National Emergency Management Organization

Damage Assessment and Needs Analysis

HURRICANE RICHARD

Initial Situation Assessment Report

BELIZE C.A.

Damage Assessment and Needs Analysis Committee
Initial Situation Assessment (ISA)
Hurricane Richard
October 25th 2010

The Preliminary assessment of damages ideally be undertaken within 9 hours after the all clear has been given. The assessment will be informed by one or all of the following;

- ***An aerial reconnaissance done by national or regional teams***
- ***District/Local surveys***
- ***The application of pre-established baseline vulnerability database***
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The objectives of this stage in the DANA process are to;

- ***To obtain a general overview of the damage.***
- ***Identify the initial needs of the impacted population including emergency response requirements***

From this stage a report will be generated on completion of the assessment. The damage and losses presented here reflect the available information, compiled during a brief period of time. This is not a final assessment of the damage and needs since it reflects information available at the time of the assessment.

This information is collected within 9 hours of the all clear and will therefore:

- ***Provide a general overview of the extent and magnitude of the damage etc.***
- ***Determine the need for a Disaster Declaration***
- ***Provide information that would inform the responses of the International and Regional Donor Community***
- ***Assist in determining the initial response to the event***
- ***Help to determine the need for the second phase of the assessment process.***

Event Summary

Hurricane Richard with sustained winds of 90 mph made landfall 20 miles south of Belize City on a westerly track moving at 13mph, in the region of Northern Lagoon at approximately 5:00 p.m. and continued a path through to Gallon Jug in the Orange Walk District, with hurricane force winds extending 20miles from the centre and tropical storm force winds extending 105miles from the centre, with the strongest winds located within the NE quadrant of the system. Richard's large circulation interacted with numerous population centers including both national cities and resulted in notable damages to both agriculture and housing sector.

In preparation for landfall, some 4,639 individuals sought shelter nationally and it is believed that thousands of other coastal dwellers voluntarily relocated inland to family and friends. There are no casualties directly attributed to Hurricane Richard.

The path of Hurricane Richard took it directly across the countries 2 cities; Belmopan, Administrative Capital and Belize City, Commercial Capital and 53 communities, inclusive of some of the most heavily populated towns and villages, impacting the Belize, Cayo, Orange Walk, and Stann Creek Districts (4 of the country's 6 districts), affecting or impacting approximately 192,800 persons[1] . Much of Hurricane Richard's impact was caused by its strong associated winds and storm surge in Belize City. At this time some 831 homes/ dwelling are reported damaged or destroyed in 55 communities. The Citrus industry recorded the greatest loses in the agriculture sector as 1,500 acres of un-harvested oranges and grapefruits were blown off trees.

Hurricane Richard also produced significant environmental impact to forest cover.

Total Direct losses have been estimated as being $49.2 Million based on very preliminary reports of damages.

- Housing Infrastructure (Homes/dwellings) $14.5 Million Dollars
- Agriculture $34.7 Million Dollars

******All estimates are presented in BZD***

[1] Abstract of Statistics 2009 Population estimates, Statistical Institute of Belize.

SITUATION:

1. Nature of the Disaster

Hurricane Richard, the seventeenth named storm of the 2010 North Atlantic Basin Hurricane Season, evolved from a low pressure system in the Western Caribbean on the 21st of October, 2010. The Tropical Depression which evolved into Hurricane Richard formed near latitude 17.5 North, 81.1 West or about 523 miles East South East of Belize City, moving Westward at 3 mph.

At 1 p.m. on October 21 2010, Tropical Depression 19 strengthened to Tropical Storm Richard and was centered near latitude 16.2 N and longitude 80.2 W. TS Richard moved Westward at 5 mph into more favourable conditions for development and develop into a Category 1 Hurricane early Sunday afternoon (24th October 2010) just off the Bay Islands of Honduras.

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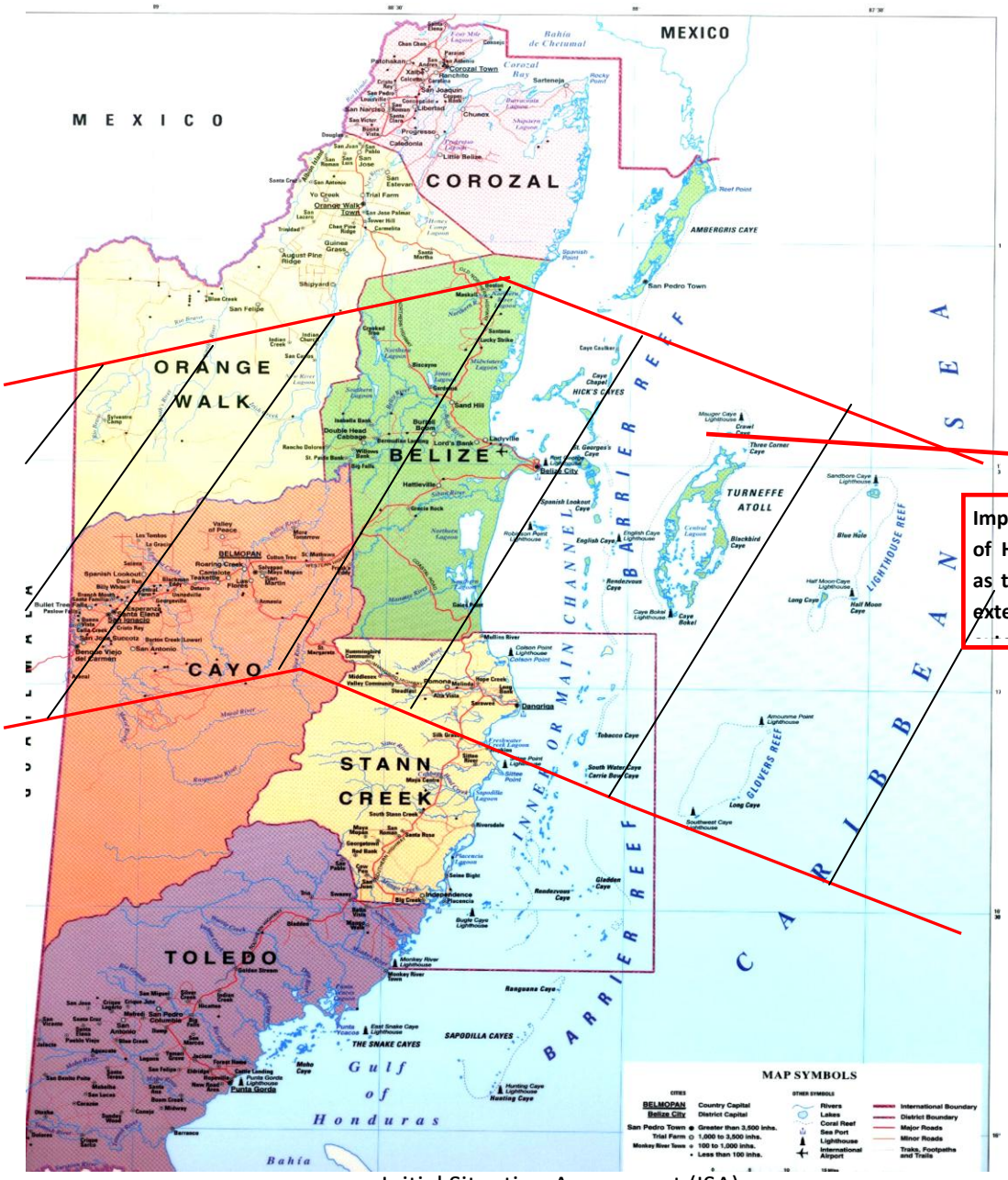
The National Emergency Management Organization issued the 'ALL CLEAR" for the country of Belize at 6:30 am on Monday October 25, 2010.

2. Areas Affected

As the system had extended tropical force winds associated with it, extending some 105 miles out from the center and hurricane force winds extending up to 20 miles from the center, the entire coast of Belize was impacted by Hurricane Richard, with the he primary wind impact being along the path of system, affecting the Belize, Orange Walk (south), Cayo and Stann Creek Districts, impacting in excess of 53 communities and the two cities; Belmopan (administrative) and Belize (commercial). (See illustration below and Summary Table of Impacted Communities).

Map 1: Illustration of Areas of Greatest Impact



3.1. Effects on Population

Hurricane Richard, due to the extensive reach of its storm bands, is believed to have resulted in varying degrees of impacts to the entire Belizean Coast. It should be noted that some 38% of the Belizean population (approximately 117,000 individuals)[2] resides on Belize's coast and cayes. Greatest impacts on population were recorded in those areas at or adjacent to where the eye of the storm made landfall and in the direct path of the eye. Some 4,639 individuals were displaced to some 76 shelters nationwide in preparation for landfall of the system. It is estimated that thousands of coastal residents also voluntarily evacuated inland to family and friends.

District	# of Shelters	# of People
Cayo	9	498
Belize	16	1501
Stann Creek	7	502
Toledo	6	398
Orange Walk	21	891
Corozal	17	849
Total	**76**	**4639**

It should be noted that most of the individuals seeking refuge in national shelters were urban poor who came to shelters unprepared to provide for their most basic needs. An initial assessment by the Ministry of Health indicated that shelteree's also exhibited symptoms of a large cross section of illnesses and consideration of adequate health care for shelters is key in future planning.

There are no recorded deaths and 3 related injuries associated with the impacting storm system.

Belmopan and its surrounding areas (Las Flores, Salvapan, Maya Mopan, San Martin) recorded the greatest impact to its population base. Initial estimates indicate approximately 15-20 % of homes in these areas were completely destroyed and a larger number of homes suffered varying degrees of damages to roof and wall structures.

[2] 2010 population estimates derived from SIB publication "Belize: Total Population Estimates and Projections (1980-2050)"

Subsistence farms in these areas also suffered significant wind damages. Losses of subsistence farms and disruption of livelihoods due to the hurricane can result in a situation of food insecurity for the impacted rural populations in the immediate to short term.

Tropical Storm force winds associated with the hurricane damaged/disrupted a number of homes in Belize City (field teams to assess total percentage level of impact). Most of these affected dwellings only suffered Levels 1& 2 damages[3]. Homes in Belize City were temporarily disrupted by the associated storm surge. It is expected that these homes will also record damages to household properties due to the flooding. Future detailed assessments are expected to quantify these losses. It should be noted that damaged/disrupted homes in Belize City are found principally in areas known to be associated with high levels of poverty and known as having large numbers of Female headed households. These individuals will require assistance to repair or rebuild their premises.

Damage to electricity infrastructure resulted in a nationwide blackout. The loss of this essential service temporarily disrupted the provision of medical services in the Belmopan Region and has also resulted in the disruption of water services to villages along the Western Highway. The loss of electricity also disrupted shelters and shelter operations. Most shelters are without back-up electricity generation capability and so shelterees had to weather the storm by candle light.

The recent resurgence of cholera in the region warrants a prioritization of the restoration of access to safe water to impacted communities.

As a result of the system all schools were closed for Monday October 25, 2010 and are scheduled to remain closed until Wednesday October 27, 2010, this disruption of classes has impacted some 72,000 students.

Health Overview

Reported sites indicated that they saw and/or received 50 cases with treatable conditions. Three persons (6.1%) were admitted out of those needing medical attentions. These were conditions were directly related to diarrhoea, fever, cough, vomiting, asthma, bleeding related to foetal death and minor injuries. There were three deaths reported not directly related to the storm in San Pedro (foetal death), Orange Walk and KHMH.

[3] Level 1 Damage (Loosed roof covering or wall siding, small parts of roof blown off, broken windows); Level 2 Damage (Wooden structures shifted off foundations, windows and doors blown out, large pieces of roof missing)

3.2 Damage by Sector:

Road Infrastructure: Damages to the road networks within the broad impact zone has been minimal. Damages in road infrastructure are primarily due to road washouts, and shoulder erosion due to excessive waters crossing the road. Fallen vegetation/trees temporarily obstructed passage along many major and minor roads. Most debris has been cleared and roads are once again traversable. The Ministry of Works has indicated that all repair needs can be accommodated under their normal maintenance program.

Housing Infrastructure: Areas which saw the largest amounts of damaged or destroyed houses/ dwellings in the Belize Rural, Belize City and Cayo District, including such areas as pan, La Democracia, Hattieville, Mile 8 Community, Belize City (primarily Port Loyola Area), Gales Point Manatee, Mullins River.

There are reports of losses and damages of residents/ buildings in Belmopan and its surrounding regions. It is estimated that 15 -20 percent of homes in the San Martin/ Las Flores areas have suffered level 3 and 4 damages (see illustration above). Most damaged structures in San Martin will require complete reconstruction.

Central Belmopan saw primarily level 1 & 2 damages (See illustration above) with a large portion of the damage being linked to the loss of roofing material or damages resulting from flying debris. Actual damages will be quantified by the local assessment teams deployed in the area. Detailed assessments are required to determine final numbers of impacted buildings and to determine the integrity of structures which suffered wind associated damages and that have shifted on their foundations or have completely lost their roofs.

In Belize City, the Port Loyola Area was hardest hit. Damage was greatest among wooden /Plywood structures. Dwellings in Belize City were also disrupted by the sea surge associated with the hurricane. These houses, although only temporarily disrupted by the rising sea water, are expected to record loses to household items and electricals. The detailed assessment of the effected population will allow for a greater quantification of these losses.

It should be noted that these estimates do not include loss of household items or personal belongings; this will be quantified through the detailed assessment.

Very initial estimates associated with lost or damaged dwellings are calculated as being $14.5 Million dollars BZD. (9.5 million replacement costs, 5 million recovery costs)

Summary of Impacted Communities						
	Cayo	Belize City	Belize Rural	Belmopan	Stann Creek	Totals
Population affected	51,500	66,700	20,500	20,000	24,100	192,800
Communities threatened & affected	• Georgeville • Esperanza • Seven Miles • El Progresso • Santa Elena • Trapichie Area • Hillview • Mosquitoville • Shawville • Marathon Area • Santiago Juan Layout • Bullet Tree (Slight) • Santa Familia (Slight) • Duck Run (1,2,3) • Spanish lookout • La Gracia • Buena Santa Theresita)	• Fabers Road • Caesar Ridge • Collet Division • St. Martin De-pores • Bellama Phase 3 • Kings Park • Fair-weather • Westly High School • Fort George Marina • Memorial Park	• Lemonal - Willows Bank St. Paul's Bank Rancho Burrell Boom Freetown Sibun – • La Democracia Maskal Village • Bomba Village • Lucky Strike • Santana Village • Sandhill • Lord's Bank Village • Gracie Rock	• St. Matthews - • Tea Kettle - • Blackman Eddy • Ontario • Unitedville • St Margaret's • Armenia • Valley of Peace • Cotton Tree • Roaring Creek Homes • Camalote (Armenia Belmopan • Moretomorrow Village	• Hummingbird Community • Middlesex • Pomona • Hope Creek • Mullins River • Gales Point • Dangriga • Sarawee	
Approx Households impacted	39	300	55	271	166	**831**
Level 1& 2 Damages (minor)						**400**
Level 3 & 4 Damages (major or destroyed)						**431**

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Public Buildings: One health post in San Victor (Corozal) not used as shelter was broken into by villagers to be used as a shelter.There were no associated substantive damages to this facility. Several buildings (Schools and churches) which served as shelters developed water leaks during the course of the event however the integrity of the infrastructure remains intact. One church in Belize City (Nazarene Church) lost portions of its.

At this time there are no reported damages to schools, however it should be noted that the assessment of education buildings are still underway.

Tourism: Losses to the sector have not yet been quantified. Field assessment teams have confirmed the destruction of all major tourism related piers in Belize City; these include the Radisson Hotel & Marina Pier, Princess Hotel & Marina Pier and the water taxi terminal pier,

Agriculture: The Citrus industry reported the largest amount of direct losses in the agricultural sector. These losses were attributed to the impact of storm winds on un-harvested citrus crops. An assessment carried out by the Citrus Producers of Belize Limited (CPBL) indicates that some 1,500 acres of unharvested citrus (oranges and grapefruits) was lost. This equates to a direct loss of $29.1 million BZD by the industry. Agriculture assessments continue within the impact zone of Hurricane Richard.

Field assessment teams also confirmed losses to the Papaya industry. A total of 85 acres of papaya at the productive (harvesting) stage was completely destroyed in Indian Creek, Orange Walk District. An additional 45 acres of papaya plantation at the vegetative stage was blown down. Partial damage is recorded in an additional 30 acres of plantation. The direct economic loss to the sector is estimated as being $5.08 million dollars (BZD). [4]

An estimated 6 acres assorted vegetable field was also reported damaged in the Orange Walk District. This represents approximately $18,000 BZD in loses.

Some 100 acres of coffee were reported damaged in Gallon Jug. The Coffee industry suffered an estimated $384,000 BZD in direct loses.

The Ministry of Agriculture is also assessing damages to subsistence farms within the path of the storm as aerial assessments have indicated that numerous small plot multicrop cultivations have been damaged. .

Initial cost estimate of the direct damages to the agricultural sector at this time is $34.68 Million dollars (BZD). [5]

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[4]; 45 acres of papaya x BZ$12,000.00 (cost /acre)

[5] Information determined from aerial recognizance as well as Ministry of Agriculture field reports.

Telecommunications/ Electricity: Belize's primary electricity distributer (Belize Electricity Limited) reports that all generation sources and substations are intact. There are LV poles and conductors down throughout the hurricane impacted zones resulting in power outages in Belize City, and the Southern and Western regions of the country. BEL is working to re-energize Feeder 2 in Belize City allowing for electricity to the Karl Huesner Memorial Hospital. Electricity service was maintained for the Orange Walk and Corozal Districts as well as for San Pedro and Caye Caulker, it is expected that service will be returned country wide within 48 hours.

Petroleum: BNE suspended operations at the declaration of the preliminary phase by NEMO. Operations remain suspended as the Iguana Creek Bridge is now flooded. While there is no true direct economic loss to the petroleum producer, losses are associated with the ancillary service providers such as trucking and barging operators.

Environment: Strong winds associated with Hurricane Richard caused significant damages to forest vegetation. The vegetation type most affected is the *Orbignya cohune* (Cohune Palm). Large stands of cohune trees blew over in the path of the storm. Significant breakage of large trees was also visible. This was most acute in hilltop forests. Impacted forest stocks require active management to ensure effective rehabilitation of forest stands.

Large sediments plumes are observed along the Belizean coasts, North Stann Creek, Mullins, Sibun and Belize Rivers. This is a common product of storm events. Surface runoff and sediment upturn caused by the advancing storm is known to disrupt coastal ecosystems and can also affect negatively fisheries catch. The increased sediment loads in our coastal zone can pose a threat to fragile coral and sea grass communities. A rapid environmental assessment is being undertaken by the Department of Environment allowing for a greater qualification of environmental damages and associated economic costs.

4. Projected Evolution/Secondary Threats

"Secondary impacts" of a storm are those related to the direct impacts. In most cases these secondary threats are tied to public health and human security. At this time no secondary threats have been identified by assessors. As hurricane Richard did not produce enough precipitation to trigger floods and cause pooling it is felt that traditional risks associated with water and vector borne diseases are low, however monitoring of local situations is advised.

Hurricane Richard left in its path a large amount of debris (plant and building material). Secondary effects associated with the damages caused to large stands of forest resources also require the attention of national authorities.

B. NATIONAL RESPONSE

5. Damage assessment field teams as well as Relief Field teams are presently undertaking initial assessments of damage and needs.

NEMO continues to monitor the situation for the evolution of secondary threats and work in the coordination of national response efforts.

The Government of Belize has released $3Million BZD for immediate emergency response and relief efforts.

6. Priority Needs

Initial assessments have identified the need to restore housing for many of those in the impact zone. These assessments indicate that a large number of damaged homes are associated with lower income communities, elderly and single parent households. There is a need for immediate assistance to provide for adequate secure shelter for displaced individuals. **Immediate needs include roofing and construction materials**.

As there are a large number of displaced persons, whether homeless from the loss of dwellings or from dwellings damaged that require assistance in restoration there is an immediate need for the provision of basic humanitarian aide. **Immediate need for personal hygiene kits, daily food rations and non-food relief items (clothing, bedding).**

In the short term adequate temporary housing should be identified for those left homeless allowing a safe place of logging until the restoration of their homes are completed.

Health personnel working in the affected areas will need to have medical kits containing Oral Re-hydration Salts (ORS), antipyretics, tetanus toxoide, anti-inflammatory drugs, anti-malaria drugs, and blood testing supplies.

This report is submitted to NEMO for its consideration and action.