damaged. Assessment now underway with assistance from CARILEC. Target date for restoration to critical areas: 30/Sep/95. Full restoration: 31/Dec/95	Maintenance personnel, generators, poles, equipment and materials for restoration (cables, ducts, insulators, transformers, conductors).	
<b>Telecommuni-</b>	Telephone communication curtailed because of	Maintenance personnel.	

**SUMMARY OF DAMAGE  
ANTIGUA AND BARBUDA**

Type / Sector	Summary of Damage	Recovery and Rehabilitation Needs	Additional Information /Remarks
<b>Communications</b>	damage to distribution network. Restoration currently taking place. Radio communication in initial stages limited by damage to equipment and lack of electricity. Target date for full restoration of telephone service: 31/Dec/95.	Communications equipment Poles and cables	
<b>Education</b>	65% of schools damaged, including 12 elementary and 2 Secondary schools. Two schools destroyed. Target Date for restoration of schools: 30/Sep/95	45,000 sq ft metal roofing 40,000 sq ft plywood decking Timber framing, Nails, other lumber 500 fluorescent lamps, 5,000 lin ft 3036 x 2 1/2 electrical wire. 100 single pole switches.	
<b>Public Buildings</b>	60% of government buildings damaged.	Construction and roofing materials	
<b>Public Works (Roads, Bridges etc.)</b>	No information available		
<b>Air and Sea Ports</b>	Navigational aids (markers) at sea ports destroyed. Harbour needs sounding before cruise ships can return. Doors of cargo shed in need of urgent replacement. Salvage crew needed for disposal of wrecks. Some damage to Air Terminal Building, Air Traffic Control Tower and CFR Hall.	Installation of Navigational aids Equipment for sounding harbour Replacement of doors of cargo shed Salvage crew for disposal of wrecks Tug for removal of beached vessels	See detailed assessment by CIDA
<b>Businesses</b>	65% of businesses damaged, some severely.	Reconstruction of premises. Replacement of stocks and equipment	
<b>Agriculture</b>	Assessment carried out. Report on extent of damage expected shortly. List of needs for rehabilitation of sector has been prepared.	Food and veterinary supplies for poultry (30,000 birds) rabbits and cattle. Chain saws, pruning shears and pruning sealers for clearing trees. Herbicides, Insecticides, Fungicides, Fertilizers. Seeds and Plants. Work equipment (gloves, boots, etc.)	

**SUMMARY OF DAMAGE  
ANTIGUA AND BARBUDA**

Type / Sector	Summary of Damage	Recovery and Rehabilitation Needs	Additional Information /Remarks
		Agricultural engineers, tree crop specialists, personnel to assist in reconstruction of stock buildings and in rapid plowing	
<b>Tourism</b>	Several hotels reported damage, in a few cases severe. There are reports of 4 hotels destroyed (2 each on Antigua & Barbuda). Ongoing assessments indicate 6 hotels currently in operation, 5 to reopen by the end of October, 11 to reopen by the end of November and 4 not expected to reopen until 1996. Damage to beaches also reported. Assessment will be undertaken to determine extent.	Furniture, equipment, facilities and plant.	
<b>Estimated cost of damage</b>	US \$500 million		
<b>Major outstanding needs (as of 16/09/95)</b>	<ul style="list-style-type: none"> <li>- Restoration of Electricity.</li> <li>- Rehabilitation of housing and public buildings</li> </ul>		



<b>SUMMARY OF DAMAGE BRITISH VIRGIN ISLANDS</b>		
<b>Type/Sector</b>	<b>Summary of Damage</b>	<b>Other Information / Remarks</b>
<b>General</b>	Overall, damage relatively minor, except in Anegada.	
<b>Casualties</b>	No casualties reported	
<b>Health</b>	No damage to health facilities reported	
<b>Housing</b>	Damage has been reported to many homes as the high winds blew off roofs. This occurrence was observed more in Anegada and Virgin Gorda.	
<b>Water</b>	Limited water supply is available in most areas of the territory (at 07/Sep). No significant damage to this sector has been reported as yet but an assessment is underway	
<b>Electricity</b>	Per lind poles downed in many areas. No damage reported to the BVI Electricity buildings or generating plants.	
<b>Telecommuni- cations</b>	No major damage to telephone facilities was reported. However, on Anegada telephone service became unreliable after lines were blown down.	
<b>Education</b>	Damage to schools reported.	
<b>Public Buildings</b>	No damage reported	
<b>Public Works (Roads, Bridges etc.)</b>	No major damage to roads were reported although most roads were strewn with debris. Assessment is ongoing.	
<b>Air and Sea Ports</b>	No damage reported	
<b>Businesses</b>	No damage reported.	
<b>Agriculture</b>	No damage reported	
<b>Major outstanding needs (as of 16/09/95)</b>	None Identified	

<b>SUMMARY OF DAMAGE COMMONWEALTH OF DOMINICA</b>			
<b>Type/Sector</b>	<b>Summary of Damage</b>	<b>Recovery and Rehabilitation Needs</b>	<b>Other Information/ Remarks</b>
<b>General</b>	Most significant impact on agriculture, roads and coastal defences.		
<b>Casualties</b>	1 death and 1 serious injury reported		
<b>Health</b>	No damage to health facilities reported		
<b>Housing</b>	Minor damage suffered. Government report states that 39 units require total	Estimate for reconstruction and rehabilitation - EC \$365,178	

**SUMMARY OF DAMAGE  
BRITISH VIRGIN ISLANDS**

Type/Sector	Summary of Damage	Other Information / Remarks
	construction while 41 require partial rehabilitation.	
<b>Water</b>	DOWASCO, the local water utility company, reported silting conditions in its reservoirs, but it expected to be able to restore service to most areas within a day.	
<b>Electricity</b>	No significant damage reported.	
<b>Telecommunications</b>	Telecommunications severely disrupted during passage of the system, with very limited international communications being possible during this time. Most communications restored shortly after the storm.	
<b>Education</b>	Some damage to 5 schools reported.	Cost of repair: US \$40,000.
<b>Public Buildings</b>	No damage reported	
<b>Public Works (Roads, Bridges etc.)</b>	Significant damage to roads, especially West Coast road. Also, significant coastal damage. (Sea defences breached in some areas).	Rehabilitation of roads, bridges and coastal protection works. Estimated costs EC \$62.4 million (including \$44.25 million for coastal protection works).
<b>Air and Sea Ports</b>	Damage reported to Cabrits Cruise Ship Berth, Woodbridge Bay Port, Roseau Waterfront Pier, Anse de Mai and Soufriere floating jetties and Canefield Airport sea defence.	Cost of repair approximately EC \$4 million
<b>Businesses</b>	No damage reported (other than to agricultural and hotel businesses as stated elsewhere).	
<b>Agriculture</b>	90% of banana acreage and 50% of tree crop production destroyed. Provisional estimate of EC \$15 million loss of banana earnings and \$5 million non-banana crop losses. Also EC \$1.6 million for livestock	Replanting and restoration of tree and fruit crops. Agronomic services.  Replacement of boats, shed, engines, fishing equipment and landing sites.

**SUMMARY OF DAMAGE  
BRITISH VIRGIN ISLANDS**

Type/Sector	Summary of Damage	Other Information / Remarks
	<p>and EC \$1.55 million for forestry and environment.</p> <p>The fisheries complex has been damaged. Several fishermen lost boats, equipment and facilities.</p>	<p>EC \$ 48.5 million required for rehabilitation of banana crop.</p> <p>EC \$10.42 million for rest of agricultural sector. (EC \$15.2 million for Emergency Action Programme).</p>
<b>Tourism</b>	<p>Several hotel properties along the western and northern coastlines sustained major damage mainly because of heavy seas. Includes loss of or damage to jetties, swimming pools, rooms, furniture, equipment etc. Several dive operators also lost jetties. Some beaches eroded.</p>	<p>Estimate of EC \$4.106 million to rehabilitate affected properties.</p>
<b>Estimated cost of damage</b>	<p>EC \$175 million.</p>	
<b>Major outstanding needs (as of 16/09/95)</b>	<ul style="list-style-type: none"> <li>- Technical review of damage</li> <li>- Rehabilitation of roads and coastal</li> <li>- Rehabilitation of agricultural sector</li> </ul>	

**SUMMARY OF DAMAGE  
MONTSERRAT**

Type / Sector	Summary of Damage	Other Information / Remarks
<b>General</b>	<p>Impact relatively minor.</p>	
<b>Casualties</b>	<p>No casualties reported</p>	
<b>Health</b>	<p>No damage to health facilities reported</p>	
<b>Housing</b>	<p>Minor damage</p>	
<b>Water</b>	<p>No damage reported</p>	
<b>Electricity</b>	<p>No damage reported</p>	
<b>Telecomms</b>	<p>No damage reported</p>	
<b>Education</b>	<p>No major damage reported. Technical college lost part of its roof.</p>	

**SUMMARY OF DAMAGE  
BRITISH VIRGIN ISLANDS**

<b>Type/Sector</b>	<b>Summary of Damage</b>	<b>Other Information / Remarks</b>
<b>Public Buildings</b>	No damage reported	
<b>Public Works (Roads, Bridges etc.)</b>	No information available	
<b>Air and Sea Ports</b>	Some damage to the port from rough seas.	
<b>Businesses</b>	No damage reported	
<b>Agriculture</b>	Some damage to agriculture reported. Some fishermen lost fishing pots.	
<b>Tourism</b>	No information available	
<b>Estimated cost of damage</b>	Not available	
<b>Major outstanding needs (as of 16/09/95)</b>	Assistance to fishermen who lost boats and equipment.	

**SUMMARY OF DAMAGE  
ST KITTS AND NEVIS**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Recovery/ Rehabilitation Needs</b>	<b>Additional Information / Remarks</b>
<b>General</b>	Significant Impact		
<b>Casualties</b>	Only minor injuries reported		
<b>Health</b>	JNF, Mary Charles, and Pogson Hospitals damaged (including damage to the roof and some equipment at JNF). Also 3 Health Centers damaged. Estimate of damage to sector: US \$50 million	Repairs to JN France Hospital to include reinforcement of maternity and private ward, rehabilitation of operating theatre and rehabilitation of rest of hospital. Repairs to damaged Health and Day Centres.	
<b>Housing</b>	Approximately half of the residential buildings are estimated to have received some sort of damage. Estimate of damage: US \$10 million	Roofing material, lumber, cement, plywood and other building materials.	
<b>Water</b>	Some water mains were broken and some intakes were silted or blocked with debris. Estimate of damage: US \$5 million	Repairs to mains.	
<b>Electricity</b>	Many electricity poles and lines are down throughout the island. There was also extensive flooding at the power station due to a damaged roof. Estimated damage: US \$10 million	Personnel and material to restore electricity.	
<b>Telecommunications</b>	Telephone company reported one break in the fibre optic cable with a second possible break.		
<b>Education</b>	15 of 30 schools damaged, in some cases severely. Some may need to be refitted. Estimated damage US \$12 million	Repair of schools. Refitting with furniture, fixtures, office equipment, supplies. Replenishment of stocks for school feeding programme.	

**SUMMARY OF DAMAGE  
ST KITTS AND NEVIS**

Type / Sector	Summary of Damage	Recovery/ Rehabilitation Needs	Additional Information / Remarks
<b>Public Buildings</b>	Extent of damage to Government Headquarters and other Government facilities still being assessed. Estimated damage US \$5 million		
<b>Public Works (Roads, Bridges etc.)</b>	There has been extensive damage to the Island Main Road, which has been severed in three places and undermined in several others. Estimated damage: US \$20 million	Rehabilitation of Roads	
<b>Air and Sea Ports</b>	The Deep Water Port, Transit Sheds at the port and the Airport all suffered damage. Estimated damage: US \$7 million.	Engineering survey of underwater damage to sea ports. Repair or reconstructions of damaged parts of air and sea ports.	
<b>Businesses</b>	Damage to the Private Sector is reported as being relatively minor. Damage includes damage to buildings and loss of stocks. Estimated damage: US \$7 million (including industrial sector).	Repair of buildings; replacement of stocks.	
<b>Agriculture</b>	Wind damage to crops is extensive and heavy rains have caused extensive soil erosion. The Sugar Industry suffered damage to plant, equipment, crops and infrastructure. Estimated that 30% of sugar crop was lost. Estimated damage: US \$35 million.	Survey of damage to sugar industry equipment and facilities. Rehabilitation of sugar industry.	
<b>Tourism</b>	Tourism Sector has received some damage but it is anticipated that at least 95% capacity can be restored within two weeks. Damage includes damage to furniture, plant and equipment. Also loss revenue, including Departure and Head taxes. Estimated damage: US \$20 million.	Repair of properties; replacement of plant, equipment and furniture.	

**SUMMARY OF DAMAGE  
ST KITTS AND NEVIS**

<b>Type / Sector</b>	<b>Summary of Damage</b>	<b>Recovery/ Rehabilitation Needs</b>	<b>Additional Information / Remarks</b>
<b>Estimated cost of damage</b>	US \$197 million (including US \$20 million classified as "General Economic Activity Impact").		
<b>Major outstanding needs (as of 16/09/95)</b>	Technical assessment and rehabilitation of agriculture and infrastructure.		



## 5.0 SUMMARY OF ASSISTANCE PROVIDED OR PLEDGED

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

DONOR	ASSISTANCE PLEDGED/PROVIDED
<b>CDERA PARTICIPATING STATES</b>	
CDERA Coordinating Unit	Cots and Rations for 35-Man CDRU Team Personnel to assist in assessment and coordination at the National Level. 125 cases of bottled water Support for 2-person UWI engineering assessment team for St Kitts/Nevis
British Virgin Islands	Cash donation for affected islands
Bahamas	US \$100,000 (\$50,000 to each of Antigua/Barbuda and St Kitts/Nevis) 30 Men from Defence force to be made available through the CDRU for reconstruction efforts An Electricity restoration team to be made available through CARILEC
Barbados	US \$50,000 for affected islands including US \$30,000 worth of relief supplies for Antigua/Barbuda and St Kitts/Nevis. Defence Force and police personnel as part of regional contingent. Disaster Coordinator to support EOC.
Dominica	12,000 pounds of fresh fruits and vegetables to Antigua/Barbuda and St Kitts/Nevis
Jamaica	<ul style="list-style-type: none"> <li>- Team of pole line personnel</li> <li>- Military roofing team</li> <li>- Public Health personnel</li> <li>- Damage Assessment personnel</li> <li>- Persons to operate supply management systems</li> <li>- Launched local appeal for cash donation</li> <li>- Engineer from Regiment Troop</li> </ul>
St Lucia	Police personnel (through RSS) Doctors and Nurses Disaster Coordinator to support EOC Generator
St Vincent and The Grenadines	Has offered artisans to assist in reconstruction
Trinidad and Tobago	Team of Engineer and Crew from Water, Electricity and Telephone Utilities (one team from each) Approximate 30 men from Defence Force deployed Transportation services (BWIA and Air Caribbean) Medical Team from Ministry of Health Local Appeal for cash donations being coordinated by St Vincent de

<b>DONOR</b>	<b>ASSISTANCE PLEDGED/PROVIDED</b>
	Paul Society
<b>REGIONAL PRIVATE SECTOR AND NGOS</b>	
Bermudez	One container-load of biscuits (through NEMA - Trinidad and Tobago)
BRC West Indies Limited	400 sheets of Permaclad roof covering.
CARILEC	Line crews from member utilities to assist APUA (Antigua) with electricity restoration over 3 month period.
CARIB EXPRESS	Aircraft to move response personnel and relief supplies
Caribbean News Agency (CANA)	US \$50,000 in pledges raised through regional "radiothon" in collaboration with UNDP-Barbados.
LIAT	Aircraft to move response personnel and relief supplies
Neal and Massy, Trinidad and Tobago	Food, water, housing materials and personal care items to fill two containers. (Through NEMA, Trinidad and Tobago.)
Shell Antilles & Guianas Ltd	US \$10,000 through CDERA for Participating States affected. (Part of US \$40,000 contribution for all affected states)
Texaco	Has indicated an intention to make a cash donation for affected states.
University of the West Indies	2-person engineering assessment team for St Kitts/Nevis
<b>FOREIGN (NON-CDERA) GOVERNMENTS</b>	
Australia	AUD \$50,000 for Antigua/Barbuda through DHA
Canada	CDN \$50,000 each for Antigua/Barbuda, St Kitts/Nevis and Dominica through CDERA. Additional CDN \$200,000 through PAHO to support the relief operations. (Includes \$30,000 to support CDERA operations).
United States (including USAID/OFDA)	Three shipments of relief supplies for Antigua/Barbuda and St Kitts/Nevis which included plastic sheeting, blankets, polyester, tents, water jugs, water tanks, gloves, chain saws, ready-to-eat meals, batteries, medical kits. Emergency communications equipment including "Inmarsat-M" satellite terminal. Personnel and equipment to assist with immediate relief countries affected.
UK (including BDD/C)	US \$25,000.00 for mobilizing CDRU Aircraft for transporting relief supplies Team to provide assistance for electricity restoration.
<b>MULTILATERAL AGENCIES (INCLUDING UN)</b>	
Caribbean Development Bank (CDB)	1. Technical Assistance Grant US \$100,000 through CDERA. 2. Technical Assistance Grant of US \$150,000 from the Inter-Islands through CDERA
CARICOM Secretariat	2 persons to assist in preparing proposals for reconstruction projects.
European Union (EU)	900,000 ECUs for emergency relief in affected islands. (400,000 through PAHO, 500,000 through IFRCs).
OECS/NRMU	Environmental personnel

DONOR	ASSISTANCE PLEDGED/PROVIDED
PAHO	US \$10,000 Health and supply management personnel Communication equipment Medical supplies Supplies for hospital to include bandages, gloves, heavy duty wet and dry vacuum cleaner, electric autoclave, generator, pump, sheets, mattresses, pillow cases, syringes and needles.
UNDP	US \$50,000
UN-DHA	US \$50,000 to Antigua through CDERA, US \$50,000 to Dominica.
UNICEF	US \$20,000 (50% to each of Antigua/Barbuda and St Kitts/Nevis). Can provide additional \$200,000 to support children's needs once an appeal is launched.
USAID/OAS Caribbean Disaster Mitigation Project (CDMP)	Will provide assistance in the reconstruction phase to include training in safe construction techniques (US \$75,000).
<b>OTHER INTERNATIONAL ORGANIZATIONS</b>	
IFRCs and Red Cross Societies	International Appeal for CHF 1,420,000 underway. Two (2) delegates sent to the Caribbean to assist. Other assistance being provided in collaboration with National Societies.
International Maritime Satellite Organization (Inmarsat)	? "Inmarsat-M" portable satellite phone. ? Free "air time" as per international agreement.

## **6.0 PRESENT STATUS**

The immediate response phase is over and efforts are now focussed on recovery. The external assistance effort in this area is significantly constrained by the need for more refined sectoral assessments.

Detailed sectoral assessments are being developed and refined. In Antigua and Barbuda, the recovery process is underway with electricity restored to the City Center and surrounding areas. Water has been restored to many districts.

## **7.0 ISSUES AND RECOMMENDATIONS FOR CONSIDERATION**

### *7.1 General*

The information provided above highlights the hazardousness of the Caribbean Small Island environment.

The problem that would have to be addressed in risk mitigation and implementation relates to the operational rules of administrative agencies that superficially treat or neglect disasters altogether.

Undoubtedly, the epistemology which underlies planning practice in the region and which imbibes the notion of rational behaviour can be problematic. Scientists are inclined to feel that risks need only to be made clear to policy makers for appropriate action to occur. They are quickly learning, however, that well-developed and logically consistent presentations are not always adopted.

A comprehensive approach to development planning is needed to effect mitigation implementation. It is clear that this process involves a diversity of affected publics, and links mitigation directly into the planning process.

Within this framework, hazard risks can be evaluated just as economic and other factors are. Effective risk mitigation planning must take place before the event. Only then can community participation and education of policy makers be effective.

### ***Issue #1***

In all National Disaster Plans, responsibilities are assigned to designated positions within the Public Service but there is no measure of accountability, i.e if a Permanent Secretary in a Ministry is given the responsibility of coordinating food or shelter and defaults on this, there is no mechanism for sanction.

#### *Issue # 1 - Recommendations*

- i. Accountability must be a central element of the process of public sector reform and strengthening.
- ii. Given the diversity and nature of threats to our communities, hazard considerations must be incorporated in the everyday activities of the Public Sector.
- iii. To facilitate this therefore, National Disaster Organizations must be given the adequate resources and authority to solicit the necessary inter-agency coordination.
- iv. Resource managers in the region must be made accountable for ensuring a minimum loss of resources that they manage. All public sector entities must have an action plan for becoming operational in the shortest possible time after an impact.
- v. Asset security and employee safety are essential functions and responsibilities of public service managers.

### ***Issue 2***

Institutionalised disaster training and research in the region is unstructured and uncoordinated. Every effort must be made to utilize existing educational and vocational institutions to generate the culture necessary for the support and pursuit of the strategies of disaster reduction and resource sustainability.

#### *Issue #2 - Recommendations*

- i. Require appropriate elements of the disaster management agenda be incorporated into the curricula of administrators, doctors, lawyers, police professionals, teachers, insurance personnel and in the school environment.
- ii. The Capacity 21 Project should support CDERA in the refinement and adoption of a set of protocols as guidelines for incorporating disaster planning into the Public Sector.

### ***Issue 3***

Calls for improvement in the preparation for and management of hazards associated with human-use systems has been repeatedly made in many fora. That they need to be made again, highlights the need for more resources to be directed for the follow-up of recommendations and programme implementation.

To achieve this, there will be the need for regular and sustained interagency consultation on programme planning to maximize the limited available resources. Agency territoriality must be de-emphasized and the needs of the constituencies to be served given paramountacy.

#### ***Issue #3 - Recommendations***

- i. Review of intra and inter agency dynamics to include an analysis of the decision making infrastructure in the public service.
- ii. Island states and territories in the region must take a longer term comprehensive and integrated approach to risk mitigation.
- iii. There is a need to identify a management strategy to balance current action with losses from future disaster events.
- iv. 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.

### ***Issue 4***

Advancement in science and engineering and planning shows that often disasters can be avoided and/or the impacts of those that occur lessened. The random nature of the technological and natural hazards threats to our region highlights the importance of planning.

### ***Issue 5***

The ideal of any emergent hazard management system is to anticipate rather than suffer consequences to rapidly reduce the hazard or ameliorate the consequences where indicated, and to do so with a minimum burden on social resources and opportunities foregone.

There can be little doubt that, in the region, the challenges of nature and technology, in increasing the exposure of our people to risk, pose a dilemma for governments, which seek the fullest protection for their people and their property.

The situation is further confounded by the fact that under normal circumstances few citizens or businesses place a high priority on hazard management. However, in the event of disasters, these individuals and business leaders expect governments to effectively manage them, but seldom associate long-term planning with effective disaster management.

#### *Issue #5 - Recommendations*

- i. An initial element of any comprehensive hazard management programme for developing islands must be the establishment of an inter-agency coordinating institution.
- ii. Existing disaster/emergency coordinating bodies could be upgraded with physical, manpower and legal resources to perform this role.
- iii. A detailed assessment of the social and economic impact of both technological and natural hazards on our productive centers is critical. This is necessary to guide the application of hazard mitigation regulations in future development plans.
- iv. Pre-planning for post disaster reconstruction is needed to ensure that an effective and rapid recovery occurs within the framework of the re-establishment of strong socio-economic systems.

### *7.2 Issues Central to Rehabilitation Assistance Resulting from the 1995 Events*

#### 7.2.1 Need for Flexible Reconstruction Assistance

Given the impact on critical economic centers of the island states by the recent events, there is a need for development financing agencies and institutions to consider how they can better plan, programme and deliver time sensitive reconstruction assistance.

In this regard, there is a need to review the following areas:

- i. Alternatives available for flexible funding and programming;
- ii. Application of regular development assistance programming and implementing procedures to deliver reconstruction assistance;
- iii. The possibility of varying the application of standard procurement rules to obtain specified commodities;
- iv. How time critical reconstruction components can be given high priority in delivery of reconstruction assistance;

### 7.2.2 Addressing Building Construction and Design Issues

A new approach to disaster management involving improvement of both human and environmental conditions and the interactions between people and environment.

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

I subscribe to the view that major disaster problems are essentially unsolved development problems - housing quality, land use, regional capital and finance capacity.

The following recommendations are therefore offered for consideration and support.

- i. Develop and publish 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 benefitting agency.

## **8.0 GRASPING OPPORTUNITIES FOR MITIGATION**

Major national disasters provide political and financial opportunities for reducing future vulnerability if long and short term policy commitments to loss reduction are made at all levels of government and the lessons learnt from these and past events are applied in rebuilding and reoccupation of the hazard areas.

Most governments lack legislation or incentives for mitigation. Post event mitigation

policies for repair and rebuilding are absent.

## 9.0 GOING BEYOND EVENT FOCUSED RESPONSE

A review of the political, professional and public statements following disasters in the Caribbean in the last two decades highlight the rampant difference between articulation of concern and commitment to action.

There is no doubt that since 1979, when Hurricanes Frederick and David struck Dominica and the Mount Soufriere Volcano erupted in St Vincent, that some progress has been made at institutionalizing national and regional preparedness and response mechanisms.

However, there is little evidence to suggest the commitment to or implementation of national or agency policies to institutionalize disaster prevention or loss reduction. Consequently at this time, we are still repeating calls for legislation and enforcement of building codes.

There is a need for us to ensure that our concern for the sustainability of our economic agenda transcends the event and is incorporated into our programming.

Reconstruction and rehabilitation assistance cannot and should not be separated from pre-disaster preparedness planning. To achieve this, the integration of hazard considerations into long-term economic and land use patterns is essential.

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## APPENDIX A: SUMMARY OF IMPACT ON ANGUILLA

Type / Sector	
General	Sustained substantial damage.
Casualties	No casualties reported
Health	Slight damage to hospital, but it remained fully operational
Buildings	About 50% of houses and public buildings sustained some damage. This was severe in some cases.
Water	No information available
Electricity	75% of electricity affected with 80% of poles being knocked down. On 10/Sep it was estimated that an additional 7 days would be required to restore power.
Telecommunications	Telephone communication was completely disrupted. Radio station was off the air for some time after impact.
Education	Schools due to reopen on 18th September.
Public Works (Roads, Bridges etc.)	Blocked roads were reopened shortly after the disaster. Information on extent of damage to roads not available.
Air and Sea Ports.	Jetty has been surveyed and is intact. Sea bed has been surveyed for the first 100 yards and is in good condition for vessels to dock.
Businesses	Information not available
Agriculture	Information Not available
Tourism	Two major hotels received major structural damage and are unlikely to be in service for the coming season.
Estimated cost of damage	Not available
Major outstanding needs (as of 13/09/95)	Building materials for reconstruction of homes and public buildings.



## APPENDIX B: REPORTS AVAILABLE

<b>Title/Subject</b>	<b>Prepared by</b>	<b>Date</b>
Summaries of Impact of Hurricane Luis on CDERA Participating States and Response Actions	CDERA	06/Sep/95 07/Sep/95 08/Sep/95
Notes of Meetings of Donor Disaster Coordinating Group	UNDP - Barbados	Various Meeting Dates
Impact Analysis of Hurricane Luis	National Emergency Management Agency (NEMA) - Government of St Kitts and Nevis	07/Sep/95
Hurricane Luis Sitrep #7	PAHO Emergency Preparedness Department, Caribbean Sub-regional Office (Barbados)	10/Sep/95
Eastern Caribbean Donor Group Rapid Needs Assessment Report	James Armstrong (UNCHS), Team Leader, Rapid Needs Assessment Team.	13/Sep/95
Hurricane Luis Report - Antigua and Barbuda.	CDERA	15/Sep/95
Economic Rehabilitation and Reconstruction - Post Hurricane Luis.	Government of Dominica	15/Sep/95
Rapid Needs Assessment Report for Wallblake Airport, Anguilla	Brian Lackey, CIDA	14/Sep/95
Rapid Needs Assessment Report for Golden Rock Airport, St Kitts-Nevis	Brian Lackey, CIDA	13/Sep/95
Rapid Needs Assessment Report for V C Bird International Airport, Antigua	Brian Lackey, CIDA	18/Sep/95
Rapid Needs Assessment Report for Canefield and Melville Hall Airports, Dominica	Brian Lackey, CIDA	12/Sep/95
Assessment of Damage caused by Hurricane Luis in the Eastern Caribbean	David Lashley, CIDA	N/A
Post Hurricanes Luis & Marilyn Project Proposals	St Kitts National Emergency Management Agency	Sept 1995
Preliminary Review of Situation after Hurricane Luis and Marilyn	St Kitts National Emergency Management Agency	Sept 1995

1. See minute of 8th September 1995 from Director of Public Works, Antigua.