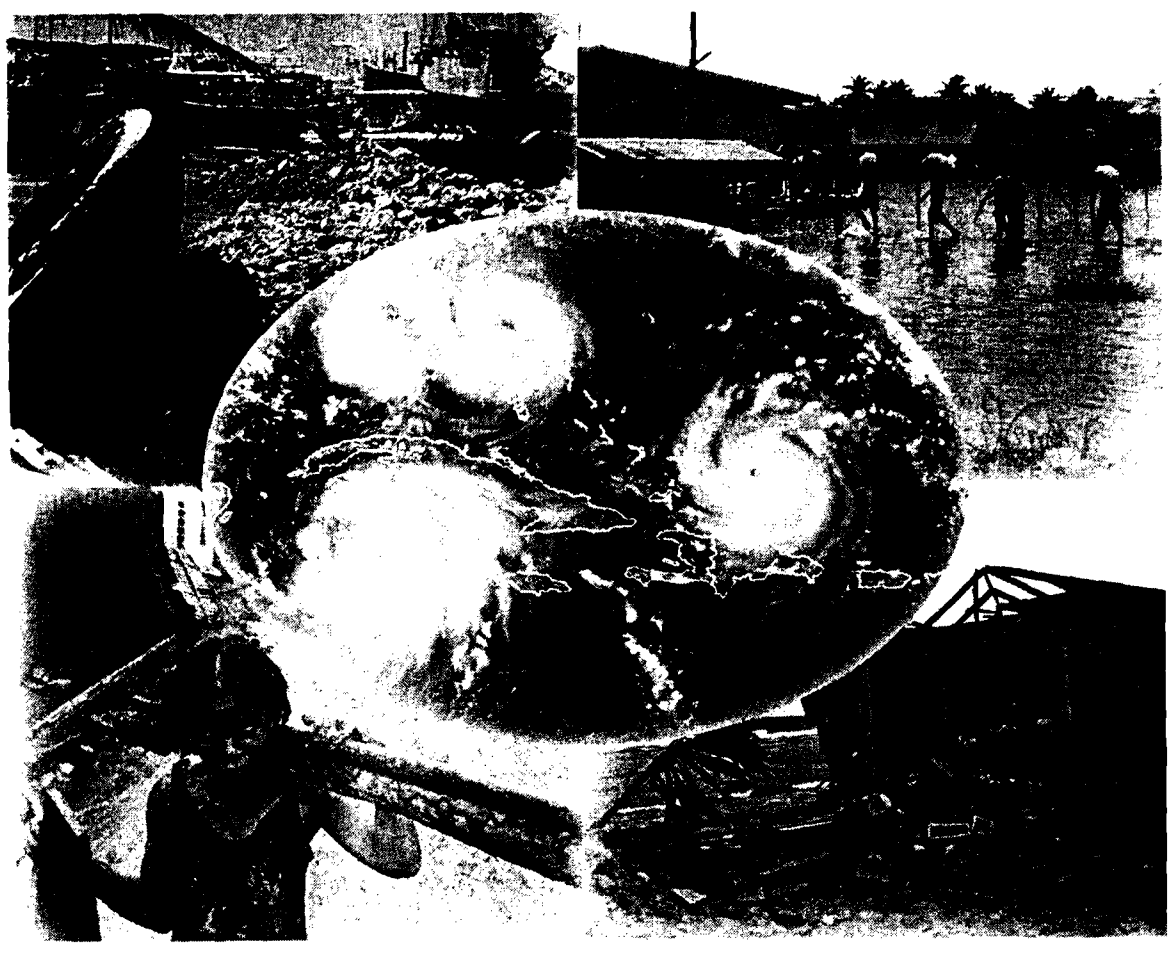


LC/CAR/L.39



UNITED NATIONS



**COMPARISON OF THE SOCIO-ECONOMIC IMPACTS
OF NATURAL DISASTERS
ON CARIBBEAN SOCIETIES IN 2004**

2005

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Acknowledgments

This report resulted from a review of the post-disaster socio-economic assessments that were conducted by the Economic Commission for Latin America and the Caribbean (ECLAC) during the hurricane season of 2004 and is part of a United Nations Development Programme (UNDP)-funded Project 00041194, Lessons Learned in Risk Management in the Caribbean 2004.

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1. INTRODUCTION

This study sets out to synthesize the several country reports to address the terms of reference. It therefore examines the nature of the events as they impacted the countries in 2004 and seeks underlying common local conditions that might have contributed to damage. It therefore follows to a great extent the presentation structure of the national reports on the impact of the disasters. The study has benefited from a search of the literature on natural disasters and visits to the strategic objectives of a number of international agencies that focus on a variety of aspects of natural hazards and their impact on societies. It has observed convergence on the subject of disaster preparedness and has noted agreement with a number of recommendations that the ECLAC team has made in that regard.

This study is structured as follows:

1. It provides some understanding of the approach taken to the study.
2. In Section 3 it describes the events of 2004.
3. The report discusses in synthesized form the macroeconomic indicators that could be compared across countries.
4. Section 5 of the report presents a discussion of the effects of the natural events of 2004 on the major sectors.
5. Section 6 abstracts from the reports the causal factors impacting the type and extent of damage in the countries.
6. A consolidation of Recommendations emanating from the reports is presented in Section 7.
7. Section 8 discusses possible regional mechanisms for joint approaches to follow-up on recommendations.
8. Section 9 outlines the training needs to implement the recommendations.
9. In Section 10, a presentation of Lessons Learned is made.
10. Section 11 is an acknowledgement of some of the other documents consulted.
11. The Annex presents a number of useful tables from the country reports.

2. APPROACH TO THE STUDY

The country reports, as referred to, have been compiled on the basis of a methodology developed by the Economic Commission for Latin America and the Caribbean (ECLAC) and refined on a continuous basis over the years. The reports compiled after the occurrence of a natural event are based on a careful study and documentation of the data and information sets and sources that are required to assess the overall impact of the natural event. The evaluation begins with the compilation of the relevant data as prescribed in the ECLAC manual for the purpose of assessing the conditions that obtained before and after the event. The data present two snapshots at two different points in time. The exercise may therefore be regarded in part as one of comparative statics. The data sources are both governmental and private sector in origin and assist the assessment team to assess damage and losses. The assessment goes beyond the comparative statics of impact and recommends rehabilitation and reconstruction projects to be undertaken with mitigation against future damage because of the same risk factors and vulnerabilities that contributed to the disaster under review. To a great extent, one can refer to this aspect of the report as being dynamic. The methodology therefore presents both the comparative statics and the dynamics of "getting back on track" better equipped to face similar natural events in the future. The rigour of the analysis has made the ECLAC methodology a reference point for the consideration of the granting of assistance from the International Financial Institutions, notably the Inter-American Development Bank (IDB), to the stricken countries.

The "Team" referred to in this report refers to the group of experts from ECLAC and from elsewhere (for example, Consultants) that was brought together to conduct an evaluation as described in this report.

The synthesis of the country reports has been impaired to some extent by the deviation in many country cases from the table formats as prescribed in the ECLAC Manual. Those tables evince from the country situations the data needed to make the estimates of damage. Deviation from them because of the unavailability of data from the countries gives rise to a surfeit of anecdotal reporting. A desirable prerequisite to the mounting of a mission should be that the countries commit to presenting data in accordance with the required format. Failure to do so would result in a report that does not present as homogeneous a clinical analysis as is desirable, but the experience over the year has proved that in most instances reports have provided acceptable results as required by the donor community to mobilize resources in assistance to the affected country's reconstruction needs.

The unavailability of information to the natural disaster damage assessment teams is due to data inefficiencies at the national level and to an apparently precipitated entry into one affected country to undertake the assessment. The result was anecdotal evidence and an insufficiency of data, let alone standardized tables, which must be the object of the assessments. In spite of this, the assessments seem to have an acceptable degree of accuracy and are, in general, the best possible approximation under the circumstances.

Regarding the socio-economic impact of natural hazards, the study is aware of comments made in a Caribbean Disaster and Mitigation Project (CDMP) paper entitled "Natural Disasters: Linking Economics and the Environment with a Vengeance". The paper was originally presented by Jan C. Vermeiren, PhD, at a conference on Economics and the Environment, under the auspices of the Caribbean Conservation Association (CCA) in the latter part of the 1980s.

3. DESCRIPTION OF THE EVENTS

In 2004 the Caribbean was assailed in quick succession by a number of storms and hurricanes of great violence. It would be difficult to ascribe damage in the aftermath of any of the September and after hurricanes solely to the event as at that date, as the territories suffered from previous visitations whose cumulative effects probably contributed to the September disasters¹. A chronology of the 2004 events has been well documented in the report of the Cayman Islands and is reproduced here for clarity in understanding the dynamics of the assault on the countries.

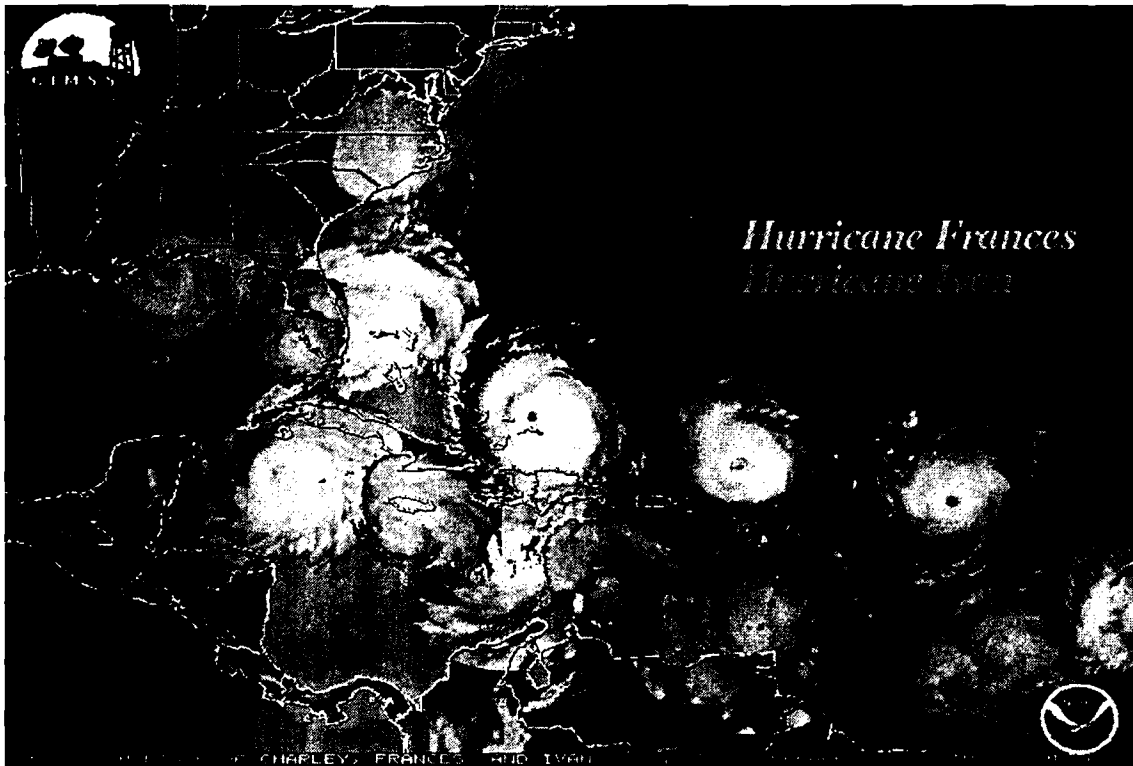
Name	Dates	Maximum Wind (average)	Deaths
		(km / hr.)	
Tropical Depression One	31 July	50	
Hurricane Alex	31 July- 6 August	200	
Tropical Storm Bonnie	3-12 August	110	
Hurricane Charley	9-14 August	240	15
Hurricane Danielle	13-21 August	175	
Tropical Storm Earl	13-15 August	75	
Hurricane Frances	24 August-9 September	240	23
Tropical Storm Gaston	27 August-	116	
Tropical Storm Hermine	29-31 August-	55	
Hurricane Ivan	2-24 September	275	90
Tropical Depression Ten	7-9 September	58	
Hurricane Jeanne	13-29 September	200	2000
Hurricane Carl	16-24 September	232	
Tropical Storm Lisa	19 September	116	

Source: ECLAC, on the basis of several sources (taken from Cayman Islands Report).

¹ Usually a natural disaster damage assessment team is mounted to visit the stricken country or area to evaluate the impact of a natural event. In the case of the events of 2004 as they impacted a number of countries, before an assessment of the effect of the first hurricane could be undertaken, another hurricane struck, hence the difficulty, even if one wanted to do so, of separating the effects of the first as opposed to the second or subsequent events.

A subset of the weather systems highlighted in the above table is presented in the chart below. The graphic presentation indicates the stress on the countries over a relatively short period of time. Chart 1 refers.

Chart 1
Trajectories of Hurricanes Charley, Frances and Ivan
(Taken from the Report on Haiti)

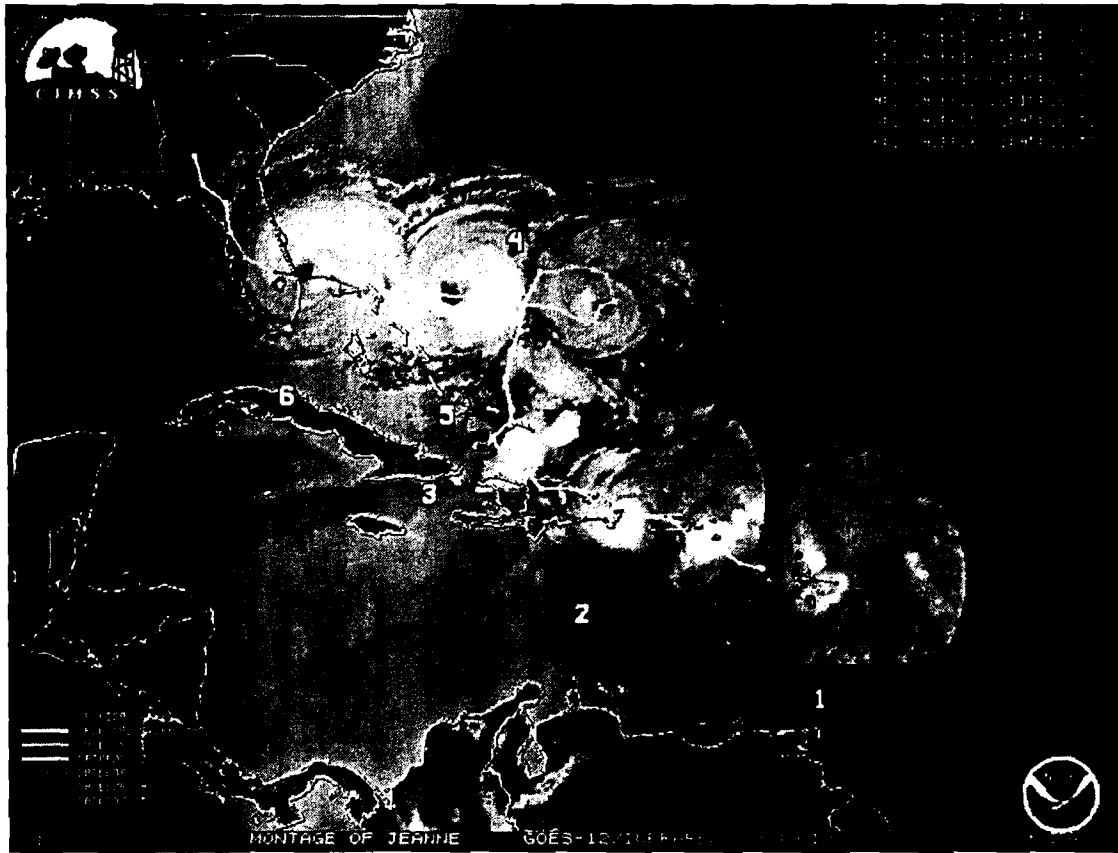


Source: NOAA

The description of the event shows the differential effects of the natural events on the countries – a combination of the strength of the hurricane at the time of visitation, the speed of forward movement of the system and the natural features of the geographical areas visited. The socio-economic, cultural and human interface with the areas also determined the extent of the damage. The chart below (Chart 2) is a graphic of the forward march of hurricane Jeanne.

Chart 2

A visual of the forward march of Hurricane Jeanne



Source:
NOAA

Table 2 below focuses on the events of September 2004, cognizant of the possible cumulative effects of previous weather systems on the affected countries that form the subject of the present study.

Table 2
Summarized description of hurricanes Ivan and Jeanne by date

Date/ Country	Hurricane/ Storm	Category description	Location	Population & area affected	Description	Estimate of Total Damage (US \$ Million)
2-5 Sept.	Hurricane Frances					
7 Sept.	Hurricane Ivan	4	Grenada	Significant damage to St. George, St. David, St. John, St. Andrew.	Also to housing, electricity, telecommunications and other utilities.	\$885.0
10 Sept.	Hurricane Ivan	4	South coast of Jamaica	More than 102,000 households. Some 14% of total population directly affected.	Damage to housing, churches & other buildings, Schools & other Govt. buildings, historical sites, health sector, productive sectors, Significant damage to infrastructure and environment	\$595.0
13 Sept.	Hurricane Ivan	Category 4- 5 hurricane	Grand Cayman	Some 35,189 persons or 83% of the Grand Cayman population affected directly. Some 17% of population (> 6,000 persons) evacuated & sheltered).	Damage to all utilities. Communities isolated by debris or high water. Health care system proved to be robust. Damage to roads by storm surge and flooding. Damage to telecommunications.	\$3434.7
16-17 Sept.	Hurricane Jeanne	2	Dominica n Republic / Haiti	1.8 million in D.R. More than 33,000 evacuated from East, North-East & Central parts of the Country. Provinces of Duarte & Sanchez Ramirez hardest hit.	Damage to Housing, education & health.	\$ 296
17-18 Sept.	Jeanne	Storm	Haiti	Areas in North- West and Artibonite in Haiti. More than 3000 dead	Record amount of rainfall caused landslides & flooding in NW of country. Damage to housing, agriculture. Basic food was lost as subsistence crops were planted on slopes that liquefied.	\$295.9

20 Sept.	Hurricane Jeanne after Hurricane Frances	2	Freeport, Bahamas	Mayaguana, Long Island, San Salvador, Rum Cay, Cat Island, Eleuthera, New Providence, the Berry Islands, Abaco and Grand Bahamas	Some 9% of population primarily affected. Damage to housing on shorelines, schools, roads, bridges, due to storm surge in coastal areas.	\$550.9
25 Sept.	Hurricane Jeanne after Hurricane Frances	3	Abaco and Grand Bahama	Abaco and Grand Bahamas		

Source: ECLAC, based on country assessments

Table 2 above indicates that the main agents of destruction in all of the events highlighted were storm surge, wind and rain which led to flooding and environmental damage. Much of the damage to assets was caused by wind in association with the damaging effects of the rains. For example, damage to furniture and fixtures in dwellings and offices followed the damage or total removal of roofing by the winds. Damage to roads, bridges and coastal housing was the result of storm surge impacting on construction and settlements located in hazard zones. Flooding brought with it death and the menace of communicable diseases after the floods subsided and bacteria were released into the atmosphere. Associated with the extensive damage was the location of human settlements in hazard zones, inappropriate construction techniques and lack of risk bearing infrastructures aggravated the impact in those countries or territories with the highest vulnerability (as in the Haitian and Grenadian case).

This speaks to the role of government in the final determination of where people may be allowed to settle. The impact of the events on the countries as presented later in this report is seen as directly related to man's interaction with his environment. A synthesis report by R.A.M & Associates LLC Emergency Preparedness² makes the following point:

“The destructive power of natural hazards combined with vulnerabilities....can lead to large-scale covariate losses due to events in areas where population and economic investment are concentrated ...”

Beyond a certain level of damage, economic or social systems suffer fracture or complete break down. The tragic situation in Gonaives in Haiti is an example of large numbers of people living in a hazard zone and putting further pressure on the natural resources through:

1. The ill effects of high population density.
2. Rapidly increasing population in the area.
3. Traditional methods of procurement of fuel for cooking and heating.
4. Grossly inefficient and low-yield cultivation practices without the benefit of modern technology.

² “Natural Disaster hotspots: A Global Risk Analysis”, R.A.M & Associates LLC Emergency Preparedness

5. Inadequate provision of basic services such as running water and sewerage systems

There is no doubt about the link between economic activity and level of development in a disaster-prone area and the amount of damage that will be sustained in the event of a severe trauma. As the value of investment increases, so much more is put at risk. By the same token, as development is more complex and diversified risk management and risk transfer reduce overall impact. The study shows that population pressure in risk areas compounds the risk and, more often than not, contributes to a worsening of the disaster. The landslides and flooding in Haiti demonstrate the effects of a high population on a high-risk area with broken infrastructure. High coastal populations and economic activity result in judicious land use being subservient to economics. The damage in Gonaive and in the Cayman Islands demonstrates the effect on populations of shoreline-based industry and settlement.

Natural disasters and the Millennium Development Goals

The foregoing description of the events of 2004 illustrates the effect of natural disastrous events on a country, let alone a poor country. Impact is estimated in terms of percentage of Gross Domestic Product (GDP). The countries of the Caribbean are among the countries of the third world engaged in trying to attain the Millennium Development Goals (MDGs) by the year 2015 as a strategy for reducing poverty. This involves the attainment of a set of economic and social targets. For example, in addition to the goal of attaining food security, the goals and targets require a concerted planning effort, not only by the governments but by them working with civil society towards their attainment. The issues of crime and punishment, for example, are premised on dialogue and the establishment of communications mechanisms to have the goals fully understood. The health targets require, to a greater extent than before, planning at the local or small area level so that extreme conditions of poverty do not pass under the radar and escape detection and subsequent correction. Much of the success in the achievement of the MDGs impinges on the role of government and on the issue of governance as an all-pervasive link to development. In the context of this study on the impact of natural disasters, the issue of vulnerability to natural disasters must be taken fully on board as it has repercussions on the growth trajectory of the countries concerned. Governance must encompass and directly address the issue of the unplanned occupation of areas for economic and settlement purposes that exacerbates the risk of the populations occupying those areas and, by extension, the economy and society at large. To this extent, all factors such as building codes, population density in given areas and laws governing setbacks to building away from the high water mark should be addressed by governments in their planning paradigms.

When a portion of GDP is lost every few years because of a natural event, the attainment of the MDG targets is set back as the activities that should have been devoted to achieving progress have to be spent in repair. Moreover, the disaster in as much as it increases the population under poverty and causes the destruction of basic infrastructure (such as water supply, sanitation, health facilities or schools) further detracts from the attainment of the goals. In 2004, those MDG targets of the Bahamas, Haiti, Jamaica, Grenada, the Cayman Islands and the

Dominican Republic were set back as food security in all of these countries became more of an elusive dream following the damage to their agricultural sectors.

4. MACROECONOMIC INDICATORS

Indicators derived from the uniform table completions would have provided an excellent standardized analysis of magnitudes and configurations of damage across countries. This report presents a limited analysis as afforded by the tables. Table 3 standardizes data on the rate of growth of GDP before and projected after the event as well as of tourist arrivals. A uniform set of country tables would have led to a more formidable synthesized table of indicators. In the absence of this dataset, Table 5 presents a picture of damage at country level. The descriptions of damage at country level show the effects on the coastline, especially in the case of the islands. Coastal damage, damage to coral reefs and the loss of livelihoods of the people engaged in coastal or maritime pursuits as a form of income are described without the numbers being anchored to standards such as GDP or total revenue.

Table 3
Macroeconomic Indicators – annual percent changes

Series	Country	2000	2001	2002	2003	2004 <Prior>	2004 <After>
GDP per capita	Bahamas	...	-1.3	1.4	2.9	3.0	-4.6
	Cayman	4.5	2.6	4.3	3.7	6.7	-5.5
	Haiti	...	-2.8	-2.3	-1.3	-5.5	...
Tourist Arrivals	Bahamas	15.2	-0.5	5.2	4.4	12.5	15.0
	Cayman	-3.1	11.8	21.2	12.5	15.0	...
	Haiti						

Source: Abstracted from country reports

Although detailed tables are not available, indications are that impact in Jamaica in 2004 amounted to 8% of GDP. In Grenada, the impact estimate was of the order of 200% of GDP. The impact in Haiti, as disastrous as it was in terms of its toll on human life, was of the order of 1.1% of GDP.

The following text box is taken from the Cayman Islands Report and sheds some light on the quality of the damage to the economies of all of the countries in this study with the exception of Haiti. The numbers are estimates, hopefully the best that can be found, but they shed light on the impact on GDP, which is a useful indicator.

Table 4
Impact of 2004 natural events estimated

The 2004 Hurricane Season in the Caribbean Subregion

Tropical storm and hurricane activity in the Caribbean basin has been especially notorious in 2004. Not only the Small Island Developing States have been affected; the bordering continental countries have been stricken as well, as the cases of Florida and Cozumel in Mexico attest.

ECLAC has been called upon to assist the affected island States, through the application of its well-known damage and loss assessment methodology, to evaluate the impact of each disaster. The main results of those analyses are the following.

<i>Island State</i>	<i>Natural Event</i>	<i>Economic Impact, US\$ million</i>	<i>Impact as % of GDP</i>
<i>Grenada</i>	<i>Hurricane Ivan</i>	<i>889</i>	<i>212.0</i>
<i>Jamaica</i>	<i>Hurricane Ivan</i>	<i>595</i>	<i>8.0</i>
<i>Dominican Republic</i>	<i>Tropical Storm Jeanne</i>	<i>296</i>	<i>1.9</i>
<i>Bahamas</i>	<i>Hurricanes Frances and Jeanne</i>	<i>381</i>	<i>7.3</i>
<i>Cayman Islands</i>	<i>Hurricane Ivan</i>	<i>3,432</i>	<i>183.0</i>

Before the assessment in the Bahamas and in the Cayman Islands were completed, it was assumed that the most severe socioeconomic and human loss toll were concentrated in the least developed, smaller countries such as Grenada and Haiti. Nevertheless, the analysis reveals that other island states with higher degrees of development have been seriously affected as well.

In disasters of this type, most losses are sustained by the productive sectors of agriculture and tourism and are expected to persist for a relatively long time period of several years. In addition, damage to assets – especially housing and other essential infrastructure – also has a negative bearing on social wellbeing.

While most of the impact falls on the shoulders of the private sector, Governments are required to take care and assist the lower income strata of the population. In most instances, the government's capacity to face these challenges is very limited, and recovery is seriously hampered, especially in the face of recurrent disaster events.

It is therefore deemed essential that all states in the sub region undertake planning measures and activities to reduce disaster risk as an integral part of their development process.

See ECLAC, www.eclac.cl/mexico

5. EFFECTS ON THE MAJOR SECTORS

The social sectors comprising health, education and culture and housing were in most cases badly damaged. Notwithstanding the damage to the other sectors, the social sectors may be considered to have been among those most severely hit as they impacted persons, many of whom had been vulnerable to any type of event. These sectors merit to be highlighted ahead of the other sectors for their impact on human suffering.

Housing

Generally, the advanced age of many of the buildings combined with their location in areas not conducive to human settlements, but placed there to service extremely large populations that had gravitated to hazard-prone areas without official fiat, was the main immediate cause of direct damage. In the face of poor statistical databases that have led to relatively weak estimates of damage, it is safe to conclude that in each of the countries, over 80% of the damage to the housing stock was direct.

In the **Bahamas**, damage to housing was due to exposure rather than to poor quality of construction or materials. In the case of **Grenada**, an analysis of Hurricane Ivan suggests that the probability of a hit as strong and storm surge as great was less than one in a hundred years. In this case, the housing stock, which was apparently sturdy, simply could not withstand a Category 4 hurricane. In the **Cayman Islands**, there is no evidence in the report of poor housing stock. Some order existed in the housing sector as the houses were in most cases insured. The same does not hold true in Jamaica where, as the ECLAC team had seen on a prior occasion, there is a range of quality in housing stock. A problem that is perhaps politically difficult is to move people from living in hazard areas. The communities of Bybrook and Swift River in **Jamaica** are in fact flood plains and were visited in late 2001. Location of fishing villages in land strips between the shore and lagoons aggravates their exposure and vulnerability as made evident in 2004. Without the relocation of the communities that have settled there to make a livelihood from farming and ancillary services, a repeat of the floods that accompanied Hurricane Michelle is in the offing. The same holds true for fisher folk in the aftermath of the 2004 hurricanes.

The damage to housing in the **Dominican Republic and Haiti** is allied to poverty, for the most part as well as its location on flood-prone areas. Some parts of the city of Gonaive are below sea level even in normal circumstances. Poor construction materials in both cases made simple the devastation in housing. Settlements in unstable steep slopes, the agricultural practices, tree-cutting for fuel and housing settlement characteristics in Gonaives and Artibonite in Haiti and those in the Jimani area in the Dominican Republic contributed significantly to the disasters recorded in those locations since May 2004.

Health

In the Bahamas and the Cayman Islands the health sector fared relatively well in terms of damage. In the Bahamas, the evacuation of patients in advance of the hurricane reduced damage

and injury. In the Cayman Islands, an exemplary hospital design and construction resulted in the hospital withstanding the force of the winds with minor damage.

In both the Bahamas and the Cayman Islands, disaster preparedness and the necessary crisis management helped to minimize damage to the sector. Orderly actions kept casualties low and the good practice of insurance on assets has ensured relatively painless replacement of assets destroyed.

In Grenada, the looting that accompanied the destruction to the Princess Alice Hospital must be considered an act of desperation on the part of the people, most of whom lost their houses. A people-centred approach to disaster preparedness should not witness such anti-social acts as looting. A populace, disciplined in the face of onslaught from a natural event is more likely to surmount the immediate problem than a situation in which social cohesion disappears at the first 40 mile-per-hour gust. The reconstruction effort should have the benefit of the input of town planners and social planners in the new solutions that must be put in place.

Education

In the Bahamas, schools seemed to have fared well in the onslaught. Schools were open to pupils in a bit less than one month. Much the same experience was that of the Cayman Islands where pupils were out of school for periods ranging from 25 days to 40 days. Damage in the Caymans derived from their topography – extremely low-lying islands lying in the path of a strong hurricane. In the Dominican Republic, schools were damaged by flooding and rains. The underlying cause may have been the location of the schools in the first place. Reconstruction planning will have to more closely address the question of the location of human settlements and activities.

Tourism

An attempt to abstract from the tables on tourism and the rest of the sectors was of limited success. The data difficulties at national level prevented a proper comparative study of the effects on the countries affected.

With the exception of Haiti, all of the countries included in this study have vibrant tourism sectors. The Cayman Islands, for example, has a tourism sector that contributes over 50% of GDP and employs over 27% of the labour force. Table 6 below examines the direct and indirect damage done to the tourism sector. Of note is the tendency in almost all of the countries for indirect damage to account for a greater portion of total damage to the tourism sector. That statistic probably carries with it a tale of woe as it shows the vulnerability of the activities allied to the hotel industries. It is more than likely the case that the large hotels had carried insurance against loss of business. The same does not appear to have been the case with the small entrepreneurs who conducted tourism-related business.

Infrastructure

In some cases, such as the Bahamas, the infrastructure could be described as being of good quality. The characteristic of the storm as it impacted on the Bahamas was slow-moving. This means that the islands were visited by more rain and wind than would have been the case in a swifter advancing hurricane. This would suggest that engineering works were constructed to certain tolerances that in this event were simply surpassed. This question of building standards must be addressed because as the economy develops in economic terms, its real estate stock will increase in value and the exposure to damage will be greater.

In the Bahamas, telecommunications links were maintained despite the breaking of a fibre optic cable.³ The reason for the continuity in service was entirely the result of the topology employed in the design of the network. The same did not apply in the case of electricity. It should be possible to design electricity networks on a similar basis. A quick look at the literature suggests that a "mesh" approach to distribution could be studied to provide mutual support among the islands.

³ It was not clear at the time of the study whether the cable actually was severed or just pressed by a sunken object. The consequence on reduced quality and interruption of service calls for redundancy or alternate available communication.

Table 5 EFFECTS ON THE MAJOR SECTORS

SECTOR	BAHAMAS	CAYMAN	JAMAICA	DOMINICAN REPUBLIC	HAITI	GRENADA
Housing	<p>Major damage, especially near shorelines, generally and inland on Grand Bahama and Abaco. Most damage to roofs and consequently, to furniture & appliances.</p> <p>Govt. response by way of a housing repair & reconstruction emergency programme. BBS 1.4 million provided to 668 households</p>	<p>Housing stock suffered damage to the extent of CI\$ 1.44 billion. Some 91% of damage to housing was direct.</p>	<p>Some 102,000 households reported damage. About 14% of housing stock damaged. About 5,624 houses completely destroyed. Most of damaged houses not covered by insurance. Total damage to housing sector estimated at J\$14 billion.</p>	<p>Damage to > 7500 houses, 19% of which totally destroyed. Main contributing factor was poor housing stock. Extensive use of makeshift materials. Area poor and over 30 percent of households were female-headed, some precariously located. Some of the area was tourist oriented and other parts were sugarcane and cattle lands. Total damage to sector was RD\$356.9 million. Of this RD\$294.8 million was direct. Indirect damage was RD\$62.1 million.</p>	<p>Main underlying cause of damage was a degraded environment due to over-exploitation of natural resources. Topography of Gonaives is flat and below sea-level. The increased population resulted from the urban creep in which people from rural areas flock to the city in search of employment. This added to the already existing poverty. In the city, damaged drainage system increased the vulnerability of the city to landslides and flooding. Total damage to Housing was G4.2 billion. No estimate of indirect damage.</p>	<p>Damage to this sector was estimated to be EC\$ 1.38 billion, of which EC\$1.37 billion was direct damage. The import content of the replacement is estimated to be of the order of EC\$ 1.1 billion.</p>
Health	<p>Department of Public Health well prepared before the event. Evacuated</p>	<p>Damage to this sector was estimated at CI\$ 19.0 million. The health sector</p>	<p>Total damage close to J\$ 758.3 million, of which direct damage was some</p>	<p>Ministry of Health moved in teams to control the outbreak of communicable</p>	<p>Some 3,000 dead, 2,600 injured and 14,000 homeless. Hospital in</p>	<p>Damage to major public hospitals, health centres & other medical</p>

	<p>patients in good time. Estimates of damage were not available for Private hospitals. Dept. of Environmental Health provided support in clearing debris & mounted an insect vector control and food safety initiative as well as larviciding, fly control and management of animal waste. Summary of impact on the health sector is incomplete because of lack of statistics.</p>	<p>received the least damage among the social sectors. Apparently good design of hospital enabled it to withstand a Cat. 5 hurricane with relatively little damage.</p>	<p>J\$ 718.2 million. Population inadequately covered by Health insurance.</p>	<p>diseases. Some 37,940 homeless. About 145 shelters and other accommodations held 22,313 people. Damage estimated at RD\$ 92.1 million. Of this, RD\$5.4 million was direct damage, while indirect damage was RD\$86.7.</p>	<p>Gonaives totally inoperable. Total damage to Health sector was G 172.5 million. Of this, G169.4 million was direct. Indirect damage was G3.2million.</p>	<p>facilities estimated at EC\$ 11 million. Of this amount, damage to General Hospital was EC\$ 4.5 million. Major damage to hospital roof of Princess Alice Hospital. Looting in additional damage sent the damage figure to EC\$ 3.5 million.</p>
Education	<p>Mostly minor damage to schools. Schools re-opened in less than 1 month.</p>	<p>Damage valued at C1\$ 44.8 million. School days lost varied from 25 to 40 per student. About 64% of student population was directly affected. Similar experience in private schools.</p>	<p>Schools suffered light direct damage. Some indirect damage associated with use of schools as shelters.</p>	<p>Schools damaged by wind and flooding. Total damage to Education sector was RD\$44.9 million, of which RD\$43.6 was direct and RD\$1.3 million was indirect.</p>	<p>Public sector education system is inadequate. Haiti is second country in the world where the private sector services the education needs of the majority of pupils. Total damage to education sector was G203.7 million. Of this, G200.9 million was direct damage. Indirect damage was G2.8 million</p>	<p>The nature of damage (wind and rain) caused an estimated damage of EC\$ 215 million. Most of this was due to damaged or completely destroyed roofing. Also in the Culture aspect of education, severe damage to sporting facilities (notably the stadium) was estimated at EC\$ 83.2 million, of which damage to the stadium was</p>

						estimated to be EC\$ 80.1 million.
Tourism	Taxes from this sector contribute 10% of Govt. Taxes. Direct damage mainly to roofing and furnishings. Indirect losses were covered by insurance. Arrivals in September 2004 40% lower than in Sept. 2003.	Tourism contributes >50% of GDP & employs >27% of labour force.	Whereas the report contains some description of damage to the tourism sector, it does not present a standardized table showing the effect of damage of the sector to GDP.	In 2003 tourism represented 8% of GDP as compared with 3.8% in 1990. After the Free Zones, Tourism constitutes the second major generator of foreign exchange (37% of the total). It is estimated that the sector generated 164,694 jobs in 2003, some 29% of them direct.	...	The tourist sector suffered extensive damage to its accommodation units as roofs were blown off and fixtures and furnishings damaged by the winds. The yachting sector suffered the loss of some boats and other damage. The estimate is for a contraction in the sector by 25%.

Table 6
COMPARATIVE EFFECTS ON THE TOURISM SECTOR

SECTOR	COUNTRY	Unit of currency	TOTAL IMPACT	DIRECT DAMAGE	LOSSES	LOSSES AS % OF TOTAL	LOSSES AS % OF DAMAGE
Tourism	Bahamas	000Bah \$	109,935.3	29,313.3	80,622.0	73.3	275.0
	Cayman	000CI \$	462,421.2	281,890.0	180,531.2	39.0	64.0
	Dominican Republic	000RDS	2,689.0	1,534.9	1,154.1	42.9	75.2
	Haiti	Gourdes	...	...	...	...	...
	Jamaica	Million J\$	1590.7	466.3	1,124.4	70.7	241.1
	Grenada	EC\$ million	264.3	196.7	67.6	25.6	34.3

Source: Extracted from country reports

6. CAUSAL FACTORS IMPACTING THE TYPE AND EXTENT OF DAMAGE

The report to this stage has highlighted a number of factors contributing to the impact in the countries.

Firstly, the mere position of the countries affected, lying as they do in the Caribbean hurricane zone and often in the path of hurricanes that within more recent times have become more violent, pre-disposes them to damage. Resulting from this geographical attribute, damage from floods and landslides due to intense rainfall were the major causes of harm to housing and to agriculture.

The low-lying nature of the Bahamas and the Cayman Islands deprives them of higher ground to occupy easily. The result is that building to setback specifications will hardly protect against massive storm surge. In the case of the Bahamas, it has been recommended by the ministry and international organizations⁴ that to minimize future potential natural disaster-associated crop losses, replanting of long-term crops should be done only in areas where there is no history of localized flooding or storm surge. Whereas it seems to be the correct thing to do, a way will have to be found to “convince” the farmers to relocate their operations. This may well involve a total re-set of their habitat, their lifestyle and their ancestral ties. For example, some societies would react against abandoning their dead in cemeteries that would now become remote from their places of relocation.

In addition, the importance of tourism to many of the countries demands littoral activities. Human settlements are usually formed in association with economic activity and opportunities to earn livelihoods. Damage is further aggravated when the constructed tourism infrastructure (including landscaping and facilities such as golf courses) interfere in the natural dynamics between the beach and shore and the backwaters and mangrove forests.

⁴ FAO offered a national technical cooperation project (TCP) that would look at inputs as relief to farmers and, alongside the Caribbean Development Bank, were looking at a risk mitigation project with respect to agriculture, taking a similar pilot effort in Jamaica as a starting point. The Government intends to request a TCP on hurricane preparedness. This would be reinforced by the proposal being discussed since November 2003 for another one to restructure the public marketing system.

Despite information on the risks associated with building on the edge of the water, tourism plants will continue to be built with the investor/proprietor taking a calculated risk of damage. In that case caution will be taken to secure insurance coverage, albeit at high rates. The infrastructure of the country relates to the economic activity. For example, an examination of transport and coastal infrastructure in the Bahamas shows the following areas of damage:

- Airports
- Coastal erosion and erosion protection
- Docks
- Drainage (including culverts)
- Roads
- Seawalls

Losses

- Estimated cost of road operation and transport services in current circumstances
- Loss of vehicles

The same type of damage is evident in the Cayman Islands.

In the poorer communities, usually of the larger territories, the priority of the poorer communities is to secure housing and food in close proximity to each other. The establishment of human settlements in flood plains or on slopes made unstable by “slash and burn” approaches to procuring land for agriculture, largely subsistence, is a calculated action with known probabilities of disaster. To such communities, securing food for the immediate needs of the body enjoys a higher priority than considerations of the probability of occurrence of an adverse natural event.

General observations

1. The ECLAC methodology distinguishes between damages and losses and tracks the secondary effects but does not take into the reckoning the permanent or lasting impact of the sort that would result in the degradation of the physical environment.⁵ The methodology acknowledges the possibility of land loss or loss of environmental resources but given the imperfect nature or insufficiency of the market to fix appropriate prices to environmental resources, focuses on valuing the loss (or impact) on environmental services that do have a market value. Environmental services are in many cases linked to sectoral activities and products, as in the case of agriculture and tourism, and the negative

⁵ The impact of an event comprises both damage and losses. So called damage refers to the impact that the disaster has on assets, be these physical, social, economic or environmental, i.e. includes “human capital” as far as there is sufficient pre-disaster baseline date. Losses refer to the effect of the disaster on flows (income, expenditure, investment, capital gains or losses, exports and imports, and financial flows in general. “Secondary” effects refer to the impact on the performance of the most relevant economic variables in the short- to medium- term (five years at most). Longer-term impact is not possible to ascertain with any degree of certainty as other factors influence the overall performance of the economy. By the same token, long-term environmental impact is fraught with too many uncertainties such as climate variability and change to be able to adequately isolate the effect of one single event.

impact of environmental damage will be reflected in the specific sector. Special cases are when environmental services such as CO₂ capture or water retention has a market value, but this is not the case in the Caribbean, in general. In addition, ECLAC is aware of the fact that some environmental damage is self-correcting in the long run, although losses may be incurred in specific sectors or short-term corrective measures will be made as in the case of beach replenishing and landscape reconstruction. It is the belief of the consultant that reports as yielded by the application of the ECLAC methodology serve the purpose intended and that their scope and orientation are appropriate.

2. The task of reviewing the country notes was made more difficult as the presentation of statistical tables was not as meticulous as it should have been. In a number of reports, there emerged some confusion as to the unit of measurement that was being used to measure values. This detracted from the time within which the task was to be completed. For the macroeconomic impact both present value and constant price data should be systematically presented. The actual damage value has to be explicitly established and indicated at replacement value, book value or restoration costs, as esteemed more appropriate in the specific sector. Comparability and non-duplication of data are essential criteria to be carefully applied.

7. CONSOLIDATION OF RECOMMENDATIONS FROM THE ECLAC REPORTS

This section presents some of the recommendations made and presented in the reports. The sense of the recommendations has for the most part been captured in the edited list of recommendations that appear in this section.

- The ECLAC methodology is based on data and information flows that are organized in the countries and which can be unlocked at the time of the disaster to avoid gross overestimations of damage coming from traumatized data providers, or underestimations due to lack of information or yielding to the political and economic pressures to minimize the negative external image that may affect sensitive activities such as tourism.⁶ At an early stage in ECLAC's training sessions with a number of countries, the need for data and information was made clear. Governments must understand the importance of harmonized data and information collection and management and take steps to design, construct and manage their data and information architectures. The lack of adequate data has resulted in estimates of damage that at best can only be considered to be "orders of magnitude". ECLAC has for a number of years provided technical assistance in the establishment of integrated national databases to the countries of the Caribbean. A more urgent approach to building those databases in partnership

⁶ Worldwide coverage of a disaster portraying an important tourism destination as devastated by a hurricane or prone to health hazards in its aftermath will lead to travel cancellations and diversion to other destinations, even if there is no actual damage or minimal destruction in the tourism infrastructure, thus causing heavy losses to the sector and, in highly dependent countries, negative impact on its economic performance.

with the countries would be preferable to mere advocacy which does not seem to have had the anticipated effect.

- Training of nationals of all Caribbean countries in the understanding of the ECLAC methodology is a must. The concepts of direct and indirect damage have more recently given way to the categorization of damages and losses. The trainers must first all be brought “up-to-speed” with the recent changes before they train at national level. The fact that this new change did not permeate to the level of the assessment teams has given rise to some diversity in the writing of the reports. The concept of what was called “secondary effects” –and now referred to as global impact must become clear to personnel at national level who can serve as the first collectors of data to strike early estimates of damage and to work with the ECLAC assessment team when it undertakes its mission.

Risk reduction and transfer considerations

- The countries should, as part of their planning process, give equal importance to physical planning, risk reduction and financial transfer mechanisms, taking into account the exposure to risk of the country in question. This should lead to the development of a national disaster management policy, complete with disaster warning drills for appropriate public defensive action, and the promotion of appropriate economic instruments such as insurance schemes, disaster prevention funds and catastrophe-bonds. This recommendation was strongly made in the Bahamas study which encouraged the participation of the community in all aspects of confronting exposure to natural hazards. The encouragement to secure insurance would be an important risk transfer mechanism, especially at the level of the household. Most establishments engaged in the productive sectors, and especially tourism, have already espoused this form of risk transfer. The term “risk transfer” is used to mean “shifting the responsibility or risk financing burden to another party”.
- Governments should initiate a programme under the IDB, Caribbean Development Bank (CDB) and/or the World Bank’s disaster prevention and hazard management facilities, including the appropriate training in methodologies that, firstly, rapidly express the emerging needs assessment (such as the Damage Assessment and Needs Analysis (DANA) and others); and express total damage and losses and their implications (as is done by the ECLAC methodology) to determine changes in the country’s macroeconomic situation, its capacity to mobilize, execute and absorb the resources for the reconstruction process. Part of this second set of actions should be to enhance the country’s response mechanism and emergency management, namely the National Emergency Management Offices (NEMO) and the appropriate planning and budget institutions.
- Projects aimed at rehabilitating and strengthening of the country’s infrastructure should be coupled with more resilient national development strategies.

- Institutional strengthening in terms of having both appropriate legislation that promotes risk management, transfer and reduction and appropriate information management and coordination should be promoted among public sector offices and institutions and the private sector. Risk transfer is possible once risk “ownership” is established formally and affected activities do not externalize risk management costs to government. This is to say that the financial viability of economic activities in the private sector should include investment in risk management.
- Projects should be initiated to promote information networks to keep the population informed of the approach of the natural event and to act as an effective early warning system.
- In countries and areas prone to landslides that have been the result of deforestation, programmes of re-forestation and alternative land use should be part of their poverty reduction strategies.
- In all countries, land use zoning and building codes should not only be revisited but enforced. Design and construction should be done to withstand at least Category 4 hurricanes. Existing buildings, including houses, should be retrofitted –particularly those that provide basic social services such as health facilities, schools and other structures used as shelter-- with appropriate roofs, shutters, paint on external walls and other measures to reduce damage due to wind and rains. In the case of housing, retrofitting could be tied with government-sponsored actions tied to insurance schemes and construction/retrofitting credits to households.

Regarding development issues and longer-term considerations, the following areas are proposed as priority:

- Follow-up work to the Climate Change Project.
- The identification and implementation of training for the national emergency management organizations and the Meteorological Service.
- The need for a/physical planning update as part of a national plan to include disaster mitigation strategies and climate change considerations.
- Poverty reduction and attainment of MDGs tied to vulnerability reduction and risk management policies at the micro level (i.e. self insurance, microcredit and micro insurance schemes).

This report brings to the fore an observation made in the recommendations section of the Haiti Report that is substantially translated with editorial adjustment by the consultant. The comment suggests that the ECLAC disaster damage assessment is reactive. If nothing changes

this stance, the reports would perhaps always describe the same types of damage. The consultant interprets this to include the ECLAC response. The strategy of intraregional cooperation should go beyond the phase that reacts to an event to make provision for preventative, risk reduction, mitigation and management and risk transfer actions.

The instruments of management and transfer of risk at the Caribbean subregional level should be conceived and developed in such a manner as to become an aspect of the regional strategies for development and integration. The submission of the consultant is that a partnership between the United Nations Development Programme (UNDP), IDB and ECLAC with regional institutions such as the CDB together with the respective governments and any other organization with the required competence should be formed to address in a proactive manner the issues of prevention, risk management and risk transfer.

The internal environment – Reduction of vulnerability of the population

The reduction of the vulnerability of the population through the strengthening of their resilience to future natural hazards must be the aim of any reconstruction effort. To this end, several recommendations are put forward:

- Small grants, soft loan facilities or community micro-financing facilities to assist persons in the rural and coastal communities to rebuild their livelihoods. Particular grants/lending facilities should be targeted to the fisheries sector, farmers and the women of those communities who lost assets through damage to small shop holdings and home-based enterprises, such as food preparation and backyard gardening.
- Projects that support the improved resilience of schools and health centers as they are used as shelters should be paired to access to education by the school age population.
- School book, meals and uniform grants (including footwear grants) should be carefully planned and introduced as many children walk to school in the rural areas.
- Model starter homes, built to standards which will resist the devastation of hurricane force winds, should be constructed as demonstration units for communities, many of which will be involved in self help projects to rebuild their communities.
- Housing settlement location and hazard mapping should be undertaken to avoid the continued situation of having communities live in heavily exposed areas.
- Projects that support public health and sanitation education should be supported to reduce the burden on the health system and establish an alternative to the reliance on the major health institutions for the resulting health issues that follow poor sanitation.
- Study and emulate the “best practice” of the Bahamas Hospital in terms of its design to withstand a Category 4 or 5 hurricane.
- In all countries, as part of the enabling of the communities to cope with the effects of a natural disaster, a mechanism to address the psycho-social trauma of the

affected population should be put in place. Such support is required for all persons affected but particularly the most vulnerable: the women, children and the elderly in the rural communities. The mechanism can effectively introduce disaster prevention and mitigation education.

- In order to minimize human suffering in the immediate aftermath of the natural event, there should be public sector projects aimed at water and food warehousing at all times in the event of need after damage occasioned by a natural event.

To the extent that all planning for vulnerability reduction will be made at the level of the Ministry of Planning, all major actors will form the team. In addition, the fiscal impact of all mechanisms to be introduced will be provided for.

Summary of the recommendations from the countries and other agencies

It is clear that information is seen as the frontier to be conquered in the effort to reduce vulnerability and to measure the effects of damage and losses. In a paper entitled "Considerations for the adequate management of disaster information centers CRID" delivered at a Regional Meeting to Develop a Toolkit for Disaster Information Management, held at the Radisson Europa Hotel in San Jose, Costa Rica, on 21-22 September 2004, the following recommendation was made. It is quoted below:

"Paradoxically, many of these negative effects could be reduced, and most of their causes prevented if both governments and the population at large, made adequate use of existing information on, for instance, the consequences of population growth and urban density, environmental deterioration and climate change. Although natural and other related risks pose threats to every society, in reality these risks are proportionally more destabilizing in developing countries, including some specific regions in the Americas."

The same paper again addresses the importance of the creation of information support systems to inform decision-making. The following point is made and is presented below:

"Clearly, the use of information in order to make decisions and carry out planning processes must go beyond the simple monitoring of the catastrophic effects of natural disasters on economies, societies and the environment, as well as the reconstruction planning process following a catastrophe."

The recommendation emerging from the foregoing is that ECLAC should recognize that it performs that function and seek to put in place the national capabilities as part of its development assistance to the Caribbean and Latin American countries. This will involve inputs from the statistical and economic development divisions as well as other substantive units of ECLAC throughout the region.

8. POSSIBLE REGIONAL MECHANISMS FOR JOINT APPROACHES TO FOLLOW-UP ON RECOMMENDATIONS

A Caribbean-wide strategy for risk reduction

One recommendation appearing in the Cayman Islands report addressed the issue of risk reduction. The recommendation observed the sophistication of the finance sector in the Cayman Islands and suggested that they were particularly well positioned to develop new innovative instruments for risk transfer and reduction that might lead to a regional Caribbean strategy that spreads and reduces risk among countries. This would reduce the risk of any particular territory and lower the cost of insurance and reinsurance premiums while expanding the insurance market. This suggestion finds resonance in the recommendation found in the Report on Haiti which appears in the following paragraph in an edited working translation.

This report recalls the recommendation of the Report on Haiti that sees the effects of the hurricanes in 2004 as being at one and the same time a challenge and an opportunity to all countries in the region. The differentiated effects of the events illustrate the direct relationship between the process of development, vulnerability and the capacity to respond, to reconstruct and to do so with mitigation. The strategy of intraregional cooperation should go beyond the phase that reacts to an event to make provision for preventative, mitigation and management and risk transfer actions. The latter suggestion is the combined result of our exposure to recurring seasonal phenomena such as hurricanes and our physical, economic and social vulnerability. The instruments of management and transfer of risk at the Caribbean subregional level should be conceived of and developed in such a manner as to become an aspect of the regional strategies for development and integration.

The future UNDP intervention in planning to help define development projects to face reconstruction needs while promoting disaster mitigation, risk reduction and risk management should be Caribbean-wide in its scope. The interaction between physical, social and economic planners and their legal arms would make for a fruitful discussion, not among academics, but among technocrats who could move the vision forward into directly productive action.

9. TRAINING NEEDS REQUIRED TO IMPLEMENT RECOMMENDATIONS

The events of 2004 have shown that information –both at country and local level- was not as available as it should have been⁷. To this point there continues to be a disconnect between the training delivered at national level and the Administration in the countries where training in the ECLAC methodology has been delivered. All countries of the Caribbean should be trained in the ECLAC methodology, aiming not only at disaster management institutions but including planning and statistical offices, economic affairs and finance authorities and private sector organizations and business and industry associations.

At national level, heads of national disaster assessment teams should be designated and they should receive training as a separate group or they could receive training by being attached to assessment teams outside their own countries in the event that they are for that moment spared the damage of a natural event.

A number of countries have fledgling units that respond to national emergencies. Work visits to established national emergency management offices, such as the Office of Disaster Preparedness and Emergency Management (ODPEM) in Jamaica, or NEMO in Belize should be arranged. The Cuban experience in disaster response to reduce human impact and minimize life losses could also provide useful experience sharing in the region.⁸

⁷ The countries continue to be deficient in the production of national accounts and their supporting tables. These tables will supply the greater portion of the datasets required as their supporting tables will capture data on production, costs of production and other aspects of the economy that would assist in the making of a plausible estimate of impact.

⁸ Although ECLAC did not conduct an assessment of the impact of the hurricane season in Cuba, the preliminary balance of the Cuban economy conducted by the ECLAC Subregional office in Mexico points out that over US\$1.5 billion of damages and losses were estimated by government, with minimal human suffering.

10. LESSONS LEARNED

The following are some of the main lessons learned:

1. The main lesson learned was that the smaller the country, the more devastating will be the damage, as there will be no regions spared the onslaught of the event. It means that the smaller countries must take care to locate their utilities and health services in areas that are relatively safe from flooding and landslides. On this matter, private developers should be held responsible for their actions that accentuate damage and should be made to reverse their works that affect the natural ecological/environmental balance.
2. In all cases studied, the role of government is seen as crucial. Governance issues are all the more important and urgent in the case of small economies that tend to be the most vulnerable to natural events. In all countries studied, the need for effective disaster preparedness and risk reduction measures is urgent.
3. As economic development takes place and wealth accumulates, the greater will be the risk of severe damage and loss. This means that hand in hand with development, must be planning against the geographical/geological and other hazard factors to which the country is exposed.
4. The higher the level of development attained, the more robust must engineering works be. On the other hand, the less diversified the economy, losses will not be compensated among different sectors.
5. For small islands that are somewhat remote from each other, food and water security must at all times be present. External links to other nearby countries should be maintained, as well as reasonable emergency stocks.
6. At national level, risk management activity should be carried out at the local, community level (parish, settlement, village or municipality) as the appropriate political subdivisions and geographical areas that are prone to natural disaster damage.
7. The preparation for hurricanes should be made within a multi-hazard framework since other less frequent events such as earthquakes and volcanoes are also present in the region. This preparation would be an integral part of management and planning as well as part of the education curriculum at all levels.
8. The location and physical design of schools should make them more suitable for providing reasonable accommodation as shelters. This is also true for other structures used as shelters such as churches and community centres.

Annex

Table 1				
Commonwealth of the Bahamas: Summary of damage and losses caused by hurricanes Frances and Jeanne (BS millions)				
	Direct damage	Indirect losses	Total	External component
	228.59	322.33	550.92	344.59
Productive sectors	<u>39.95</u>	<u>284.35</u>	<u>324.30</u>	<u>239.19</u>
Tourism	29.30	250.00	279.30	223.44
Agriculture	10.65	34.35	45.00	15.75
Infrastructure	<u>92.24</u>	<u>12.17</u>	<u>104.40</u>	<u>57.68</u>
Transport	44.45	3.39	47.84	30.25
Telecommunications	37.15		37.15	24.15
- Electricity	2.80	6.00	8.80	1.82
- Water and sewerage	0.54	2.78	3.32	0.35
Public buildings	7.30		7.30	3.29
Social sectors	<u>96.40</u>	<u>2.47</u>	<u>98.87</u>	<u>44.62</u>
Housing	71.70	0.20	71.90	31.20
Health	2.90	2.25	5.15	3.60
Education	21.80	0.02	21.82	9.82
Emergency relief		<u>1.75</u>	<u>1.75</u>	<u>-1.22</u>
Clean up and waste disposal		<u>21.60</u>	<u>21.60</u>	<u>4.32</u>

Source: ECLAC estimates

Table 2
The Bahamas
Macroeconomic indicators
1994 – 2004

					Pre-Hurricane	Post-Hurricane
	2000	2001	2002	2003 /a	2004 a/	2004 a/
	<i>Annual rates of growth b/</i>					
Gross domestic product (1991 prices)	5.0	-2.0	2.3	0.2	3.0	-1.7
	<i>in Bahamian dollars</i>					
Gross domestic product per capita	16,205	15,997	16,218	16,691	17,102	16,407
	<i>Annual rates of growth b/</i>					
Real sector indicators (rates of growth)						
Tourist arrivals	15.2	-0.5	5.2	4.4	16.4	10.6
Value of construction starts	19.0	-8.0	55.0	-6.9	--	
Value of construction completions	-34.2	8.0	-5.9	-12.7	--	
Electricity generation (mwh)	6.9	3.9	5.6	-1.6	--	
Balance of payments	<i>Millions of Bahamian dollars</i>					
Current account balance	-471	-348	-339	-427	-24.3*	
Merchandise balance	-1,371	-1,151	-1,151	-1,204	-367*	
Exports fob	805	614	740	681	--	
Imports fob	2,176	1,765	1,776	1,885	--	
Services balance	1,029	951	980	902	334*	
Income balance	-173	-190	-211	-163	-24*	
Unilateral transfers	43	42	42	38	9*	
Financial and capital balance c/	410	318	400	538	133.4*	
Net foreign direct investment	250	101	169	145	--	
Financial capital d/	161	217	79	292	--	
Global balance	-61	-30	61	111	109*	
Variation in reserve assets e/	61	30	-61	-111	109*	
Other indicators of the external sector						
External debt (millions of Bahamian dollars)	368	346	311	349	--	
External debt (% of GDP)	7	7	6	7	--	
Prices						
Rate of change in the consumer price index (end of period)	1.0	2.9	2.2	3.0	2.8	
Weighted deposit real interest rate	2.2	2.2	2.1	1.0	1.0 a/	
Weighted lending real interest rate	9.9	9.3	9.1	8.1	8.0 a/	

Central government	<i>Millions of Bahamian dollars</i>				
<i>Recurrent revenue (budget)</i>	930	986	1023	1062	1176
<i>Current expenditure</i>	846	836	954	969	
<i>Capital account deficit (budget)</i>	132	138	137	142	137
<i>GFS deficit</i>	14	164	188	122	164
	<i>Percentage of GDP</i>				
<i>Overall balance with grants</i>					
<i>Overall balance without grants and net lending</i>	0.4	-0.7	-2.6	-2.9	-3.5 a/
Money and credit	<i>Millions of Bahamian dollars</i>				
<i>Domestic credit</i>	4,158.5	4,676.9	4,940.4	4746.18	5225.39+
<i>To the public sector</i>	647.4	774.8	870.8	705.54	950.62+
<i>To the private sector</i>	3,511.1	3,902.1	4069.6	4040.64	4274.77+
<i>Liquidity (M3)</i>	3,464.6	3,624.6	3,742.7	3931.82	4374.39+
<i>Money supply and deposits in national currency (M2)</i>	3,378.3	3,532.7	3,651.1	3,676.8	4100.56+
<i>Foreign currency deposits</i>	86.3	91.8	91.6		--

Source: ECLAC on the basis of official information.

a/ Preliminary figures

b/ At constant 1991 prices.

c/ Includes errors and omissions

d/ Includes the capital and financial balance minus net foreign direct investment and plus errors and omissions

e/ The (-) sign indicates an increase in reserves

*: End Q1

+: End 2004

Table 3
Cayman Islands
Macroeconomic Indicators 1999 - 2004

	1999	2000	2001	2002	2003	2004 Pre Ivan (a)	2004 Post Ivan (b)
Nominal Gross domestic product (CIS million current)	1,382.50	1,444.90	1,482.30	1,546.00	1,603.20	1,710.00	1,616.03
Gross Domestic Product (1986 prices)	803.80	811.80	816.70	830.60	847.20	873.50	860.39
Growth in real Gross domestic product (1986 prices)	3.40	1.00	0.60	1.70	2.00	3.10	-1.50
Gross domestic product per capita (CIS\$000)	35,220.83	34,705.83	34,556.67	35,000.00	34,970.00	35,634.17	33,675.96
Employment, wages and prices							
Unemployment rate	...	...	7.50	5.60	5.60	3.90	...
Total employment			26,608.00	28,091.00	28,871.00	29,991.00	
Rate of change in the consumer price index	6.80	3.00	1.30	1.70	1.20	1.90	2.50
Non-resident exchange rate	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Weighted deposit real interest rate							
Weighted lending real interest rate	8.00	9.20	6.80	4.70	4.10		
Central government							
Total revenue		278.50	285.40	314.10	326.20	342.10	326.50
Current revenue		277.70	284.40	314.10	326.20	342.10	
Current expenditure			290.60	295.70	305.20	292.80	269.40
Current account balance			-6.20	18.40	21.00	49.30	-42.90
Capital revenue			0.90	0.00	0.00	0.00	
Capital expenditure			25.90	17.70	18.80	25.00	
Overall fiscal balance			-31.20	18.40	21.00	24.30	...
Public sector external debt	128.20	144.40	143.50	132.10	143.90		
Interest payments			6.10	3.80	5.10		
Millions of Cayman Islands dollars							
Monetary and credit							
Domestic credit			1,629.40	1,331.00	1,380.80	1,387.70	

Total	private sector			1,478.30	1,235.70	1,384.80		
Total	public sector			151.10	95.30	-4.00		
Money	supply (M3)	561.00			3,631.70	4,028.90	4,512.37	
Foreign	currency				3,075.20	3,284.20		
Balance	of payments							
Current	account							
Merchandise	balance			-502.00	-520.30	-605.30	-674.50	
Exports	(f.o.b)			2.40	3.00	4.30	5.50	4.00
Imports	(f.o.b)			514.90	494.40	553.50	669.00	747.20
Services	balance							
Total	receipts			488.90	467.00	458.30	501.30	
Supplementary								
Visitors	arrivals	1,430.20	1,385.00	1,548.90	1,877.60	2,112.50	2,429.38	
Notes								
Source	and (b) Forecasts/projections for 2004 before and after Ivan ECLAC estimates.							

Table 4
Cayman Islands
Summary of Damage and Losses caused by Hurricane Ivan
(CIS million)

Sector and sub sector	Impact			Ownership	
	Total	Damage	Losses	Public	Private
Total	2,861.1	2,369.6	491.7	124.9	2,735.7
Service Sectors	1,508.7	1,372.6	136.0	48.2	1,460.5
Education	44.8	43.0	1.8	34.9	9.9
Health	18.9	9.6	9.3	11.7	7.3
Housing	1,444.9	1,320.0	124.9	1.6	1,443.3
Productive Sectors	931.4	711.3	220.1	---	931.4
Agriculture	5.6	0.4	5.2		5.6
Commerce	463.4	429.0	34.4		463.4
Tourism	462.4	281.9	180.5		462.4
Infrastructure	407.0	285.1	122.2	65.2	341.8
Electricity	68.9	33.9	35.0	5.6	63.3
Water and Wastewater	5.6	4.8	0.8	3.6	2.0
Road Transport	194.9	146.2	48.7	24.6	170.3
Ports and Airports	15.7	9.7	6.0	13.7	2.0
Telecommunications	79.5	48.1	31.7	0.3	79.2
Public Buildings	42.4	42.4	---	17.4	25.0
Environment	10.5	0.6	9.9	10.5	---
Emergency Assistance	3.5	---	3.5	1.0	2.0
Source: ECLAC					

Table 5
Summary of damage and losses caused by hurricane Ivan in Jamaica
(Million Jamaican Dollars)

Sector and subsector	Damage and losses			Sector	
	Total	Direct	Indirect	Public	Private
Total	36,886.3	23,182.2	13,704.1	9,605.8	27,180.5
Social sectors	13,684.6	12,943.3	741.3	2,520.7	11,163.9
- Housing	11,163.9	10,474.8	689.1		11,163.9
- Education and culture	806.9	794.9	12.0	806.9	
- Health	758.4	718.2	40.2	758.4	
- Public buildings	955.4	955.4		955.4	
Productive sectors	13,375.6	4,133.3	9,242.3	312.1	13,063.5
- Agriculture and livestock	8,550.0	3,407.0	5,143.0		8,550.0
- Food processing	2,204.9	210.0	1,994.9	312.1	1,892.8
- Mining	1,030.0	50.0	980.0		1,030.0
- Tourism	1,590.7	466.3	1,124.4		1,590.7
Infrastructure	6,987.9	3,545.0	3,442.9	4,117.5	2,770.4
- Electricity	1,397.9	589.0	808.9	279.6	1,118.3
- Water supply and sanitation	678.7	190.4	488.3	578.7	
- Transport	3,255.9	2,460.0	795.9	3,199.1	56.8
- Telecommunications	1,535.3	198.6	1,336.7		1,535.3
- Airports	120.1	107.0	13.1	60.1	60.0
Environment⁹	2,560.6	2,560.6	...	2,560.6	
Emergency expenditures	277.6	---	277.6	94.9	182.7

Source: ECLAC.

⁹ To avoid double accounting, damage to assets already accounted for in other sectors are not included in this figure.

Sector	Direct damage	Indirect damage	Total
Agriculture	54	46	100
Manufacturing	18	4	22
Wholesale and retail trade	...	11	11
Tourism	305	101.2	406.2
Electricity	70	21	91
Water/sewage	7	1	8
Telecommunications and broadcasting	76.5	62.4	138.9
Cable	8	5	13
Education	195	1	196
Transport	10.3	1.2	11.5
Housing	1,372	9	1381
Health	11	0	11
Total	2,127	263	2389.6

	Direct Damage	Indirect Losses	Total	External component
Damage to infrastructure (to be rebuilt, repaired, strengthened)	44,448.10		47,842.90	28,891.27
- Airports	21,200.00			
- Coastal erosion and erosion protection	1,280.00			
- Docks	2,908.10			
- Drainage (including culverts)	500			
- Roads	4,060.00			
- Seawalls	4,000.00			
Losses		3,394.80		1,357.92
- Estimated cost of road operation and transport services in current circumstances		3,394.80		
- Loss of vehicles	10,500.00			
Source: ECLAC, on the basis of data from the Ministry of Works and Utilities				

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