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TURKS AND CAICOS ISLANDS

MACRO SOCIO-ECONOMIC ASSESSMENT OF THE DAMAGE AND LOSSES CAUSED BY TROPICAL STORM HANNA AND HURRICANE IKE

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PREFACE

This report was prepared on the request of the Government of the Turks and Caicos Islands, through the Ministry of Finance and Economic Planning, following the passage of Tropical Storm Hanna on 31 August to 3 September 2008 and Hurricane Ike on 6 September 2008. The implications of the impact posed a need, apart from the immediate humanitarian response, for a rapid assessment of the social and economic impact.

The assessment was carried out using the Economic Commission for Latin America and the Caribbean (ECLAC) disaster assessment methodology (DALA). The DALA has been successfully used in both Latin America and the Caribbean and has been applied in East Asia and Africa.

This assessment will complement and expand on the emergency and humanitarian needs identified previously by the Government of the Turk and Caicos Islands. The result of such an assessment provides a quantitative approximation of the overall damage to the economy and its impact on the affected population.

Baseline data for the conduct of the Macro Socio Economic Assessment are drawn from among official government data sets including: the Population and Housing Census 2001 estimates of population 2007, the Survey of Living Conditions 2000, Social Indicators 2005, Vital Statistics Report 2006, Tourism Statistics 2000-2007, National Accounts Statistics 2000-2007, and other relevant data sets from the Government Central Statistical Offices, Ministry of Finance and Ministry of Planning.

Mission components

The ECLAC mission was supported by the United Nations Development Programme (UNDP) Jamaica office; and the Planning Institute of Jamaica (PIOJ) through the release of an officer to be part of the ECLAC team. The team received the guidance and support of Mr. Ricardo Zapata, ECLAC Focal Point for Disaster Risk Reduction, ECLAC Subregional Headquarters in Mexico. The mission was undertaken from 26 September to 7 October 2008.

The ECLAC team comprised:

Asha Kambon	ECLAC, Coordinator and Social Sector Specialist
Michael Hendrickson	ECLAC, Macro Economist
David Smith	Coastal Zones and Infrastructure Specialist
Hopeton Peterson	Sustainable Development Specialist, PIOJ

This report was made possible by the cooperation, coordination and support provided by the relevant government authorities. The national counterparts were coordinated by Mr. Delton Jones, Permanent Secretary, Ministry of Finance, Office of the Deputy Premier and Ministry of Finance and National Insurance. Ms. Katherine Forbes coordinated technical support and ground logistics.

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Executive summary

The Turks and Caicos Islands suffered the effects of being in the path of two meteorological systems within a very short space of time. First, Tropical Storm Hanna hit the island over an extended number of days from Sunday 31 August to Wednesday 3 September 2008. The path of this system was erratic and it effectively circled the chain of islands for the period reported, bringing torrential rainfall and resulting in major flooding in many of the communities of these islands. The second system was Hurricane Ike which passed just south of the Turks and Caicos Islands on 6 September, as a Category 4 hurricane, with 135 mph winds, affecting primarily the Turks Islands and South Caicos as a result of its path.

The Islands suffered no loss of life but there was much displacement of persons who sought refuge in shelters and at the homes of family and friends. The Turks and Caicos Islands can be satisfied that the social construction of the society, with some 65% of the population being defined as Non-Belongers, did not disrupt the emergency response to the events in any significant way. All persons requiring safety, shelter or food support were provided with such, despite the challenges faced by rapid growth of the TCI population from 19,886 in 2001 to 33,202 in 2006.

The report suggests that there are social dimensions to events such as natural disasters which policy need take heed. These included the existing vulnerability of women and their families who comprise 34.8% of all households and the possible threats to social cohesion such as the psychosocial trauma experienced by island populations following traumatic events such as hurricanes.

In all, 31% of the population or 10,270 people were affected by Tropical Storm Hanna and Hurricane Ike, with 2% of the population or 825 people being severely affected.

The total impact of Tropical Storm Hanna and Hurricane Ike on the Turks and Caicos Islands was estimated at $213.6 million. This amount is a bit conservative, as data limitations in some sectors did not allow for a full accounting of impacts on them. However, this amount provides a good estimate of the substantial impact of the disaster.

Given the scale, duration and intensity of the two events, the usual expectation is that the total impact would have been higher. Nevertheless, as a result of the fortuitous situation where Providenciales, the main growth island with the highest cost capital stock, was spared the ravages of the disaster, the financial impact was not as high as would be expected for this scale of hydrometrical event. Notwithstanding this, there was significant social fall-out that could hurt people's livelihoods in the short to medium term, and also major environmental damage in an already fragile ecological environment.

The engine of growth, tourism, was spared the ravages of the disaster, with the fall-out being mainly in the social sectors and infrastructure. This was reflected in the profile of the impact. Total damage (impact on assets, including stocks) was $119.5 million or 56% of the total impact. Meanwhile, losses, both from income lost and higher contingent spending

amounted to $72.0 million or 44% of the total. The contained losses stemmed from the fortune of geography, with the spread of the islands allowing for only modest impact on Providenciales.

The per capita total impact of the disaster at $6119.5 was relatively high, though not close to the $75,000 for the Cayman Islands in the wake of Ivan in 2004. Underscoring the relative weight of the disaster, the total impact represented 25.8% of GDP, 96.2% of tourism GDP, which is quite significant, 54.4% of gross domestic investment, 35% of consumption and 350.6% of public debt, highlighting that debt is still at quite manageable levels.

The distribution of impact across the various subsectors of the productive sector, suggests that approximately 57.0 per cent of the total damage and loss was suffered by the tourism subsector while the wholesale and retail trade accounted for 31.4 % (see figure 2).

Total impact to infrastructure which entails damage and loss to electricity, water supply, transport and roads, telecommunications, airports, seaports and fire services amounted to US$55.7 million. This accounted for 26% of the total impact.

The total effect to the social sector caused by Tropical Storm Hanna and Hurricane Ike amounted to US$111.3 million of which 58% was accounted for in damage and the remainder, 42% in losses. The distribution of the damage and loss within the social sector suggests that 69% of the effect in the social sector was applied to housing, 27% to health and 5% to education.

The report concludes with the presentations of a number of issues for consideration such as preparations for the next hurricane season, review of risk management processes; short-term recommendations which included training in the informal construction sector; strengthening capacity of the emergency and maintenance services; provision of micro credit facility for fisher folk and small and 'backyard' farmers; vulnerability reduction for the telecommunications subsector and advice on the oil storage facility at Cockburn Harbour, South Caicos.

Strategic mitigation approaches included the strengthening of disaster management capacity; the call for relocation and/or retrofitting of community homes and structures located in hazard zones and the upgrading of the quality of housing and sanitation of the poor urban centers and outlying communities.

I. BACKGROUND

A. Description of the phenomena and their effects

1. The meteorological phenomena

The Turks and Caicos Islands suffered a hit by two meteorological systems within a very short space of time. First, Tropical Storm Hanna hit the island over an extended number of days ranging from Sunday 31 August to Wednesday 3 September 2008. The path of this system was erratic and it effectively circled the chain of islands for the period reported, bringing torrential rainfall and resulting in major flooding in many of the communities of these islands. A report by the Caribbean Net News describing the effects of this event is given in box 1.

Box 1

Published on Wednesday, September 3, 2008

By Tess Hennigan
Caribbean Net News Staff Reporter
Email: tess@caribbeannetnews.com

PROVIDENCIALES, Turks and Caicos Islands: The effects of Tropical Storm Hanna have taken their toll on the Turks and Caicos Islands (TCI) according to local reports.

On Wednesday evening, reports came in with some updates on current conditions in the TCI.

A generator designed to provide emergency power for Middle Caicos failed around midnight on Tuesday leaving the island without power. The causeway joining Middle and North Caicos has sustained significant damage, with 75 percent of the pavement and 40 percent of the roadbed gone, and both barrier walls destroyed.

The winds and rain lessened around 11:00 am on Wednesday, after dumping thirteen inches of rain on Middle Caicos.

Grand Turk was calm and rain-free for most of Wednesday, with intermittent power outages.

According to reports, Providenciales has been experiencing regular power outages, and the port is shut down leaving a much-needed shipment of food stranded in Puerto Rico.

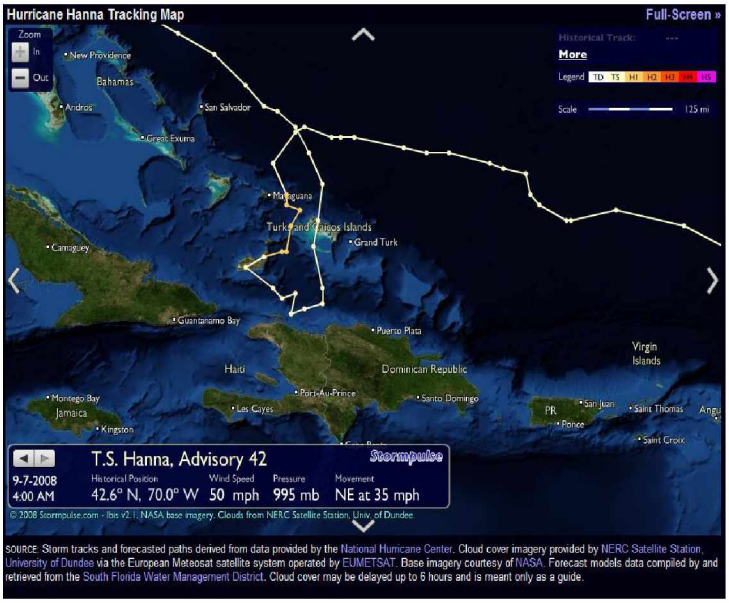
With no food to stock shelves, the grocery stores are reported to be closed and there is considerable concern over the food supply situation with the possible imminent arrival of Hurricane Ike.

Reports from a private weather station on Middle Caicos indicated that wind speeds of 85 mph were clocked during the storm before the equipment was blown down.

Most of the phones are down throughout the islands leaving only sporadic cell phone communications for incoming and outgoing calls.

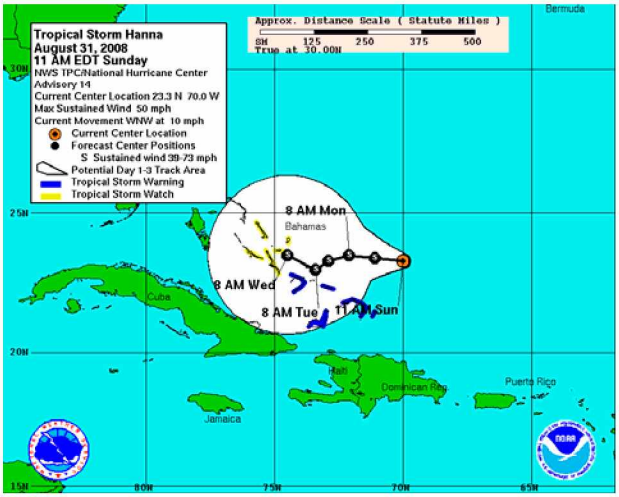
Track advisories issued by the National Hurricane Centre (NHC) are presented in the following images, which give some indication of the circuitous route taken by this tropical storm (maps 1 and 2). In particular, map 1 shows that Tropical Storm Hanna approached the Turks and Caicos Islands initially on a southward moving path, and then looped and came through the islands from the south. On its approach from the south, the Caicos Islands would have been much more affected than the Turks Islands.

Map 1: NCH track advisory number 42 for Tropical Storm Hanna



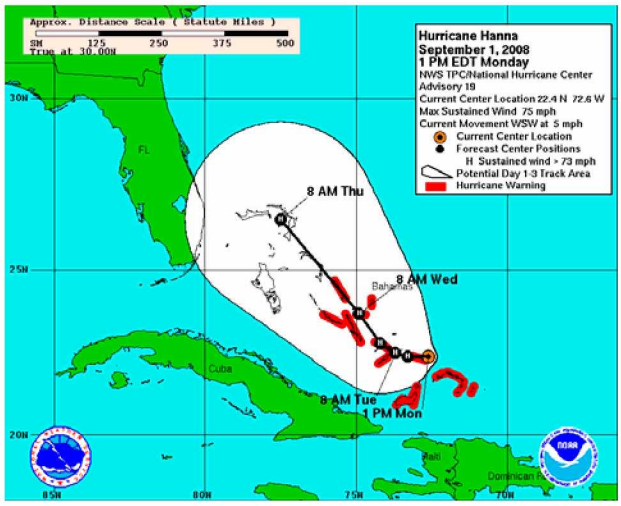
Map 2 shows that on 31 August 2008, the system was north-east of the Turks and Caicos Islands. On 1 September, it was much closer to these islands and the centre of the system had dipped to the north-west. By the 3 September, the eye of Tropical Storm Hanna was south of the Turks and Caicos Islands and very close to Middle Caicos. It is of interest to note from the advisory quoted above that 13 inches of rain were observed on Middle Caicos, and that wind speeds of up to 85 mph were also observed. This system carried a significant amount of rainfall, which affected several communities throughout the Turks and Caicos Islands.

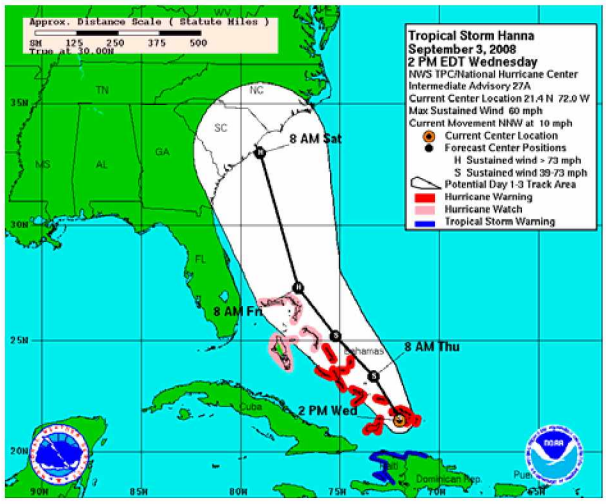
Map **2: NHC track advisories for Tropical Storm Hanna**



The second system to affect the Turks and Caicos Islands was Hurricane Ike, the name given to the ninth storm of the 2008 Atlantic Hurricane Season. The storm lasted for a total of 14 days; it formed on 1 September 2008 and dissipated on 14 September 2008. Hurricane Ike made its passage across the northern Caribbean, through the Gulf of Mexico, finally making landfall along the Gulf Coast of the United States. It was the most intense storm of the season so far, reaching Category 4 status on 4 September north-east of the Turks and Caicos Islands. At that time, Hurricane Ike had maximum sustained winds of 145 mph and a pressure of 935 millibars. It passed just south of the Turks and Caicos Islands on 6 September, as a Category 4 hurricane, and with 135 mph winds, affecting primarily the Turks Islands and South Caicos as a result of its path. This occurred less than one week after the passage of Tropical Storm Hanna, which circled the islands twice before heading northward.

Map **2: NHC track advisories for Tropical Storm Hanna…..cont'd**

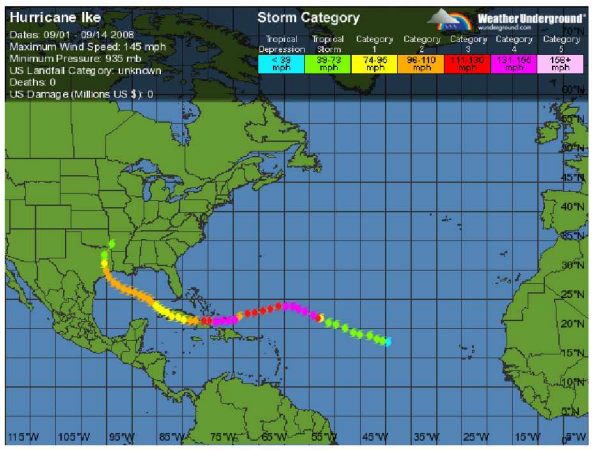




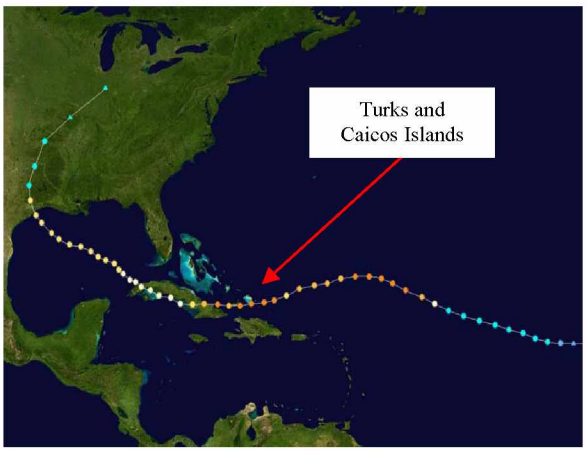
Source: NOAA

Along its entire path, Hurricane Ike affected the Turks and Caicos Islands, Cuba, the Bahamas, Haiti, Dominican Republic, and the American States of Florida, Mississippi, Louisiana, Texas and Ohio. The storm has been blamed for a total of 143 deaths and has caused an estimated US$30.5 billion in damages. The path of the hurricane is shown in maps 3 and 4.

Map 3: Hurricane Ike's path through the Caribbean



Map 4: Complete path of Hurricane Ike

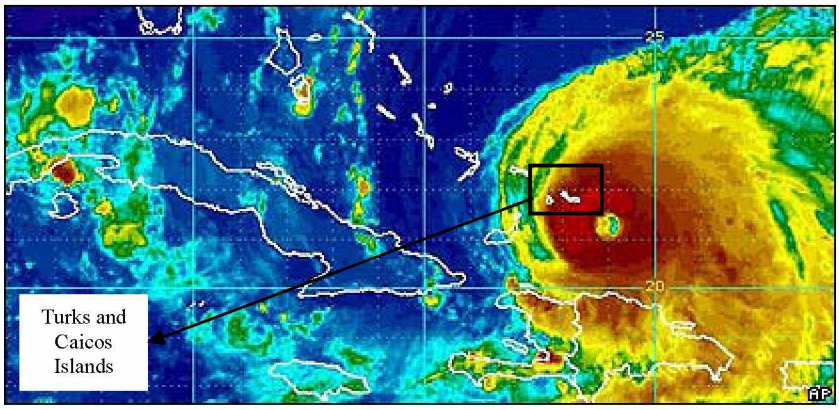


2. The effects of the hurricane event

Tropical depression number nine was upgraded to Tropical Storm Ike on 1 September 2008, as it passed north west of the Cape Verde Islands. Ike increased in intensity and passed directly over the Turks and Caicos Islands as a category 4 hurricane with winds of 135 miles per hour on 6 September 2008. Utilities, such as, electricity and water were disrupted during and after the hurricane's passage. There was damage to 95% of the buildings particularly in the Turks Islands and on South Caicos and over 700 persons lost their homes. The islands suffered extensive damage and the Turks and Caicos Islands was declared a disaster area by its

government. A satellite (Infra-red) image of the hurricane with its well formed eye approaching the Turks and Caicos Islands is presented in map 5.

Map 5: Satellite imagery of Hurricane Ike



B. Background rainfall and hurricane parameters

1. Rainfall

At the south-eastern end of the Turks and Caicos chain, the average annual rainfall on Grand Turk and South Caicos is approximately 21 inches. Further west, towards North Caicos and Providenciales, the average annual rainfall increases to approximately 40 inches. Generally, the climate can vary considerably from island to island, such that one island may be experiencing drought, while another is experiencing rainfall.

In an average year the Turks and Caicos has 350 days of sunshine. Table 1 shows the average monthly rainfall observed in Grace Bay, Providenciales, from January 1995 to October 2005, while table 2 shows the average monthly rainfall in Grand Turk from 1993 to 2001 at North Base. The Environmental Health Department collects rainfall data for several of the islands on a monthly basis.

Table 1: Monthly rainfall in Grace Bay, Providenciales

Average monthly rainfall taken in Grace Bay, Providenciales from January 1995 to October 2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average	Median
January	1.10	0.60	0.00	4.20	0.80	2.30	0.70	0.60	2.00	0.80	1.10	1.29	0.80
February	1.10	2.30	0.60	4.10	0.30	2.00	0.55	0.70	0.10	1.15	0.10	1.18	0.70
March	1.20	3.60	2.30	4.20	1.00	0.50	0.15	0.80	1.35	2.50	0.05	1.60	1.20
April	0.10	1.70	0.00	1.80	1.10	0.00	0.40	1.25	8.25	0.80	2.60	1.64	1.10
May	1.20	4.90	4.20	1.00	7.10	2.00	3.80	2.15	1.80	4.30	7.40	3.62	3.80
June	1.50	4.30	1.90	6.00	3.30	1.80	6.80	1.45	0.50	3.20	3.10	3.08	3.10
July	7.00	1.30	0.00	0.50	7.80	0.10	1.90	0.20	2.40	2.90	2.70	2.44	1.90
August	5.00	1.30	4.25	6.20	4.90	2.00	1.10	5.60	5.40	0.30	12.15	4.38	4.90
September	1.80	0.90	1.30	3.60	12.30	8.10	0.60	5.90	3.20	8.90	5.40	4.73	3.60
October	3.30	6.50	4.00	1.80	6.90	7.70	5.30	3.30	6.20	1.40	17.70	5.83	5.30
November	1.60	4.00	0.20	1.40	7.30	5.25	4.80	0.90	2.45	3.10		3.10	2.78
December	2.70	0.70	1.90	0.30	0.30	2.50	2.55	0.25	2.45	0.15		1.38	1.30
Yearly Total=	27.60	32.10	20.65	35.10	53.10	34.25	28.65	23.10	36.10	29.50	52.30		
Monthly Maximum=	7.00	6.50	4.25	6.20	12.30	8.10	6.80	5.90	8.25	8.90	17.70		
Monthly Minimum=	0.10	0.60	0.00	0.30	0.30	0.00	0.15	0.20	0.10	0.15	0.05		

Source: The Environmental Health Department

The data indicates that the yearly total for Providenciales varied from a low of 20.65 inches (1997) to a high of 53.10 inches (1999). For Grand Turk, the corresponding figures ranged from 11.30 inches (1995) to 22.72 inches (1994), however this latter data is much less comprehensive than the Providenciales data, with near-complete data being available for only four of the eight years of record.

For either case, when it is considered that the 13 inches[1] observed on Middle Caicos during Tropical Storm Hanna occurred during a three-day period, it can be seen that this represents a significant proportion of the yearly total. The intensity of this rainfall would therefore have created a major problem with flooding.

Table 2: Monthly rainfall at North Base, Grand Turk

Average monthly rainfall taken at North Base, Grand Turk from January 1993 to October 2000

	1993	1994	1995	1996	1997	1998	1999	2000	Average	Median
January		2.01	2.17				5.16	1.34	2.7	2.1
February		0.35	0.79			1.57	1.85	1.18	1.1	1.2
March		4.13	1.02				1.61	0.87	1.9	1.3
April		4.92					0.87	0.20	2.0	0.9
May		0.98	0.39					0.16	0.5	0.4
June		0.12					1.46	0.39	0.7	0.4
July		0.94	3.27					0.20	1.5	0.9
August		0.16	1.61				5.51	0.71	2.0	1.2
September			2.05				2.40		2.2	2.2
October		4.88							4.9	4.9
November	1.57	3.23							2.4	2.4
December	0.12	0.98							0.6	0.6
Yearly Total=	–	22.72	11.30	–	–	–	18.86	5.04		
Monthly Maximum=	1.57	4.92	3.27				5.51	1.34		
Monthly Minimum=	0.12	0.12	0.39				0.87	0.16		

Source: The Environmental Health Department

[1] Anecdotal information provided from the District Commissioner in Middle Caicos.

2. Hurricanes

Table 3 below summarizes of all of the hurricanes that have passed within a distance of 300km or less from the Turks and Caicos Islands between 1900 – 2004. The hurricanes are listed in chronological order and their category strength is illustrated by the colour scheme presented. The data shows that in that 105-year period, six Category 4 hurricanes have passed within a 300 km distance of these islands. On average, this translates to a frequency of one Cat 4 hurricane every 17.5 years, passing the Turks and Caicos Islands at a distance where serious damage could be sustained. It should also be noted that hurricanes of lesser intensity, Categories 1, 2 and 3 strengths, have also occurred recently and have devastated the Islands due to storm surge and flooding.

This frequency of occurrence speak to the fact that design of infrastructure in the Turks and Caicos Islands needs to take into account wind loading from hurricanes. Where infrastructure is to be built in the coastal zone, hurricane wave loading is to be taken into account, as well as set-backs and "step-ups" driven by storm surge predictions.

Table 3: List of Hurricanes from 1900 – 2004 Affecting the TCI

NO	NAME	DATE	Vmax (knots)	CAT	DIST to Vmax (km)	Pc (mb)
1	NOT NAMED 3 1901	7/8/1901 0:00	80	1	268.92	
2	NOT NAMED 4 1905	10/6/1905 12:00	70	1	258.03	
3	NOT NAMED 3 1906	9/5/1906 0:00	115	4	147.18	
4	NOT NAMED 4 1908	9/12/1908 0:00	95	2	106.13	
5	NOT NAMED 2 1919	9/6/1919 18:00	80	1	148.02	
6	NOT NAMED 2 1923	9/25/1923 6:00	70	1	163.26	
7	NOT NAMED 8 1924	11/11/1924 6:00	80	1	149.14	
8	NOT NAMED 1 1926	7/25/1926 12:00	110	3	165.78	
9	NOT NAMED 6 1926	9/16/1926 18:00	130	4	76.53	
10	NOT NAMED 4 1928	9/14/1928 18:00	135	4	272	
11	NOT NAMED 4 1932	9/4/1932 6:00	110	3	199.07	
12	NOT NAMED 5 1933	7/27/1933 18:00	80	1	54.28	
13	NOT NAMED 11 1933	8/31/1933 0:00	70	1	84.29	
14	NOT NAMED 12 1933	9/2/1933 6:00	115	4	230.62	
15	NOT NAMED 9 1945	9/14/1945 6:00	105	3	50.3	977
16	EDNA 1954	9/7/1954 6:00	70	1	109.6	
17	HAZEL 1954	10/13/1954 6:00	85	2	193.35	
18	HILDA 1955	9/13/1955 6:00	85	2	145.76	
19	BETSY 1956	8/13/1956 6:00	95	2	220.29	
20	DONNA 1960	9/8/1960 0:00	130	4	165.78	
21	FLORA 1963	10/9/1963 0:00	75	1	285.14	983
22	FAITH 1966	8/28/1966 6:00	90	2	195.7	973
23	KATE 1985	11/18/1985 0:00	80	1	207.66	976
24	EMILY 1987	9/23/1987 6:00	70	1	291.2	984
25	BERTHA 1996	7/9/1996 12:00	100	3	274.43	965
26	HORTENSE 1996	9/12/1996 6:00	105	3	166.03	962
27	FRANCES 2004	9/2/2004 5:03	125	4	195.27	936

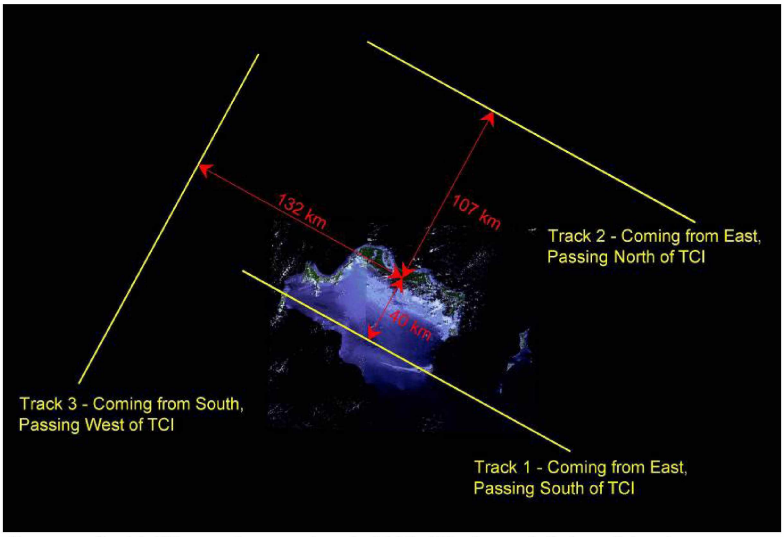
Legend:
Category 1
Category 2
Category 3
Category 4
Category 5

Source: National Hurricane Centre, Florida

Analysis of the historical hurricane tracks over the 105 year period, using data from the NHC, showed that there are three typical tracks which the hurricanes tend to follow[2]. Either they approach Turks and Caicos Islands from the east and pass south of the islands, approach Turks and Caicos Islands from the east and pass north of the islands, or approach Turks and Caicos Islands from the south and pass west of the islands. These typical tracks are shown in map 6.

[2] Smith Warner International, 2008. "Turks and Caicos Islands – Hazard and Vulnerability Assessment"

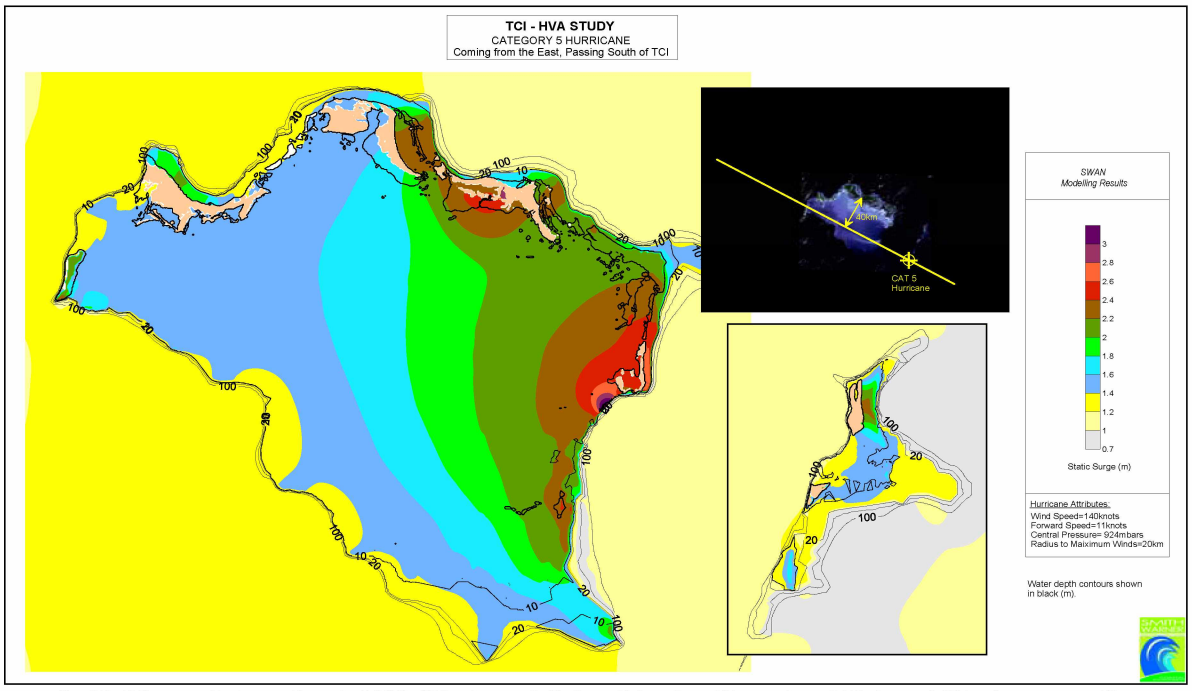
Map 6: Three generated storm tracks, based on historical data



Source: Smith Warner International, 2008. "Turks and Caicos Islands – Hazard and Vulnerability Assessment"

Hurricane Ike was typical of Track 1 in this schematization, with the distance from the islands being somewhat larger than in map 6. Map 7 below shows predictions of storm surge for a Category 5 hurricane passing on a westerly track and to the south of the Turks and Caicos Islands.

Map 7: Storm surge predictions for a Category 5 Hurricane South of the TCI



Source: Smith Warner International, 2008. "Turks and Caicos Islands – Hazard and Vulnerability Assessment"

3. Emergency actions

On the close approach of Tropical Storm Hanna, the National Emergency Operations Centre (NEOC), the disaster coordinating centre for the Turks and Caicos Islands was activated. A number of persons in low lying flood-prone areas sought shelter with family and friends in higher areas. A number of government-run shelters were also activated, which housed 12 persons on Grand Turk and 225 persons on Providenciales. Meanwhile, the Caribbean Disaster Emergency Response Agency (CDERA) was put on standby to provide assistance to the country.

Tropical Storm Hanna raised the readiness of the population for these types of events. Therefore, on learning that Hurricane Ike was heading directly for the Turks and Caicos Islands, citizens undertook emergency preparedness measures, including boarding up their homes, preparing hurricane kits and following the path of the storm through information channels.

Given the scale of the damage on the most affected islands, especially among the most vulnerable segment of the population, there was an urgent need for relief and assistance. The government and a number institutions and agencies rose to the challenge. The United Kingdom provided assistance by early deployment of HMS Wave Ruler and Iron Duke which came to the Turks and Caicos Islands soon after Hurricane Ike (within the first week) and assisted in early stabilization efforts. The government initially provided 5000 tarpaulin and two 40 ft water containers. Government also provided hot meals through two soup kitchens in Grand Turk and one in South Caicos at a cost of $2.25 million. The cost of the meals and handling for the Bermudian soldiers was borne by the Government of Bermuda to the tune of $115,230. Meanwhile, the International Federation of the Red Cross, in collaboration with the British Red Cross provided 3,100 tarpaulins, 1,500,000 water purification tablets, 5,000 mosquito nets and 5,100 jerry cans. The Independent Grocers Association (IGA) provided 1000 hot meals for a family of four for five days at $12.00 per plate. Tropical shipping warehoused five free 20 ft slots for government every week.[3]

[3] Source: ECLAC estimates based on Government data provided.

II. AFFECTED POPULATION

Tropical Storm Hanna and Hurricane Ike swept across the Turks and Caicos Islands in late August and then in early September 2008, respectively.

The Islands suffered no loss of life but there was much displacement of persons who sought refuge in shelters and at the home of family and friends. The Turks and Caicos Islands can be satisfied that the social construction of the society, with some 65% of the population being defined as Non-Belongers, did not disrupt the emergency response to the events in any significant way. All persons requiring safety, shelter or food support were provided with such. Table 4 presents selected characteristics of the Turks and Caicos Islands' population. Significant among those characteristics to note, is the rapid growth of the population from 19,886 in 2001 to 33,202 in 2006.

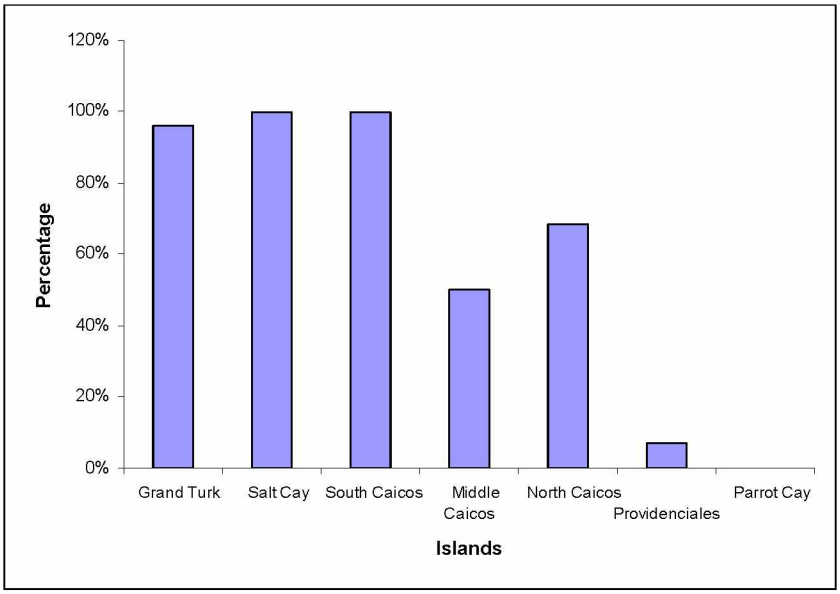
Table 4: Selected characteristics of the Turks and Caicos population

Year	2001	2006	%
Total Population	19,886	33,202	
Number of Households	7,254	11,858	
Growth rate	7.5	66.9	
Average household size	2.8	2.8	
Population By Sex			
Female	9,989	16,678	50.23%
Male	9,897	16,524	49.77%
By Status			
Belonger	**10,335**	**11,750**	**35.39%**
Female	5,316	6,044	18.20%
Male	5,019	5,706	17.19%
Non-Belonger	**9,551**	**21,452**	**64.61%**
Female	4,673	10,634	32.03%
Male	4,878	10,818	32.58%

Notes: Number of Households for 2006 is estimated using the average household size of 2.8
Source: Statistical office, DEPS

The most affected population, as expected, could be found in those Islands which felt the brunt of the disaster. Figure 1 illustrates the proportion of persons who were affected as a result of the impact of Hanna and Ike. Almost the entire population of Grand Turk, South Caicos, and Salt Cay were affected. These islanders either suffered the primary impact of the weather systems, resulting in wide-spread flooding and/or wind damage to homes or the secondary effects of loss of electricity and water for considerable periods of time. The weather systems resulted in a shortage of food on the islands and arrangements were put in place to ensure that those who were in need received a basic food supply. The affected population included those who suffered complete destruction of their homes from the weather systems.

Figure 1: TCI: Proportion of population affected by Tropical Storm Hanna and Hurricane Ike by Island



Source: ECLAC estimates based on official government data.

It is important to note that Belongers and non-Belongers were affected alike by the disaster and this may be a function of the economic structure of the society. The Poverty Assessment which was concluded in 2000[4] noted that Turks and Caicos Islands islanders comprised 49.5% of the poor, as detailed in table 5. It should be remembered that poverty is a central dimension of vulnerability to natural disasters. The limited asset base of the poor acts as a constraint in their ability to withstand the effects of devastation and ability to bounce back quickly following a disaster.

Table 5: Poverty by Nationality

Nationality		% of the Poor
TC Islander		49.5
Bahamian		1.7
Haitian		38.0
Dominican Republic		3.4
Other		7.4
Total	**%**	**100**
	N	**769**

Source: Poverty Assessment 2000, Table 5

Table 6 details the affected and severely affected population by island. In all, 31% of the population or 10,270 people were affected by Tropical Storm Hanna and Hurricane Ike, with 2% of the population or 825 people being severely affected.

[4] Discussions are underway by the Government of the TCI and the Caribbean Development Bank for a newly administered Poverty Assessment.

Table 6: TCI: Affected population

Island	Population 2006	Estimated Population at time of disaster (2008)	Number of people severely affected[1]	Total number of people affected[2]
Grand Turk	5,718	5,718	457	5489
Salt Cay	114	238	6	238
South Caicos	1,118	1,600	240	1596
Middle Caicos	307	307	…	154
North Caicos	1,537	1,537	…	1052
Provo	24,348	24,348	122	1741
Parrot Cay	60	60	…	…
Total	33,202	33,808	825 (2%)	10270

Source: Statistical Office, DEPS and data from official Government sources.
[1] - Severely affected = without homes
[2] – Affected population = living in damaged and/or destroyed homes.

A. Key social dimensions of disasters

1. Vulnerability of women

Box 2 presents some of the issues, peculiar to women, which need to be kept in mind as the society seeks to understand how the impact of Tropical Storm Hanna and Hurricane Ike impacted on different segments of the population. Through an appreciation of the differing starting points of men and women better recovery and reconstruction programmes can be considered.

Box 2: Vulnerability of women

(a) Female-headed households (FHH) comprise 34.8% of heads of households in TCI and were more often found among the poor than their male counterparts (20.4% and 17.4%, respectively);

(b) FHH traditionally have an increased burden of care than their male counterparts due to their inability to earn similar incomes, and the necessity to meet similar needs with fewer resources;

(c) Women continue to dominate the category of employment as domestic workers (49 males for every 100 females) with the attendant disadvantages – lack of social security benefits, low wages;

(d) The poorest households had more children than the wealthiest (3.9% to 1.9%, respectively);

(e) Women who depend on the informal economy to either support their families outright, or contribute to their family income through backyard gardens, were sorely affected by the destruction of fruit trees, vegetables – okra, corn, melons (evident particularly in North and Middle Caicos); and

(f) Women and children are at risk of violence and depravation as male partners may turn to alcohol abuse and other deviant behaviours as the toll of not being able to support their families and earn an income, becomes a reality following the devastation of Tropical Storm Hanna and Hurricane Ike.

2. Threats to social cohesion

Hurricanes have played an important role not only in the economic status of the country shifting from cotton production to salt production and to tourism in the late part of the twentieth century. It has also shaped the country's social development as well.

The history of the Turks and Caicos Islands suggests that the effects of the devastation of an early nineteenth century hurricane caused the abandonment of settlements along with enslaved persons. This series of events allowed descendants of those who stayed behind to be known as "Belongers"[5].

In the context of the social dislocation which may be caused in the aftermath of a natural disaster, such as the impact of Tropical Storm Hanna and Hurricane Ike on the Turks and Caicos Islands, it is recommended that policy makers be mindful of the social disruption which such events may cause and act swiftly to arrest what may be a deteriorating situation or to strengthen social cohesion.

Five dimensions of social cohesion which may be addressed through social policy in the aftermath of the disasters which are pertinent to the Turks and Caicos Islands are:

(a) Addressing the material conditions of the population affected following the disaster – their dislocation from housing and schools, and access to health facilities; and the possible deteriorating relationships with others;

(b) The restoring of the sense of safety and peace – the psychosocial trauma which residents of Small Island Developing States (SIDS) experience following a natural disaster cannot be over emphasized and returning people to a sense of safety and peace is important. This is true for the aged and the young and for people from all walks of life. It may require speedy efforts to restore safe housing and normalcy and the provision of psychosocial counseling;

Box 3: Psychosocial Trauma and Disasters

The term psychosocial, relates social conditions to a person's mental health. Following catastrophic events such as earthquakes, hurricanes, tsunami or volcanic eruptions, people may experience physical or psychological trauma. Psychological trauma may result in realistic or unrealistic stresses and fears being aroused, which can overwhelm individuals' and communities' ability to cope. It is important to remember that people react differently to catastrophic events some coping better than others.

Psychosocial trauma or the manner in which a natural event such as, a hurricane, can impact on a person's social conditions (their livelihoods or living conditions) and concomitantly their mental health may influence family dysfunction, loss of employment and deterioration of living conditions.

(c) Strengthening social networks – often after a disaster people migrate seeking employment or temporary shelter elsewhere. They send their children off to schools on different islands until things return to normal in their own environment. These

[5] The status of Belonger according to the Revised Immigration Ordinance of May 15, 1998, is a status gained through birth, being born to a Belonger or acquired by the decision of the Turks and Caicos Government under local legislation.

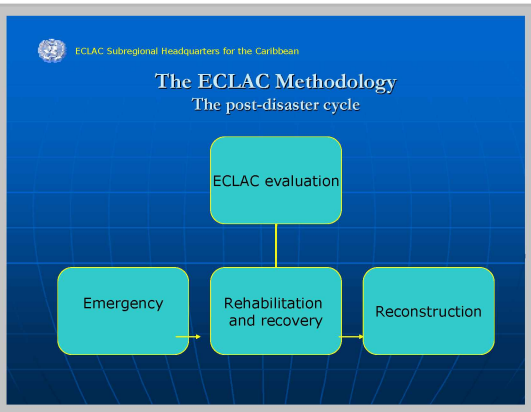
various disruptions may affect the normal social networks which are usually available to individuals and families and give people a sense of faith and trust in the society;

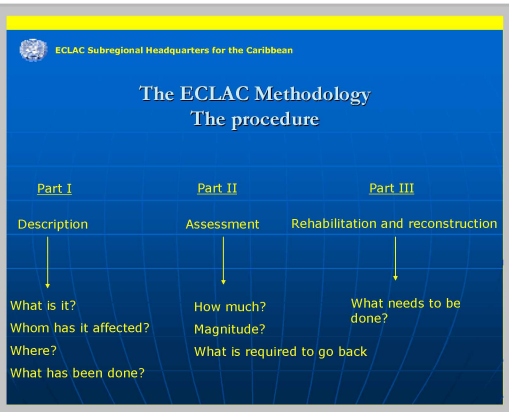
(d) Ensuring social inclusion - a sense of belonging and non alienation from their own environment. In the reconstruction and rehabilitation phases of addressing the disaster, people must feel a part of the process and that the disaster is not being used as an opportunity to dislocate them and exclude them from their environment or social processes; and

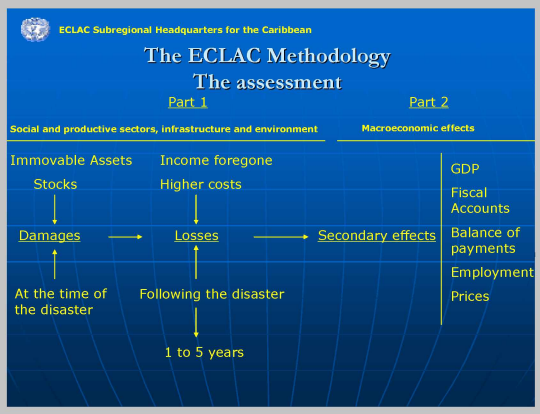
(e) Fostering social equality – it is important that the various populations, and in the case of Turks and Caicos Islands the Belongers and Non-Belongers, feel that their concerns are being heard and treated equally with those of others. This calls for open and transparent mechanisms for reconstruction.

III. DESCRIPTION OF DAMAGE AND LOSSES BY SECTOR

Box 4: Damage assessment: The ECLAC Methodology







The ultimate goal of the ECLAC assessment methodology is to measure in monetary terms the impact of disasters on the society, economy and environment of the affected country or region. National accounts are used as a means of valuation, supplemented with procedures for specific estimates such as environmental damages and the differential impact on women.

Application of this methodology provides affected countries or regions with the means to determine the value of lost assets and define reconstruction requirements. It enables the identification of the most affected geographical areas and sectors, together with corresponding reconstruction priorities. In addition, it provides a way to estimate effects on economic flows, the affected country's capacity to undertake reconstruction on its own and the extent to which international financial and technical cooperation are needed. Moreover, it can be used to identify the changes to public policy and development programmes/plans needed to deal with needs arising from the disaster and to avoid undesirable effects in economic performance and public well-being.

Assessment activities described in this Handbook should be carried out when the emergency stage has been completed or is nearing conclusion, so as not to interfere with those actions and to ensure the availability of the necessary personnel and basic information. They are intended to facilitate the identification of needs and priorities for the reconstruction stage.

Source: ECLAC Handbook for estimating the socio-economic and environmental effects of disasters; diagrams: ECLAC Subregional Headquarters for the Caribbean.

A. Productive sector

The main productive sectors in the Turks and Caicos Islands as a whole suffered varying degrees of impact by Tropical Storm Hanna and Hurricane Ike. The islands of North and Middle Caicos suffered mainly from flooding caused by Tropical Storm Hanna, while the islands of Grand Turk, South Caicos and Salt Cay bore the brunt of the wind damage associated with Hurricane Ike. This chapter outlines the economic consequences of damage and losses to the economic sectors. In addition, sector analysis indicates:

(a) The external impact of the damage and losses as reflected in the loss of foreign income through exports;

(b) The incremental need for foreign supplies and imports; and

(c) The need for incoming resources in the form of foreign assistance or aid and insurance and reinsurance payments.

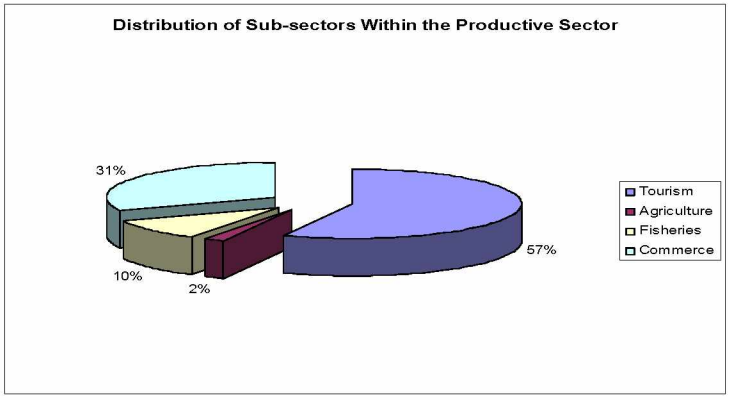
Table 7 outlines the distribution of impact across the various subsectors of the productive sector. Approximately 57.0% of the total damage and loss was by the tourism subsector while the wholesale and retail trade accounted for 31.4 % (see figure 2).

Table 7: Distribution of impact across subsectors of the productive sector (US$)

	Damage	Loss	Total
Tourism	$2,966,141.00	$8,849,917.00	$11,816,058.00
Agriculture	$337,250.00	$74,025.00	$411,275.00
Fisheries	$832,115.00	$1,220,000.00	$2,062,115.00
Wholesale and Retail Trade	$3,951,840.00	$2,603,637.00	$6,555,477.00
Environment (Waste removal)		$4,800.00	$4,800.00
Total	**$8,090,130.00**	**$14,772,379.00**	**$22,862,509.00**

Source: ECLAC estimates based on official government data

Figure 2: Distribution of subsectors within the productive sector



Source: ECLAC estimates based on official government data

1. Tourism

The economy of Turks and Caicos Islands is highly dependent on the tourism sector. In 2007, the tourism sector contributed over 34% of GDP and over 16% of employment. Between 2001 and 2007, jobs grew by 51.0% (9407) in the sector, and this trend continued in the months preceding the hurricane.

Overall, the extent of damage to the tourism industry was considered to be minimal based on two factors. First, Providenciales, which accounts for some 87% of the hotel room stock, was spared significant damage. Second, the hurricane hit during the low season, when visitor arrivals and activity are minimal. Normally, during this period hotel occupancy levels run at between 40% and 50% and proprietors use the opportunity to undertake annual refurbishments. The experience of Grand Turk, however, was completely the opposite. The passage of the hurricane had a crippling effect on the economy of Grand Turk, which, though having only 3.9% of total hotel room capacity is largely dependent on tourism.

The hurricane reduced the available room stock, in Providenciales, albeit temporarily, in a very marked way. In the two weeks after Hurricane Ike, an estimated 80% of the hotels on Providenciales remained closed. This resulted in losses of approximately $2,000,000 in revenue.

2. Damage

Most of the hotels in Grand Turk, in particular, experienced extensive roof damage or complete loss of roofs which resulted in damage to equipment and furnishings. In addition, Hurricane Ike was particularly harmful to trees and other forms of vegetation. Based on the level of damage experienced by the hotels, a majority of proprietors anticipated being out of business for between 8-12 weeks. In some cases though, hotels began operating on reduced capacity. In this environment, with scaled-down activity it is expected that profit margins will be squeezed with adverse effects on tax proceeds and employment in the sector.

Based on partial data, damage was estimated to have reached $2.9 million (see table 8).

Table 8: Estimate of damage caused by Tropical Storm Hanna & Hurricane Ike

Tourism	
Damage (US$)	
Activity	**Damage**
Hotels	$2,837,275.00
Guest Houses	
Marina	$9,650.00
Heritage & Recreational Sites	$100,000.00
Cruise Ships	na
Other	$19,216.00
TOTAL	**$2,966,141.00**

Source: ECLAC estimates based on official government data

3. Loss

The estimates of losses were made using data provided by the Department of Economic Planning and Statistics, informal survey of hotels and information obtained from the Turks and Caicos Tourist Board. Based on these data:

(a) Average length of stay is seven days;

(b) Room rates ranged between $125 and $175/day; and

(c) Average tourist expenditure was $262.39 (2004).

The assessment also included loss of revenue from airport tax. In addition, the fact that the hotel damaged on Grand Turk invested an average of $100 per day for emergency generators was considered.

Table 9: Estimate of losses caused by Tropical Storm Hanna & Hurricane Ike

Loss Estimates (US$)	
Activity	**Loss**
Hotels	$609,050.00
Guest Houses	$28,800.00
Marina	$120,000.00
Heritage & Recreational Sites	$44,067.00
Cruise Ships	$8,000,000.00
Other	$48,000.00
TOTAL	**$8,849,917.00**

Source: ECLAC estimates based on official government data

Losses resulting from Hurricane Ike resulted from the following:

(a) Lower hotel occupancy (particularly in Grand Turk);

(b) Lower tourist expenditure (partly due to discounted room rates);

(c) Increased expenditure on energy due to the use of emergency generators to compensate for the loss of electricity; and

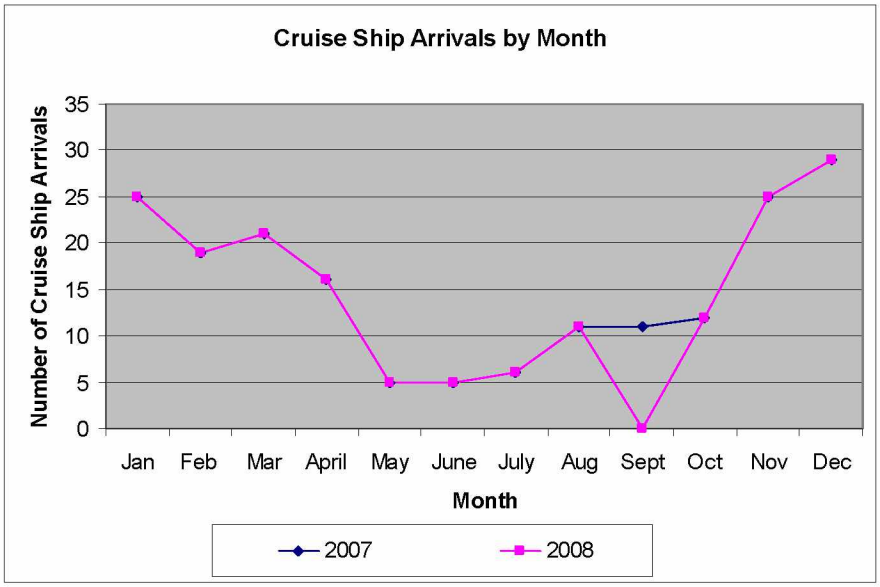
(d) Lower revenues from exit taxes

Based on available data, total effect on the tourism sector was estimated at $10.8 million (see table 10). The bulk of the losses, resulted from revenues forfeited, associated with the closure of the Grand Turk Cruise Centre for the entire month of September. This resulted in lower cruise passenger arrivals and revenues. In 2007, some 532,245 cruise passengers were brought to the island. However, cruise ship arrivals were halted due to the passage of the hurricanes even though the cruise ship centre was largely spared any significant impact.

However, without a fully functioning support infrastructure the island's cruise industry was crippled.

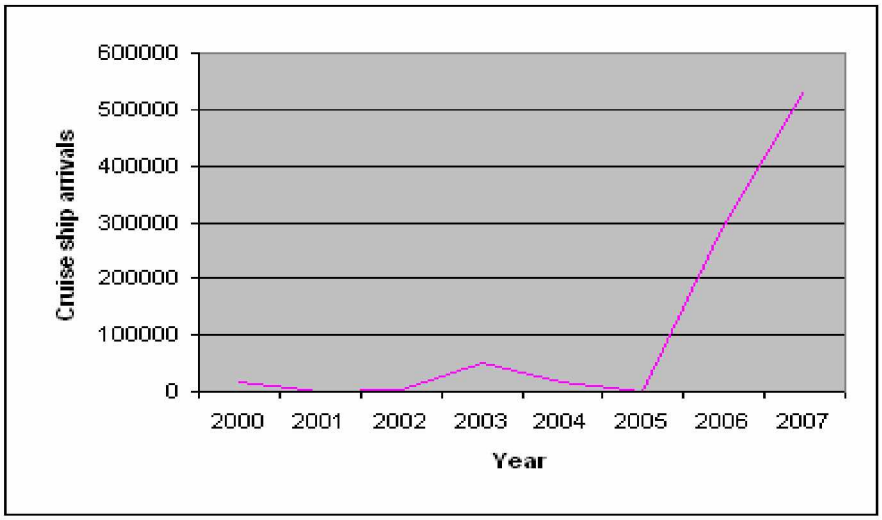
The Grand Turk Cruise Center is the largest private employer on Grand Turk. The cruise center staff, combined with shore excursion operators, comprise approximately 80% non-government jobs in Grand Turk. Cruise ship arrivals prior to the 2006 were on average 20,000 visitors per year. This number increased dramatically to 295,000 visitors in 2006 and 532,245 in 2007. Based on trends established since 2007, cruise ship arrivals were expected to show an increase in 2008. However, due to the hurricane, earnings from cruise arrivals can be expected to show a decline. Lost cruise passenger arrivals for the month of September are estimated to be 59,000 visitors. Loss of revenue from cruise ship activity for September is estimated at $8 million. Nevertheless, one encouraging development is that cruise ship arrivals resumed on 8 October 2008, as scheduled. Although the multiplier from this resumption was not as large as in the past due to the closure of shops, commercial and other businesses that cater to passengers and taxi drivers who would have benefited from tours. Figures 3 and 4 present a picture of the loss of cruise ship arrivals to Grand Turk. The graph extrapolates what the arrivals would have looked like had Hurricane Ike not occurred.

Figure 3: Cruise ship arrivals by month



Source: ECLAC estimates based on official government data

Figure 4: Cruise ship Tourist Arrivals (2000- 2007)



Source: ECLAC estimates based on official government data

Loss of revenue due to reduced hotel occupancy was estimated at $6 million. In Grand Turk, it was estimated that over 90% of the rooms will be unavailable for between 8 and 12 weeks. After adding damage and losses, it was estimated that the total impact caused by Tropical Storm Hanna and Hurricane Ike to the tourism sector was estimated at $11.8 million.

Table 10: Damage and Loss estimates in the Tourism Sector

Tourism			
Damage & Loss Estimates (US$)			
Activity	**Damage**	**Loss**	**Total effect**
Hotels	$2,837,275.00	$609,050.00	$3,446,325.00
Guest Houses		$28,800.00	$28,800.00
Marina	$9,650.00	$120,000.00	$129,650.00
Heritage & Recreational Sites	$100,000.00	$44,067.00	$144,067.00
Cruise Ships	na	$8,000,000.00	$8,000,000.00
Other	$19,216.00	$48,000.00	$67,216.00
Total	**$2,966,141.00**	**$8,849,917.00**	**$11,816,058.00**

Source: ECLAC estimates based on official government data

4. Agriculture and livestock

Agriculture constitutes a minor industry in the Turks and Caicos Islands. In 2007, the sector contributed 1% of GDP. At present, agriculture is chiefly a subsistence activity among some 100 subsistence farmers on North and Middle Caicos. There are three farms which have

the provisional status of developing/commercial or commercial farms.[6] A 40 acre government farm in Kew, serves as a mother farm.[7] There is need for new technological approaches and incentives to attract young persons and investors to the sector to increase its productivity and sustainability

5. Crops and livestock

The passage of Tropical Storm Hanna and Hurricane Ike caused almost complete devastation to crops. The effect on the sector was estimated at $411,275. The destruction to crops resulted in farmers losing vegetables, root crops and fruits at varying stages of maturity. Tree crops including coconuts, sapodillas, sugar apples, avocadoes and mangoes, were also severely damaged, most of them flattened and/or broken by the power of winds from Hurricane Ike. Damage amounted to $337,250, as detailed in table 11.

Table 11: Damage and Loss estimate in the Agriculture Sector

Item	Damage	Loss	Total
Production Losses			
Vegetables	51 000	6600	57 600
Fruits	55 250	33425	88675
Sugar Cane	40 000	4000	40000
Ground Provisions	34 000	3600	34000
Horticulture Plants		400	400
Losses of Stock			
Seeds	5 000		5000
Seedlings/Plants	98 000		98000
Planting Materials	10 000		10000
Chemicals	39 000		39000
Damage to Physical Infrastructure	5 000		5000
Livestock Losses		1000	1000
Drainage Works		25000	25000
Total	337250	74025	411275

Source: ECLAC estimates based on official government data

Loss to the agricultural sector was estimated at $74,025. This comprised in the main loss of income from crops on the government farm that were ready for market; and loss of income to subsistence farmers. The immediate impact of this is that these farmers will be deprived of their livelihood support which will further increase their socio-economic vulnerabilities, especially in an environment of rising costs of living. The quantity of damage to agricultural stocks, including

[6] This category represents farms that have not fully attained commercial status, but are in the process of doing so and are currently at varying stages of development.
[7] In total, agriculture uses approximately 200 acres of land on both these islands.

seedlings and planting materials, was noteworthy. This category accounted for close to 30% of the overall damage in the sector and could have a short to medium term impact on agricultural production.

Given the strategic importance of agriculture in improving the country's food security as well as in the control of rural-urban migration, a concerted effort should be made to rehabilitate the sector as quickly as possible. Government assistance to the farmers affected by the hurricane would help to rebuild confidence in the agriculture sector and assist the Government in realizing its goals diversifying and strengthening output and productivity in the sector.

6. Fisheries

Fishing is a major activity in Turks and Caicos with a majority of the commercial fishing taking place mainly on the Caicos Bank. In terms of value, the fisheries resources rank as the third most important industry in the Turks and Caicos Islands economy after tourism and the financial services. Catches are dominated by lobster and queen conch, both of which are processed and exported primarily to the United States[8]. Finfish species such as groupers, snappers and large pelagics are utilised for local consumption or as part of the sport fishery.

Fishing infrastructure in Turks and Caicos Islands is characterized by trap boats, electronic reel boats, traps, cold storage facilities and processing plants[9]. Commercial fishers experienced damage or loss of fishing infrastructure which prevented or considerably slowed down fishing activities following the hurricane. In addition, damage to fishing infrastructure by the power outages, led to spoilage of some stock.

Damage to the fisheries subsector was estimated at $832,115 (see table 12). This included structural and roof damage to three processing plants; lost or damaged boats; and lost or damaged traps. Among the fish processing plants, roof and ceiling damage; and damage to packing boxes and pump houses formed the bulk of the damage. South Caicos, one of the predominant commercial fishing areas in TCI, reported damage amounting to $678,115 or roughly 80.0% of the damage accrued. The disruption of the fishing subsector in South Caicos is expected to lead to severe short-term hardship for the population because of the centrality of this activity to livelihood. On Grand Turk, where the subsector is much less important damage amounted to $130,000.

In addition to damage to fishing infrastructure, the subsector also incurred revenue loss due to the inability of fishers to sell their products. Loss was estimated at $1, 230, 000 based on retail value estimates in South Caicos over a three to four month period (see table 14 below). A shortcoming of these estimates, however, is that they only take into account losses in terms of lost sales and not future losses to the fisheries resource base.

It has been estimated that it will take another three to four months for business to be back to full operation. Rebuilding the sector will undoubtedly require considerable capital outlay. In

[8] Lobster is exported mainly as frozen tails and conch as frozen clean meat.
[9] The products are mainly landed and processed at any of the five Class 'A' fish processing plants in the country

seeking to rebuild the sector serious consideration should be given to incorporation of mitigation measures into fisheries operations in order to reduce future damage and losses.

The total effect on the fisheries subsector amounted to $2,062,115.

Table 12: Total Damage and Loss in the Fisheries Subsector

Area	Damage	Losses	Total Damage & Losses
Providenciales	$24,000	$40,000	$64,000
Grand Turk	$130,000	$360,000	$490,000
South Caicos	$678,115	$830,000	$1,508,115
Total	**$832,115**	**$1,230,000**	**$2,062,115**

Source: ECLAC estimates based on official government data

7. Wholesale and retail trade

The wholesale and retail trade accounts for approximately 7% of the GDP of the Turks and Caicos Islands and also contributes significantly to employment. In 2005, there were a total of 944 such establishments in Turks and Caicos Islands of which 73.6% or 695 and 174 or 18.4% were located in Providenciales and Grand Turk, respectively. Of this, retail establishments are dominant, followed by petty traders, construction and transportation services. The latest available data categorize 74.9 % business establishments as micro, 9.2% as small, 11.3% as medium and 4.7% as large firms.

Based on partial data, total damage in the wholesale and retail sector is estimated at $3.9 million. This includes damage relating to the destruction of a wide range of commercial and services activities including supermarkets, small shops, restaurants, and bars. Grand Turk was by far the most severely affected island with an estimated 80% of the businesses experiencing some form of damage. In a large majority of the cases, wind damage was the predominant source of damage although there were instances of flooding. One large supermarket was completely destroyed and two others received major damage to roof as well as structural damage. There was also considerable loss of stock. In particular, supermarkets, restaurants and small grocers in Grand Turk, Salt Cay and South Caicos suffered losses from their meat and dairy inventory due to power outages or inconsistent power supply during and after the hurricane.

Using partial data, losses due to business disruption were estimated at $2.6 million. As observed in other jurisdictions that have undergone similar hurricane impact losses associated with business interruptions have been somewhat mitigated by the quick response of merchants to reestablish their businesses. However, the efforts of merchants to resume operations have been hampered by the increased operational costs brought about by the need to use generators for emergency electricity.

In analyzing the differential impact of the hurricane and the response of businesses, it was observed that the impact was more pronounced among micro and small businesses which comprise approximately 84% of registered businesses. In general, these types of businesses are more vulnerable to external shocks largely because a majority of them are uninsured; have very little savings and have no other source of income. For these reasons, these types of businesses have tended to reestablish their businesses quickly although with considerable financial difficulty and with an imbedded precariousness and susceptibility to future shocks. It was observed that larger businesses that were insured were better able to cope and resume operations on a less vulnerable footing.

In crafting a strategy for the recovery, a number of critical issues will have to be taken into consideration as follows:

(a) In the short to medium term, businesses are likely to experience reduced cash flow, as well as an inability to service any existing debts. This will have significant implications for the local economy and the suppliers of goods and service to the wholesale and retail sector;

(b) Business owners of all sizes in Grand Turk have to face the burden of rebuilding their homes at the same time that they are trying to rebuild their businesses. This will make it more difficult for the business to recover; and

(c) Shortage of goods in the wholesale and retail sector is likely to lead to price increases in the short run and higher imports to restock inventory are expected to lead to a widening of the merchandise deficit of the balance of payments.

Table 13: Damage and Loss estimates in the Wholesale and Retail Establishments

Activity	Damage	Loss	Total Damage & Loss
Wholesale & Retail Trade			
Small Shops	$1,093,644	$1,033,737	$2,127,381
Supermarkets	$2,039,476	$355,800	$2,395,276
Bars and Saloons	$19,200	$36,500	$55,700
Restaurants	$768,800	$527,600	$1,296,400
Mechanic Shops, Garages, Service Stations	$30,720	$350,000	$380,720
Craft Shops	n.a	$300,000	$300,000
Total	**$3,951,840**	**$2,603,637**	**$6,555,477**

Source: ECLAC estimates based on official government data

B. Infrastructure sector

1. Water storage, treatment and supply

Water supply for residents of the Turks and Caicos Islands typically comes from wells that tap into the fresh water lens, which lies beneath some of the islands; from infrequent rains; and from reverse osmosis desalination plants. Many residents in the Turks and Caicos Islands have sizeable cisterns to store water collected from roofs or delivered by truck. For example, until recently, each home built in Providenciales was required to have one of these.

For Grand Turk, there was some damage to the roof of the storage tanks next to the water plant at the Pan-Am Overflow (building dimensions were approximately 100' x 100'). In addition, there was minor damage to pipes at this location. As a result of the loss of electricity following the storm, stand-by generators were borrowed from the Turks and Caicos Utilities Ltd (TCU) and from a local contractor. In summary, two generators were borrowed, a 600KW unit from the TCU, and a 150KW unit from the local contractor. Fuel had to be purchased in order to run these generators on a "24 x 7" basis for a two-week period until the main power was returned. It should be noted that water for Grand Turk is produced from a desalination process (City Water) and is operated by the government, and not by a private enterprise, as it is on Providenciales.

Throughout the other islands, most people obtain water from cisterns. As a consequence, there were no water supply shortages following the passage of the two storms, unless piping was damaged, or as was the case in many instances, electricity was out and pumps were not able to work. Even in those instances, however, people made an effort to fix damaged piping themselves, or were able to bale water out of the cisterns by hand. Water shortages therefore never became an issue with this event.

In Providenciales, the Turks and Caicos Water Company deals with the production of potable water. The company uses seawater wells to draw water to be treated at the reverse osmosis desalination plants, which are located along the coast. The present production and storage of Turks and Caicos Water is approximately 2.3 million gallons per day. The distribution of water is handled by Provo Water, for which the present demand is between 10 –11 million gallons per month. There were no major reports of water shortages in Providenciales following either Tropical Storm Hanna or Hurricane Ike.

Estimate of damages and losses were developed following a meeting at the Ministry of Housing, Agriculture, Works and Telecommunications. Damage estimates were developed from an evaluation of the costs to repair the damaged storage tank roof. Losses initially accounted for the rental of fuel for generators, and were subsequently expanded to take into account the trucking of water to various homeowners and/or businesses.

The computed damage and loss figures are given as:

(a) Estimate of Damages (Total) $300,000

(b) Loss of Income (Total) $ 39,200

For future hurricane events of a major nature, it may be prudent to adopt the following strategies so as to provide a reduction in the vulnerability of the water supply systems.

(a) It is recommended that the desalination plant in Grand Turk be equipped with an adequate stand-by generator and with a fuel storage tank; and

(b) On an ongoing basis at the start of, and throughout, the hurricane season, maintenance personnel should ensure that the generator is serviced and in working condition, and that the tank is fully stocked.

2. Electricity generation and transmission

Electricity in the Turks and Caicos Islands is supplied by the Provo Power Company Ltd. (PPC) and by the Turks and Caicos Utilities Ltd. (TCU). PPC supplies the majority of the power to Providenciales, North Caicos, Middle Caicos and South Caicos, while TCU supplies power to Grand Turk and Salt Cay.

Approximately 90% of power lines are above ground and are consequently vulnerable to wind and falling trees. New installed cable lines and electrical switch gears are underground; these are vulnerable to flooding during heavy rains from tropical storms and hurricanes. Standby power generators are used in cases of emergency, however, they are limited in number, a fact that can create problems at hospitals, airports, and clinics.

All the inhabited islands depend on diesel fuel for power generation. Fuel is brought in from Providenciales and Grand Turk to the other islands by ferry. This inter-island transfer of fuel is loaded from an offshore linkage. In the event of heavy seas due to inclement weather, this process could be at risk. The question of adequate standby fuel storage is therefore an issue for consideration.

(a) Turks and Caicos Utilities Ltd. (TCU)

A meeting was held with the Managing Director of the TCU, in order to gain a first-hand account of the damages sustained during the two events. It was confirmed at this meeting that the TCU supplies power to both Grand Turk and Salt Cay, and that over 95% of the system had gone down during Hurricane Ike. This included poles, lines, line hardware, transformers, generator buildings, etc. In addition, it was estimated by TCU management that it would take approximately three months for the rehabilitation work to be completed, which would mean that the last customers would be connected by December. It was also noted that a part of the customer base would not come back on line, as these were people whose houses had been destroyed in the storm. This grouping was however, expected to be a small part of the customer base. In Grand

Turk the TCU services approximately 2200 customers, while in Salt Cay this number is closer to 100.

It was noted by the Managing Director of the TCU that prior to the hurricane, the peak generating capacity was 4 MW. At the time of the ECLAC visit in September/October, they had gone back to 700KW and it was expected that they would go to 3MW by the end of the year (i.e. not back to their previous peak). In the rehabilitation exercise, all equipment would have to be sourced from North America.

With respect to damages and losses sustained, it was noted that since all fuel was imported from the Bahamas, there may have been some savings from the lack of fuel usage. This figure, however, was overshadowed by the loss of income estimates while there was no electricity supply. Damage estimates were obtained from the Managing Director and his Financial Officer, while the estimate of losses were computed from the company's gross annual revenue and factoring this for the time when consumers were off-line.

With respect to reduction of vulnerability for future events, it was indicated that the company would:

(a) Replace existing (or failed) 45-Class 3 and 40-Class 4 poles with 40-Class 3 poles;

(b) Continue the practice of burying the pole by 10% of its length plus 2ft; and

(c) Going underground in some areas, although this was really a matter of cost.

Finally, the management of the TCU made a plea for grant assistance based on the fact that it was a relatively small utility, and that damages and losses exceeded its annual revenue expectations. It is recommended that this request be given due consideration.

(b) Provo Power Company Ltd. (PPU)

A meeting was held with the Vice President, Operations. He indicated that of the company's total estimated damage and loss estimates, approximately 60% of the damages occurred in South Caicos, with the remaining 40% being distributed between Providenciales (≈20%), Middle Caicos and North Caicos (≈ 10% each). In South Caicos, a sister company of PPC provides electrical power. This company is known as Atlantic Equipment (AEP), and is subsidized by the government due to the small customer base there. Of a total customer base of approximately 9150 connections, the breakdown per island was estimated to be: Providenciales 7620 (83%); Middle Caicos 150 (2%); North Caicos 800 (9%); South Caicos 570 (6%). It should be noted that Beaches Resort in Providenciales is the largest customer of the PPC. The closure of this resort for rehabilitation until 15 November 2008 was therefore expected to generate a significant loss of revenue for the company, although this would have been mitigated to some extent by the Business Interruption Insurance, which was slated to come into effect 30 days after the event.

Throughout the hurricane, PPC kept approximately 25% of its 28MW capacity going. It was possible to do this as the company uses underground feeders for parts of Provo. By the time

of the ECLAC mission, approximately 22MW had been restored to service. Damage to equipment included:

(a) 50 poles down in Providenciales;

(b) 50 poles down in North Caicos;

(c) 25 poles down in Middle Caicos;

(d) 400 poles broken off in South Caicos (representing approximately 90% of total number of poles);

(e) Damage to the submarine cable running from Providenciales → Pine Cay → Dellis Cay → North Caicos; and

(f) Property damage to building infrastructure.

Work had started on the rehabilitation exercise shortly after the event, and power was restored to Provo within approximately 10 days, to North Caicos within approximately 17-20 days, to Middle Caicos within 20-28 days and was expected to be back in South Caicos within six weeks. In all, it was expected that there would be full resumption of service to all customers by the end of October. It should also be noted that PPC gave 50 generators to residents of South Caicos on a "first come, first served" basis. It can be conservatively estimated that approximately 40% - 50% of households on that island used generators during the long period of outage.

The following actions were being taken by the PPC, which were intended to reduce the vulnerability of the system to future events:

(a) In many cases, poles were over 20 years old. These were to be replaced with 40-Class 3 poles;

(b) The conductors on the poles were to be upgraded; and

(c) In some cases, it was found that the depth of pole embedment was inadequate. This was to be addressed in all replacement works.

From a point of general interest, it was noted that the entire system was being upgraded on a five-year budget plan (including generation, as well as transmission and distribution equipment). The load growth was estimated to be at a rate of 15% per year, with 6MW of capacity being added this year. Upgrading efforts would target reliability and customer service issues.

3. Damages and losses

The costs incurred as a result of the hurricane were obtained following discussions with the two company managers listed above. These values are summarized as follows:

(a) The total cost of the estimated direct damages for the electricity generation sector, based primarily on damage to equipment, was $8,500, 000; and

(b) The total cost of estimated indirect losses for the electricity generation sector, based primarily on loss of income and cost of fuel, was $2,253,000.

4. Telecommunications

Telecommunication services (land lines and mobiles) are provided by Cable and Wireless, through a combination of microwave links between the islands. The microwave links also carry VHF nets for emergency telecommunication services used by police officers, Emergency Operations Centre (EOC) officials and other relevant personnel. The Cable and Wireless Office and the microwave towers are located in an area vulnerable to flooding on Front Street, Grand Turk. Mobile services to this sector are also provided by Digicel, which claims a market share of between 40%-50%.

(a) Cable and Wireless

A summary of damages suffered by C&W was obtained through an interview with the Chief Executive Officer, as follows:

(a) To a large extent, damage to fixed lines resulted when utility poles which held telephone cables were brought down;

(b) Understandably, mobile services were not too badly affected;

(c) The company needed to purchase bucket trucks and service vehicles to operate in Grand Turk, South Caicos and Salt Cay;

(d) Stand-by generators were used where available, with approximately 12 generators being brought into service;

(e) C&W was likely to waive rentals to compensate users for the period when service was down. To some extent, however, these losses were mitigated by the fact that mobile usage increased during and after the hurricane; and

(f) There were some problems with poles going down in Middle Caicos.

(b) Digicel

An interview was held with the General Manager of Digicel. He and his senior team members indicated that damages occurred to equipment during both Tropical Storm Hanna and Hurricane Ike. Specifically:

(a) During Tropical Storm Hanna, there was a lightning strike in South Caicos that caused the system to go down. The same event resulted in the breaking of a leased tower in Grand Turk; and

(b) During Hurricane Ike, Digicel lost tower related equipment in Grand Turk at two separate locations. In South Caicos the company suffered microwave damage and in North Caicos there were antennae damages.

There was also damage to generator spares and some technical hardware equipment.

Loss of income for a two-day period following these events was mitigated by the fact that many customers made additional calls before the event, and by the fact that free mobile phones were given out, thereby facilitating additional calls. Other losses included the cost of chartering a light aircraft, a helicopter, accommodation and food for staff, boat charters, etc.

Vulnerability reduction measures being implemented by the company include:

(a) An increase in the redundancy of the system;

(b) The use of dishes that are better suited to handling higher winds – i.e. cone shaped antennae, which are more streamlined;

(c) A policy which would see the changing out of antennae in all critical locations;

(d) More spare parts to be kept in inventory; and

(e) Strategic use of local personnel, in the individual islands, who would be trained and be responsible for the repair of equipment in times of need.

5. Damages and losses

Total estimates for both telecommunications providers were obtained from interview and information provided as described, and is given as follows:

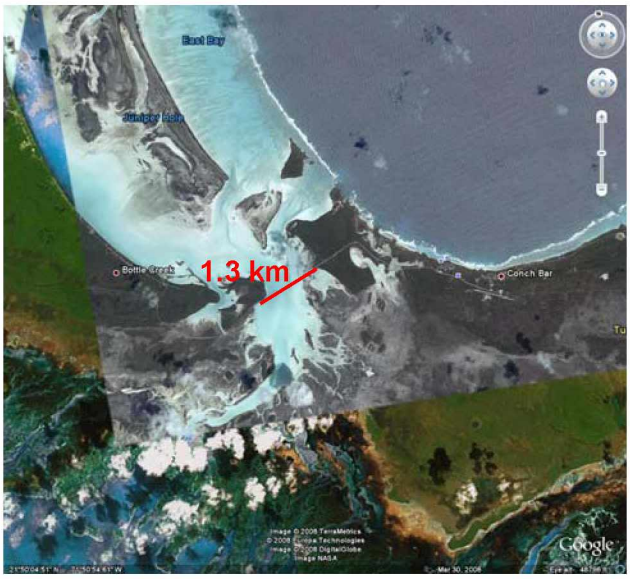
(a) Total estimate of damages was $2,605,000; and

(b) The total losses related to Hurricane Ike for this subsector were estimated to be $674,750.

6. Transportation/Roads

The damage observed to this subsector was restricted primarily to the causeway spanning North and Middle Caicos, which is shown as a red line in map 8 below. This causeway forms a critical link between these two communities, and was severely damaged during Tropical Storm Hanna.

Map 8: North to Middle Caicos Causeway



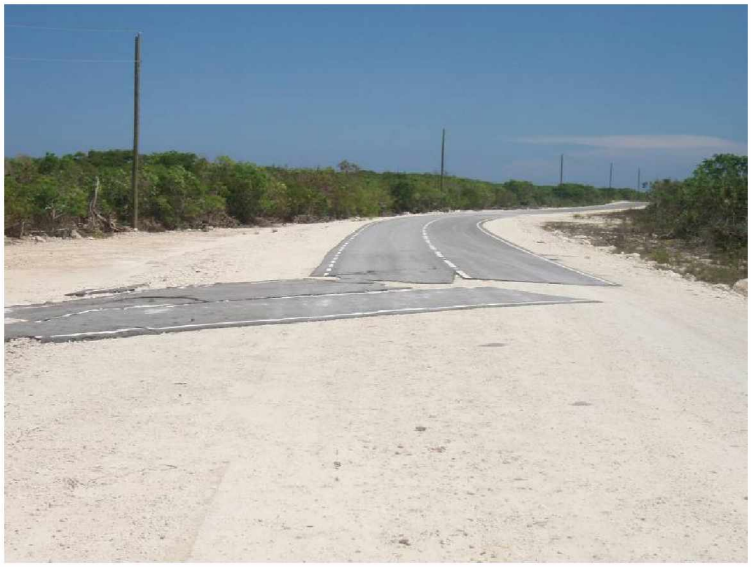
Source: Google

A site visit to this facility indicated that there were a number of problems with the causeway as constructed. First, the armour stones that were used to provide protection to the causeway itself appeared to be smaller than would have been expected. Many of these stones were moved by the waves generated by Tropical Storm Hanna, leaving the underlying geo-textile fabric exposed.

Damaged Causeway – Exposed Geo-textile Fabric

Second, the coping wall marking the edge of the road appeared to have not had an adequate foundation. As a result of this, the wall failed in many places, ripping out pipes for services in many locations. The pavement also failed in many locations, with the surface coating being torn up or simply shifting to another location. Finally, it appeared that the waterway opening was quite inadequate to pass the storm surge and water flow that must have occurred during Tropical Storm Hanna. As a result of this, it is evident that the storm water overtopped the causeway in all excepting the most elevated locations, adding to the general destruction of this roadway.

Damaged Causeway – Roadway Surface Shifted



Rehabilitation of this roadway should include the following elements:

(a) Repairs to the roadway – sub-base and surface layers;

(b) Repairs to the revetment – replacement of existing armour stones with a more robust layer; replacement of geo-textile fabric where this has been ripped;

(c) Repairs to the concrete boundary wall, ensuring that better foundation details are included this time around;

(d) Installation of more culverts in order to increase the waterway area underneath the causeway; and

(e) Re-installation of the many light standards that were toppled during the storm.

Total estimates for this subsector, did not include losses, but only damages, which were $11,000,000 (see table 14).

Table 14: Damage to North Middle Causeway

Damage to North-Middle Causeway	
Repairs to roadway	$2,000,000.00
Repairs to revetment	$3,000,000.00
Repairs to conc. Wall	$1,000,000.00
Installation of more culverts	$5,000,000.00
Total Damages	$11,000,000.00

Source: ECLAC estimates based on official government data

7. Airports

Information on the status of airports in the TCI was obtained through a meeting with the Chief Executive Officer of the Turks & Caicos Islands Airports Authority. He outlined a number of areas where damage occurred throughout the islands due to the passage of the two storm systems.

In Grand Turk, the following damages were recorded:

(a) Significant damage to the glass surround and instruments of the control tower, thereby requiring extensive repair;

(b) Damage to the roof of the main office building;

(c) Loss of some of the runway lights;

(d) Damage to the roof and ceiling of the terminal building;

(e) Damage to the roof and contents of the workshop facilities building;

(f) Demolition of an old hangar; and

(g) Damage to the perimeter fencing.

The airport was down for a four-day period, and at limited capacity for a further six days for restorations.

Jags McCartney International Airport, Grand Turk after Hurricane Ike

Destroyed Hangar

In South Caicos, the damage recorded included:

(a) Damage to runway lights;

(b) Near total destruction of the control tower, including instrumentation; and

  (i) Note that this required control tower assistance from Provo, liaising with ground personnel in South Caicos

(c) Damage to perimeter fencing.

This airport was down for a period of 10 days, plus a further six days for restorations.

In Providenciales, the damage recorded included:

(a) Damage to perimeter fencing;

(b) Damage to the roof of the terminal building; and

(c) Damage to the windsock.

The international airport was down for a period of six days, which led to cancellations of many of the flights of international carriers such as Delta, US Airways, British Airways, Air Canada and Bahamas Air. The majority of the losses incurred to this subsector were as a result of these cancellations, which led to non-payment of departure tax, landing fees, parking fees and air navigation fees.

Total estimates for this sector are given as follows:

(a) Total estimate of damages was $5,031,000; and

(b) The total losses related to Hurricane Ike for this subsector were estimated to be $275,000.

8. Seaports

Damage to seaports was observed in Grand Turk and South Caicos. First, in Grand Turk, there are two ports, a container port and a cruise shipping port. There was limited or no damage to the container port, with the exception of an empty container blown out of the holding area and onto the beach.

Minimal Damage to Port in Grand Turk

At the cruise shipping terminal, however, there was significant damage to buildings and landscaping. It is estimated that over 800 coconut trees and thousands of other trees were blown down. In addition, the irrigation system was badly damaged as well as the roofs of many of the buildings housing curio and tourist shops. The Terminal reopened on 8 October 2008, so it is estimated that its closure would have caused significant hardship to a number of people.[10] On a cruise ship day, approximately 500 people work in this facility, while visitor and crew numbers can reach up to 6000 for that day.

In addition to the on-site facilities, Carnival Cruise Lines provides tours to visitors, which include adventure type trips, as well as tours to heritage and museum sites.

In South Caicos, there was damage to the main container dock face and associated edge areas. A brief above water inspection indicated that some scour damage must have occurred at the base of the dock face, leading to slumping and leaking of fill material behind the dock face. This indicates that the area usually reserved for set down of containers being unloaded, will be unsafe for this usage until remedial work is carried out.

Damage to Dock in South Caicos

Total estimates of damages and losses for this subsector are summarized as follows:

(a) Total estimate of Damages was $13,800,000; and

(b) The total losses related to Hurricane Ike for this subsector were estimated to be $6,000,000.

9. Fire and correctional services

There was some damage that occurred to the new prison in Grand Turk. Specifically, there was a requirement for the following:

[10] The VP-Strategic Planning, Carnival Corporation, estimated that the company employs directly or indirectly, up to 70% of the non-Government workforce in Grand Turk.

(a) Replacement of offices;

(b) A new Fire Services building;

(c) Repair to the detention building;

(d) Replacement of furnishings; and

(e) Repair to vehicles.

Damaged Detention Building

The total estimate of damages for this subsector was $5,200,000.

C. Social sectors

The DALA methodology includes, within the social sector, an estimation of the housing, health and education subsectors. The housing subsector estimates damage and losses to all structures used as dwellings within the Turks and Caicos Islands, whether privately or publicly owned. The education subsector in addition to estimation of damage and losses to publicly and privately-owned educational facilities also includes sporting facilities and heritage sites.

Table 15 details the extent of damage and loss in each subsector of the social sector. The total effect to the social sector caused by Tropical Storm Hanna and Hurricane Ike amounted to US$111.3 million of which 58% was accounted for in damage and the remainder, 42% in losses.

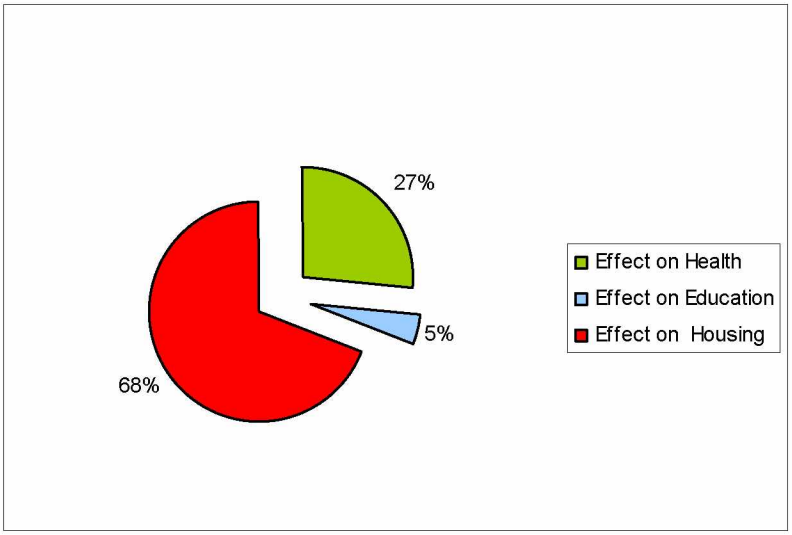
Table 15: Total effect on the social sector

	Damage	Loss	Total
Effect on Health	$3,274,731.00	$26,437,929.00	$29,712,660.00
Effect on Education	$2,376,650.41	$2,670,000.00	$5,046,650.41
Effect on Housing	$58,647,880.36	$17,952,119.6	$76,600,000.00
Total	$64,299,261.77	$47,060,048.64	$111,359,310.41

Source: ECLAC estimates based on official government data

Figure 5 illustrates the distribution of the damage and loss within the social sector. It suggests that 69% of the effect in the social sector is applied to housing, 27% to health and 5% to education.

Figure 5: Distribution of effect of the impact of TS Hanna and Hurricane Ike to subsectors within the Social Sector

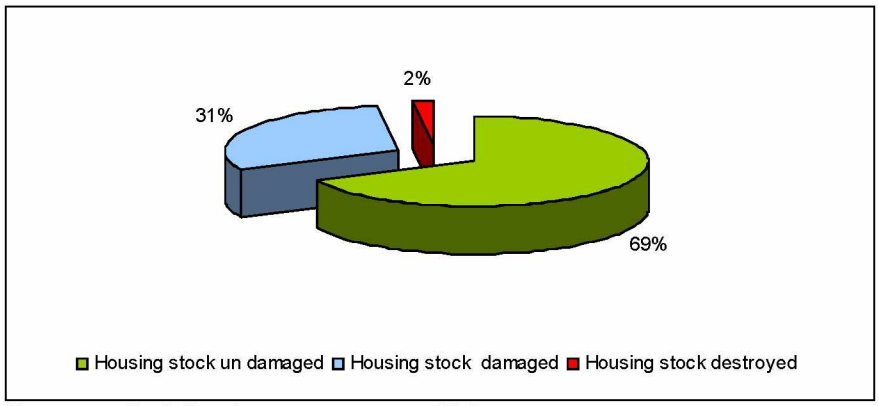


Source: ECLAC estimates based on official government data

1. Housing

Approximately 33% of the stock of dwellings was damaged in the Turks and Caicos Islands, with the majority of the housing stock some 69% remaining undamaged, as illustrated in figure 6. Of those that were damaged, 2% were totally destroyed.

Figure 6: Distribution of housing stock following impact of Hanna and Ike



Source: ECLAC estimates based on official government data

But this does not tell the severity of the story. When the impact of the disasters by Island as detailed in table 16 is examined, it was recognized that some islands such as Grand Turk, Salt Cay and South Caicos suffered damage to virtually every house. Some islands such as Providenciales, although having a large absolute number of houses damaged, 751, proportionately suffered less damage to its housing stock, 8%, than any of the other islands.

The other islands, North Caicos, suffered 67%, and Middle Caicos suffered 49% damage to their housing stock. Such a serious blow to a country's housing stock may result from two possibilities: the nature of the event itself and/or the quality of housing.

For Turks and Caicos both factors seemed to have played a part in the damage to the housing stock. In the case of Providenciales, its location took it out of the direct impact of the hurricane, although it was affected severely by Tropical Storm Hanna. But the quality of its housing which is newer than that found on Grand Turk or Middle and South Caicos, would have acted as a safeguard in the face of a natural event. Providenciales has experienced a development boom since 1990 and its housing and other structures such as hotels and villas, by and large, possess outer walls built of concrete. It is mainly the poor on Providenciales that can be found in precarious housing conditions.

Table 16: Turks and Caicos Island: Housing stock damaged and destroyed by island

By Island	Estimated number of HH at time of disaster	Total Number damaged	Number destroyed	Total Number D&D
Grand Turk	2,042	1940	155	2095*
Salt Cay	85	85	2	87*
South Caicos	600	570	86	656*
Middle Caicos	112	55	…	55
North Caicos	561	376	…	376
Providenciales	8,882	744	7	751
Parrot Cay	21	..	…	
Total	**12,303**	**3770**	**250**	**4020**
Note: *The fact that more houses are listed as damaged than originally estimated may be explained by the dynamic nature of the migrant population in TCI.				

Source: ECLAC estimates based on official government data

Table 17 provides a number of selected characteristics of households by island. It can be noted that even though this information is based on the 2000 Poverty Assessment, there is little evidence to suggest that the characteristics of the housing stock would have improved dramatically. In some instances it may have deteriorated due to the rapid influx of immigrants spurred on by economic growth of the economy and the demand for labour. An increase in precarious and temporary structures could have resulted. Actually initial damage assessment identified an increase in the number of dwellings over the estimated number, for 2006.

In such a difficult to regulate environment, it would not be surprising if the proportions of houses where the outer walls were made of wood and plywood had increased from the 37% as indicated for Grand Turk and 32% for South Caicos. Even if there had been no increase, such structures would have been at risk in the face of a hurricane at Category level 4 with wind speeds of 135 miles per hour, as presented by Hurricane Ike.

The poverty assessment had reported that 26% of the population of the Turks and Caicos Islands was poor with only 3% of the population being described as indigent. The poor accounted for 18.3% of the households. The living conditions of poor households were described as difficult. One indicator of such difficulty was the presence of pit latrines. The report indicated that pit latrines were used by 34.1% of the population and that in many instances shared latrines among households was not uncommon. Actually 28%, of the population reported sharing pit latrines. Flooding following Tropical Storm Hanna posed environmental health issues for the presence of pit latrines and would have increased already difficult living conditions.

Table 17: Turks and Caicos: Selected Characteristics of Households by Island

By Island	Estimated number of HH at time of disaster	% of Poor	Proportion of HH living in rented private dwellings	Proportion of HH living in privately owned dwellings	Proportion of HH living in Flats	HH with wood outer walls	HH with plywood outer walls
Grand Turk	2,042	32.8%	44.6	62.6	16.2	37.7	…
Salt Cay	85		14.3	91.8	…	2.0	…
South Caicos	600	45.2%	35.8	71.7	3.9	32.5	15.8
Middle Caicos	112	61.4%	24.4	82.3	10.3	8.2	9.4
North Caicos	561	0.8%	31.5	70	15.9	7.2	2.2
Providenciales	8,882	15.3%	66.3	25.8	48.6	22.1	10.9
Parrot Cay	21	…	…	…	…	…	

Source: ECLAC estimates based on official government sources; and the Standard of Living Assessment 2000 V.2

The islands which experienced the worst devastation also had the highest proportion of poverty, Grand Turk with 32.8% poor and South Caicos, 45.2%. Middle Caicos, although having a higher percentage (61.4%) of the poor, did not result in a higher percentage of devastation to its households, as would have been expected. The extent of damage may be attributed to it having been more impacted by flooding from Tropical Storm Hanna than by Hurricane Ike.

Table 18 presents the summary effects on the housing sector. Of the US$76.6 million of the total effect to the housing sector caused by Tropical Storm Hanna and Hurricane Ike, 77% can be accounted for in the damage to the sector. The remainder accounts for the losses. Of the losses, 55% is attributed to the private generation of electricity by householders. Loss of rental income constitutes 35% of total losses. Unfortunately insurance in the housing sector was very low as the culture in the Turks and Caicos Islands, particularly in the islands other than Providenciales, is to build from personal savings rather than through mortgage financing. And even where mortgage financing occurred, it was reported that many insurances had expired. It would be safe to estimate that more than 50% of the properties damaged by the disasters were either uninsured or underinsured.

Table 18: Turks and Caicos Islands: Summary effects on the Housing Sector (US$ Millions)

Total Effect	76.6
Total Damage	58.6
i. Value of Damage to Houses	24.8
ii. Value of damage to totally destroyed houses	22.5
iii. Value of Damage to furnishings	11.3
iv. Imported component	52.8
Total Losses	18.0
i. Removal of debris	1.8
ii. Additional cost for the generation of electricity	9.9
iii. Loss of rent	6.3

Source: ECLAC estimates based on information received from official sources.
Import component at 90% of value

2. Education

Education on Turks and Caicos Islands is provided by a complement of some 39 schools spread across the islands in a mixture of public and private ownership. In the Turks and Caicos Islands, education for all students of school age is mandatory and virtually free in the pubic sector.[11] Schools cover all levels of education as is detailed in table 19. All told, the education system in Turks and Caicos Islands services 6,031 students with 3,461 students enrolled in government schools and 2,570 in private schools. The majority, 70% or 4,230 students attend school in Providenciales.[12]

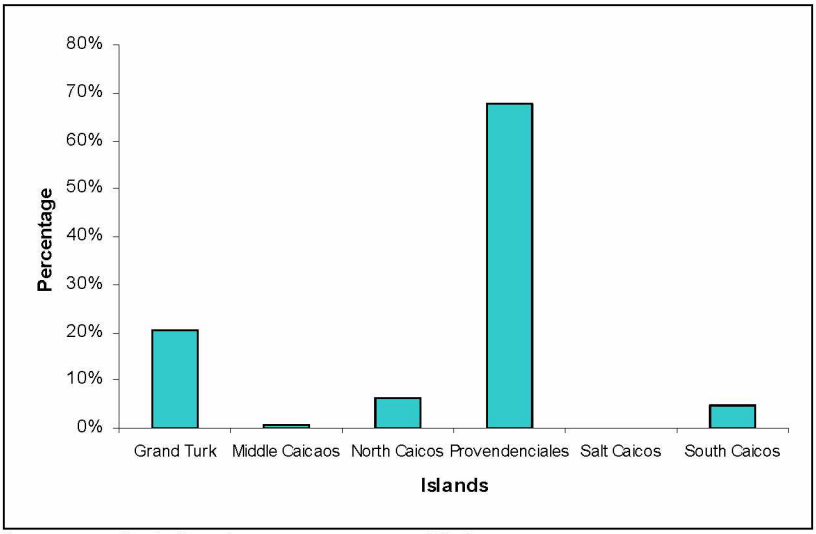
[11] Minimal fees are charged in the public sector. Education Department reports states.
[12] Based on Government Department of Education data submitted to the ECLAC team.

Table 19: Turks and Caicos Islands: Number of Schools by Island

Number of schools by Island							
Island	**Pre school**	**Primary**	**Primary and High**	**High**	**Tertiary**	**Special**	**Total**
Grand Turk	6	2	0	1	0	0	9
Middle Caicos	0	1	0	0	0	0	1
North Caicos	1	2	1	1	0	0	5
Providenciales	3	6	4	3	2	2	20
Salt Cay	0	1	0	0	0	0	1
South Caicos	0	1	1	1	0	0	3
Total	**10**	**13**	**6**	**6**	**2**	**2**	**39**

Source: Social Indicators 2005. DEPS

Figure 7: TCI: Proportion of Student enrolment by island



Source: ECLAC estimates based on official government data

The next largest group of students is enrolled in Grand Turk which accounts for 20% of school enrolment or 1,185 students. Student enrolment is illustrated in figure 7. The government is the largest provider in the education sector, making provision for more than 57% of school places. At the time of the assessment no estimates of damage had been received from the private sector.[13]

[13] Based on Department of Education date 2008.

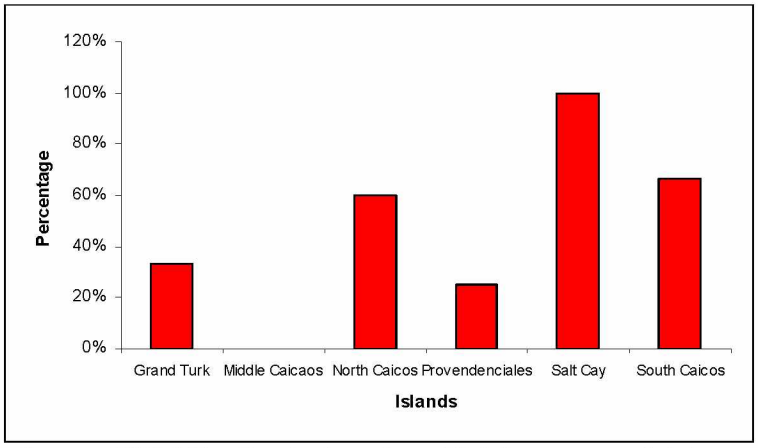
Table 20: Enrolment by island and education level for 2005/6

Island	Pre school	Primary	Primary and High	High School	Tertiary	Special	Total
Grand Turk	172	492	0	405	0	0	1069
Middle Caicos	0	36	0	0	0	0	36
North Caicos	15	158	10	146	0	0	329
Providenciales	251	1467	599	889	257	99	3562
Salt Cay	0	6	0	0	0	0	6
South Caicos	0	91	65	99	0	0	255
Total	438	2250	674	1539	257	99	5257

Source: Social Indicators 2005 Table 4.2

All schools were closed due to the impact of Tropical Storm Hanna and Hurricane Ike some for a longer period than others. There were schools that were forced to remain closed because of water damage caused by the flooding or roof damage from the winds, and others because of their use as shelters. Still others which were neither affected by wind nor water were affected because of the lack of electricity and water which affected the totality of at least five of the six islands affected, in the aftermath of the disaster.

Figure 8: TCI: Proportion of schools damaged from the impact of Hanna and Ike by Island



Source: ECLAC estimates based on official government data.

Although the absolute number of schools that were damaged appears small, as can be seen in table 21, in some instances as in Salt Cay where the only school on the island suffered damage then such damage can become a severe setback for the students on the island. In the case of Grand Turk at least 33% of the school stock was damaged as illustrated by figure 8. In North Caicos 60% of its schools were damaged, while in South Caicos just over 60% were affected.

In real terms it means that the school life of a significant proportion of students has been disrupted.

Not only has the school life of children been disrupted but also family life, as many parents reported, particularly in Grand Turk, of having to send their children off island to attend school elsewhere, and stay with family and/or friends until life returned to some degree of normalcy.

Table 21: TCI: Damage to Public Education Facilities by Island

Damaged Schools By island	Preschools	Primary	Primary and High	High Schools	Tertiary	Special	Total
Grand Turk	…	2		1	1		4
Salt Cay	…	1					1
South Caicos	…		1	1			2
Middle Caicos	…						
North Caicos	…	2		1			3
Providenciales	…	3		1			4
Parrot Cay	…						
Total							**14**

Source: ECLAC estimates based on official government data

3. Damage and Loss

The details of the damage suffered to schools in the islands are presented in table 22. From the description of the destruction it is clear that schools experienced widespread impact. Not only were the buildings affected but school equipment, supplies, furniture and environment. Public buildings in the Turks and Caicos Islands have not been insured in the past.

Table 22: TCI: Description of Damage to school and sporting facilities by Island

Details of Damage	Description of Damage	Value
Grand Turk		
Education Department	Damage to roof and floors; exterior and interior walls; electrical fittings; air condition units; doors and windows; computers and printers; staff furniture; book cases; rugs and mats	$53,790.00
Ona Glinton Primary School	Auditorium roof damaged; class room floor; electrical equipment and air conditioning; door windows; school furnishings; computers, battery packs, printers, photocopier; teachers desks and chairs; other staff desks and chairs; book stock and cases.	$42,240.00
Eliza Simons Primary School	Damage to ceiling walls door and windows; computers and printers; lights and fans; student desks and chairs; teachers desks and chairs; other staff desks and chairs; teachers books and charts	$70,000.00
HJ Robinson High School	Administration block demolished to be replaced; Block G damage to roof ceiling windows, teachers desks student desks; electrical fittings and guttering and painting; Block I: damage to roof and ceiling, door, windows, gutters, electrical and painting; Staff room: damage to ceiling, windows, painting and air-condition; Block J: demolished to be replaced ; Block L: roof and ceiling damaged; Block L2: roof and ceiling; storage room: roof and doo and windows; Block D: demolished to be replaced; Block E: demolished to be replaced; Music teacher's room roof and ceiling, guttering and steel pan (instruments); New Science Black: damage to doors and windows and guttering; Art room roof ceiling doors windows; restrooms roof, guttering and louvers; Block H guttering; workshop Block: roof ceiling and gutters	$1,500,000
HJ Robinson High School	Furnishings: Tools and machines: table saw; joint planer; surface planer; lathe; Bench Drill; Bench Grinder; Surface Grinder, Bench Vice; Hand tools; Sporting Equipment: table tennis boards; high jump beds; shot put; discuss; javelin; stop watches; starting blocks; volley ball equipment; other equipment: drafting tables, fans, megaphone, overhead projector; student desks; computer chairs; computer work stations; computers.	$83,382.00
TCI Community College	Damage to materials: Books, photocopiers; teachers desk and chairs; computers; electrical equipment; laboratory equipment; etc.	$53,827.30
	Damage to buildings	$149,816.11
Salt Cay		
Mary Robinson		$15,000.00
South Caicos		
Marjorie Basden High School	Damage to roof doors and window; furniture , computers	$50,000.00
Stubbs Primary School	Damage to roof and sea water damage to furniture and flooring	….
Middle Caicos		
Doris Robinson Primary	Damage to windows and doors, furniture, machinery and school supplies	$15,000.00
North Caicos		
C Hubert James Primary School	Roof damaged including trusses; shingles damaged.	$47,000.00
Adlaid Omiler Primary School	Porch damage; roof damage on Admin ;block; long building suffered oof damage	
Raymond Gardiner High	Tech Block damaged: roof destroyed and all classrooms-woodworking; home economics; technical drawing and furnishings	$47,000.00
Providenciales		
Clement Howell High School	Roof, ceiling lighting fixtures and fans; damage to gutter pipes; flooding of classrooms; destroyed floor rugs; window damage; damage to auditorium ceiling and bathrooms	$50,000.00
Ianthe Pratt Primary School	Entire roof damage; windows panes; damage to fence; playground; trees; games	$30,000.00
Ball Park	7 light poles down fence broken	$8,970.00
Oseta Jolly Primary School	2 blocks roof and ceiling; toilet block eave and ceiling; gutter damage too all buildings; classrooms suffered damage	$50,000.00
Enid Capron Primary School	1 Block roof damage and ceiling; roof damage to admin block and door damage; infant block damage to roof and shingles; doors and shingles damage.	$35,000.00
Total		**$2,301,025.41**

Source: Based on official government estimates available at the time of assessment

Table 23 presents the effect of the disaster on the education sector. The total effect amounted to US$5.05 million. Of this total damage, US$2.38 million was the value for damage to school buildings and furnishings. The losses to the sector amounted to US$2.67 million or 53% of the total effect. A significant portion of this value is derived from the cost of generating electricity to facilitate the education system.

Table 23: TCI: Summary effects of Hurricane Ike on the Education Sector

Total Effect	**$5,046,650.41**
Total Damage	$2,376,650.41
i. Damage to schools	$2,301,025.41
ii. Damage to school grounds	$1,200.00
ii. Damage to sporting facilities	$8,790.00
iii. Damage to Ministry facilities	$3,000.00
ii. Damage to school materials and furnishings	$53,790.00
iii. Damage to heritage sites	$8,845.00
Imported component	$556,701.30
Total Loss	**$2,670,000.00**
i. Losses due to removal of debris	$4,000.00
ii. Losses incurred for the generation of electricity	$2,592,000.00
iii. Losses for scheduled meeting	$48,000.00
iv. losses incurred for sanitizing	$12,000.00
v. Losses incurred for demolition of dangerous facilities damaged by hurricane Ike	$14,000.00

Source: ECLAC estimates based on information received from official sources
Import content based on 90% of value

4. Health

The Ministry of Health provides a wide range of services to the population of Turks and Caicos Islands at both the primary and secondary care levels, as detailed in table 24. A network of health centres, one each on the main islands of Grand Turk, Providenciales, North Caicos, Middle Caicos, South Caicos and Salt Cay, exist. Hospital care is provided through the two government hospitals one on Grand Turk (20 acute beds) and the other on Providenciales (10 acute beds). Middle and North Caicos are supplied with outreach specialist care from one facility. If treatment cannot be provided in Turks and Caicos Islands, then patients are referred abroad for treatment through the Treatment Abroad Programme paid for by Government. In addition to the public health facilities, four private clinics are available on the Islands.

The government is seeking to address the acute shortage of hospital care on the island by the construction of a new hospital in Grand Turk and Providenciales. The hospital is projected to be completed during 2009 and is expected to become operational early in 2010.

Table 24: TCI: Total Number of Health Care Institutions (2005)

General Public Hospital	**2**
Private Clinics Private Clinics	**4**
Primary health/ Medical Centres	**7**
Family Planning Clinics	**7**
Total Number of Health Care Institutions (2005)	**20**

Source: ECLAC estimates based on official government data.

The health status of the population is fairly high evidenced by the low infant mortality rate and the maternal mortality rate. For 2005 the infant mortality rate was 3.1 per 1,000 live births and the maternal mortality rate was zero. [14]

Thirteen of the 16 government health institutions reported damage.[15] The details are presented in table 25. Of the health facilities most affected, the Grand Turk Hospital was the most seriously impacted. The Grand Turk Hospital, a 30-bed hospital, serves not only the island of Grand Turk but also receives referrals from other islands of Turks and Caicos. Outpatient and emergency services resumed immediately after the storm and the operating theatre was functional within 48 hours, with the assistance of personnel from HMS Iron Duke and Wave Ruler and also the contractors for the new hospital under construction nearby. General Ward, Maternity Ward and the Geriatric Ward were reported to have suffered major damage so as to make them non functional. Other parts of the hospital such as the kitchen, laundry, maintenance and medical stores were severely damaged. Details of the damage to the health facilities are presented in table 26.

Despite these difficulties, it is suggested that the current hospital will have to serve the population of Turks and Caicos Islands for at least two hurricane seasons. Therefore the repairs to the hospital must be undertaken with risk reduction as a high priority.[16]

[14] Social Indicators 2005, Statistical Office DEPS
[15] At the time of the assessment no private sector institutions had submitted reports of damage.
[16] Report on Grand Turk Hospital by David Taylor, PAHO/WHO 17 September 2008

Table 25: TCI: Damage to Health and Social Services Sector Institutions

Type of Institution	Number	Name/Location	Description of damage
General Public Hospital	2		
		GDT Hospital	Severe to moderate damage
Private Clinics	4	…	
Primary Health/Medical Centres	7		
		Primary Clinic in Salt Cay	Moderate roof damage
		Primary Care South Caicos	Moderate roof damage and damage to generator house
		Primary Care Middle Caicos	minor roof damage
		North Caicos	minor roof damage
		Providenciales	minor damage
Total Health Care institutions	13		
Human Service Institution			
	1	Residential Unit , South Caicos	Moderate damage to roof, furniture, fixtures and equipment demanding the relocation of the children
	1	Special needs Centre Providenciales	Minor damage to building caused by disaster but increased damage due to use of Centre by additional persons
	1	Providenciales Children's Home/ NISI House	Major damage causing damage to furniture, clothing, food
Total Human Services institutions	3		
Total number facilities	19		
Total Number facilities damaged	9		
Percentage damaged	**47%**		

Source: ECLAC estimates based on official sources

Table 26 presents the total effect of the impact of Tropical Storm Hanna and Hurricane Ike on the health sector. The total effect amounted to US$29.7 million. Total damage accounts for US$3.27 million or 11% of the effect and losses account for US$26.4 million or 89%.

Table 26: TCI: Summary effects on the Health Sector

Total Effect	**$29,712,660.00**
Total Damage	**$3,274,731.00**
i. Damage to Health facilities	3,193,000
ii. Damage to equipment and furnishings	81,731
iii. Imported component	$2,947,257.90
Total Losses	**$26,437,929.00**
i. Environmental health including clearing of debris and public education	$944,620.00
ii. Addition cost of generation of electricity	$131,820.00
iii. Loss due to transfer of patients to other facilities for care	$25,000,000.00
iv. Losses due to forgone income	$25,500.00
v. Losses to the establishment of temporary clinics	$130,000.00
vi. Additional cost to staff services	$101,580.00
vii. Additional cost of communications	$2,000.00
viii. Additional cost for relocation of families in need	$56,559.00
ix. Lost due to additional cost of water	$45,850.00

Source: ECLAC estimates based on information received from official sources.
Import component estimated at 90% of value

D. The environmental sector

The impacts of Tropical Storm Hanna and Hurricane Ike on the environmental sectors were felt primarily in the areas of:

(a) Damage to beaches;

(b) Clean up requirements for these beaches;

(c) Damage to equipment in national parks; and

(d) Damage to vegetation and signage in national parks.

The Department of Environment and Coastal Resources maintains a system of national parks in and around Grand Turk. These areas include the Columbus Landfall National Park, the South Creek National Park, the Grand Turk Cays National Park and the Long Cay Sanctuary. These areas are typical of a variety of plant and animal life, healthy coral reefs and extensive white sand beaches. The first of these four national parks is devoted primarily to more active uses, and includes zoned areas for diving, swimming, picnicking, cruise ship berthing and a trans-shipment port. By contrast, the latter three national parks have traditionally been known for less active pursuits such as bird watching and kayaking. The Columbus Landfall National Park is bordered by a system of historic, but now derelict saltwater ponds that discharge directly to the park. These all form a part of the attraction base of the island's national park system.

Recently, with the advent of cruise shipping to the southwest end of the island, it is of paramount importance for the department to work in tandem with the cruise company (Carnival) to ensure that these natural resources are not overwhelmed by an unsustainable number of visitors.

As a result of Hurricane Ike, one of the main public beaches in the park system, Governor's Beach, was badly eroded and had a significant amount of debris left on the beach face and back of beach areas, which required extensive cleanup activities. It is expected, however, that the beach will recover within a couple of months. It should be noted that a programme of beach profile monitoring has been set up and is ongoing. This should provide the Department with a much needed base of data by which to assess long-term beach movement trends.

In addition to beach erosion damage and cleanup requirements, all of the swim zone markers were removed from the Columbus Landfall National Park. These markers are very important, as these swim zones border areas of varying interests such as the approach of large boats and water sports vessels. The restoration of this system of markers is therefore considered to be of utmost importance, as in the current situation, it could give rise to life-threatening situations.

Eroded Scarp of Governor's Beach (looking north)

Cleanup of Debris at Governor's Beach (looking south)

Swim Zone Marker

On the southeast corner of the island, the South Creek National Park provides a unique experience for visitors to interact with a mangrove-lagoon type of environment. The passage of

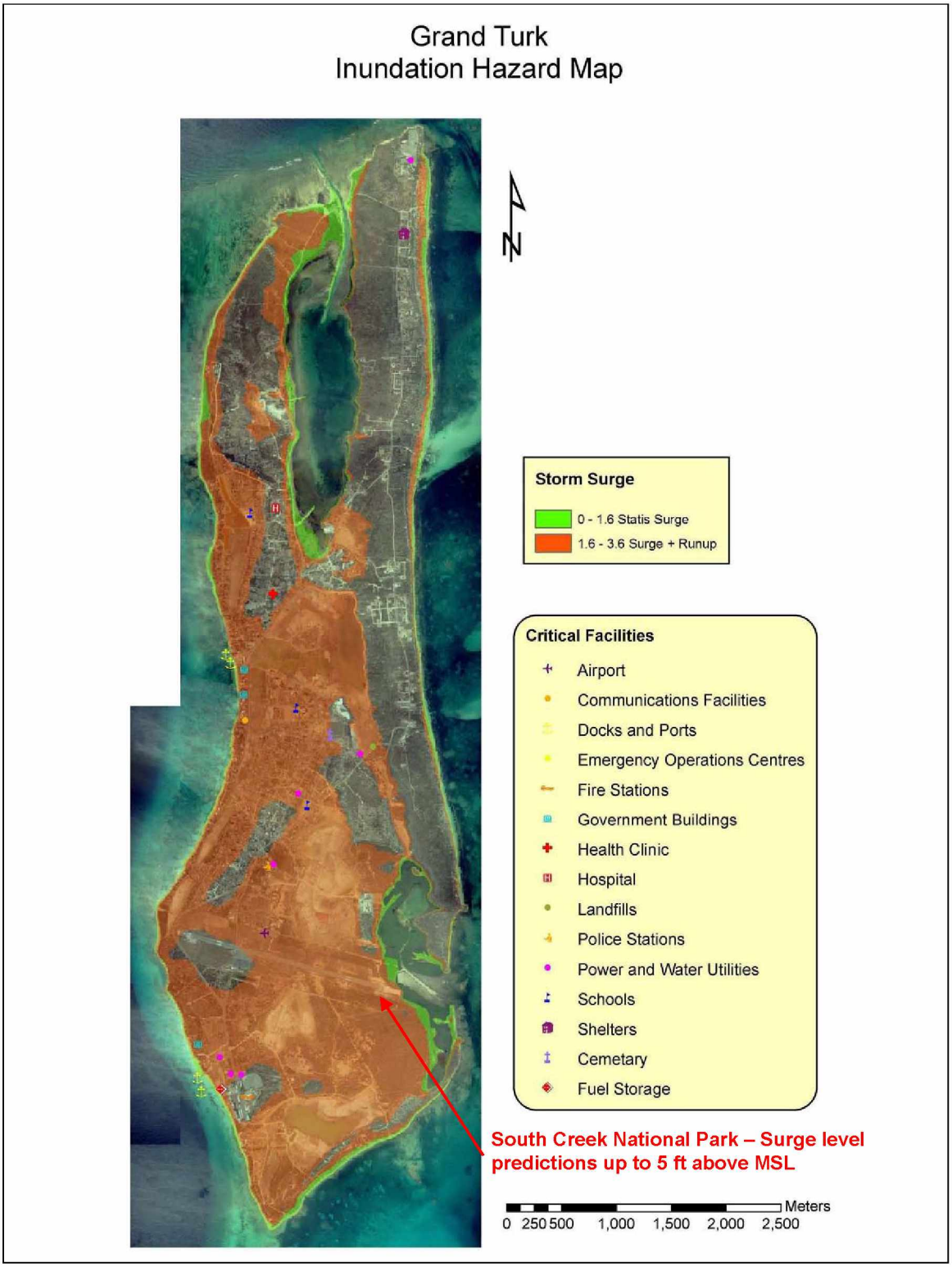
Hurricane Ike resulted in very significant hurricane surge in this section of the island, resulting in damage to many of the mangrove plants in the park. The surge and wave action also destroyed sections of the boardwalk throughout the park, as well as the kayak landing stages.

It is of interest to note that storm surge predictions presented in a recent hazard and vulnerability analysis, indicate similar levels of storm surge to those observed in Hurricane Ike[17] for the area of the South Creek National Park. An image showing the predicted storm surge is given in figure 9.

Some damage also occurred to a small bridge in the national park, but fortunately, to a large extent the signage throughout the park was undamaged.

[17]Smith Warner International Ltd., 2008. *Turks and Caicos Islands Hazard & Vulnerability Assessment*

Figure 9: Inundation Map Showing Storm Surge Predictions (© Smith Warner International Ltd.)



1. Solid waste and debris disposal and clean up

A major feature of Hurricane Ike is that it resulted in the accumulation of solid waste. The debris produced consisted mainly of household articles, white goods, tree limbs, leaves and silt deposits. At the time of this report, there were no estimates of the amount of waste generated and clean-up cost for this waste. However, a major area of concern relates to the co-mingling of all forms of waste for disposal in the disposal sites designated for municipal waste. Another issue is insect vector control in the aftermath of the hurricane. The Government of the Turks and Caicos Islands is responsible for the removal of debris from public places and households after a storm or any other related event. The private sector is usually responsible for removal of its own debris. The cost for this clean up is estimated at US$4.8 million[18]. The clean up cost for the private sector was not ascertained.

Following is a summary of damages and losses for the environmental sector:

(a) Swim zone markers – Governor's Beach;

(b) Damaged docks – South Creek National Park;

(c) Replacement of office building;

(d) Office equipment; and

(e) Artificial reefs.

Total damages amount to an estimated $387,000

Losses:

(a) Beach clean up; and

(b) General cleanup of debris throughout Grand Turk.

Total losses amount to an estimated $25,322,000

[18] As there was no data available, this estimate was based on the clean up cost in Cayman after Hurricane Ivan in 2004 for which approximately twice the figure was given above. The population affected by Ike in Turks and Caicos was about half the population affected in Cayman in 2004.

IV. THE MACROECONOMIC EFFECTS

A. Summary damage and losses

The total impact of Tropical Storm Hanna and Hurricane Ike on the Turks and Caicos Islands was estimated at $213.6 million (see table 26 below). This amount is a bit conservative, as data limitations in some sectors did not allow for a full accounting of impacts on them. However, it provides a good estimate of the substantial impact of the disaster.

Given the scale, duration and intensity of the two events, the usual expectation is that the total impact would have been higher. Nevertheless, because Providenciales, the main growth island with the highest cost capital stock, was spared the ravages of the disaster the financial impact was not as high as would be expected for this scale of hydrometrical event. Notwithstanding this, there was significant social fall-out that could affect people's livelihoods in the short to medium-term, and also major environmental damage in an already fragile ecological environment.

The engine of growth, tourism was spared the ravages of the disaster, with the fall-out being mainly in the social sectors and infrastructure. This was reflected in the profile of the impact. Total damage (impact on assets, including stocks) was $119.2 million or 56% of the total impact. Meanwhile, losses, both from income lost and higher contingent spending amounted to $72.0 million or 44% of the total. The contained losses stemmed from the fortune of geography, with the spread of the islands allowing for only modest impact on Providenciales.

The per capita total impact of the disaster at $6119.5 was relatively high, though not close to the $75,000 for the Cayman Islands in the wake of Ivan in 2004. Underscoring the relative weight of the disaster, the total impact represented 25.8% of GDP, 96.2% of tourism GDP, which is quite significant, 54.4% of gross domestic investment, 35% of consumption and 350.6% of public debt, highlighting that debt is still at quite manageable levels, which could provide some leeway for borrowing to facilitate recovery.

Summary breakdown of total impact by type:	**US$ million**	**Percent**
Destruction and damage to assets (Damage)	119.2	56
Production losses, increased operational expenses and revenue losses	94.4	44

Total impact in relation to main macroeconomic variables:

- 25.8% of GDP
- 96.2% of tourism GDP
- 40.6% of exports of good and services
- 54.4% of gross domestic investment
- 35% of consumption
- 350.6% of public external debt
- $6119.5 per capita impact

With regards to the sectors, the social sectors accounted for 52% of the total impact, which largely represented the fall-out in the housing subsector ($76.6 million) almost 69% of the impact on the social sectors and 35.9% of the total impact. Of the total impact on the housing sector, damage amounted to $58.6 million and losses $18 million. The housing stock on Grand Turk, South Caicos and Salt Cay was devastated with almost every home suffering some degree of damage, with many homes completely losing their roofs. The health sector accounted for 26.7% of the social sector damage and 13.9% of the total impact of the disaster. The bulk the costs was for medical treatment overseas, as the Grand Turk Hospital and other health facilities were damaged during the hurricane, and patients requiring dialysis and other critical care were sent abroad for treatment. Meanwhile, the impact on the education sector was relatively small at 4.5% ($5.0 million) of the total social impact. The total number of schools and other educational institutions damaged were relatively small, making the impact more one of dislocation and hardship for students and teachers, than a severe drain on financial resources.

Table 27: Summary Damage and Losses from Tropical Storm Hanna and Hurricane Ike on the TCI

Sector and subsector	Damage and losses			
	Total Impact	Damage	Losses	% of total
	US$ thousands			Impact
Total	**213571.9**	**119190.4**	**94381.5**	100.0
Productive sectors	20825.6	8068.1	12757.5	9.8
Agriculture & Fishing	2473.4	**1169.4**	**1304**	1.2
Agriculture	411.3	337.3	74	0.2
Fishing	2062.1	832.1	1230	1.0
Wholesale & Retail Trade	6555.4	3951.8	2603.6	3.1
Hotels & Restaurants	11796.8	2946.9	8849.9	5.5
Social Sectors	**111359.3**	**64299.3**	**47060**	52.1
Housing	76600	58647.9	17952.1	35.9
Education and culture	5046.7	2376.7	2670	2.4
Health	29712.6	3274.7	26437.9	13.9
Infrastructure	**55678**	**46436**	**9242**	26.1
Electricity	10753	8500	2253	5.0
Water Supply	339.2	300	39.2	0.2
Transport and Roads	11000	11000		5.2
Telecommunications	3279.8	2605	674.8	1.5
Airports	5306	5031	275	2.5
Seaports	19800	13800	6000	9.3
Fire Services	5200	5200		2.4
Environment	25709	387.00	25322	12.0

Source: ECLAC, based on official data and information

Infrastructure was the second most badly affected sector with impact estimated at $55.7 million or 26.1% of the total impact. The brunt of the impact in the sector was suffered by seaports (35.6% of the infrastructure sector) or $19.8 million. A number of ports suffered structural damage from battering waves and are in need of urgent repairs. Roads and other transport were also badly affected by the hurricane, with the recently completed causeway linking Middle Caicos and North Caicos severely undermined. The cost of repair to this essential transport bridge is expected to be significant. The electricity generation and distribution systems were buffeted by the hurricane. Costs to the sector amounted to $10.7 million, equal to over 19% of the impact on the infrastructure sector. Other infrastructure, including airports, fire services and water supply suffered varying impacts stemming from direct damage to plant and losses from business interruption.

Regrettably, the fallout on the environment has been fairly severe. A number of beaches suffered severe erosion, low lying areas were flooded in many districts and the trees were battered in the worst affected islands. The estimated cost of $25.7 million for damage, clean-up and other costs does not truly reflect the extent of the ecological damage the islands have suffered, which would take quite some time for full recovery.

Fortunately, the productive sectors, especially the mainstay-tourism was spared the worst effects of the disaster. Indeed, the total impact on the productive sectors amounted to $20.8 million, 9.8% of the overall total. Damage and losses in tourism was $11.8 million, which was miniscule compared with the $462 million in the Cayman Islands in 2004, after Hurricane Ivan. Nevertheless, in Grand Turk in particular, the adverse effects on the sector, especially the cruise ship terminal and smaller hotels have led to unemployment and loss of income for workers and business persons. Wholesale and retail were affected to the tune of $6.6 million, again the monetary costs not reflecting the hardship faced by small businesses. Meanwhile, the fishing subsector incurred impact of over $2.1 million, linked to loss of boats, traps and spoilage of stocks, while agriculture was buffeted, especially small backyard gardens. The government operated experimental farm also suffered important damage and losses.

1. Macroeconomic impact of Tropical Storm Hanna and Hurricane Ike on the Turks and Caicos Islands

(a) Introduction

As a small, open economy with a limited resource base, the Turks and Caicos Islands face a number of structural and cyclical constraints that challenge economic growth and management. This underscores the need for prudent policies and management to optimize the use of resources, create a dynamic and competitive economy and guarantee sustainable development. In effect, management would always be a case of managing within tight spaces. Nevertheless, as the case of other small, vulnerable economies has shown, this can be done effectively.

In recent years, the Turks and Caicos Islands have recorded dynamic growth (averaging 13%) in the last five years. Surging activity in construction, tourism and financial intermediation have provided the engine of growth. Construction value added has taken off by leaps and

bounds driven by hotel and condo construction, private homes and commercial properties. Similarly, the mainstay tourism sector has been catapulted by strong growth in visitor arrivals (12.2%) in the last five years, as the entrenched transformation of the economy to a tourism base, enhances the demand for its relatively unique, niche product. Indeed, the development of high-end resort tourism and real estate has enhanced the overall quality of the product, making the Turks and Caicos Islands an elite destination with fairly high per capita tourist spending. Nevertheless, the events of 11 September, highlighted the vulnerability of the economy to a major shock to the pivot of growth and underscores the need for some diversification both of the economic base and the tourism market itself.[19]

Domestic financial intermediation has taken off, leading to financial deepening and a more credit-based economy. However, the off-shore financial services sector that posted commendable growth in its early years has not maintained expected momentum in the wake of the Organization for Economic Cooperation and Development (OECD) Harmful Tax Competition challenge and the failure of regulation and oversight to keep pace with a more rigorous international environment. Nevertheless, improved legislation and regulation in recent times, even though outstanding work is left to be done, should hopefully redound to strengthened performance in the sector in the future. In addition, there is some nexus between tourism and financial services in that some tourists are businessmen who are interested in investment in the financial services sector and the overall attraction of high skilled labour provides a virtuous loop that benefits both sectors.

2. The macroeconomic performance in 2007

The economy slowed in 2007 (11.5%), following remarkable growth of 17.9% in 2006. Nevertheless, the 2007 growth still reflects strong growth similar to 2004 and 2005. As in most years, growth momentum has been fuelled by dynamism in tourism, construction, real estate, which together account for almost 50% of real GDP. Tourism posted real growth of over 14%, which although strong was a sharp slow down from the previous year. Growth in activity slowed markedly in the accommodation subsector, but was up marginally in the restaurants subsector. Both stay-over and cruise passenger arrivals were up during the year. Stay-over arrivals increased by 6% to 270,000 visitors, while cruise passenger arrivals rose by a substantial 80.4% to 532,225. The number of rooms on the islands rose from 2297 to 2632, over 86% of which were on Providenciales. At the same time, the number of cruise ships increased from 36 to 185. Reflecting buoyancy in the sector, the average occupancy rate was over 64%. Meanwhile, employment in tourism rose from 3,723 persons to 4,059 persons, with the female cohort exceeding the male.

Construction activity slowed relative to 2006 when astronomical growth was recorded, but at almost 20% in 2007 the sector provided major impetus to activity. Activity centred on tourism properties including hotels and condos, recreational facilities, and government infrastructure projects such as the causeway linking Middle Caicos and North Caicos, the West Caicos dock and the airport terminal in South Caicos.

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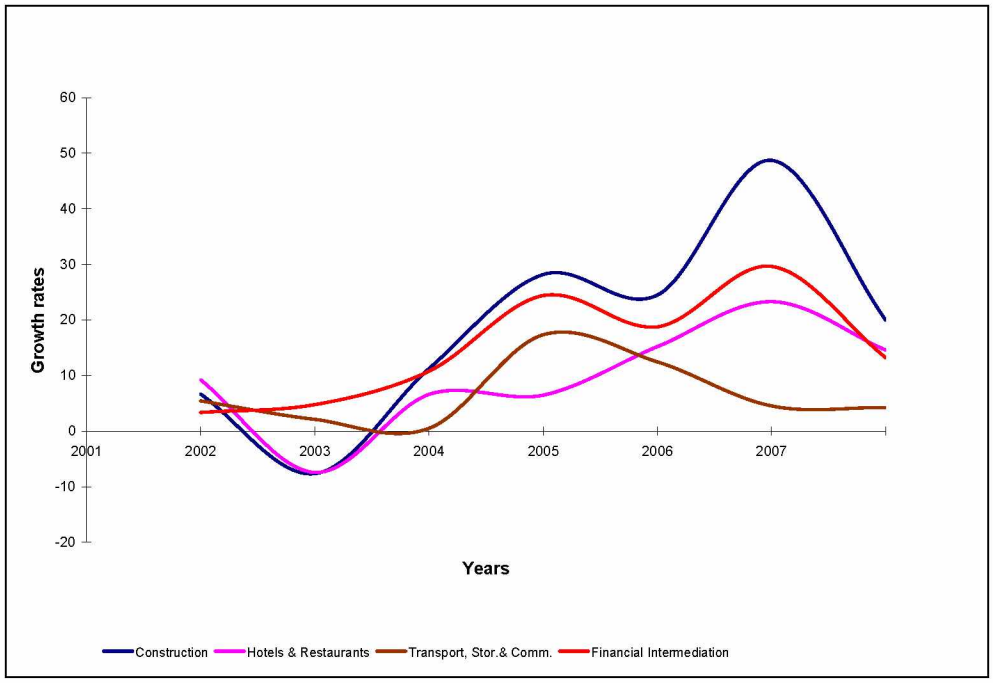
[19] Given that it is still in the phase of being discovered as a relatively unique destination with a varied ecology and offering, it is probably the right time for a marketing pitch to attract more tourists from Europe, Latin America and even Asia to diversify the market segments and reduce heavy reliance on the US market.

Figure 10: Growth of main sectors in the TCI



Source: ECLAC, based on official data

Domestic demand declined due to deceleration in capital formation, reflecting a slowdown in construction, acquisition of transport equipment and other machinery. Meanwhile, with the fall-off in economic activity and the demand for imports, growth plummeted.

3. Prices, wages and employment

Propelled by the pass-through effect of higher fuel and food prices, inflation picked up to reach 3.7% in 2007, following more subdued prices (2.9%) in 2006. Oil prices in excess of US$100, aggravated by a hike in food prices adversely affected household welfare. This underscores the need to optimize local agricultural production by the use of modern techniques that are suited to the terrain in the islands and to source food products from cheaper source markets. These should be incorporated in an overall strategy of agricultural diversification.

4. Fiscal performance[20]

With a dollarised economy and a lack of an independent monetary system and policy, fiscal policy is even more important in the Turks and Caicos Islands. In spite of vibrant economic growth, fiscal performance has arisen as a challenge to economic management in the Turks and Caicos Islands. Government finances have weakened in the last year. The recurrent position swung from a surplus of $15.3 million, equivalent of 2.1% of GDP in 2006 to a deficit of $36.1 million, the equivalent of 4.4% of GDP in 2007. Growth in recurrent revenues slowed dramatically to 2.1%, associated with weak out-turns from stamp duty, other duties both of

[20] Fiscal data used in this report are unaudited dated.

which were undermined by a number of resort projects just entering the start-up phase and the impact of the mortgage crisis in the United States, which dampened investor demand for real estate. At the same time, receipts from fees, fines and permits contracted by 4.1%, compounding the downturn in proceeds from taxes on domestic goods. On the administration side, the concerted collection drive of recent years that has galvanized growth in revenue was relaxed. This needs to be reinstated as government embarks on a Fiscal Stabilisation Plan to boost revenue, contain expenditure and ensure more prudent spending priorities, particularly emphasizing value for money or return on spending.

On the expenditure side, growth in recurrent spending fell by 19.6% to $235.9 million, the equivalent of 28.5% of GDP. Although deemed discretionary, spending on personal emoluments and goods and services are fairly non-discretionary in small economies such as Turks and Caicos Islands, where the State is the driver of employment. Personal emoluments costs decelerated providing some savings, which was also the case for debt servicing. Nevertheless, these savings were offset by higher spending on medical treatment and scholarships.

The capital budget posted a deficit of $6.9 million as capital spending, though rising marginally, surpassed revenue intake. Capital outlays were focused on infrastructure projects in transport, including the completion of the Causeway linking Middle and North Caicos. During the year, the government finalized arrangements for a $124 million facility for the construction of hospitals in Grand Turk and Providenciales. When these facilities come on stream they would alleviate the bottleneck in health care delivery and reduce treatment costs overseas.

5. Money and banking

Banking system deposits and loans and advances have grown over time, as financial deepening has gathered pace. The assets of the banking system exceeded $1.6 billion in 2007, bolstered by loans and advances, which were up by $300 million. The distribution of credit by sector remains somewhat lopsided, with construction, land development and property acquisition capturing 64% of the total. An effective diversification programme would require improved allocation of credit to viable projects in niche agriculture, fisheries, including fish farming and small businesses such as agro-processing. This would help to spread the pillar of the economy reducing risks to economic and environmental shocks. The banking system remains relatively sound with a delinquency ratio of less than 5%, which is good compared to the rest of the Caribbean. Indications are that the hurricanes would not have too much fall-out on the banking sector. Indeed, the system might be more affected by the subprime crisis in the United States, as the adverse wealth effect affects banks' wealth management portfolio.

6. Trade and payments

The Turks and Caicos Islands are highly import-dependent, with merchandise imports averaging around 56% of GDP in the last five years. Indeed, with a very limited production base, the islands import almost all of the products that they use. This high import-dependence alongside a weak export performance has resulted in a structural trade deficit

Total tourism expenditure was expected to increase in line with the 6% growth in long-stay arrivals and the more than 80% increase in cruise passenger arrivals. With these developments, the external current account was expected to be in a more healthy position.

B. Macroeconomic performance in 2008 before the disaster

The growth momentum of 2007 was expected to slow somewhat in 2008, with GDP growth of around 10%. Growth was expected to be pegged back a bit by the subprime financial crisis in the major United States market, leading to adverse contagion on the tourism and real estate demand in the Turks and Caicos Islands. Construction activity was also expected to slow as large projects, including the Causeway linking Middle and North Caicos were completed in 2007.

1. Prices, wages and employment

Inflation is expected to pick up in 2008 to 4.5%, as the accelerated rise in fuel and food prices increase imported inflation. The pass through effect of international fuel prices has a ready knock-on effect on prices in the Turks and Caicos Islands. Meanwhile, with the public sector drive to contain costs in an effort to achieve a surplus, public sector wage growth is expected to be contained. In the private sector, the slowdown in activity, particularly in construction (down by about 5%) will put a damper on wages. Similarly, employment growth is expected to be sluggish compared with last year as the diminished activity has a negative multiplier effect on job growth.

2. Fiscal performance

After the slippage in fiscal performance in 2007/2008, policy is aimed at consolidation in 2008/09. The government has budgeted an overall surplus of $8.6 million (0.9%) of GDP. Meanwhile, the recurrent account was projected to swing from a deficit of $29.2 million (3.5% of GDP) to a surplus of $8.7 million (1% of GDP). The turnaround in performance was pinned on a 13% growth in revenues to 34.3% of GDP on account of strong growth in receipts from taxes on domestic goods, duties and licenses. At the same time, total expenditure was projected to grow by only 0.1%, compared with robust growth of 19.6% in 2007/2008. Although medical costs were indicated to have fallen, this might have been due to the lack of submission of all commitments by the Ministry of Health. Outlays on scholarships declined as more stringent vetting and approval procedures were introduced.

For the year to date to end of September, public finances strengthened with the overall deficit contracting by over 85% to $4.5 million. At the same time, the recurrent deficit plunged from $23.6 million for the similar period in the last fiscal year to $2.4 million in the current fiscal year. The outcome was favourable on both sides, as total revenue grew by over 7%, while total expenditure fell by more than 11%. Although the outcomes did not meet the balance budget target, they were commendable and point in the direction of some fiscal consolidation.

Expenditure was contained mainly due to a substantial decline in costs for medical treatment overseas[21], an important area of concern for the fiscal authorities. These costs plunged by over 92%, as more stringent selection criteria were used to determine persons who should have access to overseas treatment. Spending on personal emoluments, allowances and foreign debt servicing also declined over the period to the end of September.

Meanwhile, total revenues recovered after some slippage in 2007/2008. For the year to end September, recurrent revenues increased by 13.7%, reflecting very dynamic growth in taxes on domestic goods

C. Macroeconomic performance for the first eight months of 2008 before the disaster

1. Output

Economic activity was expected to have slowed in the first eight months of 2008, relative to the same period last year. The relative slowdown in real output stemmed from reduced construction and tourism activity. Real estate activity, especially land and condo sales, was also anticipated to be more sluggish as the effects of the subprime crisis and premium cost lending in the United States took hold.

2. Prices, wages and employment

With the sharper than expected spike in international food and fuel prices, inflation was expected to exceed the projected annual rate of 4.5% during the first eight months of 2008. Although core inflation might have been more modest, the trending up of food and energy prices means a higher headline rate. Growth in public sector wages was contained during the period relative to last year, as improved expenditure management aimed at reducing the fiscal deficit kept down wage costs. Private sector wage growth was also expected to be relatively stable as the slowdown in the economy kept costs in check. Meanwhile, growth in employment was expected to have slowed relative to the corresponding period for 2007, as the decline in activity, particularly in construction curtailed the demand for workers.

3. Fiscal operations of central government and debt

Based on data for the year to date to end September, fiscal performance was expected to have improved up to the period before the disaster relative to the similar period last year. This would have stemmed from growth in revenues, which were bolstered by an economic stimulus programme based on the reduction of stamp duty on land transactions on Providenciales from 9.75% to 6%. Although spending on medical treatment appears to have fallen, this was due to late submission of invoices by the Ministry of Health, which led to an underestimation of costs, outlays on subventions, including scholarships were down significantly. Foreign debt service payments also contracted sharply, probably reflecting increasing acquisition of domestic debt.

[21] Overseas medical treatment costs have been growing steadily over time putting considerable strain on government finances. There also seems to be a moral hazard problem in that persons might be demanding more overseas treatment because the State is paying than if they had to pay a part of the costs. Government is in the process of constructing two state of the art hospitals to provide treatment locally and also plans to introduce a contributory National Heath Insurance System that would help to control medical costs.

4. Trade and external payments

During the first quarter of 2008, the value of merchandise imports expanded by 15.3%, relative to the similar period last year. With the hike in fuel prices, import costs for fuel and lubricants shot up by 44%. Meanwhile the cost of food imports was much more subdued (up 5.7%) in spite the global spike in food prices. Following the sharp slump in 2007, domestic exports recovered substantially to grow by 97% to $4.9 million in the first quarter of 2008. Exports of conch were up by more than 50%, while exports of lobster contracted by over 47%. If this pattern were maintained in the second quarter, the merchandise trade deficit would have been expected to worsen in the first semester also.

D. Performance of the economy with the disaster

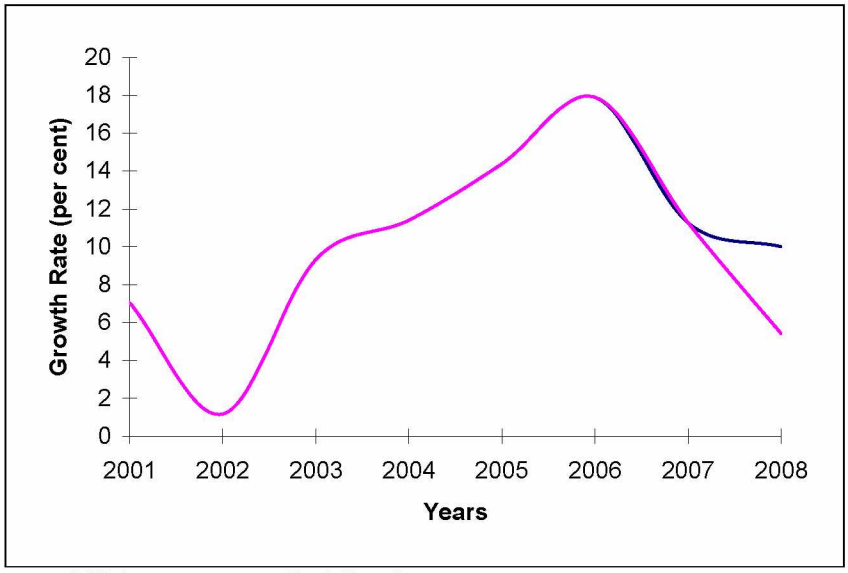
Economic performance in the wake of the tropical storm and hurricane would be affected by the nature of the events, especially in terms of the affected sectors and the extent of the post-disaster recovery effort. The primary impact of the disaster was on the social sectors, which accounted for 52% of the total impact. In addition, the impact on infrastructure represented 26% of the total impact. Meanwhile, the fall-out in the productive sectors accounted for only 9.8% of the total impact. Tourism, agriculture and fishing suffered damage and losses, but the country benefited from the fortuitous situation where Providenciales, the hub of the mainstay tourism sector, suffered relatively minor damage to the tourism plant and contained loss of business. Indeed, as disasters of this magnitude and duration go, the impact on the tourism sector could have been substantial with consequent adverse effects on revenue, activity and employment.

1. Impact on GDP

In effect the disaster was largely a socio-economic and capital stock event, with the housing stock on Grand Turk, South Caicos and Salt Cay extensively damaged and destroyed and also infrastructure including seaports, electricity and roads. Therefore the flow of incomes was not as badly disrupted as it could have been and as such GDP in 2008 is projected to contract by 4.6% from just around the forecasted 10% to 5.4%. The moderate fall-out in GDP reflects the fact that losses (income flows) were 44.2% of the total impact of the disaster.

Among the sectors, value added in the real estate, dwellings and rental sector would fall short of projections by more than 33% as a result of the widespread destruction of housing and the slowdown in the real estate subsector. A significant number of homes lost their roofs completely on Grand Turk, South Caicos and South Cay, leading to considerable loss of household furniture and other items. This would compound the fall-out in the sector. Real activity in the transport, storage and communication subsector is expected to decline by over 8.4%, associated with the relatively heavy damage and disruption in the subsector. Seaports, telecommunications and air transport suffered the brunt of losses, therefore income lost in these subsectors will contribute most to the fall in real activity in the sector. The cruise shipping terminal suffered major damage and was out of operation for some time.

Figure 11: GDP Growth Rate TCI Pre and Post Hanna and Ike



Source: Official data and ECLAC estimates

Road transport, which was expected to grow by about 12% prior to the hurricanes, is projected to remain flat with no growth in their wake. Air transport is expected to reverse the projected 5% growth to decline by 2.0%, as a result of damage to the JAGS Mc Cartney Airport on Grand Turk and the resultant loss of flights and income. Community and personal services would also be badly affected reflecting reduced activity in the public environment and by private households. Apart from housing, the other social sectors will also experience lower value added in 2008. Health and social work is projected to contract substantially, pinned back the high cost of overseas treatment, a fall in user fees and higher contingent spending to return service to normal.

Electricity and water, which has grown by almost 12%[22] over the last seven years, linked to upgrade in infrastructure, is set to contract by 4.9% in 2008 after the hurricanes, an about-turn from the 6.7% growth anticipated before the disaster. Although the bulk of the impact on the sector was to capital assets with widespread downing of electricity polls on Grand Turk, South Caicos and Salt Cay, the resultant disruption of supply and the costs of bringing supply back on stream also contributed to losses of over $2 million. Similarly, real activity in the wholesale and retail subsector is expected to contract by some 5.0%, as a number of outlets including supermarkets, hardware stores, small shops and other businesses suffered loss of supplies and increased contingent costs, such as the cost of generators to keep their businesses up and running and cleanup costs. In the case of the small shops in particular, many were uninsured, which means that owners will have to dip into their savings or acquire loans to restart business, leading to severe hardship.

[22] Nevertheless, the volatility of growth in the sector was relatively high as reflected in the standard deviation of almost 11%, very close to the mean.

With regard to the productive sectors, of signal importance was the fact that the main engine of growth, tourism, was spared the brunt of the disaster. Indeed, Providenciales the locus of activity in the sector suffered relatively mild damage. As a result real value added in tourism is projected to decline by around 3.5%. Nevertheless, Grand Turk was severely affected, with widespread closure of hotels and guest houses and the closure of the cruise ship terminal for over a month.

On the other hand, the construction sector, a dynamic driver of growth (18.8% over the last seven years), is expected to grow by around 5% more than the projected rate of 15%, reflecting reconstruction and rehabilitation works in the aftermath of the hurricanes. Reconstruction has already begun in earnest in the lower income, uninsured segment of the housing market, as households seek to rebuild and get on with their lives. Nevertheless, this poses an important risk as a number of persons are building back to the same standard that occasioned severe damage to their homes and properties. The most beneficial trade-off might be to ensure a minimum degree of retrofitting and risk mitigation standards, while ensuring that homes are repaired in reasonable time to limit hardship to households.

2. Prices, wages and employment

The consecutive hurricanes have disrupted subsistence/backyard and larger scale agricultural production. The government's model farm was fairly badly damaged. The overall impact on agriculture has led to shortages in the already small domestic food production sector and to a hike in prices. Moreover, it would increase the dependence on imported food products in an already highly import-dependent economy, resulting in a loss of foreign exchange at a time when the country could least afford it. In addition, the food shortage has been aggravated by shortage of building materials and other supplies that are in high demand for the rehabilitation and reconstruction effort. In an environment where food and energy inflation is already a major strain for households a further spike in prices from the domestic economy could mean severe hardship for lower income households.

The hurricanes could lead to a mixed result with respect to wages. While the public sector wage bill would increase in the short-term as government hires additional workers for relief, clean-up and rehabilitation operations, a number of persons in the private sector might have their work hours and wages reduced as businesses come to terms with reduced demand and the costs of undertaking rebuilding and retrofitting. This calls for a balanced intervention, including the State and the private sector, to reduce the hardships for workers at the lowest end of the workforce.

The employment fall-out from the hurricanes might be greater than anticipated because some hotels have used the situation to undertake upgrading and refurbishing. This means that a number of workers have been laid off temporarily, with resultant reduced incomes. The upsurge in construction will cushion the impact on employment by putting some persons back to work, but workers in service activity or agriculture cannot readily transfer to construction, except at the very lowest levels as they often lack the necessary skills. Rehabilitation programmes should therefore explore all opportunities to provide work for those workers who might not be readily absorbed by the labour market.

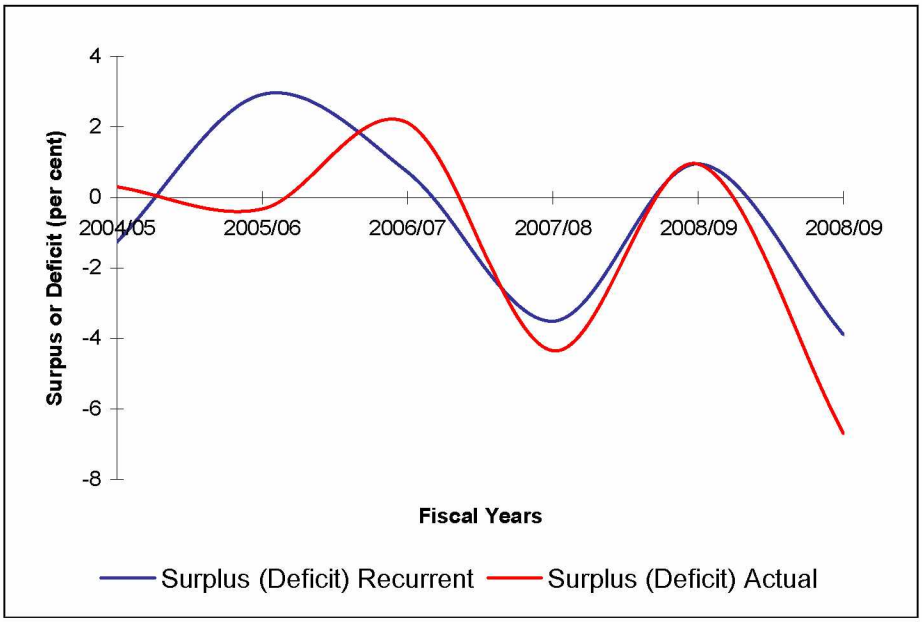
3. Fiscal operations of central government and debt

As is often said, fiscal policy "rules the roost" in the Turks and Caicos Islands. With a dollarised economy, lacking the tools of monetary policy, fiscal policy is a key catalyst of activity and employment. This is compounded by the multi-island environment which occasions the need for repeat infrastructure, including roads, airports and electrification in a number of islands. Nevertheless, the fiscal stance must strike a good balance between the need to foster the growth and development of the islands through, among other things, infrastructure development and public sector employment and the need for prudent fiscal management that emphasizes the productivity and efficiency of spending in terms of its value for money for the country. Striking this delicate balance is the only road to long-term fiscal sustainability, which is a precursor to balanced growth and development.

The fiscal stance in the TCI has been expansionary in the last year, with significant growth in both current and capital spending. In fiscal year 2007/2008, government registered a recurrent fiscal deficit of 3.5% of GDP ($29.2 million). In a move towards fiscal consolidation and stability over the short to medium-term, the government had budgeted a fiscal surplus of around 1% of GDP in 2008/2009. Even if this target seemed a bit ambitious it was of useful indicative value as it signaled to line ministries to contain expenditure, improve their efficiency and to tighten tax administration and collections in an effort to at least approach the target. Although the full scope of government outlays on relief, rehabilitation and reconstruction cannot be ascertained at this time, the disaster is expected to lead to a substantial overall deficit of 6.7% of GDP (see figure 11 and table 27 below), completely reversing the budgeted surplus of 0.9% of GDP. At the same time, the recurrent deficit is expected to come in at 3.9% of GDP instead of the budget recurrent surplus of 1% of GDP in 2008/2009. This is not unusual, however, as the severe economic shock of a disaster necessitates 'counter-shock' deficit spending in the mode of Keynesian pump-priming to return the economy to its trend or natural growth rate as quickly as possible. It is anticipated that by the end of fiscal 2009/2010, the fiscal situation would have stabilized somewhat allowing government to refocus on longer-term fiscal sustainability.

On the revenue side, recurrent receipts are projected to decline by around 6%, from 26.8% of GDP to 26.2% of GDP as tax exemptions, including duty concessions, and reduced buoyancy of the tax intake due to sluggish economic activity in most sectors, except construction. Receipts from duties were projected to decline by around 10% (around $8.0-$10 million) linked to exemptions of import duty on building materials for 30 days in some cases to facilitate reconstruction and rehabilitation. Proceeds from taxes on transactions are expected to contract by 5%. Meanwhile, returns from fees, fines and permits and interest, rents and dividends are each expected to fall by around 5% as the economic downturn reduces these payments. Similarly, taxes on domestic goods are expected to net reduced proceeds associated with lower demand and incomes. Other revenues heads would also provide lower receipts in a slowing economy. The disaster also affected productivity, especially in September, and government had to pay about $3 million to civil servants who were not at work.

Figure 12: TCI Fiscal Performance as % of GDP Pre and Post Hanna and Ike



Source: ECLAC estimates based on Official data

On the other hand, growth in expenditure is expected to accelerate as outlays for relief, reconstruction and rehabilitation boost government spending. Recurrent expenses are expected to rise from 25.9% of GDP before to 30.1% of GDP after the disaster. The overall outcome on the recurrent side for 2008 would be influenced by the improved fiscal performance during the year to date to September compared with the similar period last year. For the sub-categories of recurrent spending, medical treatment overseas- a big ticket expense is expected to grow sharply (54% more than budgeted) as persons had to be sent overseas for dialysis and other treatment due to disruption of local hospital care. Wages are expected to grow by 3% more than budgeted prior to the hurricane as government hires more workers and pays overtime for clean-up and rehabilitation activities. Social welfare expenses would rise 5% and outlays on clean-up would expand as government incurred higher costs under these heads for relief of needy persons and cleanup, repairs and maintenance.

Although the amount, type and terms are left to be determined, it is anticipated that government would have to contract debt in order to ensure a timely and orderly rehabilitation and reconstruction programme. Simply allowing the economy to return to its natural growth path without intervention, is certainly not a viable option, as this could lead to a protracted slowdown in activity with attendant hardships for the population and reduced future productive capacity as damaged capital is not replaced and rehabilitated. Therefore, the debt stock is expected to increase in line with government borrowing for reconstruction.

Table 28: TCI Government Revenue and Expenditure for Fiscal Years

SUMMARY OF	2007/08	Pre- Hanna & Ike 2008/09	Post- Hanna & Ike 2008/09
Description			
Revenues			
Taxes on Transactions			
Taxes on Domestic Goods	39,860,453	44,325,245	42,108,983
Licences	40,089,937	45,275,000	44,369,500
Duties	8,788,430	10,950,500	9,855,450
Fees, Fines and Permits	76,759,210	86,700,000	78,030,000
Interest, Rents and Dividends	28,879,036	44,215,550	42,004,773
Other Revenues	2,070,006	2,530,000	2,403,500
Refund of Revenues	12,234,226	10,914,750	10,772,858
Prior Year Adjustment	(2,154,353)	0	
	237,375		
Total Recurrent Revenues			
Loans	**206,764,320**	**244,911,045**	**230,640,114**
Private Sector Contributions			
Grants	6,917,995		
Infrastructure Development			
Capital - Land Transactions	2,120,948		
Total Capital Revenues			
	69,988,825	68589048.5	65159596.08
Total Revenues			
	276,753,145	313,500,094	295,799,710
Expenses			
Personal Emoluments			
Wages	54,860,046	67,806,496	69,162,626
Allowances	11,976,201	12,109,161	12,472,436
Rewards and Incentives	12,928,067	15,643,425	15,799,859
Pension and Gratuities	78,969	122,000	122,000
	9,778,088	6,885,316	6,885,316
Total Personnel	89,621,371	102,566,398	104,442,237
Local Travel	4,148,736	3,688,959	4,057,855
International Travel and Subsistence	2,782,053	3,388,970	3,558,419
Utilities	4,166,483	4,053,940	4,053,940
Communications Expenses	2,894,191	2,686,058	2,793,500
Office Expenses	2,421,496	2,663,451	2,716,720
Subscriptions, Periodicals, Books & Technical References	480,658	403,720	415,832
Other Supplies, Materials and Equipment	1,112,554	1,075,515	1,107,780
Operating Expenses	3,581,976	3,908,816	4,065,169
Maintenance Expenses	8,203,699	10,390,458	10,494,363
Protective Clothing, Chemicals	608,098	654,585	661,131
Rental of Assets	4,920,982	6,467,716	6,791,102
Recurrent Subprogrammes and Projects	4,300,601	6,134,050	6,134,050

Professional and Consultancy Services	1,885,678	2,018,200	2,220,020
Computer License, Software and Hardware Maintenance	528,365	756,400	756,400
Insurance	401,177	401,000	401,000
Hosting and Entertainment	5,322,733	3,967,352	4,165,720
Training	1,242,898	1,798,216	1,798,216
Drugs, Medical and Laboratory Supplies	3,260,193	2,760,000	2,815,200
Advertising and Promotions	277,289	285,460	285,460
Grants and Contributions	24,741,154	20,870,194	21,705,002
Subventions	27,834,016	21,784,811	23,091,900
Social Welfare	2,598,926	1,500,000	1,575,000
Medical Treatment Overseas	31,154,721	2,119,461	2,289,018
Medical Treatment Local		21,401,000	21,829,020
Refunds	85,884	15,000	15,000
Claims against Government	28,745	50,000	52,000
Sundry Expenses	117,369	55,000	55,000
Suspense - Credit to Expenditure	2,355,883	2,072,250	2,072,250
Debt Servicing - Domestic	943,627	1,537,125	1,537,125
Debt Servicing - Foreign	3,913,004	4,760,472	4,522,448
Prior Year Adjustments	(993)	0	0
Total Recurrent Expenses	235,933,567	236,234,577	265,188,875
Development Fund Expenditures	76,871,738	68,695,977	89,700,000
Total Expenditure	312,805,305	304,930,554	332,177,875
Surplus (Deficit) Recurrent	**(29,169,247)**	**8,676,468**	**(34,548,744)**
Surplus (Deficit) Actual	**(36,052,160)**	**8,569,540**	**(59,089,148)**

Source: ECLAC, estimates based on official data

4. Trade and external payments

The structural trade deficit would be severely aggravated by the hurricanes. The very high propensity to import in usual times, the result of a limited and undiversified production base, will be exacerbated by the hurricanes. The need for substantial imports for the relief, rehabilitation and reconstruction programme means that imports are projected to grow by around 23%, instead of the projected 14% to 81% of GDP from the forecasted 73% of GDP in 2008 (see figure 12 below). The spike in imports will be particularly reflected in a sharp upturn in imports of food items, as the government has operated a hot meal programme for the most needy citizens and also building materials for home and other property repair and also durable goods such as refrigerators and generators. Impetus for the growth in imports was also provided by the needed import duty exemptions that were provided by the government for up to 30 days in some cases to facilitate the rebuilding and rehabilitation process.

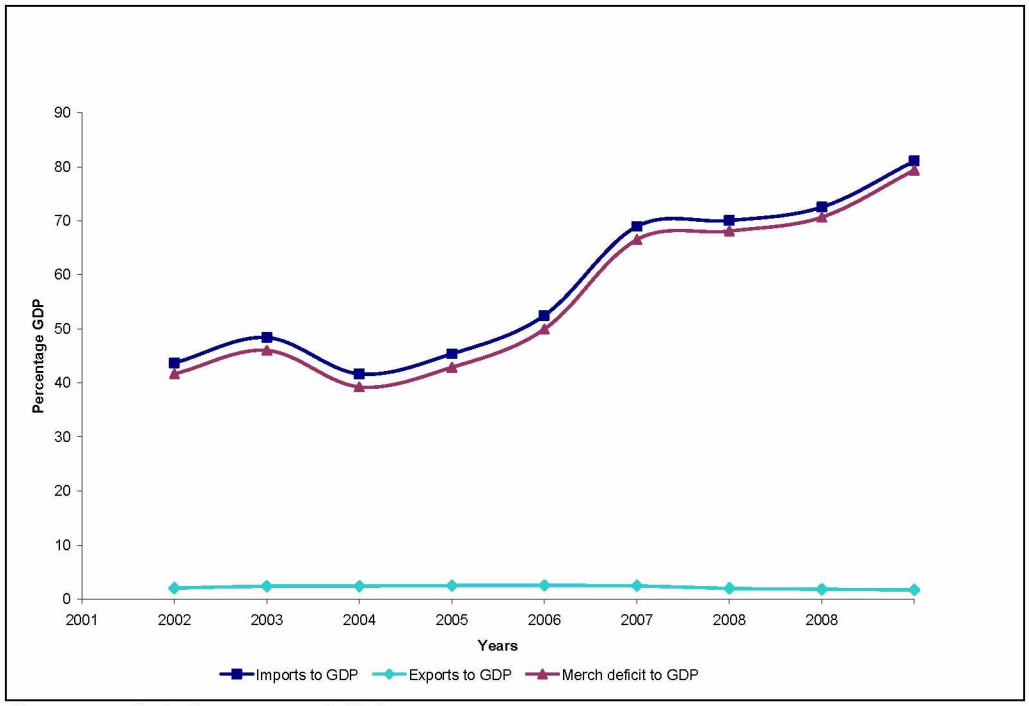
On the exports side, the already fledgling goods exports will be dampened by the impact of the hurricanes. The disruption in the fishing subsector, in particular, will weaken goods

exports, especially of fisheries products such as lobster and conchs. With these developments, exports are expected to decline by almost $2 million, after the disaster from 1.8% of GDP to 1.7% of GDP.

Services will also be affected by the disaster, as loss of business in the tourism sector and downtime in the financial services subsector will lead to lower net receipts. Tourism was estimated to suffer losses of almost $9 million, thus there is expected to be a moderate decline in tourism receipts stemming from lower arrivals, reduced length of stay for visitors who were on island during the hurricane and discounted hotel room rates in some establishments. Nevertheless, insurance inflows for insured properties are expected to cushion somewhat the slowdown in services receipts. Indeed, the government has already received $6.3 million from the Caribbean Catastrophic Risk Insurance Facility (CCRIF), and some private households will receive additional receipts, though not nearly in the proportion of the Cayman Islands after Hurricane Ivan, as the number of insured and the level of coverage was much higher in the Cayman Islands.

With respect to current transfers, aid flows are expected to increase as donors help to ameliorate the hardship of citizens in the aftermath of the hurricane. However, the perception that the Turks and Caicos Islands are relatively wealthy, notwithstanding their high and varied vulnerability, means that donor assistance is not expected to be substantial enough to make a material difference to the relief and rehabilitation efforts. This clearly points to the need to contract debt on as favourable terms as possible to expedite the reconstruction and rebuilding process and to return the economy to normal growth. Also, unlike countries like Grenada and Jamaica where remittances are usually important, these flows are not sizeable in the Turks and Caicos Islands and are not anticipated to be important. Moreover, the recessionary environment in the United States and, to some extent, in the United Kingdom means that households have little funds to remit in the first place.

Figure 13: TCI Imports, Exports and merchandise deficits as a % of GDP 2001-2008 before and after Hanna and Ike



Source: ECLAC, based on Official data

E. Economic challenges and policies going forward

Hurricanes Hanna and Ike have provided a major shock to the economy of the Turks and Caicos Islands. The heavy impact on the capital stock, made worse by income losses and unplanned spending in a number of sectors and activities, would adversely affect short to medium-term economic performance. The housing stock bore the brunt of the damage and given the low insurance coverage ratio and the high level of underinsurance, it is anticipated that the government would have to assist low income households with their rebuilding or relocation. The housing problem cannot be passed off as a private, household issue, as it impinges on worker satisfaction and productivity in the workplace. In addition, houses are an important part of the country's productive capital, impinging directly and indirectly on productive capacity and economic performance.

A National Recovery Fund (NRF) that is informed by the experience of the Cayman Islands after hurricane Ivan would be useful to expedite repairs and reconstruction of houses for the poorer, uninsured segment of the population. Similar to the Cayman Islands, the Fund could be set up as a private, independent Trust to shield it from any perception of unfairness in the conduct of its affairs. Trustees should be held to high fiduciary duties with requisite penalties for breaching them. In prioritizing assistance, the needs of families with young children, old and infirm persons and other aspects of socio-economic deprivation should be addressed first.

The key challenge is to get the economy up and running in the shortest time possible while ensuring that the rebuilding and reconstruction process have inbuilt mechanisms for guaranteeing mitigation, retrofitting and sustainability issues are tackled. An important consideration is that the economy has been growing at double digit rates for the last seven years, therefore, a sharp contraction would be all the more painful. The policy strategy should be focused on limiting the slowdown resulting from the disaster-shock, while focusing over the longer-term on putting the economy on a more sustainable growth and employment path. In this regard, an immediate policy challenge is the extent of economic stimulus that is required and how far the State should be a catalyst for the recovery.

1. The fiscal stance and recovery

The government had put forward a relatively conservative budget for fiscal 2008/2009 in the hope of achieving some degree of consolidation and buildup of reserves. On the revenue side, a number of measures focused on rate increases were programmed to increase recurrent receipts. Chief among these in terms of revenue generating impact were the increase in the international departure tax ($16 million), the customs processing fee ($6.5 million) and the Money transfers levy ($2.5 million). With respect to expenditure, the thrust was to reduce overall spending, especially 'non-productive' recurrent cost. Recurrent costs were budgeted to decline marginally, but capital spending, allocated to the Development Fund was forecasted to fall by over 10%.

Nevertheless, the shock of the disaster would now necessitate a reversal of policy focus away from consolidation and conservatism to stimulus and expansion. However, in a dollarised economy, without the tools of monetary policy (money supply expansion or interest rate cuts), recovery and expansion in the Turks and Caicos Islands will require the judicious use of fiscal stimulus, which in the current situation where the government lacks reserves would require the use of debt financing. The case for deficit/debt financing as an anti-recessionary or anti-shock tool is clearly established in theory and practice, as is evident in a number of OECD countries presently, in the wake of the financial crisis.

In the current situation, it is recommended that the fiscal arrangement between the United Kingdom Government and the Government of the Turks and Caicos be relaxed to allow the latter to undertake additional borrowing to expedite reconstruction and rehabilitation and the recovery of the economy. Currently, new borrowing is contingent on the government meeting three key ratios: net debt to current revenue of 80% maximum; debt service to recurrent revenue of 8.0% maximum and liquid assets to gross debt of 20% minimum. Nevertheless, these prudential benchmarks are relevant for an economy that is on a steady growth path. In the present situation, where the economy has faced a major shock that could derail medium-term growth prospects, deficit finance is required to return it to its normal growth trajectory. In the context of the major shock limiting the fiscal deficit to the overdraft limit of $5 million would put a serious damper on the recovery effort. Although the fiscal stabilization plan is a vital long-term target, in the post-disaster environment, it needs to be relaxed to facilitate recovery within a prudent framework.

Borrowing would be necessary and the requirement could be met by a combination of a bond issue and loans obtained on the best terms possible given current market conditions. Although the government lacks fiscal reserves and the level of debt has grown fairly rapidly in the last few years, the debt to GDP ratio remains quite moderate at less than 10% of GDP. The bulk of the debt is owed to the domestic banking sector, which reduces the vagaries of international market currency and interest rate risks. Moreover, the government has been able to service its debt in a timely manner. Crucially, with a relatively attractive and competitive tourism product, complemented by the off-shore financial services sector, the medium to longer-term growth prospects for the economy remains quite good. Therefore, the combined indicators, point to an ability to achieve debt sustainability in the longer-term, once debt is managed prudently and a significant portion is channeled into activities that promote dynamic growth in the economy. Indeed, as Lawrence Summers noted in referring to the downturn in the United States economy in the wake of the financial crisis, "since Keynes we have recognized that it is appropriate to allow government deficits to rise as the economy turns down if there is also a commitment to reduce deficits in good times." The key issue here is that the government must show a commitment to reduce the deficit when the economy recovers so that over the longer-term, its finances would be in good order.

This borrowing should be ring-fenced by prudential guidelines and requirements to ensure the maximum productivity of the debt and economic growth that would facilitate the servicing and eventual retirement of the debt. In this context, it would be useful for the government to devise an Integrated Reconstruction and Rehabilitation Plan that outlines the main areas targeted such as housing, infrastructure and agriculture, among others, and the specific projects that are planned in these areas. The value added of the projects should be outlined, the source of funding (loan or loan and Public Private Partnerships (PPP)), and the potential of the activity to service its debt on its own. This structured approach with a focus on the value for money to be derived from debt, provides a transparent and accountable framework to ensure that funds are used optimally. In fact, government had articulated two priority objectives in the 2008/09 budget-first to prioritize and control expenditure in line with appropriations and to aggressively collect and account for all revenue due to the government, including a reduction in concessions and exemptions. If such policies of restraint are maintained in the recovery and upswing phase of the economy, a sustainable fiscal stance would be guaranteed.

To ensure the efficacy of additional borrowing, the borrowing guidelines could be revised to take account of the need for new debt, with the relevant adjustments to the targets within a policy-based framework. This would track growth in debt relative to revenues, economic growth and reserves.

As alluded to before, the quality and productivity of the debt is critical to a sustainable recovery in the Turks and Caicos Islands. Too often in the aftermath of disasters, governments focus on what is expedient in the short-term without sufficient consideration to longer-term balanced growth. It is proposed that the government clearly assess the areas of priority in the recovery to get the balance right between rehabilitation of the capital stock, including housing, infrastructure and social relief on the one hand, and stimulus for productive activities that would earn income, especially exports. In this regard, it is recommended that the disaster be used as an opportunity to not only recover past production and productivity levels in the fishing and nascent

agriculture sector, but to make a major pitch for expanded output and quality in these sectors. In addition, incentives should be provided for dynamic recovery and growth in tourism, including a well-designed and aggressive marketing campaign to let source markets know that the country is ready for business.

In the 2008/2009 budget, the government signaled its intent to use Private Finance Initiatives (PFIs) with the private sector to fund some capital projects. It is proposed that where terms and conditions are favourable, the government should use PFIs and PPP with the domestic private sector to finance some reconstruction activities. This could help to shield the country from the interest rate risks and other shocks that could affect borrowing from external creditors. Also, in the current financial environment where international finance is relatively hard to come by and its cost has increased, government would need to shop around to obtain the best terms if it plans to access foreign finance. Tax reform should also be considered and rate changes made where feasible to maximize revenues. This should be supported by an improved programme of tax administration and collections.

To repay the debt on schedule, a portion of tax and other receipts should be earmarked for debt servicing. To lock in this process, an automatic trigger should be established so that when tax receipts exceed an established benchmark, a worked-out portion is transferred to a "debt servicing fund". This fund should be prudently managed by highly qualified technicians with some investments in sound instruments that safeguard its value. In addition, the debt servicing systems should be strengthened to ensure that obligations are met on-time to avoid late payment fees and penalties.

2. Real sector challenges and opportunities

Disasters present some opportunities, despite their adverse effects. This might be the time for policy authorities to galvanize efforts for a solid diversification programme to put the economy on a broader, more resilient base. The fisheries subsector might be one activity with good potential. However, there is the need to increase domestic value added by processing and packaging to meet international standards. Fish farming on an expanded scale, if provided the right incentives, could contribute to local sales and exports. Nevertheless, activity in these sectors should be left to private investors who might find opportunities for investment based on market prospects. Government should only assist with providing a broad incentive framework that would boost private investment in these real activities based on their prospective ability to be profitable.

The impetus to developing a dynamic, cutting-edge yachting sector should be expedited. This should involve the development of an integrated cluster with backward and forward linkages. An assessment should be done of the competitive advantage of the Turks and Caicos Islands in the whole 'value chain' of the sector, including venture financing, construction, maintenance, registration and provisioning of supplies. Out of such analysis, the Turks and Caicos Islands might want to proceed with the most advantageous niches and build up capacity in the others over time. The revitalization of the financial services sector, including the development of new products and services and the introduction of forward-looking regulation, especially in light of the world financial crisis is also critical.

V. CONSIDERATIONS TO THE RECOVERY AND RECONSTRUCTION PROCESSES

Box 4 highlights a number of issues of vulnerability of the Turks and Caicos Islands which the weather systems of 2008 have made visible. In developing programmes for recovery and reconstruction, such vulnerabilities need to be considered. Following are general comments for recovery efforts followed by a number of recommendations for short-term and strategic mitigation approaches.

Box 5: Key vulnerability issues for consideration

(a) Poverty and its attendant ills;

(b) Fast pace of growth;

(c) The engines of growth of the economy and their vulnerability to global shocks;

(d) The structural rigidities of the economy;

(e) The social dynamics of inequality and marginalization; and

(f) Strained carrying capacity and physical vulnerability of the islands to storm surge.

A. General considerations:

In light of the impact of Tropical Storm Hanna and Hurricane Ike it may be useful for the policy makers of the Turks and Caicos Islands to consider the following for action:

(a) Help prioritize actions for the short-term preparation and improvement before the tourism season begins (immediate reestablishment of tourism facilities such as the cruise ship terminal, public relations campaign to avoid cancellations);

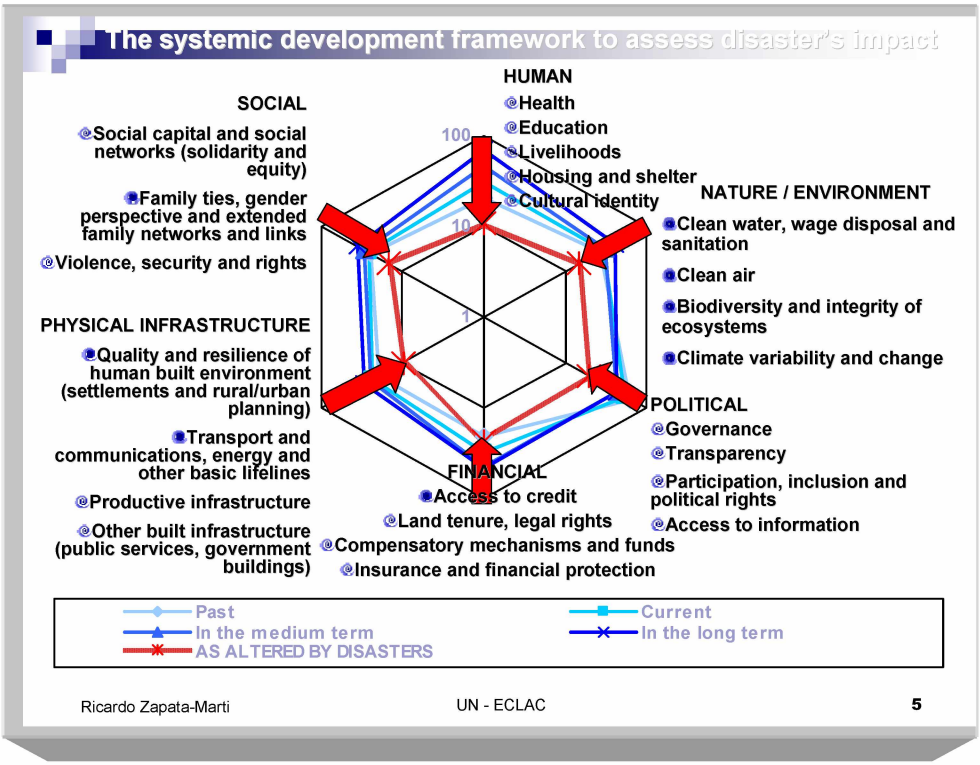
(b) Prepare adequately for the next hurricane season (six months, namely restoring relevant crucial infrastructure such as causeway between South and Middle Caicos), emphasizing the need to create an early warning facility and establish a national weather bureau to furnish accurate, real time information and generate appropriate weather indicators such as rainfall data on relevant national locations, monitor sea water temperature, even a radar monitoring mechanism and promote cooperation and interaction with regional institutions such as CDERA so as to reduce complete dependence on neighbouring countries for information;

(c) Make clear government policies which will link the recovery and reconstruction to the medium- and long-term development plans of the country. Especially important will be

the need for clear and forceful insertion of risk reduction in current development plans and the revisiting of present risk transfer and insurance mechanisms;

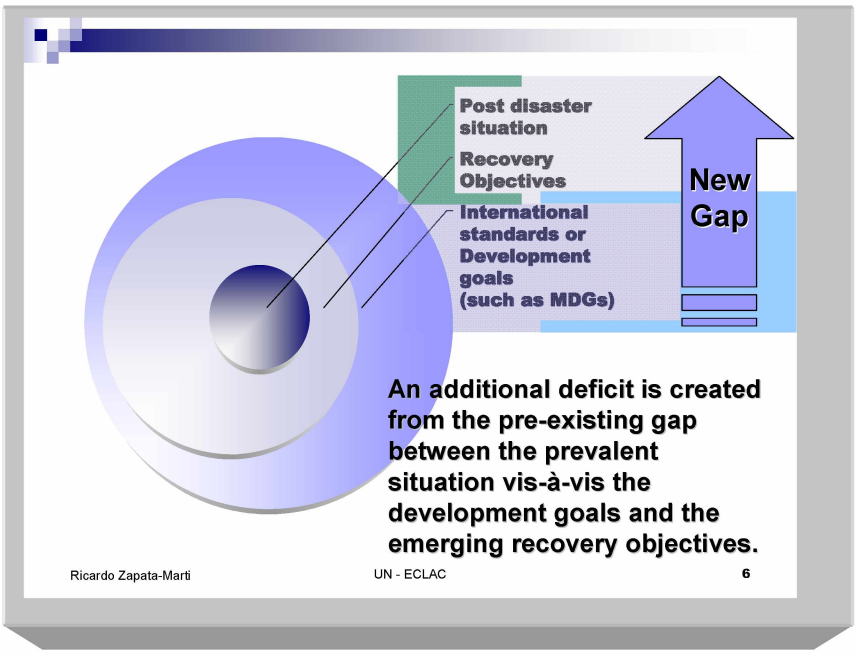
(d) It bears indicating that the current *National Socioeconomic Development Strategy* developed by the Turks and Caicos Government as their national development framework for 2008-2017 only refers to risk reduction in the context of environmental protection –which is certainly strategically crucial—but does not look at risk as a cross-cutting issue in the other axis of their strategy, namely infrastructure, quality of life, business and enterprise, people and workforce (predominantly of foreign origin and with a majority of non-nationals), and economic competitiveness.

Box 6: Systemic development framework to assess disaster impact



(e) In the face of the challenges to sustainability and given the potential impacts of climate change (that is too often viewed solely within the context of environmental protection), it may be useful to incorporate risk management as an integral systemic component, in investment policies; in the identification of financial resources for development; in risk reducing investment; as well as in the design of land use planning and construction of key motors of economic growth -tourism and financial services. Issues such as internalization of risk by the hotel and tourism industry, the redundancy of basic services and lifelines as matters of competitiveness for the services and Information and Communication Technology (ICT) ought to receive special attention. Consideration may also have to be given to the appropriate off-island backing of crucial data sets, vital information as is necessary; and

Box 7: Development gaps



(f) Finally the recovery and reconstruction framework to be constructed in the post-disaster scenario should be seen not only as a "build back better" programme but a resilience building one, that enhances the viability and sustainability for their development strategy. It should be recognized that the disaster poses an additional gap to the pre-disaster development gap, both in terms of financial resources and in other crucial aspects such as planning, regulations and legal and institutional implications. Among these, the adoption of appropriate financial protection instruments to protect against extreme events such as this one and to enable efforts for the adaptation to climate change. Issues of insufficient use of insurance and other risk transfer mechanisms and the inappropriate pricing of risk, leading to a vicious circle in which public goods become public calamities should be noted.

B. Short term Recommendations

(a) Support efforts to meet the basic needs of the poorest;

(b) Provide training for the informal construction sector in risk reduction practices at community level;

(c) Strengthen capacity at the Emergency and Maintenance Services (EMS);

(d) Design financial mechanisms to ensure reconstruction with mitigation of homes and government buildings;

(e) Provide micro credit facility for fisher folk and small and 'backyard' farmers to ensure quick resumption of economic activity;

(f) Ensure restoration and safeguarding of heritage sites;

(g) Establish vulnerability reduction for the telecommunications subsector. Methods may include: use of more streamlined antennae; better spares inventory; use of local trained maintenance personnel in each island; and

(h) Oil storage facility at Cockburn Harbour, South Caicos, is vulnerable to storm surge and waves and should be enclosed in a bern;

C. Strategic mitigation approaches to advance sustainable livelihoods and development

(a) Strengthen disaster management capacity at the micro, meso and macro levels;

(b) Build capacity in the capture of information regarding damage and loss at the community level;

(c) Strengthen baseline information systems especially national statistical systems producing timely and periodic data;

(d) Make use of risk assessment in the location of all critical facilities;

(e) Strengthen economic diversification efforts (through provision of incentives to fisher-folk, subsistence farmers, meso and micro entrepreneurs) to generate alternative employment opportunities and as a risk reduction strategy;

(f) Provide special incentives to increase the participation of youth and female producers, particularly those who are heads of households, in the economic development process;

(g) Address the relocation and/or retrofitting of community homes and structures located in hazard zones;

(h) Upgrade the quality of housing and sanitation of the poor urban centers and outlying communities;

(i) Explore the location of electricity distribution systems underground in critical areas;

(j) Ensure structurally sound design and construction of critical road network systems;

(k) Safeguard and/or halt the erosion of costal zones and the destruction of mangroves; and

(l) Develop long term plans for solid waste management.

Annex I

A. Project ideas to address issues of vulnerability, recovery and reconstruction in the Turks and Caicos Islands following Tropical Storm Hanna and Hurricane Ike.

1. Rebuilding the livelihoods of small entrepreneurs and subsistence farmers

Tropical Storm Hanna and Hurricane Ike were particularly devastating for small entrepreneurs and subsistence farmers. As a consequence, the two back-to-back systems combined have deprived both farmers and small entrepreneurs of their livelihood supports. In Grand Turk, South Caicos and Salt Cay, some 80% of small businesses experienced severe damage to their businesses. In North and Middle Caicos, the crops of approximately 100 subsistence farmers have been devastated. These affected groups are among the most vulnerable in TCI, characterized by high levels of poverty.

This project proposes that the government set up a cash grant facility (supported by extension services) that is means tested and based on losses to assist small businesses and farmers to reestablish operations and production. The main goal of this project is to allow subsistence farmers and small entrepreneurs to recover from the damage and losses by rebuilding their livelihoods with the necessary mitigation to enhance the resilience of their operations.

2. Repair and reconstruction of houses and urban rehabilitation

Many houses have been badly damaged or suffered extensive or partial damage due to the weather systems of August-September 2008. An estimated 36% of houses need urgent and immediate repairs or rebuilding. ECLAC estimates that at least 75% of the houses were without insurance, or under insured, suggesting that the State may be viewed as the mechanism of last resort for the provision of support for families in the restoration of their main asset.

It is not sufficient for houses to be repaired at the same standard that they were in the past, but a programme that encourages retrofitting for hazards caused by wind and flooding is necessary. They would require rebuilding to withstand a maximum category of hurricane, for example, a category 4 hurricane. The last hurricane experience in the Turks and Caicos Islands was some 48 years ago.

Through an organized progamme of support for home repair the authorities can: (1) provide support for those most in need and insure the rapid rebuilding of Grand Turk which was severely damaged and is the seat of Government business; and (2) influence the reconstruction at a higher standard previously constructed. The Cayman model of a funding mechanism can be considered.

The destruction caused by the disaster can be used as an opportunity to support urban renewal and rehabilitation, with a phase by phase improvement of the most vulnerable communities.

A funding mechanism with an available capital base of US$60 million for the purpose of using a combination of small grants and loans based on clearly stated income and social criteria for home rebuilding and repair could be considered.

3. Infrastructure

In all, four projects are recommended for urgent consideration. Two fall under the heading of rehabilitation, while two fall under the heading of vulnerability reduction. These projects are described in more detail in the following subsections.

A. Rehabilitation

1. Causeway repair

The first project that is in urgent need of implementation is the repair of the damaged causeway between North Caicos and Middle Caicos. This recently constructed stretch of road forms an invaluable link between the communities on these two islands, and one that should be rehabilitated in as short a time as possible.

In the redesign of this causeway, a number of design elements must be considered. These include:

(a) Accounting for an adequate waterway area, over and above what was previously provided (see photo below), in order to ensure a pathway for water to pass between the two water bodies that have been separated by the causeway. In determining the cross-sectional area of waterway required, it is recommended that hydrodynamic modeling be carried out. This modeling should be preceded by a programme of current measurement, which should be used to calibrate the hydrodynamic model.

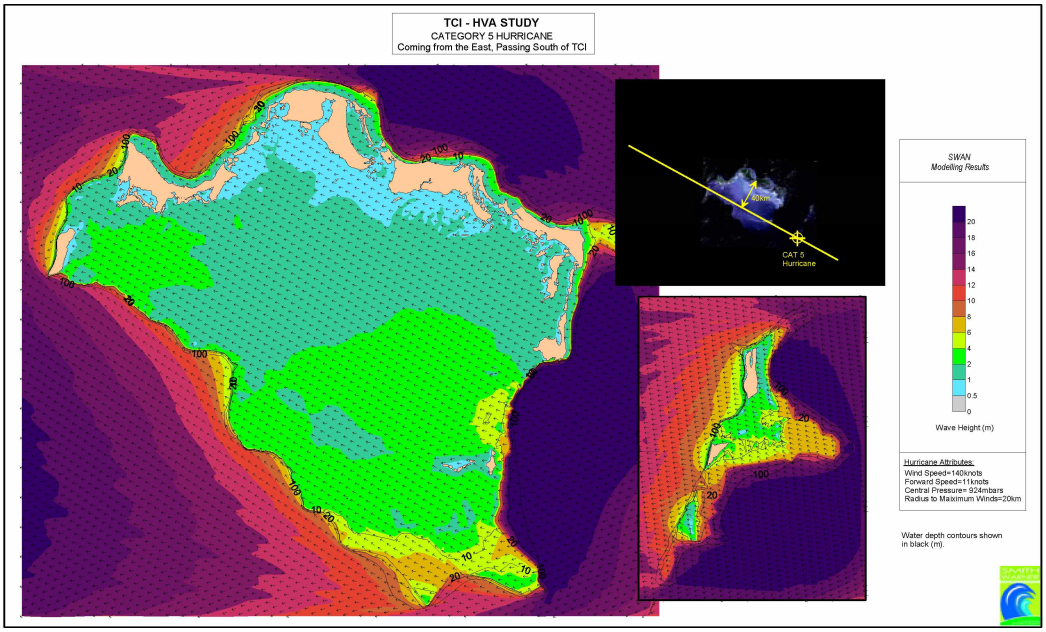
Single waterway opening

(b) The design of the armour stone revetment for the causeway should take into account (i.e. be able to withstand) a Category 4 or 5 hurricane. It appears that the armour stones used were too small (see photo), and were consequently displaced by the waves generated by Tropical Storm Hanna.

Undersized stones

(c) Some wave analysis has already been carried out, for Category 1, 3 and 5 hurricanes for the Turks and Caicos Islands[23]. The wave height predictions from this study for a Category 5 hurricane are reproduced below. From this work it can be seen (figure below) that the prediction for a Category 5 hurricane wave height in the vicinity of the causeway would be approximately 1.0m, with a possible range, depending on location, of from 0.5m to 2.0m.

Wave Height Predictions for TCI – Category 5 Hurricane



[23] Smith Warner International Ltd., 2008. "Turks & Caicos Islands Hazard and Vulnerability Assessment".

2. Cockburn Harbour Dock Repair

The dock at Cockburn Harbour, South Caicos, was damaged in several areas as a result of Hurricane Ike. The damage observed could create serious safety problems relating to the structural integrity of the dock and the continued ability of the Port management to offload containers at this location. In addition, the adjacent shorelines of the port suffered damage to the placed rocks on the south side of the main dock, (see photos below), and severe erosion on the north side of the dock.

For any rehabilitation work, the following is recommended:

(a) A dock inspection dive should be carried out, to inspect the condition of the dock down to the seabed; and

(b) The design of the rehabilitated docks should take into account the prediction for a 1.0 – 2.0 m high wave as predicted for this location in figure above.

Damaged shoreline revetment at port

Eroded North Dock Face

B. Vulnerability reduction

1. Weather station

Presently, the Turks and Caicos Islands do not have a continuous recording weather station. Consequently, storm advisories and updates must be received either from the Bahamas or from Cuba. During Tropical Storm Hanna, it was reported that 13" of rainfall fell in Middle Caicos in a three-day period, however, no official local records exist for this event, or for Hurricane Ike.

Given this state of affairs, it is recommended that the government of the Turks and Caicos Islands make a formal request to the United Kingdom Meteorological Office (UKMO),

for assistance in setting up two weather stations, one in Grand Turk and the other in Providenciales. This would greatly assist the government in reducing the vulnerability of its population during the hurricane season, by allowing adequate forecasting information to be broadcast to the local population.

2. Hydrological study

During the recent storm events, a significant amount of rainfall fell on the southern islands of the Turks and Caicos Islands. Some comparison can be made between South Caicos and Salt Cay with regards to the way that the drainage systems of these islands responded to the excessive rainfall. In South Caicos, for example, the water took over two weeks to drain away, after the passage of Hurricane Ike. By contrast, in Salt Cay, the water level was significantly down after a period of three days. This difference points to the fact that the salinas in South Caicos are likely acting to retain the rainwater, whereas in Salt Cay the drainage through the system of salinas appeared to function well.

In light of these observations, it is strongly recommended that a full hydrological study be carried out for South Caicos, to examine the way in which the salinas are presently working. In addition, one of the objectives of this project could be the optimization of the salina outlets so that drainage from this system is maximized.

C. Costs

Anticipated project costs for the rehabilitation projects have already been given in the summary of damages and losses. For the vulnerability reduction recommended projects, anticipated approximate costs are as follows:

(a) For the two weather stations recommended, including the provision of advice and specifications by the UKMO, $200,000; and

(b) For a detailed hydrological study of the salina system in South Caicos, it is recommended that $100,000 be allocated.

Annex II

Scotiabank building with extensive structural and roof damage

Damaged House in Grand Turk (the entire roof is gone)

The Jags McCartney International Airport, Grand Turk after Hurricane Ike

Jetty at Port in Grand Turk

Container Moved to Beach in front of Port in Grand Turk

A flooded street with downed utility poles

A section of the road blocked by debris

Flooded Streets in Grand Turk

Damage to electrical infrastructure

Residents of Grand Turk Gather in the Aftermath of the Storm

New poles for utilities at wharf in Salt Cay

TCU crews at work replacing poles

Damage to roof of house on Salt Cay

Temporary living quarters

Typical building roof damage in South Caicos

Damage to roof of school in South Caicos

Damage to Container Dock in South Caicos

Damage to school in Middle Caicos

Damage to Causeway (Middle Caicos to North Caicos)

Downed poles and lines in Middle Caicos

Extensive flooding in Middle Caicos

Typical roof damage in North Caicos

Causeway damage (Looking west towards North Caicos)

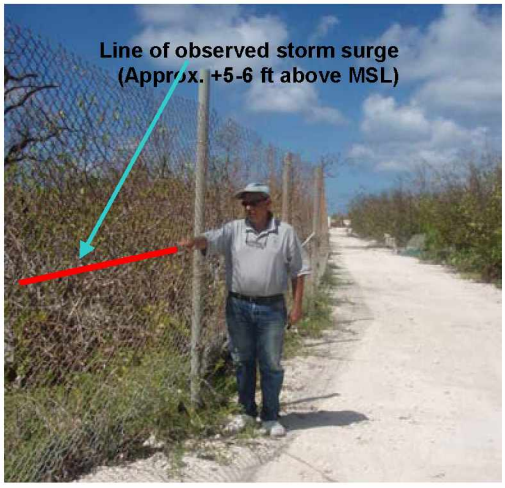
Raymond Gardiner High School (room of one of the blocks destroyed)

Damaged utility poles

Damaged house in Five Cays

Flooded street in Five Cays

Photo 37
Line of Storm Surge and Damaged Mangrove Plants



Damaged Boardwalk

Damaged Boat Landing

Destroyed Bridge

Park Signage