



The increasing risk of disasters in the Caribbean

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Hazards materialise into disasters on a regular basis but these hazards are changing, accelerating pace and increasing in strength

A systemic development policy requires incorporating the issue of disaster risk reduction as part of the strategic themes linked to integration, productivity and competitiveness and social equity. This is particularly true in small developing countries and in small island states given their exposure to natural events – mainly climatic in nature – and their insufficiently diversified economies that tend to be highly dependent on natural resources.

The ACS Member States (either island economies or countries bordering the Atlantic coast in the Central American isthmus) are linked intrinsically by the Caribbean Sea. One consequence of that link is that they have much more at stake in the face of hydro-climatic events than larger continental countries. But risk in the Caribbean Sea Basin countries is also aggravated by the multi-hazard nature of the region's geography and geology. Crossed by active tectonic plates, with a number of active volcanoes, a fragile coastal wetland environment and also a topography that presents steep slopes, a relatively short span between mountains and the coast and a rapid economic development path that has created very vulnerable infrastructure in the most hazardous areas, the Caribbean profile is one of very high risk.

The annual hurricane season in the region is the most salient example of how hazards materialise into disasters on a regular basis, but recent years have shown that these hazards are changing, accelerating pace and increasing in strength. This expected major exposure is supported by historical evidence that shows a notable increase in frequency and strength of named storms in the Atlantic.

The economic, social and environmental consequences have been thus on the rise for the whole region, increasing the costs of recuperation. The now prevalent simultaneity of impact over several territories and the short time span or simultaneity of events as shown by the 2004 and 2008 cluster of Tropical Storm Fay, Gustav, Hanna and Ike pose a major problem, from the response phase onto the recuperation and reconstruction.

Evidence presented in the Fourth Assessment of the Intergovernmental Panel on Climate Change as to the vulnerability of the Latin American region, on Small Island States and specifically on the Caribbean supports this notion. But the Caribbean people don't need to be told this, they know and experience, that not only is the hurricane season stronger, it has changed, it begins earlier, has more events and lasts longer (as Paloma in 2008 proved again).

The valuations made of recent disasters, from 2004-08 assessed by ECLAC and the functioning of the Caribbean Catastrophe Risk Insurance Facility (CCRIF) – that made its first payment to the Turks and Caicos islands due to the government on their 2008 hurricane policy – strengthen the need for closer cooperation and new, bolder initiatives. The following tables summarise the assessments made by ECLAC over the years in the Caribbean and in Central America since 1975.

In the case of the Caribbean in the period 1975-2007, disasters have caused more than 7,650 fatalities, directly affecting more than 5 million people over time. The total sum of the impact, in terms of damage and losses has risen to US\$35,656 million (2007 prices), which represents over 16.6 per cent of the average regional GDP and exceeds by two times the annual average gross capital formation. On average the Caribbean experiences an annual loss in excess of US\$1,114 million. The negative impact is actually currently more severe: the average fatalities have risen by more than 800 per year during the last seven years (from 239 for the whole 1975-2007 period), affecting annually over half a million Caribbean inhabitants (from 160,000 on average in the 32-year period). The economic impact has also increased, mostly in terms of damages (total or partial destruction of assets) that rose to US\$1,798 thousand million in 2000-07. The yearly negative impact on the external account – due to import increases and losses of export revenue mostly associated with tourism – fluctuates around US\$300 million.

As for Central America, fatalities in the 1973-2007



period reached over 50 thousand – an average of 1,564 per year – although the number has decreased to 288 on average per year in the 2000-07 period. Total affected population over the years exceeds 9 million and on average over the 2000-07 period more than half a million are touched by major disasters every year. Total impact over time exceeds US\$115,768 million (2007 prices) which means more than US\$3,618 million per year, mostly due to damages, although the incidences of drought and climatic impact on agriculture generates average yearly losses of US\$1,3 billion. The total amount of damage and losses represents more than 10 per cent of the region's annual average GDP and almost 30 per cent of the region's annual gross capital formation. The external impact exceeds US\$1,1 billion per year on average for the 32-year period.

These figures and data underline the need for renewed efforts to increase the Caribbean Basin adaptation to these increasing hazards, mitigation of its worst effects and cooperation in all the aspects of the disaster cycle. The higher costs in recent years only makes it more urgent to act swiftly and in a concerted manner, reinforcing other counter-cyclical policies the region now faces in the wake

of the energy, food and financial crises that now loom so heavily on the region's development process.

An aggravating factor is that – given their small size and relatively less diversified productive sectors – disaster impacts have a disproportionately large impact on their economies and the populations' welfare and livelihood. A worldwide comparison of the relative weight of disasters on national economies (total impact as a proportion of GDP) shows that the Caribbean nations and states rank at the very top of the list. This not only impinges on the region's capacity to cope with the post-disaster needs but on the region's capacity to prevent, mitigate and adapt to disasters. Thus a concerted, cooperative effort in disaster risk reduction becomes a matter of national interest and security and should be part of the overall integration policy agenda.

The ACS's unique position as a regional body that encompasses all of the Caribbean Basin countries and territories, together with ECLAC's even broader membership, allow for forms of cooperation and processes that can bring together developed and developing territories, as well as working to overcome other factors that divide the region. ■

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ACCUMULATED IMPACT OF DISASTERS IN THE CARIBBEAN (1975-2007) (based on ECLAC assessed events)

DATE	PLACE	TYPE OF EVENT	AFFECTED POPULATION		TOTAL DAMAGES (constant USD millions 2007)			
			Fatalities	Direct Affected	TOTAL	DAMAGES	LOSSES	Effects external sector
5/11/1975	Grenada	Tropical storm	...	...	350	138	213	105
8/10/1975	Antigua and Barbuda	Earthquake (7.7 Richter scale)	...	4,200	723	495	228	361
29/08/1979	Dominica	Hurricane David (150 knots windforce)	42	60,060	1,196	921	276	479
3/08-7/09/1979	Dominican Republic	Hurricanes David and Federico (sustained winds of 150 knots or 260 km/h and 115 (200 km/h) respectively with rainfall of over 700 mm, raising river flows to 6 mn m3)	2,000	1,200,000	18,912	13,163	5,749	3,194



DATE	PLACE	TYPE OF EVENT	AFFECTED POPULATION		TOTAL DAMAGES (constant USD millions 2007)			
			Fatalities	Direct Affected	TOTAL	DAMAGES	LOSSES	Effects external sector
05/09/1995	Anguilla	Hurricane Luis (140 knots or 250 km/h windforce)	...	...	95	79	17	37
14-15/08/1995	Sint-Maarten, Netherlands Antilles	Hurricanes Luis (76 knots or 250 km/h) and Marilyn (100 knots or 170 km/h and rainfall over 85 mm) with an accumulated rainfall reaching 316 mm	...	...	1,795	986	810	706
30/09-1/10/2000	Belize	Hurricane Keith (Graded 5 on the Saffir-Simpson scale)	3	57,403	360	272	88	72
10/2001	Belize	Hurricane Iris, cat. 4 on the Saffir Simpson scale	23	21,568	260	199	61	132
11/2001	Cuba	Hurricane Michelle, affecting the Central-Eastern part of the island, reaching cat. 5 on the Saffir-Simpson scale	5	140,415	2,306	1,713	593	465
05/2004	Haiti	Font-Verretes and Mapou (also affecting the city of Jimaní in the Dominican Republic)	2,665	16,900	n.a	n.a	n.a	...
15-18/09/2004	Dominican Republic	Hurricane Jeanne	23	32,554	330	166	164	139
18/09/2004	Haiti	Tropical Storm Jeanne, affecting the city of Gonaives, and the Departments of the North West and Artibonite	2,754	297,926	330	222	108	52
3-20/09/2004	Bahamas	Hurricanes Frances and Jeanne	2	28,500	614	368	246	336
6-8/09/2004	Grenada	Hurricane Ivan	28	81,553	990	881	109	662



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			Fatalities	Direct Affected	TOTAL	DAMAGES	LOSSES	Effects external sector
11-13/09/2004	Cayman Islands	Hurricane Ivan	2	35,189	3,823	3,166	657	n.a.
10-12/09/2004	Jamaica	Hurricane Ivan	17	369,685	663	417	246	130
12-15/09/2004	Cuba	Hurricane Ivan	0	2,200,000	1,671	...	...	...
14-15/11/2004	Dominican Republic	Flooding in the watersheds of the Yaque del Norte and Yuna rivers, Dominican Republic	10	63,520	47	36	11	169
12/2005-01/2006	Guyana	Floods due to intense rainfall at the end of December, early January 2006 on the coastal regions between Georgetown and Albion	34	274,774	500	450	50	100
02/2006	Guyana	Floods in Pomeroon and Mahaica	...	...	33	24	9	0
05/2006	Suriname	Floods in Central Suriname	0	31,698	49	40	10	0
08/2007	Saint Lucia	Hurricane Dean	...	23,167	18	12	7	0
08/2007	Belize	Hurricane Dean	...	11,379	90	47	42	0
08/2007	Dominica	Hurricane Dean		11,608	60	47	14	0
10/2007	Dominican Republic	Tropical Storm Noel	42	34,172	439	255	184	144


ACCUMULATED IMPACT OF DISASTERS IN CENTRAL AMERICA (1975-2007) (based on ECLAC assessed events)

DATE	PLACE	TYPE OF EVENT	AFFECTED POPULATION		TOTAL DAMAGES (constant USD millions 2007)			
			Fatalities	Direct Affected	TOTAL	DAMAGES	LOSSES	Effects external sector
22-23/ 12/1972	Managua, Nicaragua	Earthquake (8.5 Richter scale)	6,000	300,000	41,480	33,313	8,167	16,592
18-20/ 09/ 1974	Honduras	Hurricane Fifi (sustained winds of 95 knots or 165 km/h)	7,000	115,000	8,600	6,370	2,230	1,720
04/02/1976	Guatemala	Earthquake (7.5 Richter scale, with after-shocks of up to 6 level)	23,000	2,550,000	24,032	6,557	17,474	7,210
20-31/ 05/1982	Nicaragua	Floods	80	70,000	5,071	3,907	1,163	1,014
June-Sept 1982	El Salvador	Cluster of events, including earthquake (June 5.6 Richter), drought (July-Sept) and floods due to tropical depression (Sept)	600	20,000	1,828	1,395	432	548
May-Sept 1982	Guatemala	Cluster of events: strong rains in May, drought from July-Sept, tropical depression in Sept	610	10,000	1,149	841	309	345
1982	Nicaragua	Floods (May) and drought (starting in July)	...	...	4,978	1,422	3,556	1,493
10/10/1986	El Salvador	Earthquake (5.4 Richter scale)	1,200	520,000	7,293	5,526	1,767	1,459
13-26/ 10/1988	Nicaragua	Hurricane Joan (wind speed of 125 knots or 217 km/h)	148	550,000	5,101	4,527	574	1,876
09/04/1992	Nicaragua	Cerro Negro volcanic eruption (sand and ash for 65 hours)	2	12,000	56	31	25	8



DATE	PLACE	TYPE OF EVENT	AFFECTED POPULATION		TOTAL DAMAGES (constant USD millions 2007)			
			Fatalities	Direct Affected	TOTAL	DAMAGES	LOSSES	Effects external sector
01/09/1992	Nicaragua	Tsunami (associated with 7.0 Richter scale earthquake and sea waves of 8-15 metres on Pacific coast)	116	40,500	74	52	22	13
27-28/07/1996	Costa Rica	Hurricane César (70 knots or 120 km/h winds)	39	40,260	240	131	108	110
27-29/07/1996	Nicaragua	Hurricane César (70 knots or 120 km/h winds)	9	29,500	80	54	26	25
1997-98	Costa Rica	El Niño (flooding and drought, an anomaly in rainy season)	...	119,279	136	74	62	65
23/10-04/11/1998	Central America	Hurricane Mitch (sustained winds of up to 144 knots or 285 km/h at peak and rainfall in excess of 600 mm)	9,214	1,191,908	8,498	4,353	4,145	2,247
...	...	Costa Rica	4	16,500	129	76	53	26
		El Salvador	240	84,316	549	240	309	103
		Guatemala	268	105,000	1,058	407	651	32
		Honduras	5,657	617,831	5,365	2,835	2,530	1,778
		Nicaragua	3,045	368,261	1,397	795	602	309
Jan-Feb 2001	El Salvador	13th January (7.6 Richter scale earthquake) 13th February (independent event, 6.6 Richter scale)	1,241	2,351,886	5,476	3,410	2,066	1,059
2nd quarter 2001	Central America	Drought affecting mainly Nicaragua, Honduras, Guatemala and El Salvador	35	600,000	234	0	234	80
Oct 2005	Guatemala	Tropical Storm Stan	669	492,166	1,058	607	451	265
Oct 2005	El Salvador	Torrential rains, Tropical Storm Stan and Ilamatepec volcanic eruption	69	72,141	383	172	211	107