CARIBBEAN Safe School Initiative CSSI

IMPLEMENTATION OF THE MODEL SAFE SCHOOL PROGRAMME IN THE CARIBBEAN

HAZARD RISK ASSESSMENT REPORT AND COSTED ACTION PLAN

CANARIES PRIMARY SCHOOL

SAINT LUCIA

NDRM Natural Disaster Risk Management in the CARIFORUM

An initiative of the African, Caribbean and Pacific Group, funded by the European Union, and implemented by:

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CDEMA Caribbean Disaster Emergency Management Agency Resilient States · Safer Lives

República Dominicana Ministerio de la Presidencia

SUBMITTED BY:
Environmental Solutions Limited

TO:
The Caribbean Disaster Emergency Management Agency Coordinating Unit

Hazard Risk Assessment Report and Costed Action Plan – Canaries Primary School, Saint Lucia for the Consultancy to Develop National Safe School Policies, Assess School Vulnerability to Hazards and Develop School Costed Action Plans in Six Borrowing Member Countries

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1. INTRODUCTION

Environmental Solutions Ltd. (ESL) has been contracted by the Caribbean Disaster Emergency Management Agency (CDEMA) to develop/enhance National Safe School Polices in four Caribbean Development Bank (CDB) Borrowing Member Countries (BMCs), conduct hazard assessments of 33 schools across six BMCs, and prepare costed action plans for each of the schools based on the results of the assessments.

This document presents the Hazard Risk Assessment Report and Costed Action Plan for **Canaries Primary School, one of seven (7) schools assessed in Saint Lucia**. The report forms a part of the second and fourth deliverables (D2 and D4) under this Consultancy and has been divided into eight main sections. Section 1 describes the method and approach the consultants used to undertake the assessment. Section 2 outlines the Country Risk Profile which presents the natural hazards each country and school is exposed to. Sections 3 to 6 summarize the vulnerability analysis of the identified hazards and Sections 7 and 8 present the summary findings, proposed recommendations, and the Costed Action Plan. The results of the school safety and green assessments are presented in the Appendices.

The assessments were conducted during the period May 20 to 24, 2019 (Table 1-1) on regular school days, and as such the consultants were able to assess the schools during normal operational hours. All the schools assessed are designated emergency shelters that may be used during a hurricane or other hazard event.

TABLE 1.1: LIST OF SCHOOLS ASSESSED IN SAINT LUCIA

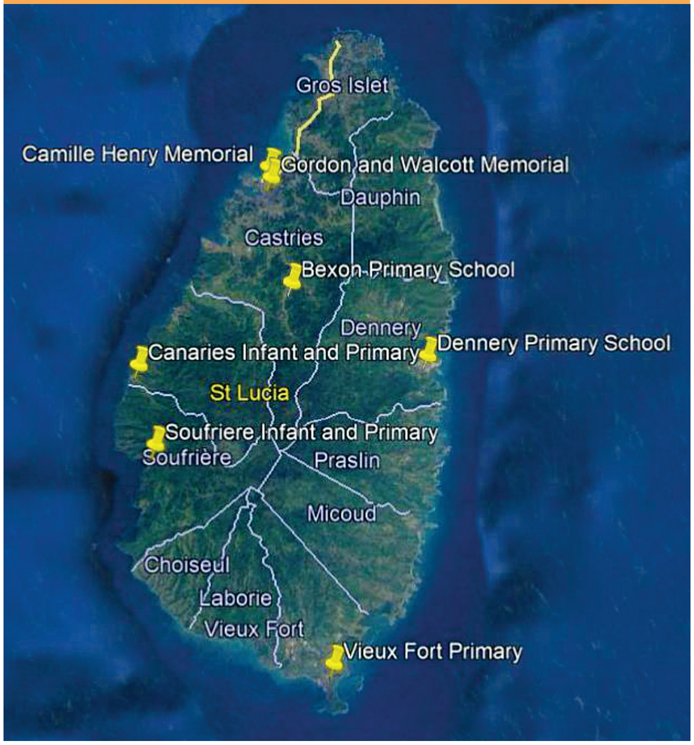
SCHOOL NAME	ASSESSMENT DATE
Bexon Primary	May 20, 2019
Dennery Primary	May 20 & 21, 2019
Vieux Fort Primary	May 20 & 21, 2019
Camille Henry Memorial	May 20 & 22, 2019
Gordon Walcott Memorial	May 20 & 22, 2019
Canaries Infant & Primary	May 20 & 23, 2019
Soufriere Infant & Primary	May 20 & 23, 2019

The assessments consisted of interviews with senior administrators, a site walk-through to make general observations and take pictures, as well as a building condition survey described below.

The results of the school assessments are found in the Appendix.

These deliverables have been prepared for the Project Implementing Agency, CDEMA, as well as the National Safe School Programme Committee (NSSPC) and national focal point in Saint Lucia. The list of NSSPC members are included in Appendix.

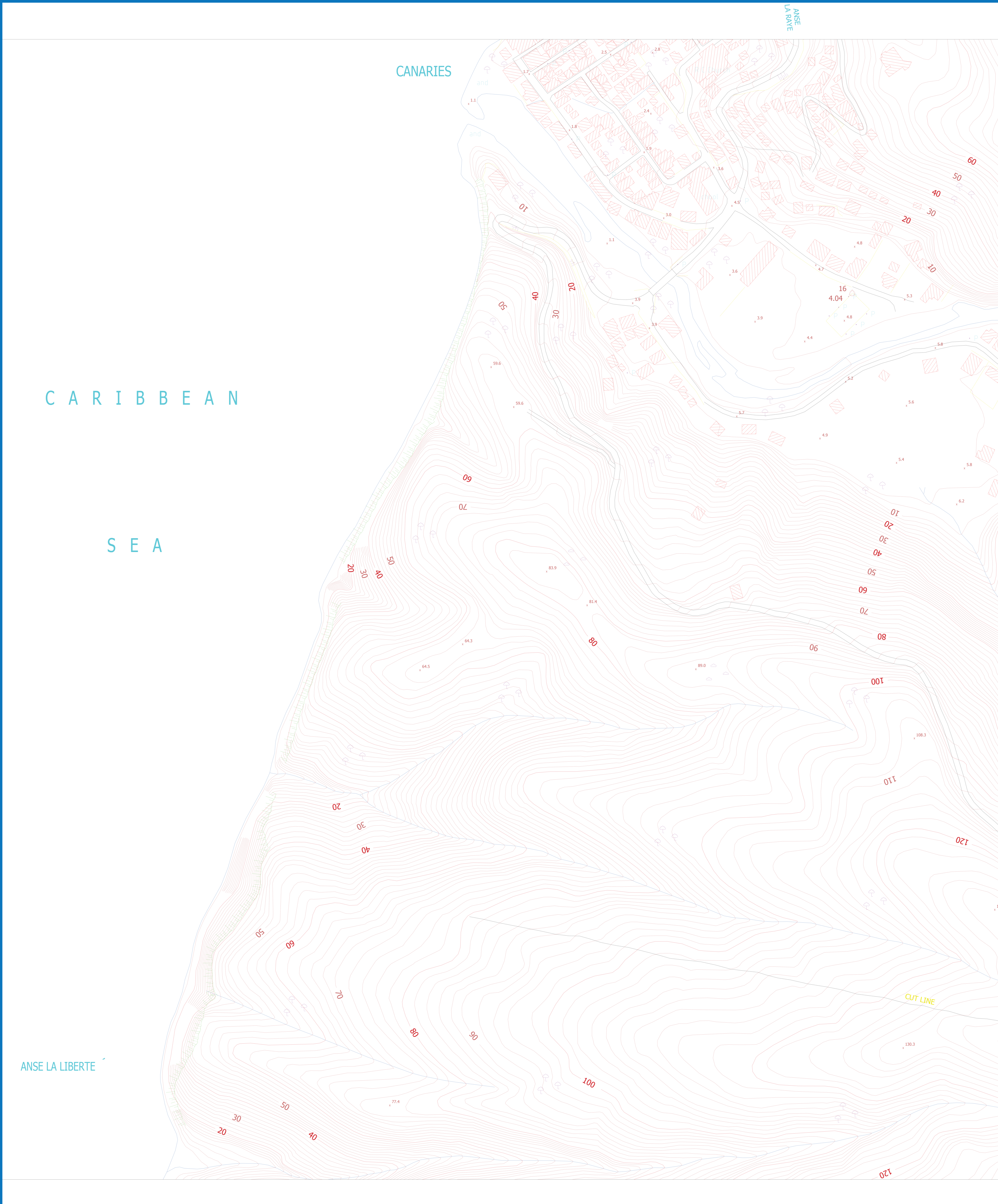
FIGURE 1.1: LOCATIONS OF THE SCHOOLS ASSESSED IN SAINT LUCIA, MAY 2019 (SOURCE: GOOGLE EARTH)



The team of assessors visited the Canaries Primary School during the period May 20 & 23, 2019. The school is located in the small fishing village of Canaries on the West Coast Road between Anse La Raye and Soufriere (Figure 1-2).The school is bordered by the Caribbean Sea and Canaries River to the west.

The Canaries Primary School is a designated emergency shelter that may be used during a hurricane or other hazard event. Additional general information on the school and the scores based on the MSSP Assessment Toolkit Checklists can be found in the Appendix.

FIGURE 1.2: CANARIES PRIMARY SCHOOL


ANSE LA RAYE
CANARIES
C A R I B B E A N
S E A
CUT LINE
ANSE LA LIBERTE

CANARIES PRIMARY SCHOOL

1.1 PURPOSE

The Model Safe School Programme (MSSP) Toolkit states that "in a region that is prone to various hazards, many schools may be located in hazardous locations. Wherever possible, Hazard and Vulnerability Assessments should be performed for schools to guide the inclusion of preparedness and mitigation measures in the design, construction and operational phases. Disaster and emergency planning should be founded on a thorough understanding of the specific hazards faced by the education sector in general and at the individual institutions."

The purpose of this hazard assessment report is to identify and analyse the hazard vulnerability of **Canaries Primary School** and to make recommendations to inform decision-making.

1.2 METHODOLOGY

The vulnerability assessment tool (VAT) draws on the methodology developed by the National Oceanic and Atmospheric Association (NOAA). Some adaptations were made to consider the local situation as well as data quality and availability.

1.2.1 HAZARD RISK ASSESSMENT

The consultants undertook the hazard risk assessments through a 3-step process elaborated below.

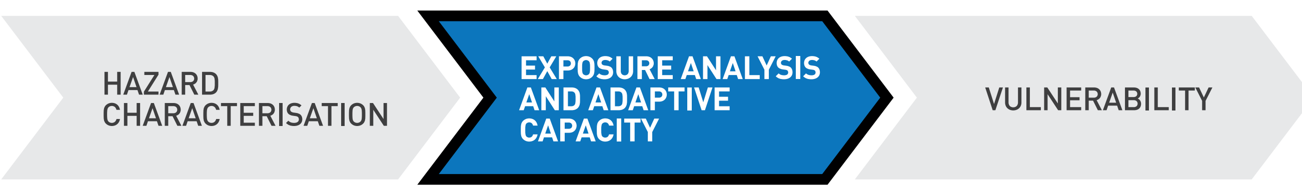
1.2.1.1 STEP 1 - CHARACTERIZING HAZARDS

The first step involved the identification of the hazards (hydro-meteorological, geological, etc.) to which each of the countries, and by extension each school, may be exposed. To characterise hazards for each country, the Consultants conducted comprehensive desk research and stakeholder consultations with key agencies and various stakeholder groups to acquire the necessary information, which included but was not limited to:

- Existing spatial data from local and regional Geographic Information Systems (GIS) databases e.g. Caribbean Risk Information System, CHARIM Handbook & Geo-node, PITCA, CARDIN etc.
- Multi-hazard maps, including:
  - Wind and cyclone hazard maps
  - Seismic zoning
  - Flood hazard maps
- Location of critical infrastructure and supporting infrastructure
- Historical and projected information on hazards for each country
- Damage history of each institution
- Previously conducted studies or country reports

Site visits were also conducted to the respective schools. These visits focused primarily on collecting physical infrastructure data and assessing the vulnerability of the facilities as they relate to the various hazards.

1.2.1.2 STEP 2 - EXPOSURE ANALYSIS AND ADAPTIVE CAPACITY



EXPOSURE ANALYSIS

Exposure analysis involved accessing various databases, including geospatial mapping using GIS, to identify the hazards to which the schools were exposed, as well as site assessments and discussions with stakeholders to ascertain history of hazard events.

Mapping hazard exposure enables stakeholders to visualise individual hazardous settings and identify cumulative hazard scenarios. This mapping also provides an effective tool to anticipate, plan and manage resources effectively in advance of these hazards. This geospatial framework is the foundation of the vulnerability assessment process.

The Consultants used the assessment tools from the MSSP toolkit to gather relevant information to help to inform exposure.

ADAPTIVE CAPACITY ASSESSMENT

The adaptive capacity for each school was determined by examining the characteristics that influence the school's capacity to prepare for, respond to and recover from hazards and disasters. The interaction between natural processes and the built environment is intrinsically linked, and it is the adaptive capacity that determines the risks and burdens created by hazards.

Some of the major factors assessed that influence adaptive capacity included:

- Are the proposed systems associated with each asset/facility designed to anticipate a hazard, cope with it, resist it and recover from its impact?
- Conversely, are there barriers to the ability to anticipate, cope, resist or recover?
- Are the systems associated with the school's assets/facilities already stressed in ways that will limit their capacity to anticipate, cope, resist or recover?
- Is the rate of impact from hazards likely to be faster than the adaptability of the systems?
- Are there efforts already underway to address impacts of hazards of interest related to the school's assets/facilities?

These variables outlined above were adopted for this project along with other indices. A systematic examination of building elements (as elaborated below), facilities, population and other components was carried out to identify features that are susceptible to damage from the effects of specific hazards. A qualitative scoring method was developed to determine the vulnerability of specific structures, exposed population and selected geographic areas. This data was analysed and used to prioritize mitigation activities and to guide disaster risk management within the schools.

The Consultants conducted targeted interviews with school administrators to identify gaps and needs for each school (institutional framework, physical infrastructure, human and financial resources). During the adaptive capacity analysis, the Consultants used the MSSP toolkit to identify gaps, needs and recommendations for capacity building measures and other interventions. Additionally, the Consultants provided a qualitative summary for each school.

Building Condition Assessment Methodology

The structural condition assessment was limited to visual observations and included both non-structural and structural-related issues. No finishes were removed to reveal hidden conditions, and no material or load tests were conducted to ascertain the structural capacity of the buildings' components. Moreover, the survey was limited to cursory inspection of electrical and mechanical systems such as ventilation, water services, plumbing and sewer utilities; egress, fire-suppression, or fire rating of the building components.

As such, any comments offered regarding concealed construction are the professional opinions of the Consultants based on analyses, and our joint engineering experience and judgment, and are derived in accordance with the standard of care and practice for evaluations of building structures.

The following standard conditions assessment definitions were used in describing the general state of the elements.

Good condition:
- It is intact, structurally sound and performing its intended purpose.
- There are a few or no cosmetic imperfections.
- It needs no repairs and only minor or routine maintenance.

Fair condition:
- There are early signs of wear, failure or deterioration, although the feature or element is generally structurally sound and performing its intended purpose.
- There is failure of a sub-component of the feature or element.
- Replacement of up to 25% of the feature or element is required.
- Replacement of a defective sub-component of the feature or element is required.

Poor condition:
- It is no longer performing its intended purpose.
- It is missing.
- It shows signs of imminent failure or breakdown.
- Deterioration or damage affects more than 25% of the feature or element and cannot be adjusted or repaired.
- It requires major repair or replacement.

The above was used qualitatively in conjunction with CDEMA's Enhanced Building Condition Assessment Tool (EBCAT) and the findings are contained in Section 5.1.

1.2.1.3 STEP 3 - VULNERABILITY ASSESSMENT

The data and information collected from Step 1 (Hazard Characterisation) and Step 2 (Exposure Analysis and Adaptive Capacity) were combined to determine how and where each school is vulnerable to hazards using the following formula:

HAZARD EXPOSURE + ADAPTIVE CAPACITY = VULNERABILITY

1.3 LIMITATIONS

This assessment represents a one-day snapshot of the school that may or may not be the total depiction of what occurs daily. The team based its findings on the data provided and individual observations made during this one- day time frame. Please be mindful that this assessment is not binding but is merely an independent review to assist school officials in their quest to examine practices and procedures to better serve their student population. It is therefore incumbent upon the Ministry of Education, education officers and school staff to consider the report and determine what they believe is legitimate and critical to address when considering school safety management issues.

Comments in this report are intended to be representative of observed conditions. The consultants have made every effort to reasonably inspect and analyze the main structural components as well the non-structural components which form part of the building envelope. If there are perceived omissions or misstatements in this report regarding the observations made, we ask that they be brought to our attention as soon as possible so that we can address them fully and in a timely manner.

2. COUNTRY PROFILE / SITUATIONAL CONTEXT

Saint Lucia is a Small Island Developing State (SIDS) located at latitude 13° 59' N and 61° W within the Lesser Antillean Arc of the Caribbean Archipelago. It is one of the larger islands in the Lesser Antilles with an area of 616km^2 (238 square miles). Saint Lucia is part of the Windward Island group of nations, which extend from Grenada in the south to Dominica in the north. Its nearest neighbours are Martinique, at 34km (21 miles) to the north and Saint Vincent, at 42km (26 miles) to the southwest. The country is sub-divided into eleven (11) districts and its capital is Castries.

The island comprises a central ridge that runs from north to south, which is dissected by rivers that form broad valleys in some areas. Its highest peak, Mount Gimie, rises to 958.6 metres (3145 feet). As a result of its volcanic origin, the country consists of fertile volcanic soils. Other evidence of its volcanic history includes The Pitons volcanic plugs in Soufrière and the world's only "drive-in volcano", located in the south-western portion of the island.

In 2014, the Government's Economic and Social Review of Saint Lucia estimated the population of the country at 172,623. About a third of this figure lives in Castries, the capital and a large proportion of the population also resides in the narrow coastal zone of the island.

FIGURE 2.1: MAP OF DISTRICTS IN SAINT LUCIA (SOURCE: ESL)

While the population continues to grow, Saint Lucia's growth rate has declined from 1.2% in 2010 to 0.7% in 2014. Saint Lucia has a fairly young population, with approximately 78% of persons being under the age of 50. Additionally, the country's youth (persons 15-29 years old) makes up about 26% of its population.

The 2010 Census reported the country's population density as 796 persons per square mile (305 persons per square kilometre). However, densities in the different districts of Saint Lucia ranged from a high of 2,139 persons per square mile (822 persons per square kilometre) in Castries to a low of 434 persons per square mile (167 persons per square kilometre) in Soufrière.

3. HAZARD ASSESSMENT/IDENTIFICATION

As with many other countries in the Caribbean, there are two broad categories of hazards that can cause potentially minor to significant impacts at any given time in Saint Lucia:

- Hydro-meteorological
  - Hurricanes and Tropical Storms
  - Flooding
  - Drought
  - Storm Surge
  - Landslide

- Geological
  - Earthquake
  - Volcano
  - Tsunami

Based on a review of reports, site visits and consultation with the key stakeholders at each school and the Ministry of Education, Saint Lucia is highly exposed to natural disasters of varying intensity and severity. Several types of disasters—hurricanes, tropical storms, earthquakes, droughts, floods, and landslides—occur frequently.

3.1 HYDROMETEOROLOGICAL

3.1.1 TROPICAL STORMS AND HURRICANES

The location of Saint Lucia in the Atlantic hurricane belt means that, while infrequent, the island is vulnerable to hurricanes and tropical storms. Hurricanes typically bring extremely heavy rainfall, which causes excess runoff and overland flow resulting in flooding. Additional flooding during storms is caused by land inundation by storm surges. Hurricanes and tropical storms are also associated with high winds, which can cause severe damage to physical infrastructure.

Saint Lucia has been hit by many tropical storms ranging in magnitude from depressions to category 5 hurricanes. Despite their magnitude, all the storms have caused some level of damage to the island. Hurricane Tomas, which impacted St. Lucia in November 2010 is considered to be one of the worst disasters in the recorded history of St. Lucia. This storm had maximum sustained winds of close to 100 miles per hour and intense precipitation, leading to widespread landslides, floods, bridge failures and coastal damage from storm surge. Total economic losses were estimated at 336 million USD (ECLAC, 2011). There were 7 deaths, 5 missing persons and 36 injuries as a result of the event. Over 500 persons evacuated to emergency shelters.

FIGURE 3.1: IMPACTS OF HURRICANE TOMAS (2010).
SOURCE: SLU DRR

Other notable storms include Hurricane Allen, 1980; Tropical Storm (later Hurricane) Debby, 1994; and while not making landfall in Saint Lucia, Hurricane Lenny in 1999 and Dean in 2007 (SLU DRR).

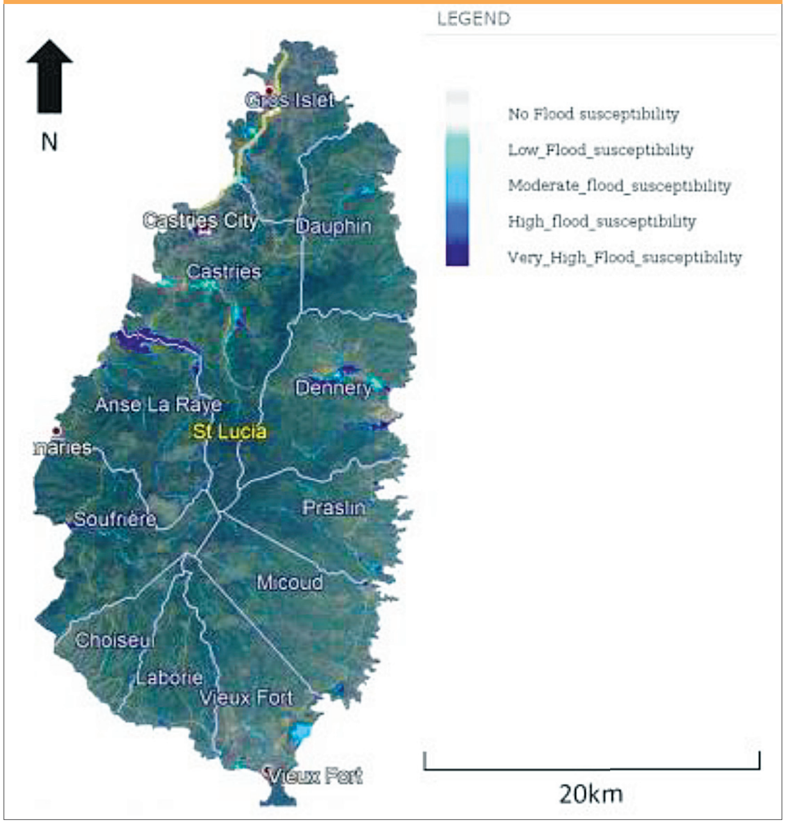
3.1.2 FLOODS

Saint Lucia is prone to flooding given the island's island's rugged topography, rock structure, thin soils and the continuous development of roads and other impermeable surfaces, all of which encourage run-off. Flooding in Saint Lucia takes a variety of forms including:

- **Flash Floods** - heavy rainfall occurs in a small drainage basin. They are difficult to forecast and are highly destructive
- **Riverine Floods** - heavy rains fall over a river system with tributaries that drain a large area. They can last anywhere from a few hours to a few days
- **Land-based flooding** - heavy rain falls over a short period of time. The land characteristics, high deforestation and the presence of obstacles to drainage cause these floods
- **Coastal/ Tidal Flooding** - large bodies of water overflow onto bordering lands. They can be caused by high tides, heavy rains that accompany hurricanes, waves created by high wind surges, and earthquake or volcanic eruptions at sea
- **Ponding** - refers to the slow build-up of water in depressions, sinks and areas with clay soils and slow percolation rates. These floods last many days because of poor drainage

The principal flood threat in Saint Lucia is from storm surge and coastal wave action. Particularly at risk are low-lying coastal areas such as the town of Dennery and the area of Anse La Raye which have experienced significant flooding in the past. Flash flooding in the interior presents a risk to local inhabitants along streams and coastal erosion due to wave action can threaten adjacent tourism activities (Table 3-1; SLU DRR).

FIGURE 3.2: SAINT LUCIA FLOOD SUSCEPTIBILITY MAP (SOURCE: CHARIM.NET, 2016)



YEAR	FLOOD EVENT
1994	Floods during Tropical Storm Debbie
1996	October 26; resulting in severe damage in Sourfrière, Anse la Raye, Castries and Vieux Fort
2006	October flooding in Cul de Sac cut Castries off from rest of island
2006	Flood waters cut north Castries off from south Castries
2007	Hurricane Dean flooding in Castries
2008	October 6-16; significant flooding in the north of island
2010	Flooding from Hurricane Tomas in several areas, notably the Hewanorra International Airport
2013	December 24-25, 2013; major flash floods across the island

TABLE 3.1: SUMMARY OF FLOOD EVENTS IN SAINT LUCIA (SOURCE: MODIFIED FROM ST LUCIA SNC, DISASTER CHAPTER; ST LUCIA JOINT RAPID DAMAGE NEEDS ASSESSMENT - FLOOD EVENT DECEMBER 24 – 25, 2013)

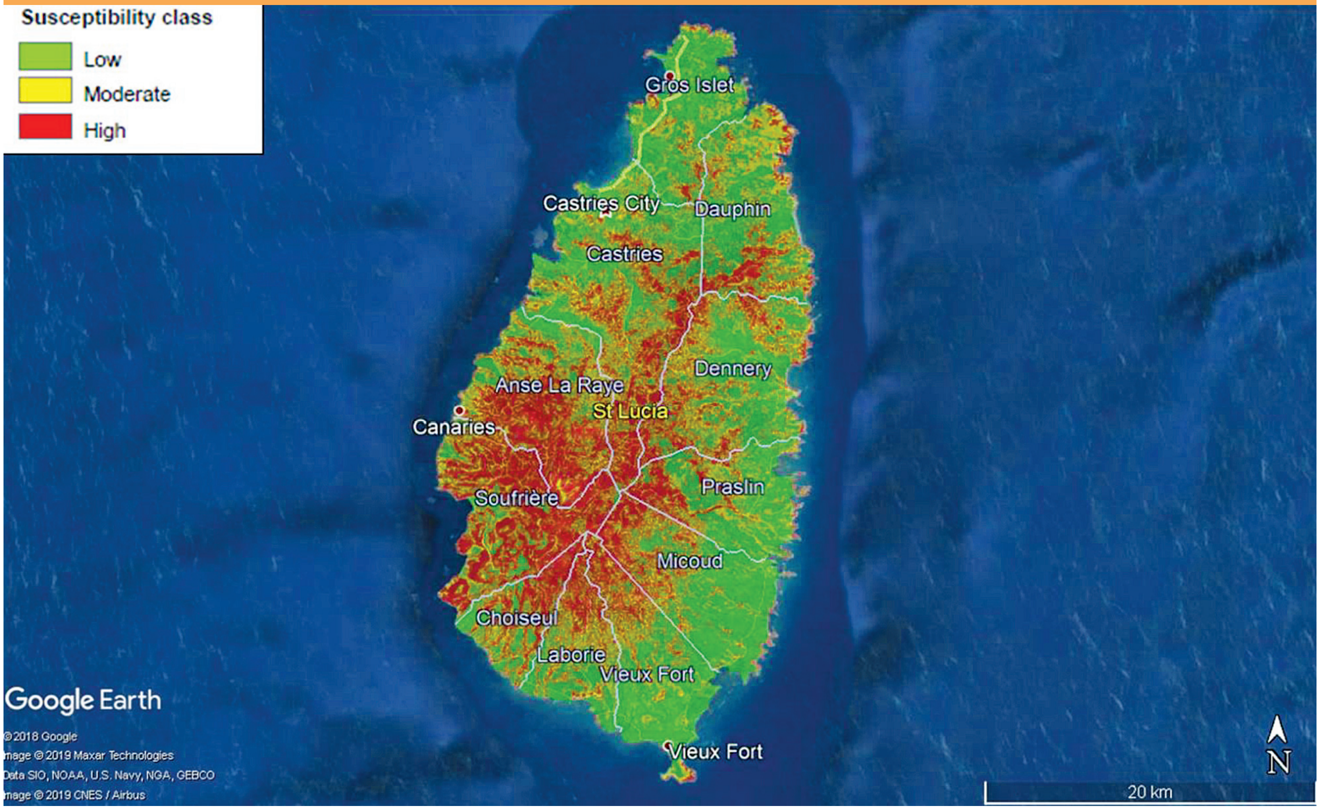
3.1.3 STORM SURGE

The main impact of storm surge is flooding. Given Saint Lucia's mountainous terrain and steep slopes, the population and economic activities are largely concentrated in low-lying coastal areas with inadequate drainage or infrastructure to withstand the impacts of flooding and storm surge. The projections of higher sea levels and increased tropical storm activity are expected to increase storm surge frequency and intensity. Communities and livelihoods are already experiencing the impacts of storm surge when coupled with sea level rise (SLR) and tropical storm/hurricane activity, and these impacts are projected to increase with climate change.

3.1.4 LANDSLIDE

Saint Lucia's mountainous topography coupled with its volcanic geology increases the island's vulnerability to landslides; several have occured in the past ranging from debris flows to rockslides. Eight major slippages, including the 1938 Ravine Poisson Landslide during the period 2002 – 2007, resulted in significant loss of lives, the destruction of property and the loss of biodiversity. Approximately 145 families have also been dislocated because of landslides in Saint Lucia over the same period. Many households, including some poorly engineers and constructed, are distributed along steep slopes, meaning they are particularly at risk. This risk is increased during the annual rainy season (May – November) and during the passage of tropical depressions and hurricanes (July – November).

FIGURE 3.3: SAINT LUCIA LANDSLIDE SUSCEPTIBILITY (SOURCE: CHARIM.NET, 2016)



3.2 GEOLOGICAL

3.2.1 EARTHQUAKE

Saint Lucia is exposed to low to moderate seismic risk (seismic zone 2 on a 0-4 scale[1]). The island is located on the eastern margin of the Caribbean plate and is regularly subjected to low intensity tremors (less than magnitude 4.0) associated with regional plate activity. As such, earthquakes are a concern despite the relatively low risk to the country. In November 2007, there was a magnitude 7.4 event located off the coast of Martinique and the shock was felt throughout the Caribbean and in Saint Lucia, causing minor damage to some structures (SLU DRR).

1 SEOC (Structural Engineers Association of California) zone system. Zone 2 corresponds to a Z factor of 0.500 as defined under CUBiC 1985. Values obtained from Gibbs (1999), Appendix 1, Table 3.

3.2.2 VOLCANO

Saint Lucia has limited exposure to volcanic hazards with one only active center on the island. The Qualibou Caldera is located on the south-west side of the island and includes active steam vents, hot springs and boiling muds. The last recorded eruption was in 1766 – a relatively minor event, ejecting ash into the air that thinly spread over a large area. Recent activity includes a swarm of minor volcanic earthquakes which was recorded in 1990 (SLU DRR 2010).

3.2.3 TSUNAMIS

Tsunamis are not considered a major recurrent risk for the Caribbean region, however the low-lying nature of coastal developments and the concentration of the population and critical infrastructure in coastal settlements make them vulnerable to tsunami activity (SLU DRR 2010). The Eastern Caribbean is in a zone of significant tectonic changes, with all tsunamigenic sources (earthquakes, volcanoes, landslides) in proximity. Since 1498, there have been over 350 tsunamis in the region of the Caribbean Sea and Bermuda, with events as recent as June 2013 (NGDC, 2014). Tsunami risk is generally associated with the potential effects of an eruption of the volcano Kick- ʹem-Jenny located some 100 km to the south off the coast of Grenada.

3.3 CLIMATE PROJECTIONS

3.3.1 SAINT LUCIA

General climate model (GCM) projections for Saint Lucia (Simpson et. al, 2012) indicate that there will be:

- An increase in sea level;
- An increase in average atmospheric temperature;
- Reduced average annual rainfall;
- Increased sea surface temperatures (sst); and
- The potential for an increase in the intensity of tropical storms.

Sea level rise (SLR) is a key concern for Saint Lucia as a 1m rise would much of the coastal infrastructure at risk including ports and airports (Simpson et. al, 2012). Some areas including Pigeon Island, Pigeon Causeway, Rodney Bay and Soufrière have been identified as extremely vulnerable to sea level rise (SLR), putting many key critical facilities (hospital, police offices, post offices etc.).

According the Climate Change Risk Atlas for Saint Lucia, changes to the frequency or magnitude of storm surge experienced at coastal locations are likely to occur as a result of the combined effects of:

1. Increased mean sea level in the region, which raises the base sea level over which a given storm surge height is superimposed.

2. Changes in storm surge height, or frequency of occurrence, resulting from changes in the severity or frequency of storms.

3. Physical characteristics of the region (bathymetry and topography) which determine the sensitivity of the region to storm surge by influencing the height of the storm surge generated by a given storm.

The main impact of storm surge is flooding because of the concentration of population and infrastructure in Saint Lucia's coastal areas. Additional impacts on storm surge flood return periods may also include:

1. Potential changes in storm frequency: some models suggest a global or regional reduction in storm frequency in the future. If this occurs, it may offset increases in flood frequency at given elevations.

2. Potential increases in storm intensity: evidence suggests overall increases in the intensity of storms[2] which may lead to increases in associated storm surges and contribute to increases in flood frequency at a given elevation.

4. EXPOSURE ANALYSIS

The term exposure is used to indicate those elements-at-risk that are subject to potential losses. Important elements-at-risk that should be considered in analysing potential damage of hazards are population, building stock, essential facilities and critical infrastructure. Critical infrastructure consists of the primary physical structures, technical facilities and systems which are socially, economically or operationally essential to the functioning of a society or community, both in routine circumstances and in the extreme circumstances of an emergency (UN-ISDR, 2009).

This exposure analysis involves developing a hazard profile for the school by assigning ratings (from 0 to 3) to the parameters listed in Table 4-1 below and averaging the parameter scores for each hazard. Based on the average scores, the school is characterized by the degree of exposure to each hazard and further assigned an **Overall Exposure Index** (sum of the average scores for all hazards).

The objective is to quantify the school's level of exposure and subsequently the potential impact (direct or indirect) of a specific hazard on people, essential facilities, and property. This will enable school administrators, the Ministry of Education and other key decision makers to have a better understanding of the hazards that present the highest risk to the school and focus planning efforts on making schools safer in this context.

2 Lower pressure, higher near storm rainfall and wind speeds

The consultants used existing data and available hazard maps to determine the level of exposure of the school to specific hazards. Table 4-2 presents the findings of the exposure analysis.

Based on the hazard identification (Section 3) and the exposure analysis, the Canaries Primary School has a high degree of exposure to hurricanes and tropical storms (and associated wind), flooding, earthquakes and tsunamis. Additionally, the school is highly likely to be affected by the climate change projections made for the area and the region (Section 3.1.3). Based on this analysis, the school has been assigned an exposure index of **10.4** (**Moderate**; Table 4-2). It would be prudent for the school to prioritise all hazards that have been given a rating of high or moderate.

OVERALL EXPOSURE INDEX		
0 - 4	VERY LOW	
5 - 9	LOW	
10 - 14	MODERATE	
15 - 19	HIGH	
20 - 24	VERY HIGH	

TABLE 4.1: PARAMETERS AND RANKINGS USED IN EXPOSURE ANALYSIS (SOURCE: ADAPTED FROM FEMA HAZARD ANALYSIS WORKSHEET)

PARAMETER	RANKINGS	SCORE
Frequency	**Highly Likely:** Near 100% probability in next year.	3
	Likely: Between 10 and 100% probability in next year, or at least one chance in 10 years.	2
	Possible: Between 1 and 10% probability in next year, or at least one chance in next 100 years.	1
	Unlikely: Less than 1% probability in next 100 years.	0
Warning (potential speed of onset)	Minimal (or no) warning.	3
	6 to 12 hours warning.	2
	12 to 24 hours warning.	1
	More than 24 hours warning.	0
Severity	**Catastrophic:** Multiple deaths; Complete shutdown of facilities for 30 days or more; More than 50%of property is severely damaged.	3
	Critical: Injuries and/or illnesses result in permanent disability; Complete shutdown of critical facilities for at least two weeks; More than 25%of property is severely damaged.	2
	Limited: Injuries and/or illnesses do not result in permanent disability; Complete shutdown of critical facilities for more than 1 week; More than 10%of property is severely damaged.	1
	Negligible: Injuries and/or illnesses are treatable with first aid; Minor quality of life lost; Shutdown of critical facilities and services for 24 hours or less; Less than 10% of property is severely damaged.	0

TABLE 4.2: FINDINGS OF THE EXPOSURE ANALYSIS FOR THE CANARIES PRIMARY SCHOOL

HAZARD	COMMENTS	FREQUENCY		WARNING TIME		SEVERITY		DEGREE OF EXPOSURE	
		RANKING	SCORE	RANKING	SCORE	RANKING	SCORE	RANKING	AVERAGE SCORE
Hurricanes and Tropical Storms	While direct hits are uncommon, hurricanes and storms frequently pass with 50km of the island resulting in considerable impacts.	**Likely**	**2**	**12-24 hrs**	**1**	**Catastrophic**	**3**	**HIGH**	**2.0**
Flooding (from hurricanes, storms or extreme rainfall events)	The school is not located in a fluvial flood prone zone. Interviews with school officials reveal that flooding occurs during heavy rainfall.	**Possible**	**1**	**24+ hrs**	**0**	**Limited**	**1**	**LOW**	**0.7**
Drought	Drought impacts the entire island of Saint Lucia, with ranging severity but high likelihood.	**Highly likely**	**3**	**24+ hrs**	**0**	**Limited**	**1**	**MODERATE**	**1.3**
Storm Surge	The school is located less than 300m from the coast. Storm surge/waves at the fronting beach would only result in partial inundation at the school.							**NOT EXPOSED**	
Landslide	The school has low exposure to landslide susceptibility (Figure 4-3). However, the connecting road transportation network (including roads and bridges) has been historically disrupted by landslides.	**Unlikely**	**0**	**6-12 hrs**	**2**	**Negligible**	**0**	**LOW**	**0.7**
Earthquake	Seismic activity is a risk for all Caribbean islands. The lack of warning and potential for catastrophic impacts suggest that the school has a high exposure to earthquakes.	**Likely**	**2**	**Minimal (or no warning)**	**3**	**Catastrophic**	**3**	**HIGH**	**2.7**

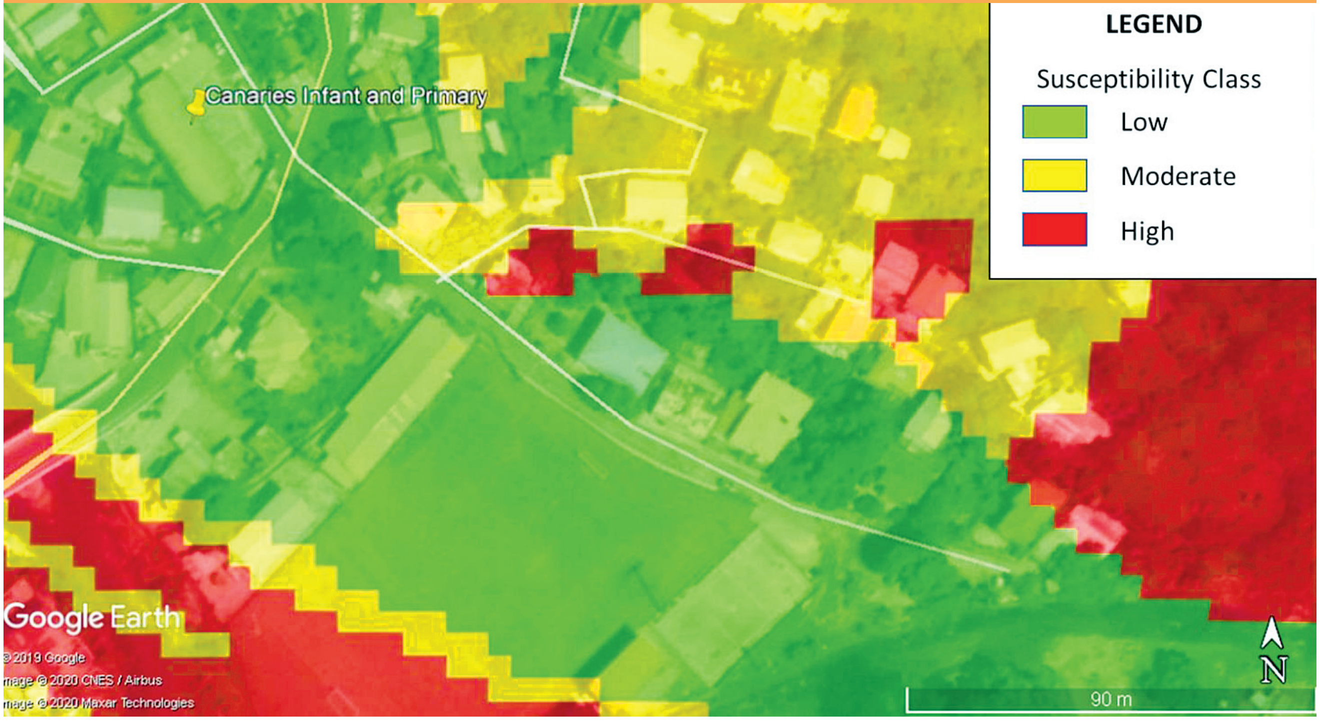
TABLE 4.2: FINDINGS OF THE EXPOSURE ANALYSIS FOR THE CANARIES PRIMARY SCHOOL

HAZARD	COMMENTS	FREQUENCY		WARNING TIME		SEVERITY		DEGREE OF EXPOSURE	
		RANKING	SCORE	RANKING	SCORE	RANKING	SCORE	RANKING	AVERAGE SCORE
Volcano	The island has low exposure to volcanic hazards.	**Possible**	**1**	**24+ hrs**	**0**	**Limited**	**1**	**LOW**	**0.7**
Tsunamis	The school is located ~500m from the coast. Eruptions from the sub-marine volcano, Kick ´Em Jenny, or seismic activity could trigger a tsunami in the vicinity of Saint Lucia with effects being felt inland. There is no early warning system in place for tsunamis.	**Possible**	**1**	**Minimal (or no warning)**	**3**	**Catastrophic**	**3**	**HIGH**	**2.3**
						OVERALL EXPOSURE INDEX		**MODERATE**	**10.4**

FIGURE 4.1: CANARIES PRIMARY SCHOOL FLOOD HAZARD MAP (SOURCE: CHARIM.NET)

FIGURE 4.2: LEFT: CANARIES RIVER SOUTH OF SCHOOL; RIGHT: SOLID WASTE IN DRAINS THAT MAY EXACERBATE FLOODING

FIGURE 4.3: CANARIES PRIMARY SCHOOL LANDSLIDE HAZARD MAP (SOURCE: CHARIM.NET)



4.1 OTHER HAZARDS

Comprehensive school emergency planning utilizes an "all-hazards" approach, which considers a wide range of possible threats and hazards. It includes those that might take place in the community and surrounding area that could impact the school. Examples include:

1. Technological Hazards
- Hazardous materials in the community from industrial plants, major highways or railroads
- Hazardous materials in the school e.g. gas leaks, sewage breaks or laboratory spills
- Infrastructure failure e.g. dam, electricity, water, communications or technology systems

2. Biological Hazards
- Infectious diseases
- Contaminated food outbreak
- Water contamination
- Toxic materials present in schools e.g. mould, asbestos, substances in school science laboratories

3. Adversarial, Incidental and Human-Caused Hazards
- Fire
- Medical Emergency
- Intruder
- Active shooter/Threats of violence
- Fights
- Gang violence
- Bomb threat
- Child abuse
- Cyber attack
- Suicide
- Missing student or kidnapping
- Off-site emergencies
- Dangerous animal
- Riots

A primary safety concern expressed by persons interviewed at Canaries Primary School was the need to manage traffic around the school. It was reported that in the past, they had to seek assistance from the Ministry of Education and safety wardens to assist children to cross in the mornings. While it was not reported as an issue, the school is located along a major thoroughfare, as such traffic management may be considered a critical issue to mitigate any incidents.

It is recommended that the school determine which of the above are priority hazards to be included in the revised emergency management plan.

5. ADAPTIVE CAPACITY

The adaptive capacity analysis describes the ability of the school to accommodate potential damage, to take advantage of opportunities, or to respond to consequences with minimum disruption or minimum additional cost (Climate Impacts Group, King County, Washington, and ICLEI-Local Governments for Sustainability, 2007). It describes the capacity of the school to learn from previous experiences and to apply those lessons to cope in future.

In the context of what the school may be exposed to (Section 3), the analysis below seeks to determine (among other things):

- If the school is already able to accommodate changes
- If there are any barriers to the school to accommodate changes
- If the rate of the projected change is likely to be faster than the adaptability of the school
- If there are efforts already underway to address impacts of various hazards in the school

To develop an overall index of adaptive capacity, 24 indicators were selected and grouped according to five determinants of adaptive capacity (Table 5-1) in the context of the hazards that may impact each school (Section 3). The indicators were selected using information garnered using the MSSP toolkit checklists, interviews and desk review of other existing data and information (Smit et al 2001, Yohe and Tol, 2002). The index was calculated by first aggregating the scores for the individual indicators to obtain a determinant value, which were then aggregated to an overall score to obtain an **Overall Adaptive Capacity Index**.

OVERALL ADAPTIVE CAPACITY INDEX		
0 - 4	VERY LOW	
5 - 9	LOW	
10 - 14	MODERATE	
15 - 19	HIGH	
20 - 24	VERY HIGH	

This approach provides a holistic perspective on the school's ability to plan for, design and implement effective adaptation strategies or to react to evolving hazards and stresses which may ultimately reduce the likelihood of the occurrence and or the severity of harmful outcomes resulting from hazards. It considers all elements of Comprehensive Disaster Management (Preparedness, Mitigation, Response and Recovery)[3]. The analysis is presented in Table 5-2.

3 https://www.cdema.org/cdm

TABLE 5.1: DETERMINANTS OF ADAPTIVE CAPACITY USED IN SCHOOL ASSESSMENT (ADAPTED FROM SMIT ET AL. 2001)

DETERMINANT	RATIONALE
Economic	■ Greater economic resources increase adaptive capacity ■ Lack of financial resources limits adaptation options
Information and skills	■ Lack of informed, skilled and trained personnel reduces adaptive capacity ■ Greater access to information increases likelihood of timely and appropriate adaptation
Infrastructure and Technology	■ Lack of technology limits range of potential adaptation options ■ Less technologically advanced regions are less likely to develop and/or implement technological adaptations ■ Greater variety of infrastructure can enhance adaptive capacity, since it provides more options ■ Characteristics and location of infrastructure also affect adaptive capacity
Institutional	■ Well-developed social institutions help to reduce impacts of climate- related risks and therefore increase adaptive capacity ■ Policies and regulations may constrain or enhance adaptive capacity
Natural/Ecological /Climate	■ Elements of the natural, physical or ecological environment of a region may enhance or limit the possibilities for adaptation (including projected climate change impacts)

TABLE 5.2: SUMMARY OF ADAPTIVE CAPACITY ANALYSIS FOR CANARIES PRIMARY SCHOOL (2019)

DETERMINANT	INDICATOR	SCORE	COMMENTS
Institutional	**1.** Is there a national policy on climate change adaptation and/or comprehensive disaster management (or related) for the education sector? **[YES = 1; NO = 0]**	1	The Government of Saint Lucia published a National Climate Change and Adaptation Policy and Strategy in 2003 (revised in 2015). Though not specific to the education sector, the primary goal of this policy framework is to "foster and guide a national process of addressing the short, medium and long term effects of climate change in a co- ordinated, holistic and participatory manner in order to ensure that, to the greatest extent possible, the quality of life of the people of St. Lucia, and opportunities for sustainable development are not compromised." There is also a Strategic Programme for Climate Resilience (SPCR), which provides a framework for planning and implementing climate change adaptation measures in Saint Lucia. A National Adaptation Plan (NAP) has been developed and was approved by Cabinet in June 2018. It was a policy process leading to the integration of climate change adaptation into national development planning (medium to long term); education is listed as a priority sector. Saint Lucia is also signatory to the Antigua and Barbuda Declaration on School Safety and is in the process of implementing the Model Safe School Programme.
	2. Have there been additions to the curriculum that integrate climate change/disaster preparedness/emergency management? **[YES = 1; NO = 0]**	1	As a part of the National Adaptation Plan (NAP), an action is to integrate into/enhance in, climate education materials, modules on hazards, impacts and risk reduction and management options, e.g. health risks (vector-borne disease, heat, injuries).
	3. Is an updated emergency management or disaster management plan in place? **[YES = 1; NO = 0]**	1	The school has a plan that was drafted collaboratively among the teaching staff using a model template from National Emergency Management Office (NEMO).
	4. Do the plans address priority hazards based on previous assessment(s)? **[YES = 1; NO = 0]**	1	Yes, the plan as it stands addresses priority hazards based on previous assessments including tsunami and earthquakes.
	5. Is there a designated environmental/health & safety officer, emergency response team or related position/team? **[YES = 1; NO = 0]**	1	Yes, there is an EFR trained officer in place. The officer also has the capacity and some resources to train other persons.

TABLE 5.2: SUMMARY OF ADAPTIVE CAPACITY ANALYSIS FOR CANARIES PRIMARY SCHOOL (2019)

DETERMINANT	INDICATOR	SCORE	COMMENTS
Information and Skills	**6.** Has the school done a walk through to identify and prioritize hazards for the population and visitors? [YES = 1; NO = 0]	0	At the time of the assessment, the school had not recently been assessed to determine hazards for the school population, visitors or vulnerable groups.
	7. Are all teachers and school staff assigned roles in the overall response, pre-, during and post-hazard event? [YES = 1; NO = 0]	1	Yes, all persons are assigned roles and responsibilities for disaster/emergency management.
	8. Have staff received training in emergency/disaster management? [YES = 1; NO = 0]	1	At the time of the assessment, only one teacher (Health and Safety Officer) had received training.
	9. Are there regular drills with staff, parents and students? [YES = 1; NO = 0]	1	Yes, the school participates in drills and simulations including CaribWave.
	10. Is the school able to manage an event independently if help is not immediately available? E.g. fire extinguishers, first aid kits, triage? [YES = 1; NO = 0]	0	The school requires a fully stocked first aid kit and trained staff to manage emergencies.
Infrastructure and Technology	**11.** Does the school have reserve water storage with adequate supply for at least 3 days? [YES = 1; NO = 0]	1	Yes, the school has storage tanks with adequate water supply.
	12. Does the school employ water conservation strategies to adapt to current usage or plan for future changes to water supply? [YES = 1; NO = 0]	0	No, there are no initiatives underway or planned.
	13. Does the school actively harvest rainwater? [YES = 1; NO = 0]	1	Yes, the school harvests rainwater for an aquaponics garden.
	14. Does the school employ energy conservation/efficiency mechanisms? [YES = 1; NO = 0]	0	While there is interest, no initiatives were underway or planned at the time of the assessment.

TABLE 5.2: SUMMARY OF ADAPTIVE CAPACITY ANALYSIS FOR CANARIES PRIMARY SCHOOL (2019)

DETERMINANT	INDICATOR	SCORE	COMMENTS
Infrastructure and Technology	**15.** Is there back up electrical power? **[YES = 1; NO = 0]**	0	This is an area for improvement as there is no back up electrical power.
	16. Does the school employ other green practices? E.g. recycling, greenhouse/garden, green policy etc? **[YES = 1; NO = 0]**	1	Yes, students practice composting, recycling, gardening and they maintain an aquaponics garden.
	17. Can the building withstand the impacts of a hazard in its current condition? **[YES = 1; NO = 0]**	1	There is no immediate concern about the structural integrity of the building, however repairs are recommended as per the Costed Action Plan (Section 8).
	18. Have school buildings/plant been repaired or retrofitted to the building code? **[YES = 1; NO = 0]**	1	Converted stairs from wood to concrete and elevated classrooms due to flood damage. The community has also upgraded the drainage around the school. Additional repairs/retrofitting are recommended as per the Costed Action Plan (Section 8).
ARE THERE ANY EXISTING BARRIERS TO ADAPTATION?			
Natural / Ecological / Climate	**19.** Physical or ecological limits? E.g. landscape/physical location limits range of adaptation options to priority hazards? **[YES = 1; NO = 0]**	0	The school's proximity to the sea and river may impose limitations on adaptation options related to buildings or hard infrastructure changes.
	20. Is climate change likely to exacerbate any of the current hazards? **[YES = 1; NO = 0]**	0	Based on climate projections, the current hazards are projected to be exacerbated.
	21. Is the rate of climate change likely to outpace adaptation efforts? **[YES = 1; NO = 0]**	0	As with the rest of the Caribbean region, Saint Lucia is one a handful of countries expected to be most intensely affected by the future impacts from climate change. The impacts of certain hazards, particularly those that affect the adequate supply of potable water are already being experienced islandwide and at the school.

TABLE 5.2: SUMMARY OF ADAPTIVE CAPACITY ANALYSIS FOR CANARIES PRIMARY SCHOOL (2019)

DETERMINANT	INDICATOR	SCORE	COMMENTS
Infrastructure and Technology	**22.** Technological limits? Availability of technological options for adaptation e.g. warning systems/ impacts of disruptions on any technology-based emergency communication resources; electronic data storage. **[YES = 1; NO = 0]**	0	None at the time of the assessment.
Economic	**23.** Financial barriers? E.g. Lack of resources may limit the ability of some schools to afford proposed adaptation mechanisms. **[YES = 1; NO = 0]**	0	The school is funded by the government.
Information and Skills	**24.** Information or cognitive barriers (individuals tend to prioritize the risks they face, focusing on those they consider – rightly or wrongly – to be the most significant to them at that point in time)? E.g. concern about one type of risk is heightened while worry about other risks decreases; lack of experience of climate-related events inhibits adequate responses. **[YES = 1; NO = 0]**	1	Based on interviews with school officials, there is an acknowledgement of the range of natural and man-made hazards facing the school. They are cognizant of the climate-related hazards.
OVERALL ADAPTIVE CAPACITY INDEX		**14**	**MODERATE**

5.1 DESCRIPTION OF STRUCTURE

The investigation consisted of a visual review of the exterior and interior elements such as walls, slab, columns and beams as well as a general walk-through to examine the existing cracks and other defects which may exist.

The buildings assessed are in generally fair condition. However, some areas will have to be addressed which include the rooms enclosed with wire mesh as external walls and the upper level timber floors. Interventions to mitigate flooding will also be included. Storm water drainage system needs to be enhanced and regularly monitored and maintained. Once the remedial works are undertaken the structural integrity and useful life of the building would be greatly enhanced.

TABLE 5.3: RESULTS OF BUILDING CONDITION ASSESSMENT (MAY 2019)

	BUILDING 1	BUILDING 2	BUILDING 3
Number of Storeys per Building:	**2**	**1**	**1**
Floor Type:	**Description:** Reinforced concrete. **Observation:** Floor slab in generally good condition at the lower level and timber at the upper in fair condition.	**Description:** Reinforced concrete. **Observation:** Floor slab in generally good condition with some spalling concrete at some areas.	**Description:** Reinforced concrete. **Observation:** Floor slab in generally good condition.
Wall/ Partition Type:	**Description:** Reinforced masonry and timber in fair condition.	**Description:** Reinforced masonry in fair condition.	**Description:** Reinforced masonry in fair condition.
Roof Structure:	**Description:** Timber in fair condition.	**Description:** Timber in fair condition.	**Description:** Timber in fair condition.
Roof Covering:	**Description:** Aluzinc sheets in fair condition.	**Description:** Aluzinc sheets in fair condition.	**Description:** Aluzinc sheets in fair condition.
Repairs/ Retrofitting Conducted:	**None**	**None**	**None**
Is there Disabled Access/ Special Needs Access to the Building?	**None**	**None**	**None**
Approx. Age of Each Building	**More than 40 years**	**More than 40 years**	**More than 40 years**
Building Use	**Classrooms, Administration**	**Kitchen, Staffroom**	**Toilet**
Overall Condition	**Fair**	**Fair**	**Fair**

5.1.1 SITE OBSERVATIONS / DISCUSSION

The below presents a summary of the observations made of the physical plant:

EXTERIOR

WALLS
There were some signs of water ingress through the external walls that may be porous, and the affected areas can be corrected by re-plastering of defective areas.

SLAB & BEAMS
Found to be in generally good condition with some isolated areas of spalling concrete.

COLUMNS
Found to be in good condition generally.

INTERIOR

WALLS
Interior walls were of both masonry and timber. Masonry walls were in good condition as were the timber panels.

WINDOWS
Broken windows were also observed the timely repairs of which will be critical in order to ensure that the building envelope is not compromised during an extreme wind event.

DOORS
Doors were all of timber in fair conditions.

Photographs obtained during our inspection are provided in the Appendix.

6. VULNERABILITY ASSESSMENT

The final step in the vulnerability assessment process is to combine the findings of exposure and adaptability to determine how and where the school is vulnerable. It is important to note that the vulnerability assessment does not remain static, it can improve or worsen with time. Changes can occur within the school, such as implementation of preparedness activities, and/or new threats may emerge. These can all influence the school's overall vulnerability.

The Canaries Primary School, because of its physical location, has inherent characteristics that exacerbate the degree of exposure to natural and man-made hazards, climate change and variability, and has been classified as having an **overall moderate exposure**. The analysis of the adaptive capacity revealed that the school has some barriers and limitations, as such their capacity to adjust to change (induced by the hazards to which they are exposed), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences is **moderate**. While the administration has taken active measures towards disaster management and the physical plant of the school has not been structurally compromised, there are additional strategies that the school can employ to improve their adaptive capacity, however these may come at significant cost (presented in Section 8). As the school is government funded, this may further constrain the school's ability to adapt. As such, the Canaries Primary School can be characterised as **moderately vulnerable**.

7. SUMMARY FINDINGS

Overall, the persons interviewed at Canaries Primary School had a good understanding of the hazards that need to be addressed at the school as priority. Our team's assessment suggests that maintenance is a priority task for the school administration which is an integral component of disaster management and risk reduction. The critical areas for improvement included having first aid materials on site and training staff in areas of emergency management. The school has good access to critical infrastructure e.g. police, fire and medical care which helps in emergency and disaster management.

Note: The number of students broken down by sex is included in Appendix A.

KEY STRENGTHS:
Canaries Primary School possesses some of the key elements to ensure quality education for children:

- The school has an updated Emergency Management Plan (EMP) with priority hazards that has been submitted to the District Education Office, the Ministry of Education and the National Emergency Management Office (NEMO).
- At the time of the assessment, the school had been assessed to determine hazards for the school population, visitors or vulnerable groups. Funding and available resources have limited implementation of recommendations.
- In speaking with students, they were aware to report any hazards to teachers/administration.
- Maintenance (routine cleanings, pest management, landscaping etc) were undertaken on a frequent basis. The school routinely reports outstanding repair issues to the District Education Office and the Ministry of Education for their attention and remediation.
- The principal maintains a list of repairs to be done and priority issues for safety that is submitted to the District Education Officer of the Ministry of Education (note: it was reported that there a several pending repairs that need to be addressed).
- The school has undertaken several green/sustainability initiatives including recycling, rainwater harvesting, maintaining a garden and composting.

FIGURE 7.1: EXAMPLES OF SAFETY HIGHLIGHTS AT CANARIES PRIMARY SCHOOL A (MAY 2019)

FIGURE 7.2: SAFETY HIGHLIGHTS AT CANARIES PRIMARY SCHOOL B (MAY 2019)

AREAS FOR IMPROVEMENT:

- The School Safety Plan needs to critically examine information about the student population (such as number of students broken down by age group and sex), as the number, age and ability of the students can make a significant difference in the event of an emergency.
- At the time of the assessment, teachers and non-teaching staff had not received training in first aid, fire suppression or emergency response.
- At the time of the assessment, there was no protocol for transporting injured persons from the school compound to emergency care.
- The school has no infrastructure or facilities to accommodate persons with disabilities.
- Audits for energy, water and waste have not been conducted however these actions fall under the purview of the Ministry of Education.
- Repairs required to the physical plant to ensure safety before or during a hazard event. Particular focus should be given to storm water drainage and flood mitigation strategies.

Section 8 – Improvement Plan and Costed Action Plan provided specific actions and timelines for recommendations on improving the overall safety of the school. Additional selected photographs can be found in the Appendix.

8. IMPROVEMENT PLAN AND COSTED ACTION PLAN

The table below summarizes our opinion of recommended improvements and budgets for capital expenditures (remedial works, repairs, retrofitting) identified by this report. Expenditures that are expected to be managed as part of normal operations are not shown. The budgets assume a prudent level of ongoing maintenance. It should be noted that costs excluded engineering indirect costs. Opinions of cost also excluded any local taxes.

The proposed estimated cost to undertake the remedial work is **Five Hundred and Eighty-Six Thousand, Five Hundred Dollars Eastern Caribbean Currency (XCD$586,500.00)**.

TABLE 8.1: IMPROVEMENT PLAN AND COSTED ACTION PLAN FOR CANARIES PRIMARY SCHOOL

RECOMMENDATION	TASK	RESPONSIBLE PARTY	FUNDS REQUIRED	TIMEFRAME SHORT-MEDIUM -LONG TERM	RESULT
Emergency Planning and Management	Erect safety signage around the school premises.	School administration in coordination with Disaster Management Agency(ies) and other relevant entities.		Short	Improved Emergency Planning and Management.
	Run drills and simulations to sensitize teachers and students.				
	Complete Emergency First Response (EFR) or First Aid Training for all teachers and staff.				
	Draft/modify emergency management plan (EMP) that addresses hazards with a rating of high or moderate, as well as other hazards. EMP should be submitted to the Ministry of Education. Include in the school safety plan disaggregated date on student population (age, gender) as this will better inform disaster and emergency planning.				

TABLE 8.1: IMPROVEMENT PLAN AND COSTED ACTION PLAN FOR CANARIES PRIMARY SCHOOL

RECOMMENDATION	TASK	RESPONSIBLE PARTY	FUNDS REQUIRED	TIMEFRAME SHORT-MEDIUM -LONG TERM	RESULT
On-site drainage of water (rainwater, wastewater from sinks, etc.) needs to be addressed	Upgrade of storm drains to include additional flood protection from adjacent existing waterway.	Ministry of Education in collaboration with Department of Works.	XCD$72,300	Medium	Improved drainage.
Other Infrastructural upgrades	Repair roof covering, ceiling and roof drains with current Building Code Standards.	Ministry of Education in collaboration with Department of Works. *some smaller projects can be undertaken by school/community /private organization as a special project.	XCD$74,400	Medium	Increased building resilience; improved school plant.
	Upgrade toilet block to include renewal of septic and soak-away.		XCD$48,500	Long	
	Upgrade of doors and windows to hurricane resistant standards.		XCD$82,500	Medium - Long	
	Construct new water storage.		XCD72,500	Medium - Long	
	Repairs to electrical wiring complete with new fixtures.		XCD$52,300	Medium	
	Painting to affected areas.		XCD51,200	Short	
	Repair defective or damaged external and internal walls and slabs.		XCD$76,800	Medium	
Secure physical plant	■ Adequately train and equip security personnel with requisite skills/tools to secure the compound. ■ Review contractual obligations of current security service providers – particularly performance clauses. ■ Explore options for other service providers by issuing a new request for proposal.	Ministry of Education in collaboration and other relevant Ministries /agencies.	Quotations to be solicited by the Ministry of Education and other relevant Ministries /agencies.	Medium	Improved safety and security of assets.

TABLE 8.1: IMPROVEMENT PLAN AND COSTED ACTION PLAN FOR CANARIES PRIMARY SCHOOL

RECOMMENDATION	TASK	RESPONSIBLE PARTY	FUNDS REQUIRED	TIMEFRAME SHORT-MEDIUM -LONG TERM	RESULT
Sustainability	Create an environmental club for students to lead on the development of various activities/initiatives aimed at "greening" the school i.e. increasing environmental sustainability through awareness and action.	Principal and/or Safety Committee.		Short	Increased awareness and sensitization.
Staff and student welfare	Create/upgrade existing and add new recreational/seating areas for staff and students (includes adding green spaces).	Ministry of Education in collaboration with Department of Works. *some smaller projects can be undertaken by school/community /private organization as a special project.	XCD$6,000	Medium	Increased emotional/mental well-being.
	Contingency		XCD$50,000		

NOTE:
The recommended actions should commence in the following time periods:
Short term= 1-3 yrs; Medium term= 3-5 yrs; Long term= > 5 yrs

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10. APPENDICES

APPENDIX A: MSSP ASSESSMENT TOOLKIT RESULTS

GENERAL INFORMATION

TABLE 10.1: VITAL INFORMATION FOR SCHOOL SAFETY

NAME OF SCHOOL	CANARIES PRIMARY SCHOOL
Type of school (Pre-school, Primary, Secondary, Tertiary)	PRIMARY
Is facility private and public?	PUBLIC
Location	MARY-ANN STREET, CANARIES, SAINT LUCIA
Name of Head Teacher or Principal	LAURA FRANCIS
Telephone	(758) 459-4400
Email	canariesprimary@gmail.com
Year building(s) constructed	-
Buildings contained on the school compound	3
Number of classrooms	-
Total school population	40
Students	Male: 42 Female: 42
Teachers	34
Non-teaching Staff	4
Number of first aid kits available	1
Number of fire extinguishers throughout the buildings?	1
Natural disaster in the past	YES
The type of event and the time it occur	FLOODING DURING HEAVY RAINS
Repairs as a result of the event	YES - Wooden stairs converted to concrete
School designated as an emergency shelter	YES

OVERALL SCORES

TABLE 10.2: SCHOOL SAFETY ASSESSMENT SUMMARY		
CHECKLIST	**SCORE (%)**	**CRITICAL STANDARDS MET**
Safety	60%	NO
Green	53%	NO

The above scoring is calculated based on the questions and Critical Standards applying to primary schools only.

SAFETY ASSESSMENT SCORES

TABLE 10.3: SAFETY ASSESSMENT SUMMARY SCORES		
SAFETY THEME	**SCORE (%)**	**CRITICAL STANDARDS MET**
Disaster Planning	84%	NO
Emergency Planning	55%	NO
Safety Admin	74%	
Medical Emergencies	78%	YES
Physical Plant	65%	YES
Physical Safety	19%	
Protection of the Person	15%	
Hazardous chemicals and materials	29%	NO

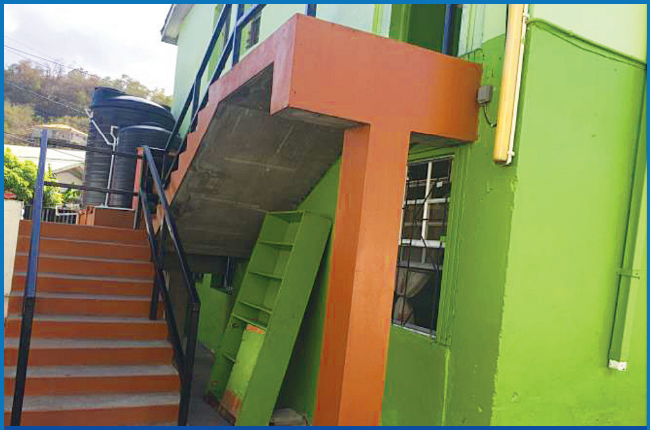
GREEN ASSESSMENT SCORES

TABLE 10.4: GREEN ASSESSMENT SUMMARY SCORES		
SAFETY THEME	**SCORE (%)**	**CRITICAL STANDARDS MET**
Sustainability Management	36%	NO
Natural Resources	35%	YES
Indoor Environment	50%	NO
Hazardous Chemicals and Materials	46%	NO
Facility and Grounds Management	90%	YES
Food Service	86%	YES

APPENDIX B: SELECTED PHOTOGRAPHS

FRONT ELEVATION

PANORAMIC VIEW



END ELEVATION

END ELEVATION

UPPER LEVEL TIMBER FLOOR

UPPER LEVEL TIMBER FLOOR

NO WINDOW
– PARTIAL LATTICE SCREEN

NO WINDOW
– PARTIAL LATTICE SCREEN

WIRE MESH

WIRE MESH

WIRE MESH

ALUZINC SHEETS ROOF COVERING
(TYPICAL)

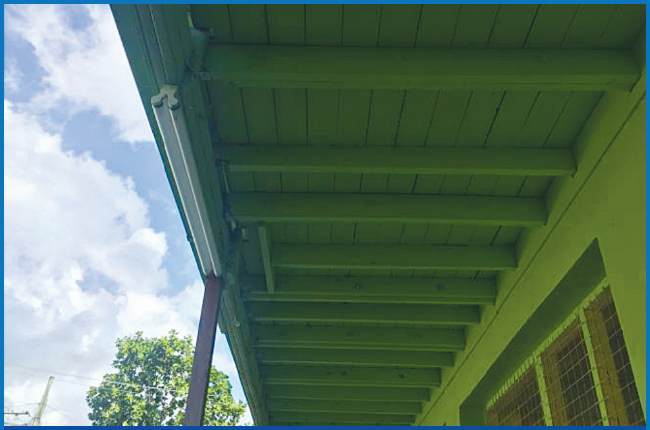
ALUZINC SHEETS ROOF COVERING (TYPICAL)

STAIRWELL

TOILET BLOCK

REAR ELEVATION

REAR ELEVATION



TIMBER FLOOR STRUCTURE

■ TIMBER FLOOR STRUCTURE

■ TIMBER FLOOR STRUCTURE

Please note that the photographs are not an illustration of all defects at the property.
They are to give you guidance on its general condition. The photographs should not be viewed in isolation.

Please note that there may be some defects in the photographs which are not referred to in the main text.

APPENDIX C: NSSPC - SAINT LUCIA

COUNTRY: SAINT LUCIA							
#	FIRST NAME	LAST NAME	GENDER	JOB TITLE	ORGANIZATION	CONTACT EMAIL	CONTACT PHONE NUMBER
1	Mr. Cyrus	Cypal	Male	Education Officer - District I	Ministry of Education	education_district1 @hotmail.com	(758) 730-0051
2	Ms. Martha	Foster	Female	Education Officer - District II	Ministry of Education	eodistrict2 @hotmail.com	(758) 730-0053
3	Ms. Francelette	Laurencene	Female	Education Officer - District III	Ministry of Education	district_three @hotmail.com	(758) 730-0056
4	Mrs. Marie	Alain	Female	Education Officer - District IV	Ministry of Education	district4edu @gmail.com	(758) 730-0113
5	Mrs. Gabriela	St. Paul	Female	Education Officer - District V	Ministry of Education	district5 @live.com	(758) 730-0061
6	Mr. Stephen	Auguste	Male	Education Officer - District VI	Ministry of Education	districtsixedu @gmail.com	(758) 730-0062
7	Mrs. Kay	Clarke - Nicholas	Female	Education Officer - District VI	Ministry of Education	districtseven7 @hotmail.com	(758) 730-0072
8	Mrs. Virgil	Mangaroo	Female	Education Officer - District VI	Ministry of Education	educationdistrict8 @gmail.com	(758) 715-9224
9	Bernez	Khodra	Male	School Safety Officer	Ministry of Education	bernezkhodra @yahoo.com	(758) 730-0160
10	Kendall	Khodra	Male	Deputy Permanent Secretary	Ministry of Education	kkhodra @hotmail.com	(758) 730-0042
11	Aldyn	Louis Fernand	Male	Director of Works	Ministry of Education	adlean.louisfernand @govt.lc	(758) 724-6312
12	Answorth	Charlemagne	Male	Building Officer	Ministry of Infrastructure	acharlemagne @gosl.gov.lc	(758) 721-7208
13	Pauline	Antoine	Female	NPA	-	-	-
14	Claudia	Louis	Female	-	Ministry of Education	planner.educationslu @gmail.com	(758) 730-0117

APPENDIX D: ORGANISATIONS CONSULTED

Organizations consulted:

- National Safe Schools Programme Committee
- Ministry of Equity, Social Justice, Local Government and Empowerment
- Physical Planning Section, Ministry of Planning
- Education Officers (Ministry of Education) – representing various districts
- NEMO
- Police Force
- Choiseul Emergency Management Organization
- National Students' Council
- St. Lucia National Youth Council
- Plant and Equipment unit, Ministry of Education
- Teachers and Principals