

JULY 2024



RAPID NEEDS ASSESSMENT – FINAL REPORT

**Hurricane Beryl's Impact on St Vincent and the Grenadines**

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## 1 INTRODUCTION

On 1<sup>st</sup> July 2024, Hurricane Beryl struck St Vincent and the Grenadines (SVG) with Category 4 hurricane force winds. In response, the Government of Saint Vincent and the Grenadines through the National Emergency Management Organisation (NEMO), requested a Rapid Needs Assessment Team (RNAT) from the Caribbean Disaster Emergency Management Agency's (CDEMA's) Regional Response Mechanism.

The remit of the RNAT was to prepare a Rapid Needs Assessment report, which aims to provide a preliminary assessment of damage. This preliminary assessment serves as a guide for a subsequent detailed needs assessment, uses the preliminary assessment, and provides the following information to each requested sector:

A detailed description of the damage to the sector;

1. A detailed description of sectoral damage;
2. Analysis of underlying causes; Why the damage occurred;
3. Assessment of potential preventative measures; How the damage could have been avoided;
4. Identification of requirements for restoring the sector to an operational capacity; What needs are required in order to restore the sector to an operational level;
5. Sector-specific recommendations. Recommendations for mitigating future vulnerability to natural hazards.

## 2 METHOD

An advanced team of seven (7) RNAT members arrived in St Vincent and the Grenadines on July 2, 2024, within 24 hours of the issuing of the 'All Clear' following Hurricane Beryl's impact. The team conducted intensive fieldwork for three (3) days until they were joined by the remaining six (6) members on July 4, 2024, and carried out their assessments within two days.

The RNAT comprised specialists from several sectors, each of whom visited impacted sites across St Vincent, Union Island, Canouan and Mayreau to assess, gather and analyse data to determine the extent of the impact and needs. Following the completion of their specialist sections of the report, the team demobilised on July 7 2024, departing as transportation services became available.

The assessed sectors follow.

- a) Infrastructure
- b) Shelters
- c) Water Sanitation and Health
- d) Social Protection
- e) Psycho-Social Support
- f) Beach and Coastal Structures
- g) Agriculture



## h) Telecommunications

Following the presentation of the preliminary RNAT results to Cabinet on July 10<sup>th</sup>, 2024, the Prime Minister of Saint Vincent and the Grenadines the Honourable Ralph Gonsalves requested for a further detailed assessment of the livelihood sectors of Fisheries and Tourism. Subsequent to this, these two sectors were also assessed across Saint Vincent and the Grenadines. The Fisheries assessment was conducted and the report prepared by Ms Sanya Compton of the Caribbean Regional Fisheries Mechanism and the Tourism Assessment and report was done by Ms Amanda Charles and Mr Kennedy Pemberton from the Caribbean Tourism Organisation.

The Health section of the report was prepared by the Pan American Health Organisation (PAHO) and also included as an amendment subsequent to the first RNAT report.

## **3 SECTORS**

### **3.1 OPERATIONS/LOGISTICS AND RELIEF**

The main response in the Southern Grenadine Islands during the assessments was the distribution of relief items. Supplies were transported from Mainland Saint Vincent via cargo vessels, unpacked at the dock, loaded onto private vehicles, and delivered to the warehouse in Union Island. From there, the items were distributed to the population.

#### **3.1.1 Challenges**

The most pressing challenges are as follows:

- Security at the dock in Union Island is limited
- There is civil unrest amongst the population when relief supplies are being distributed
- Limited vehicles for the movement of the relief items
- Limited personnel for the packing, unpacking and distribution of relief supplies
- Limited capacity of warehouse managers
- Relief items are being distributed in a haphazard manner
- Security at the warehouse is limited
- Vessels arriving at the port without a manifest of relief supplies inventory

#### **3.1.2 Recommendations**

The key recommendations are as follows:

- Increase security presence on Union Island and the other Grenadine islands (both at the docks and the warehouses) – RSS security team should augment
- Deployment of the CDRU team to Union Island to run the logistics and relief operation
- Deployment of a logistician/warehouse manager to assist with the management of the main warehouse in Union Island
- Establishment of a logistics hub on mainland Saint Vincent and Union Island for the receipt, inventory, storage, transport and overall management of all relief supplies

- All vessels destined for Saint Vincent and the Grenadines should share a manifest before departure from the home port

### **3.1 Infrastructure**

Hurricane Beryl mainly affected the southern areas of St Vincent. Major damage to houses, schools, churches, commercial buildings, health facilities, and public buildings tended to follow a now familiar pattern following the passage of major hurricanes in the Caribbean.

- a) Full and partial damage to roof cladding of most buildings.
- b) Full and partial damage to timber roof frames of most buildings.
- c) Major damage to timber stud walls of most buildings.
- d) Minor damage to masonry walls of most houses.
- e) Major damage to masonry walls of church halls.

While the damage to the south Grenadine islands was generally catastrophic, the structural damage was generally limited to the full or partial loss of roof cladding, and the full or partial loss of the roof timber frame. There was comparatively less damage to masonry walls, and reinforced concrete slabs, beams, columns and footings. Therefore, these building elements may be reused.

The immediate recommendations are made to effectively address the following.

- After the loss of roof cladding, persons in two storey houses moved to the ground floor. However, water leaked through the first-floor slab during subsequent rainfall events.
- Plastic water tanks were cracked and currently not useable.

The short term recommendations follow.

- Rebuild strong and durable roofs on the masonry walls that survived.
- Build strong and durable timber houses.
- Strengthen all roofs in preparation for subsequent events.
- Import quality building materials and restrict the use of untreated timbers greater than 2.4 m (8') so that they are not inadvertently or intentionally used in the roof structure.

The rebuilding standard should be the CARICOM Regional Code of Practice for the Construction of House (CRCP 10:2023), This standard is to the level of Irma and Maria, which impacted Anguilla and Dominica respectively in 2017, and Dorian, which impacted the Bahamas in 2019.

The infrastructure needs assessment report is provided in Annex A.

### **3.2 Shelter**

Initial reports indicated significant destruction caused by Hurricane Beryl, compounded by communication disruptions that hindered accurate assessment of the extent of the damage. Rapid shelter assessments were undertaken to gain immediate insights, with comprehensive evaluations

pending for data verification. In the Southern Grenadine Islands of Canouan, Mayreau, and Union Islands, private homes suffered major impacts, including roof loss, partial or complete damage to timber frames, and damage to masonry walls. In Clifton, Union Island, the main school sustained extensive damage, rendering it unusable. Residents sought refuge in a pre-school which also received damaged and lacked the requisite bathroom facilities. Across St Vincent and the Grenadines, schools are functioning as emergency shelters. Evaluations at five of the 40 active shelters identified various issues requiring attention to enhance safety and well-being. Recommendations will also address the needs of private residences and dwellings.

### **Immediate Needs**

- Essential household items (blankets, mattresses, cots, clothing, hygiene kits, solar lights, kitchen sets, mosquito nets, etc.)
- Tarpaulins and ropes
- Tents (only for special cases such as emergency health clinics, temporary shelters for nurses, workers, doctors, etc.)
- Cash support through vouchers for shelter materials/ repairs (where market situation allows)
- Short-term accommodation (Airbnb, hotels, etc.) for most vulnerable affected families.
- Information, education and communication materials on immediate shelter repairs.
- Shelter repair toolkits
- Collective shelters upgrades (immediate repairs to roofs, windows, doors, WASH

### **General recommendations**

- Provisions should be made for persons with a special vulnerability to evacuate to places where specialized care can be provided
- Provide community toolkits (Hammers, saws, screwdrivers, nails, screws) to support emergency repairs
- Provide tools to for debris removal (shovels, wheelbarrows, cutters)
- All Emergency Shelters should adhere to the Sphere Minimum Standards

The Shelter needs assessment report is provided in Annex B.

### **3.3 Water, Sanitation and Hygiene (WASH)**

The purpose of the water, sanitation and hygiene assessment is to determine the impact of the hurricane on the water supply, sanitation, and hygiene practises, to assess the risk to health, reduce the potential transmission of diseases, and protect public health.

An analysis of the water, sanitation and hygiene in the affected areas resulted in a comprehensive set of recommendations. All WASH-related interventions are urgent and should be carried out immediately to prevent the spread of endemic communicable water- and vector-related diseases.

Using portable toilets is strongly discouraged and will only add to the existing WASH problems. Such facilities are designed for mass events, requiring good road infrastructure for a truck to remove full toilets and replace these with clean and empty potties. Large amounts of water must be available for cleaning, plus facilities for the disposal of excreta and liquid waste. None of such requirements are available on the island.

The Water, Sanitation and Hygiene (WASH) needs assessment report is provided in Annex C.

### **3.4 Social Protection**

The passage of Tropical Hurricane Beryl significantly increased social vulnerability in St. Vincent and the Grenadines (SVG). Vulnerable populations, including the elderly, persons with chronic illness, Persons with Disabilities (PWDs), children and women, were among the hardest hit. As conditions worsen after natural hazards, such groups have fewer resources to prevent, cope with and adapt to disasters and also have less access to assistance from formal and informal networks. When considerations of age, location, and poverty levels are factored in, vulnerability is heightened.

This section of the report provides a rapid assessment of some social sector impacts and early estimates of the potential damage that may be caused by the impact of Hurricane Beryl. It also examined a number of social and gender considerations of the impact of the Hurricane to inform recommendations for gender-responsive and inclusive immediate; medium-term and longer-term recovery and/or resilience-building actions.

Main immediate recommendations follow: -

- Messaging regarding risks and safety in clean up – all communication (here and across the response) must be gender-responsive and include messaging for men and boys around wearing PPE to protect self and support family.
- Supply PPE and guidance for use.
- Provide/Improve lighting and security to reduce crime and violence risks including SGBV.
- Messaging in communities about SGBV prevention and individual roles (community leaders have a key role).

- Raise SGBV awareness and build capacity for SGBV risk reduction among shelter managers and those helping in shelters.
- Ensure awareness regarding safe SGBV services in communities and ensure accessibility.
- Speed up distribution of food and cash and in-kind assistance – establish and communicate transparent criteria and distribution approach.
- Identify persons in need of regular medication, e.g. those with NCDs, and seek to provide them with the medication
- Seek community input on communications channels that should be used.
- Increase lighting and security in public shelters
- Visits to private homes as well/include messaging on safety and security in homes.
- Use of shelter management guidelines and training of managers – expand guidelines to include social inclusion, NCDs, SGBV and mental health and psychosocial support (MHPSS).
- Integration of men and women seeking employment in paid aspects of clean-up.
- Approval of social protection framework.
- Ensure adequate MHPSS expertise (including external support).
- Establish safe space for children/childcare
- For those experiencing loss of community on Union Island and the Mainland support building of communal bonds.
- Provide counselling services to frontline workers.

The Social Protection needs assessment report is provided in Annex D.

### **3.5 Coastal Assessment**

Hurricane Beryl was forecasted to produce extensive storm surge and coastal damage. Reports from the locals, credible media and observations on the ground confirmed these forecasted impacts. The coastal specialists were able to land in Union Island, Mayreau and Canouan via helicopter conduct on the ground rapid coastal damage assessments focusing on “Physical Conditions” and “Functional Conditions”. The extent and damage due to storm surge inundation was also assessed and recorded.

The short-term physical needs follow: -

- There is a need for rapid coastal clean-up, as debris as well as oil and other chemicals from sunken boats will start to pollute the marine environment.
- There is a need to conduct a coral reef assessment to review damages to the marine protective ecosystem.

The medium-term needs follow: -

- There is a need to repair the wooden jetties as there is pressure on the two concrete jetties.
- To restore the shoreline, the following are recommended.
- Restoration and out plant of more mangroves are required along the coast.
- Armour stone revetments need to be repacked to continue protecting the shoreline

The Coastal Assessment needs assessment report is provided in Annex E.

### **3.6 Agriculture**

Given the actual situation on the ground and the prevailing weather conditions, the rapid needs assessment approach for agriculture involved ocular visits, community walks and informal interviews with fishers and community residents in Union Island and Canouan. On the other hand, the assessment in St. Vincent consisted of technical discussions and work sessions with the Ministry of Agriculture to assess initial crop sub-sector damages using baseline pre-disaster high resolution imagery and post-disaster imagery collected/produced by the Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, Industry & Labour (MAFFRTIL). This was based on a Hybrid Aerial-Ground based Rapid Disaster Needs Assessment Approach developed by the MAFFRTIL.

Immediate and short-term recommendations follow: -

- Restoration of fishing capacity/livelihoods by repairing/replacing fishing boats, repairing/replacing damaged/lost fishing and post-harvest gears/tools, repairing/replacing ice machines and cold storage equipment, and critical repairs to fisheries support infrastructure.
- Provision of planting materials to banana and plantain farmers as well as planting inputs for short-cycle crops that can be cultivated while waiting for the banana and plantain plants to be productive. Provision of alternative income support to actors/workers along the banana and plantain value chain.
- Provision of planting materials for tree crops as well as seeds, fertilizers and tools for short cycle crops and other crops that can be cultivated in the interim. Provision of alternative income support to actors/workers along the tree crop value chain.
- Ensuring ready access to planting materials and other inputs to ensure restoration or resumption of the cultivation/production of root crops, vegetable crops and other crops to prevent supply dips and price spikes.
- Facilitating access to basic needs of fishers and farmers through cash transfers and other mechanisms.

- Coastal debris clean up and restoration to enable safe coastal activities and facilitate ecosystem recovery.
- Support to critical repairs of livestock housing and continued monitoring for possible disease outbreaks.
- Detailed needs assessments to inform the specific design of emergency response interventions and ensure that the most affected and vulnerable will be reached.

The Agriculture needs assessment report is provided in Annex F.

### **3.7 Telecommunications**

The telecommunications assessments were done in the most affected areas, and a list of resources were detailed to address the needs.

The Telecommunications needs assessment report is provided in Annex G.

## **4 CONCLUSIONS**

No building that is designed and built to only survive a Category 3 hurricane, is expected to survive a Category 4. Therefore, the significant damage cannot be blanketly blamed on the usual suspects of: poor construction practices, poor enforcement, or any related thing – it can only be blamed on the hurricane.

The general rebuilding that is now necessary presents an unfortunate opportunity to rebuild to the current CARICOM regional standard. It is hoped that this opportunity will be embraced.

## **5 ANNEX A – INFRASTRUCTURE NEEDS ASSESSMENT REPORT**

### **5.1 The Context (Situation Overview)**

Hurricane Beryl affected the southern areas of St Vincent. Major hurricanes tend to result in the following damage to houses in the Caribbean.

- f) Full and partial damage to roof cladding of most houses.
- g) Full and partial damage to timber roof frames of most houses.
- h) Major damage to timber stud walls of most houses.
- i) Major damage to unreinforced concrete block masonry walls of a few houses.

This pattern of damage was assumed to be repeated in St Vincent's communities affected by the Category 4 hurricane. To verify this assumption, damage assessments were done.

### **5.2 Methodology**

The aim of the damage assessments was to determine: (i) the amount of damage, (ii) the types of damage, and (iii) the reason for the damage. The following method was proposed.

- a) Use Google Earth to examine the state of the roof cladding in the affected areas prior to the hurricane event - for comparative purposes.
- b) Review satellite maps after the hurricane event to estimate roof cladding damage.
- c) Review the Regional Security System's (RSS) aerial survey videos, and drone survey videos, to estimate the roof framing and wall damage.
- d) Review the Census data to determine the number and types of occupied houses in each affected area.
- e) Visit the sites to determine the actual damage to buildings, including schools.
- f) Analyse the collected information to determine the percentages of damage and why the damage happened.
- g) Recommend improvements to building practices that may prevent similar damage from a similar event

### **5.3 Information Gathering Challenges**

The gathering of information for subsequent analysis had the following major challenges.

- a) The resolution of the satellite images was too low to observe cladding damage on houses.
- b) Some areas on the ground were difficult to access.
- c) Torrential rainfall during the site visit to the South Grenadines reduced the efficiency of data gathering on that day.
- d) The servicing of the Coast Guard's boat frustrated efforts to visit the North Grenadines.
- e) The current Census report is currently being compiled, but the raw data was not provided.



Given the low-resolution satellite maps, and the importance of useable maps to rapidly estimate cladding losses, CARICOM should consider investing in a satellite that travelled over the Caribbean or pay for high resolution satellite imagery services. In addition, training should be provided to the RSS in taking high resolution aerial photographs.

Given the rapid nature of rapid damage assessments, consideration should be given to providing the Engineer doing damage assessments with a vehicle, so that more may be done during the relatively short duration of the assessments.

## 5.4 Scope of Operations

During the first day of assessments, the RNAT team visited the following South Grenadine islands: Union, Mayreau and Canouan. During the second day, the Engineer embedded with the Emergency Operations Centre’s disaster assessment team to view damage on the mainland.

## 5.5 Results

### 5.5.1 Percentage Impacts

The percentages of losses shown in Table 1 are based on site visits to the affected areas.

**Table 2 - Percentage of Losses**

Location	Roof Cladding Losses			Roof Frame Losses		
	Full	Partial	None	Full	Partial	None
Union	85	10	5	65	30	5
Mayreau	50	40	10	10	25	65
Canoaun	35	50	15	20	25	65
Southern Mainland	3	7	90	1	4	95

Few concrete block masonry houses collapsed and few timber stud walled houses survived in the hardest hit South Grenadines. Examples of the roof cladding and roof frame losses in Union Island are shown in Figure 1.



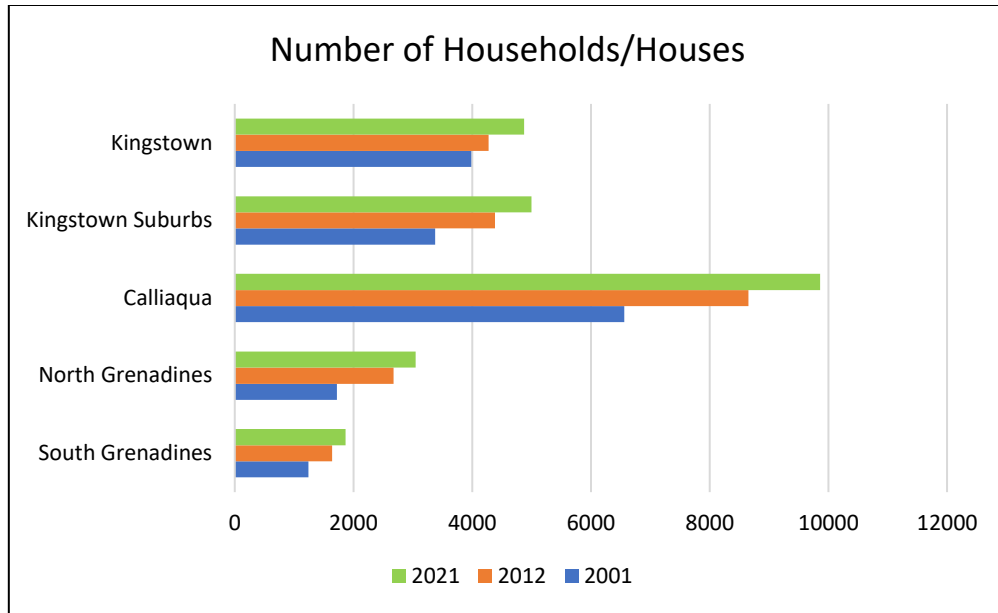
**Figure 2- Examples of roof cladding and frame losses.**

### 5.5.2 Numbers of Houses

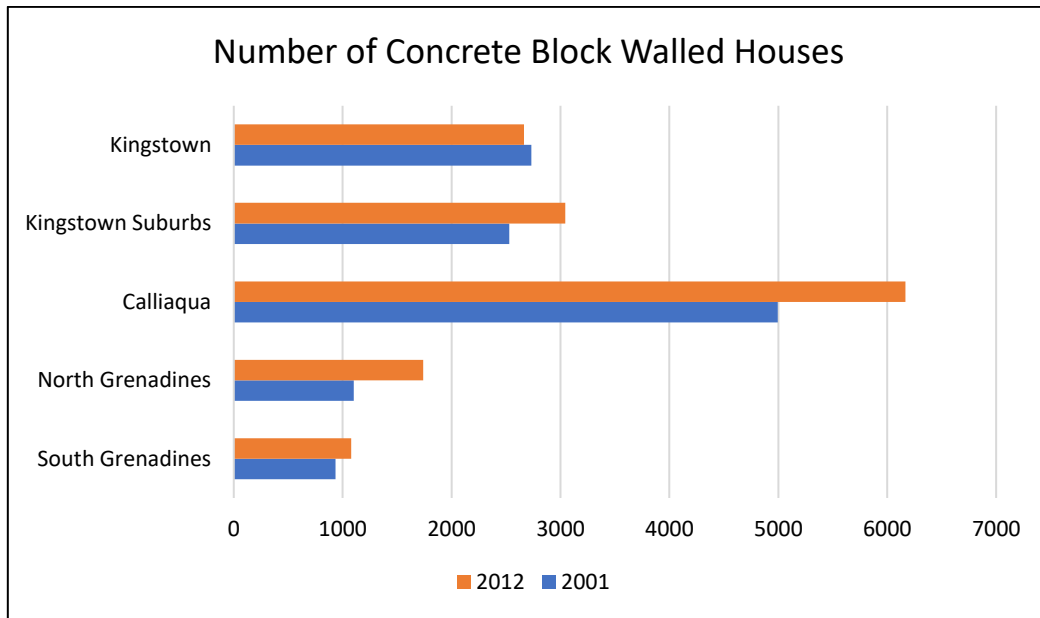
The number and types of houses in each census area is contained in the national Census report. However, the current Census report is being compiled and the data was not shared.

To determine the number of houses in each affected area, raw data was analysed from the Statistical Office of St Vincent and the Grenadines to determine several growth trends. The number of households (houses) in the 2001 and 2012 Census Reports and the 2021 household estimate is shown in Figure.2, which shows a general increase in the number of houses.

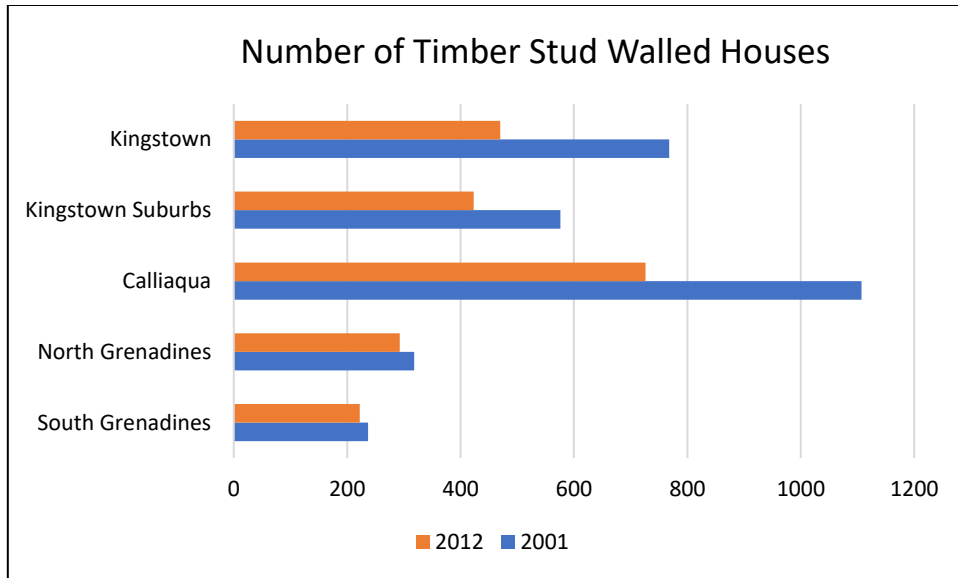
The number of concrete block walled houses in the 2001 and 2012 Census Reports is shown in Figure 3, which shows a general increase, except in Kingstown. The number of timber stud-walled houses in the 2001 and 2012 Census Reports is shown in Figure 4, which shown a general significant decline in the number of timber stud walled houses on the mainland.



**Figure 2 - Number of Households**



**Figure 3 – Number of concrete block walled houses.**



**Figure 4 – Number of timber stud walled houses.**

The Statistical Office’s 2021 household estimates only reported North and South Grenadines. To estimate the number of houses in each of the five affected islands, population the ratios in the Statistical Office’s ‘Household Population by Island, 1980 to 2012’ were applied to the Statistical Office’s 2021 household estimates. The estimated numbers of occupied houses in each affected area in 2021 is shown in Table 2.

**Table 2 – Number of houses in each affected area**

Location	Year 2021
Union Island	967
Mayreau	125
Canouan	776
Mustique	610
Bequia	2,435
Calliaqua	9,861
Kingstown Suburbs	4,996
Kingstown	4,874

Applying the percentages of losses (in Table 1) to the 2021 estimates (in Table 2), and conservatively assuming that the damage rates for the north Grenadines are similar to that of Canouan, results in the estimates of damaged properties shown in Table 3.

**Table 3 – Estimates of damaged houses in each affected area**

Location	Cladding Losses			Roof Frame Losses		
	Full	Partial	None	Full	Partial	None
Union Island	822	97	48	628	290	48
Mayreau	62	50	12	12	31	81
Canouan	272	388	116	155	194	505
Mustique	213	305	91	122	152	396
Bequia	852	1218	365	487	609	1583
Calliaqua	296	690	8,875	99	394	9,368
Kingstown Suburbs	150	350	4,496	50	200	4,746
Kingstown	146	341	4,387	49	195	4,630
<b>Total</b>	<b>2,814</b>	<b>3,438</b>	<b>18,392</b>	<b>1,602</b>	<b>2,066</b>	<b>21,358</b>

It should be noted that these numbers are based on the year 2021. If the actual number of households can be obtained from the 2024 Census Report to update Table 5.4, then Table 3 should be updated accordingly.

It should be noted that few timber walled houses remained standing. From Figure 4, we may estimate that the number of timber walled houses in the South Grenadines number approximately 200. It should also be noted that few masonry walled houses collapsed. An estimate would be approximately 10% of the full frame losses in each island from Table 3.

Some errors in data collection were corrected after site-visit verification. For example, assumptions of loss of cladding on maps, videos and photographs from a distance were later found, on closer inspection, to be: (i) buildings under construction but which had not reached the roof frame stage, and/or (ii) dilapidated houses that were abandoned (see Figure 5).



**Figure 5 – Examples of erroneous apparent roof loss.**

### 5.5.3 Costs of Damage and Recovery of Houses

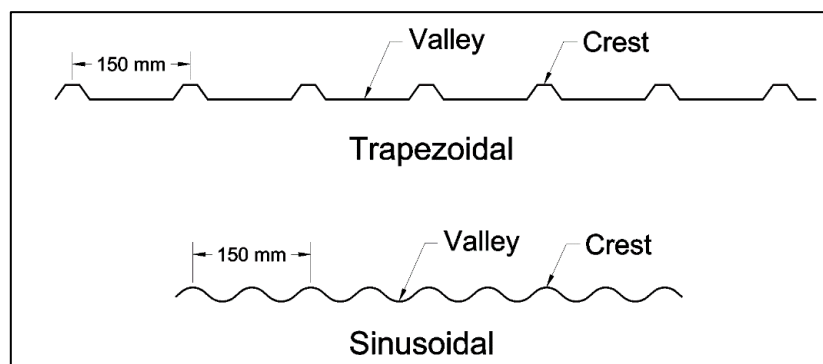
Assuming an approximate house ground floor area of 93 m<sup>2</sup> (1,000 sq. ft.), and that partial loss is approximately 70% of full loss, the preliminary damage estimate of roofs shown in Table 3 is approximately EC\$215M. Rebuilding the roofs to the current CARICOM Regional Code of Practice for Houses in the Caribbean (2023) results in an estimated rebuilding cost of approximately EC\$335M. These estimates assume a Labour: Materials ratio of 1:1.

The costs of clean-up and repairs to floor, wall and ceiling finishes and utilities is to be added to the cost estimates.

## 5.6 Damage Types

### 5.6.1 Roof cladding.

The roof cladding was generally corrugated metal in both sinusoidal and corrugated shapes as shown in Figure 6. However, some cases of asphalt shingles were observed.



**Figure 6 – Corrugated roof metal cladding types.**

The corrugated cladding was fixed to a timber roof frame with screws or nails at the crest location. The observed modes of cladding failure follow.

- a) Roof cladding pulled over the fixings.
- b) Fixings pulled out of the timber frame.
- c) Cladding ripped at the fixings.
- d) Thin roof cladding.
- e) Insufficient number of fixings for thin roof cladding.

Examples of some are shown in Figure 7.



Roof sheets pulled over the screws – leaving the screws behind.



Screw pulling out of timber frame.



Ripped cladding – remaining on the screw.



Torn roof cladding.



Metal thickness measured at 0.019” (0.48 mm), including the zinc finish.



Screws spaced 150 mm (6”) apart, but cladding torn.



**Figure 7 – Roof cladding failure modes.**

The metal cladding was generally measured at 0.55 mm to 0.39 mm, which results in a base metal measurement of between 0.5 mm to 0.34 mm when the typical thickness of the zinc finish is excluded. This results in a 26 to 28-gauge sheet, depending on whether the thickness of the zinc coating is included in the thickness.

### 5.6.2 Roof Frame

The roof frame tended to be: (i) timber purlins supported on timber rafters, or (ii) plywood sheets supported by timber rafters. The observed modes of roof frame failure follow.

- a) Rotten termite damaged rafters and/or purlins.
- b) Weak scarf or similar joint splice.
- c) No hurricane connectors.
- d) Inadequate end and edge distances of fixings (screws and nails).
- e) Over or under tightening screws leading to leaks that may rot and weaken the timber frame.
- f) Tree branches in contact with roofs allowing termites' direct access to the timber roof structure.



g) Timbers not pressure treated against termites.

Photos showing each failure mode are shown in Figure 8.



Likely point of failure – the joints in the ridge beam.



Rafter nailed to termite damaged wall beam.



Inadequate end distance (nail to end of timber). It should be minimum 7 times the nail diameter.



Inadequate edge distance (nail to edge of timber). It should be minimum 4 times the nail diameter.



Failed timber scarf joint.	Nails at the end of termite damaged timber.
	
Over tightened screw damaging the washer.	Adequately tightened screw.
	
Tree branches in contact with roof.	Loss of ridge beam at the joints.

**Figure 8 – Roof frame failure/weakening modes.**

### 5.6.3 Walls

The walls were either timber studs with timber cladding, or concrete block masonry. The timber frame was either resting on: a timber wall plate, a concrete beam, or a concrete block wall.

The modes of wall failure follow.

- a) The failed timber frames did not have bracing members, resulting their instability under lateral loads.
- b) The failed masonry buildings did not have sufficient shear walls to provide stability to the building.
- c) The wall plate was rotten.

- d) Failed walls were not connected to orthogonal walls.
- e) The masonry walls were not reinforced.

Photos showing each failure mode are shown in Figure 9.



Rotten timber wall plate bolted to concrete beam.

Collapsed wall not connected to orthogonal walls (red arrows).

Unreinforced masonry wall.

No diagonal bracing between the timber stud walls.

**Figure 9 – Roof frame failure modes.**

### 5.6.4 Critical Facilities

Churches, schools, health facilities and public buildings were found to have been similar vulnerable. Since they may be considered critical facilities to be used during or after a major hazard, they should be constructed to a higher standard. Some examples of failure are provided in Figure 8.



Church with unreinforced masonry walls and without adequate shear walls. Failure likely by movement of the roof truss transferring lateral forces to the walls.



Hospital with partial cladding loss.



Hotel accommodations, with full cladding and roof frame loss.



Hotel accommodation with partial roof cladding loss.



Cladding loss and partial frame loss of church.



Full cladding and frame loss over highest roof in church.



Full roof cladding and frame loss of school.



Full roof cladding and frame loss of library.



Damage to church. Failure likely by movement of the roof frame transferring lateral forces to the walls.

## 5.7 Recommendations

### 5.7.1 Immediate

### 5.7.2 Damaged Water Tanks

Many affected residents of the South Grenadines used plastic water tanks. The problem is that many of the tanks were reportedly damaged during the hurricane and are currently cracked and unusable (as reported by the WASH specialist).



**Figure 10 – Water tanks.**

To provide residents with immediate relief, the cracked water tanks may be sealed with structural silicone. A recommended procedure follows.

- a) The cracked edges should be cleaned.
- b) Structural silicone (not normal silicone) should be applied to the crack.
- c) A rope or strap should be circled and tightened around the tank from the bottom to the top approximately 300 mm (12”) apart to temporarily reinforce it until a more permanent solution is found.

### 5.7.3 Wasted Rainwater

Persons in two-storey masonry houses with partial or complete roof loss moved to the ground floor. The problem is that during subsequent rainfall events, residents complained that water leaked through the first-floor concrete slab.

Leaks may occur due to: (i) drying shrinkage cracks in the slab that result from excessive water in the concrete mixture, (ii) inadequate compaction of the concrete resulting in a more porous slab through which water may migrate, and/or (iii) cold joints where a crack may have developed between delayed pours of concrete.

An examination of the underside surfaces of exposed concrete slabs tended to reveal spalled surfaces exposing corroding reinforcement. This may result from: (i) insufficient concrete cover to protect the reinforcement, and/or (ii) inadequate compaction of the concrete resulting in a more porous slab through which water may migrate.

A honeycombed appearance was also noted. This generally results from inadequate compaction of the concrete. Examples of observed spalling and honeycombing is shown in Figure 11.



**Figure 11 – Spalling and honeycombed concrete.**

To provide immediate relief, the following two options are suggested.

Where the roof frame is intact, a tarpaulin may be draped over the roof frame. Where the roof frame has collapsed, a 0.5 mm (500 micro metre) thick plastic damp proof membrane (normally installed under ground floor slabs) should cover the first floor. A recommended procedure for both follows.

#### 5.7.4 Roof Frame Intact

- a) Where the roof frame is generally intact, or it can be economically repaired, repair the roof frame and install a fascia board.
- b) Install roof gutters, including down pipes to the plastic tanks or cisterns.
- c) Install tarpaulin on the roof frame.

#### 5.7.5 Roof Frame Collapsed

- a) Clear all debris from the first floors rooms where leaks are identified.
- b) Install a 0.5 mm thick damp proof membrane (plastic sheet) over the floor.
- c) Tape all plastic laps (300 mm (12”) laps) with duct tape.
- d) At the walls, wrap the plastic around a 50 mm x 50 mm (2”x2”) purlins or whatever timber is available, and fix it to the wall with screws or nails spaced 600 mm (2 ft.) apart.
- e) Seal the joints between the plastic sheets and the walls with silicone.
- f) Install drainage holes in the walls to direct any storm water to cisterns or plastic tanks through gutters or pipes.

These immediate construction methods may be efficiently done by an Engineer’s battalion of the military.

#### 5.7.6 Rebuilding

Since people were observed to be rebuilding on 4<sup>th</sup> July 2024 (see Figure 12), they should use this opportunity to rebuild to current construction standards.



**Figure 12 - Rebuilding started (4 July 2024).**

Most of the masonry walls remained intact; therefore, it is likely to be mainly roofs and timber walls that will require rebuilding.

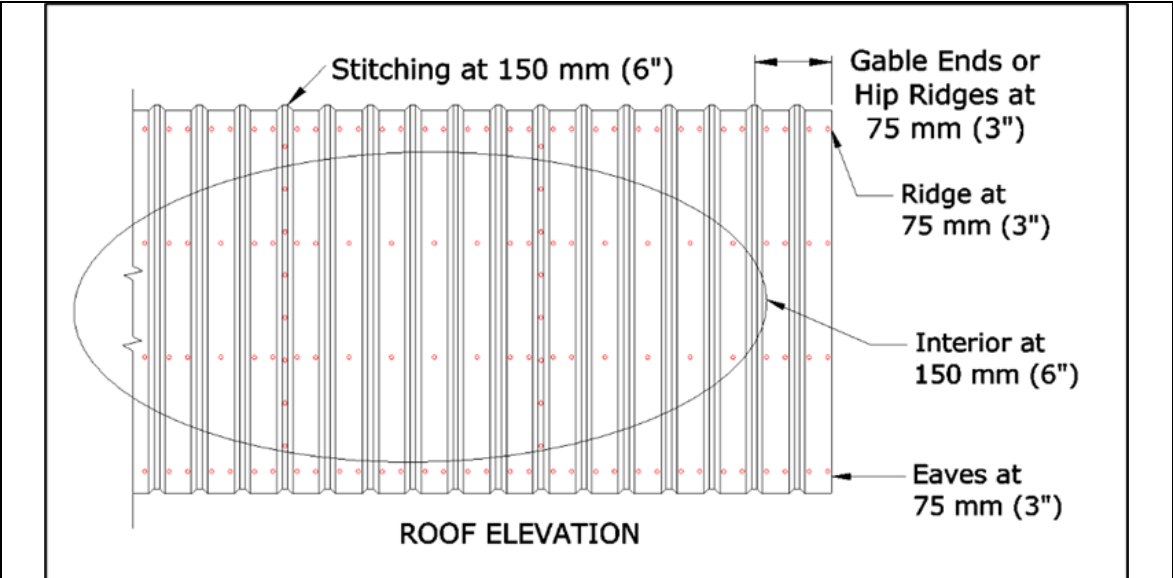


The current CARICOM residential construction standard is the CARICOM Regional Code of Practice for the Construction of House (CRCP 10:2023), which was developed under the authority of the CARICOM Regional Organisation for Standards and Quality (CROSQ), and approved as a CARICOM Regional Standard by the CARICOM Council for Trade and Economic Development (COTED) at its 56th Meeting.

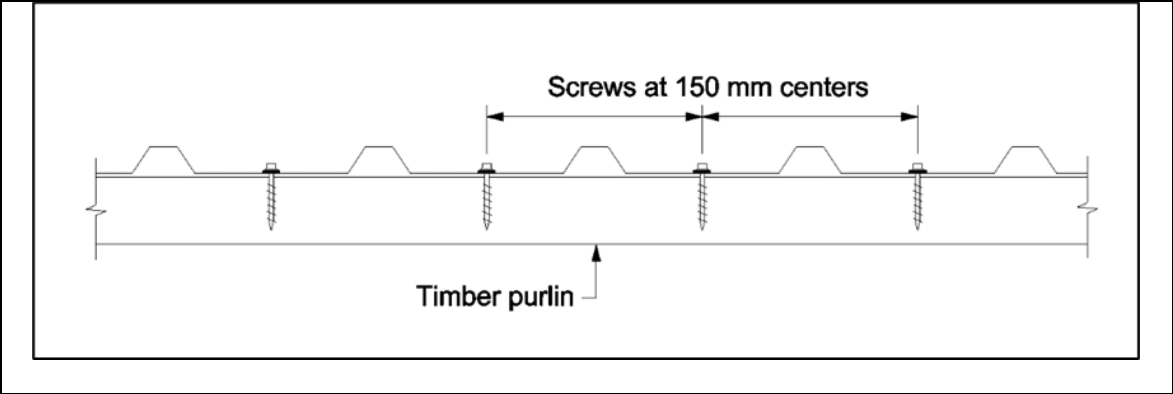
The standard for the Code of Practice is Category 5 hurricanes to the level of Irma and Maria, which impacted Anguilla and Dominica respectively in 2017, and Dorian, which impacted the Bahamas in 2019. It is recommended that this is the reconstruction standard for any rebuilding.

The Code of Practice contains a prescriptive table for selecting rafters based on their span, and sufficient details for connecting the cladding and roof frame. Some roof and wall details are provided in the following sub-sections.

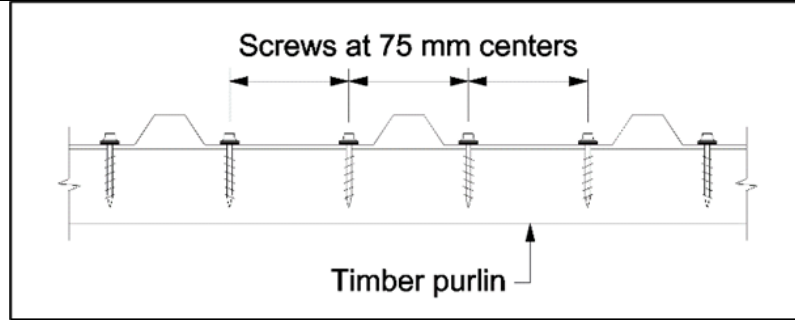
**5.7.7 Roof Details**



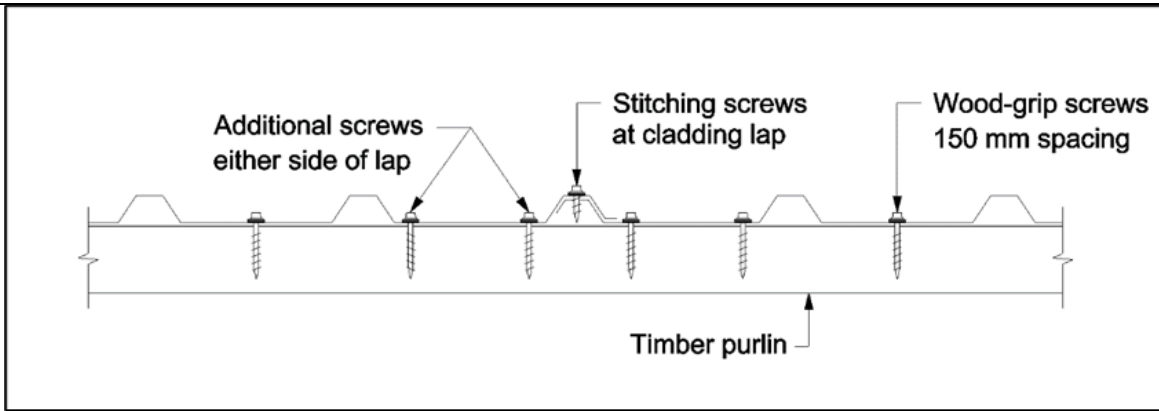
There should be an increased frequency of screws at the eaves, ridges and gable ends. Screws should be No.12 wood grip screws in galvanised steel or stainless steel.



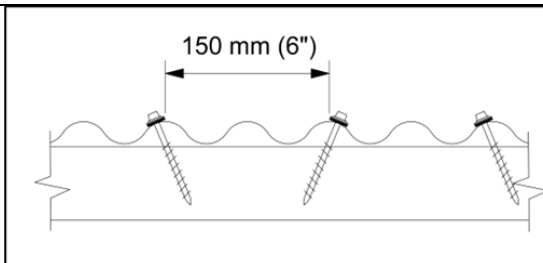
Screws at the interior.



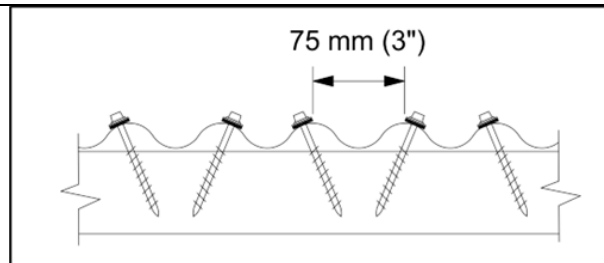
Screws at the eave, gable end and ridges.



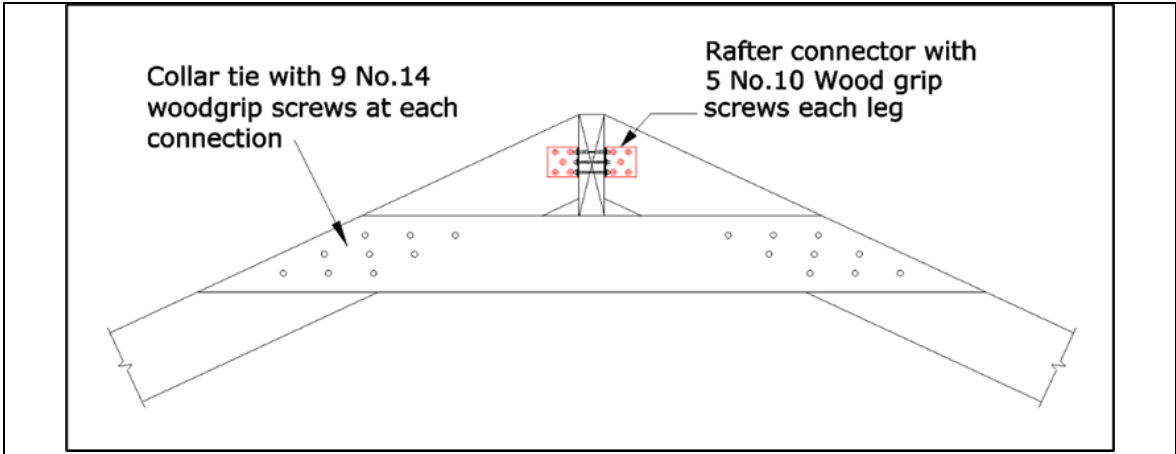
Screws at stitching cladding laps.



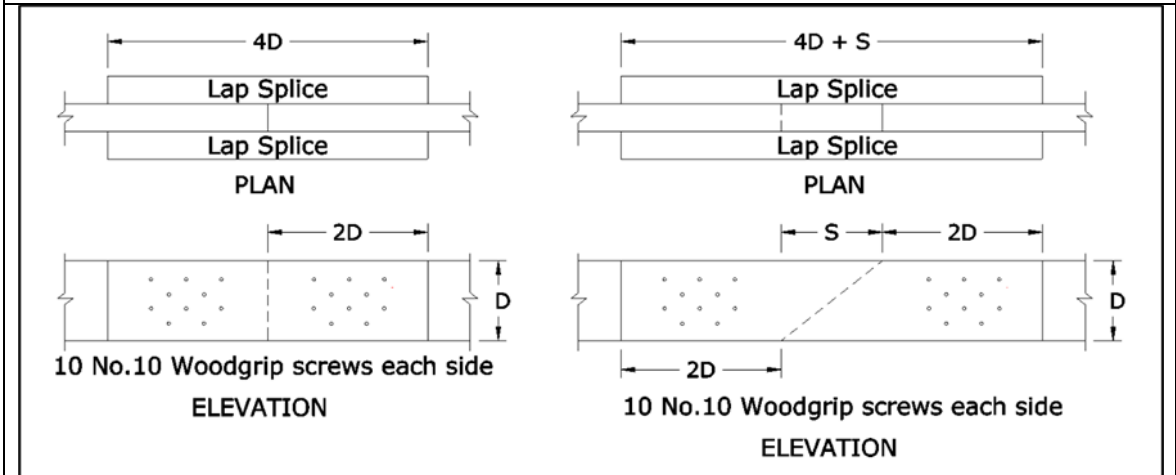
Nails at the interior.



Nails at ends.



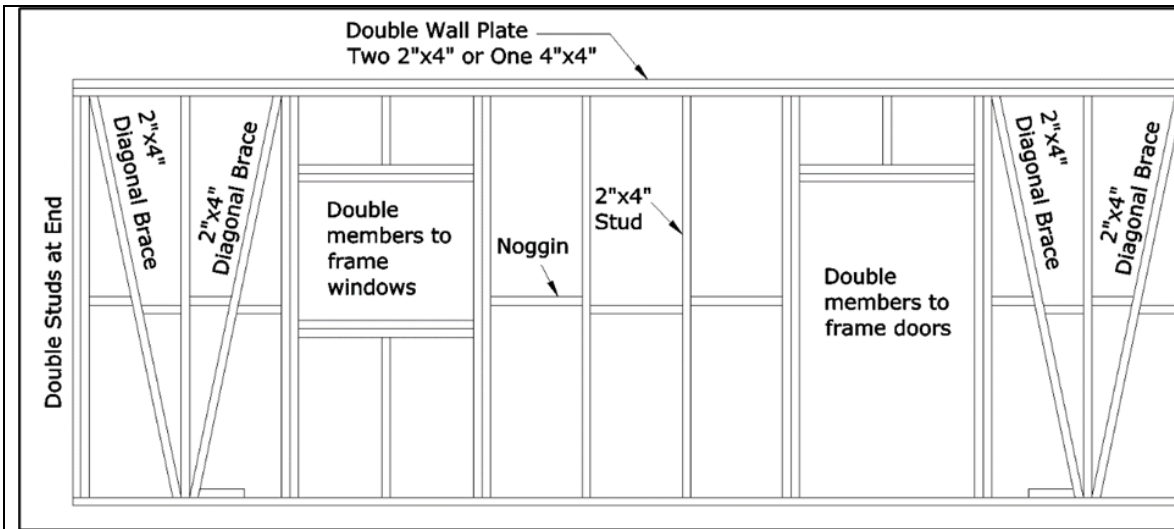
Collar ties.



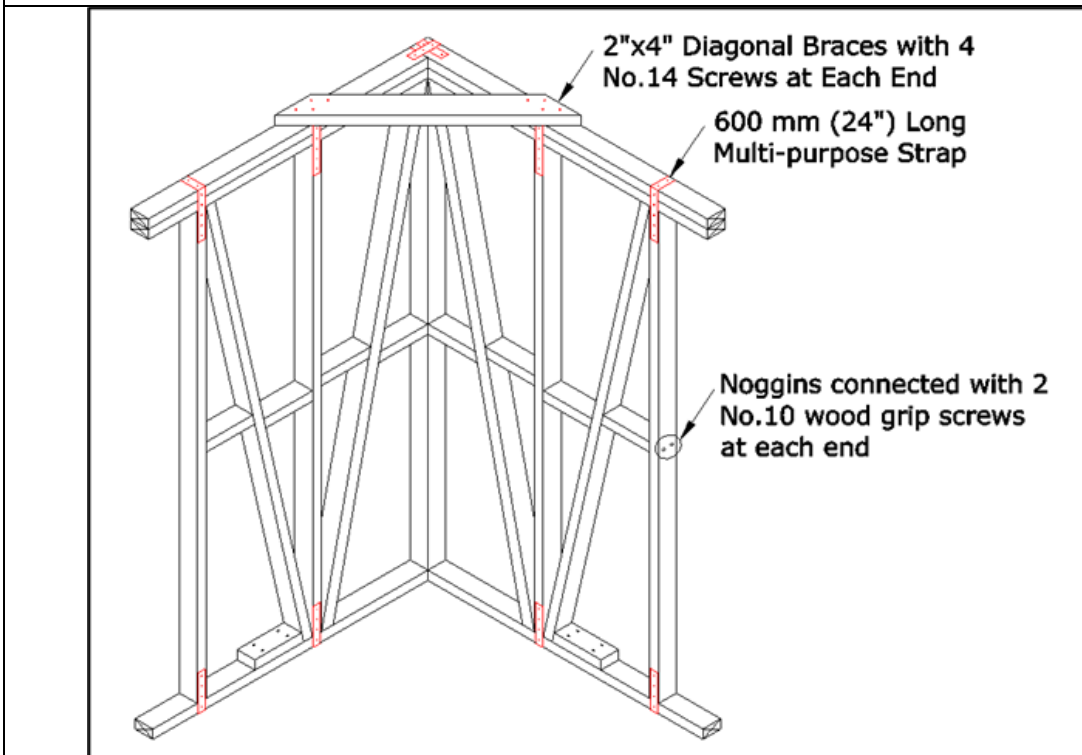
Lap splices.

**Figure 13 – Roof Details.**

### 5.7.8 Wall Details



Typical stud wall elevation.



Typical corner elevation.

**Figure 14 – Wall Details.**

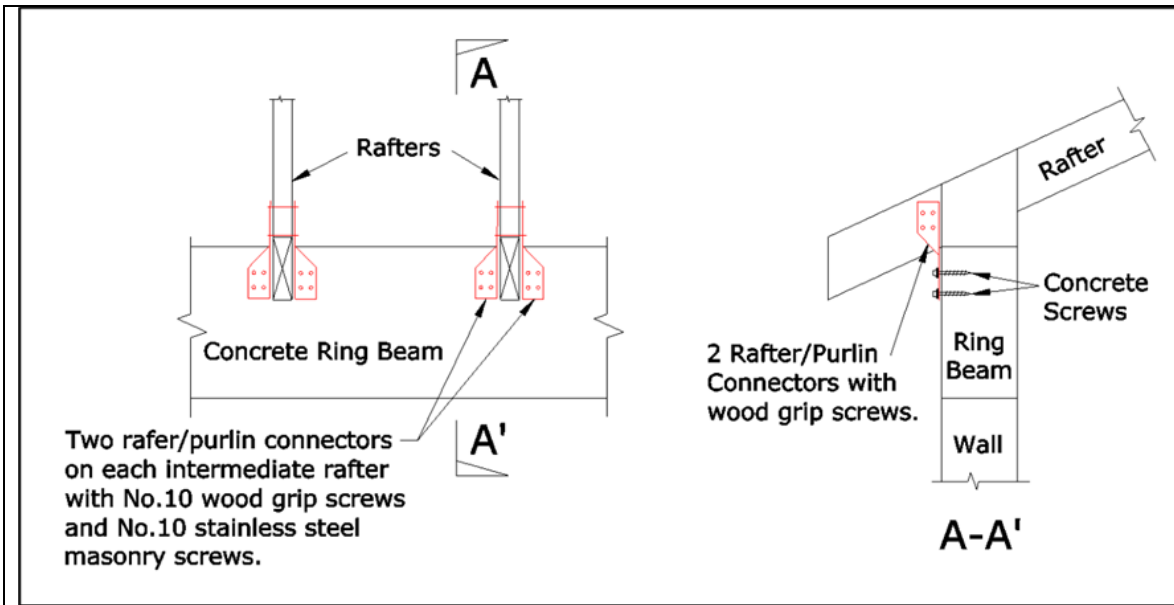
## 5.8 Short Term

In the short term, all homeowners should be given incentives to strengthen their houses. The problem is that all houses have likely been weakened by the hurricane and are more vulnerable to a subsequent lesser magnitude hazard. An example of weakening is the partial pulling out of cladding nails as shown in Figure 15.

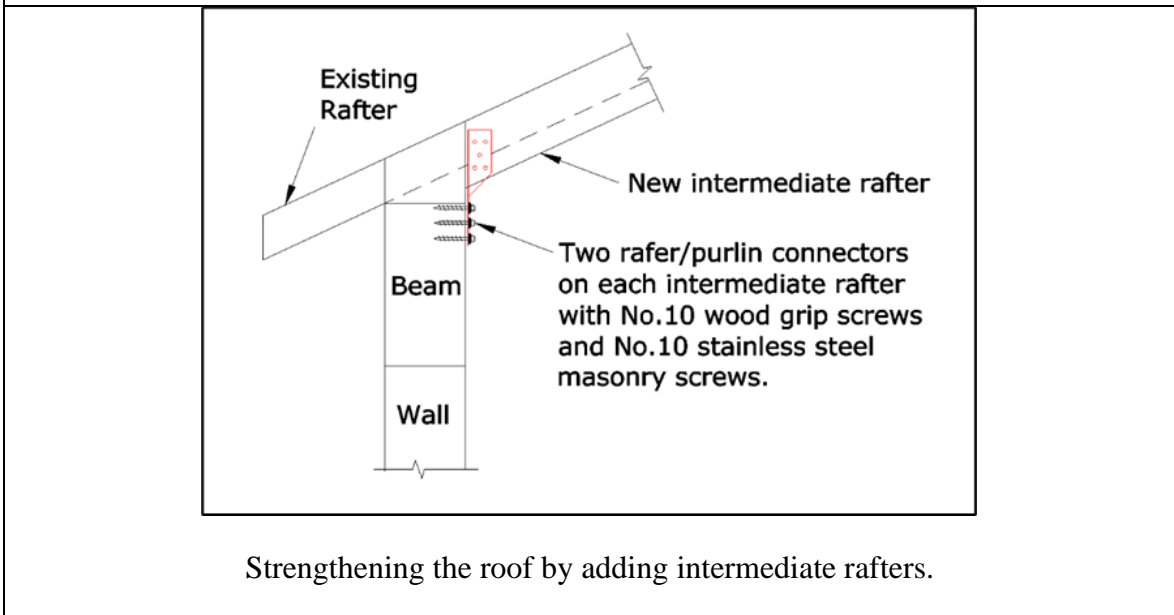


**Figure 15 – Partially pulled out nails.**

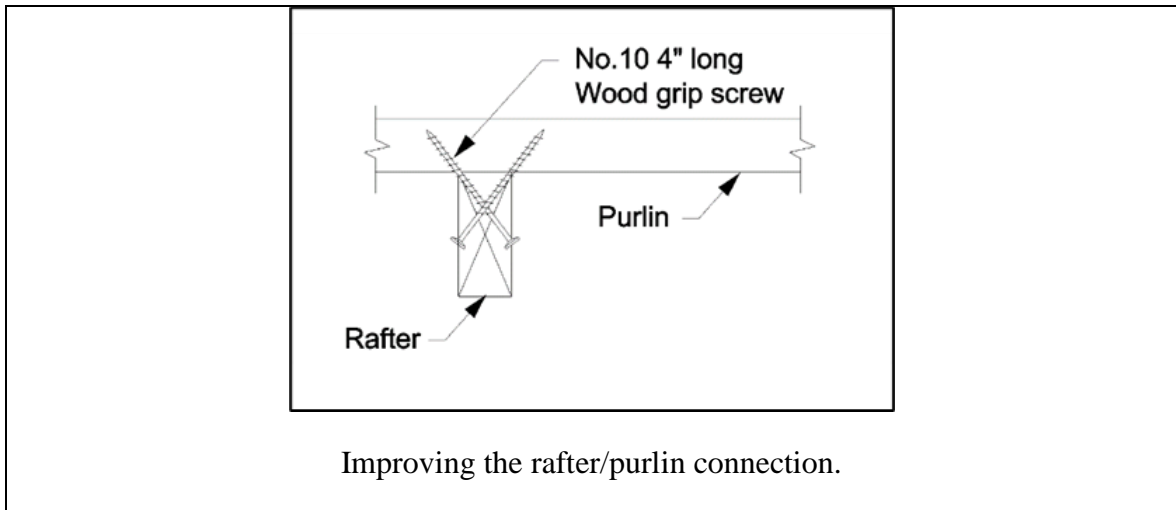
Figure 16 shows some strengthening methods.



Strengthening the rafter/wall connection.



Strengthening the roof by adding intermediate rafters.



**Figure 16 – Details for strengthening existing houses.**

### 5.9 Medium Term

Given the number of termite infested timbers, only hardwood or softwood pressure treated against termites should be used in roofs. To prevent the inadvertent or intentional use of untreated timbers in the roof structure, consideration should be given to a policy where untreated wood is only sold in maximum lengths of 2.4 m (8 ft.), unless special approval is granted.

Only 24 ga (0.6 mm) thick corrugated roof sheets should be imported into St Vincent and the Grenadines.

## 5.10 CONCLUSIONS

No building that is designed and built to only survive a Category 3 hurricane, is expected to survive a Category 4. Therefore, the significant damage cannot be blanketly blamed on the usual suspects of: poor construction practices, poor enforcement, or any related thing – it can only be blamed on the hurricane.

The general rebuilding that is now necessary presents an unfortunate opportunity to rebuild to the current CARICOM regional standard. It is hoped that this opportunity will be embraced.

Critical infrastructure like schools, hospitals and hotels, should be designed for higher-than-normal standards. We recommend that the following minimum design criteria should be specified for the main structure.

- a. Earthquake loads = Moment Magnitude 7.
- b. Wind loads = Hurricane Category 5 (Basic wind speed of 100 m/s 3-second gust in open terrain).
- c. Flood load = 1 in 100 years.
- d. Fire load = 3 hours.



## **6 ANNEX B – EMERGENCY SHELTERS & NFIS NEEDS ASSESSMENT REPORT**

### **6.1 Situation Overview**

Hurricane Beryl made a landfall on St. Vincent and the Grenadines on June 30<sup>th</sup>, resulting in widespread destruction to critical infrastructure and internal displacement. While the mainland was impacted, Union Island, Canouan and Mayreau were severely affected. To date, none of the islands have access to electricity, water and communication and private dwellings, homes, some emergency shelters and other infrastructure have been destroyed.

### **6.2 Purpose**

In situations of forced displacement, which IOM describes as “the movement of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence” it is crucial to understand the needs of the affected population. Ensuring that displaced individuals have access to secure, dignified living conditions in shelters is essential. Shelter and non-food items (NFI) assessments play a pivotal role in determining the appropriate response by providing vital details on the context, capacity, and necessary services. In the Caribbean, schools, although not ideal, frequently serve as emergency shelters and conducting shelter and settlement assessments are crucial as they facilitate informed decision-making and resource allocation, thereby optimizing humanitarian interventions and ensuring the efficient deployment of aid.

### **6.3 Physical Impacts**

#### **6.3.1 Union Island**

Recent reports estimate over 90 per cent of the private homes and dwellings in Union Island is heavily damaged or destroyed. Union Island is divided into two communities, Clifton and Ashton. Due to inaccessibility, only Clifton was covered in this assessment. In the main town of Clifton, the principal school has been destroyed, significantly reducing its capacity to serve as emergency shelter for the community, or later it's functionality as a school once the school year reopens.

Some residents were observed staying in their homes despite the damage, while others that lost their homes completely evacuated or have sought refuge in Clifton preschool. It was observed that the preschool suffers from leaks and inadequate WASH facilities, and some of the displaced persons there expressed security concerns.

Additionally, the only hospital in the island has sustained severe damage with housing quarters destroyed and the building inundated with flood water. Though largely regarded as unsafe due to open roofs and exposed wires, some hospital staff have sought refuge in some parts of the hospital building. With many roofs destroyed, people residing in Clifton are exposed to the elements, raising fears about security and the spread of vector-borne diseases. Provisions should be made to evacuate persons to the mainland whose homes have been destroyed. Observed immediate needs for residents are tarpaulins, cots, mobile partitions, WASH facilities, flashlights/solar lamps.

### **6.3.2 Canouan**

In Canouan, an estimated 90% of private homes and dwellings have been significantly damaged. The devastation has obliterated timber houses entirely. Some masonry structures remain standing, albeit without roofs.

The local school has suffered complete roof loss, compelling residents to seek shelter underneath the core structure. For alternative shelter arrangements, some residents also are taking refuge in the fishing complex, which is also leaking. Lack of water, electricity, and communication infrastructure persists for most individuals. Immediate needs include tarpaulins, cots, flashlights and mobile partitions to address the widespread shelter and NFI needs on the island.

## **6.4 Functional Impacts**

### **6.4.1 St Vincent and the Grenadines**

In St Vincent and the Grenadines, schools are being used as collective shelters (CS) accommodation. The assessment team visited five different CSs (out of 40 active) and identified the following needs/ gaps which should be addressed to enhance the the safety and well-being of internally displaced people (IDPs):

#### **Information availability**

- IDPs in the affected islands were insufficiently aware of evacuation protocols or opportunities.
- Absence of effective feedback channels.
- Some IDPs showed potential psychological trauma based on observations from the shelter warden

#### **Water, Sanitation, and Hygiene (WASH)**

- Non-functional water tanks impacting toilet usability on upper floors
- Not all toilets are in working condition (some are not flushing)
- Limited number of washing sinks
- Showers: defecation in showers, extreme odors, flooding
- Shortage of cleaning supplies preventing IDPs to perform cleaning activities
- Limited facilities for hanging clothes and laundry.
- Hygiene and dignity kits were not yet provided

#### **Security / Dignity**

- Security risks: male and female bathrooms without sufficient partitioning, light and locks.
- Concerns raised by residents about their safety due to lack of partitioning and insufficient number of security personnel.

## **Non-Food items**

- Clothing
- Essential household items (blankets, mattresses, cots, clothing, hygiene items, solar lights, kitchen sets, mosquito nets, etc.)

## **Food:**

- Food was not provided regularly

## **Accessibility Issues:**

- Facilities were not well catered for persons with disabilities, limited wheelchair accessibility.

## **6.4.2 Methodology**

In conducting this study, a structured questionnaire was developed as the primary tool for data collection. This questionnaire was carefully crafted to gather comprehensive insights into various aspects of shelter management and conditions. Key informants, including shelter managers and occupants, were identified and selected for interviews. These interviews were conducted to capture first-hand experiences, perspectives, and feedback regarding the shelters' functionality, living conditions, and any encountered challenges.

The selection of key informants aimed to ensure a diverse representation of stakeholders directly involved in or affected by shelter operations. The weather conditions that day were unfavourable, but the rapid needs assessment for Canouan involved conducting informal interviews with residents and community walks to better understand the extent of the damage. Further data and verification will be undertaken.

Through this methodology, valuable qualitative data was gathered, providing a nuanced understanding of the issues faced within the shelter environments and informing recommendations for improvement in future emergency response planning.

## **6.4.3 Recommendations**

### **Immediate Needs**

- Essential household items (blankets, mattresses, cots, clothing, hygiene kits, solar lights, kitchen sets, mosquito nets, etc.)
- Tarpaulins and ropes
- Tents (only for special cases such as emergency health clinics, temporary shelters for nurses, workers, doctors, etc.)
- Cash support through vouchers for shelter materials/ repairs (where market situation allows)
- Short-term accommodation (Airbnb, hotels, etc.) for most vulnerable affected families.
- Information, education and communication materials on immediate shelter repairs.
- Shelter repair toolkits
- Collective shelters upgrades (immediate repairs to roofs, windows, doors, WASH)

## **General recommendations**

- Provisions should be made for persons with a special vulnerability to evacuate to places where specialized care can be provided
- Provide community toolkits (Hammers, saws, screwdrivers, nails, screws) to support emergency repairs
- Provide tools to for debris removal (shovels, wheelbarrows, cutters)
- All Emergency Shelters should adhere to the Sphere Minimum Standards

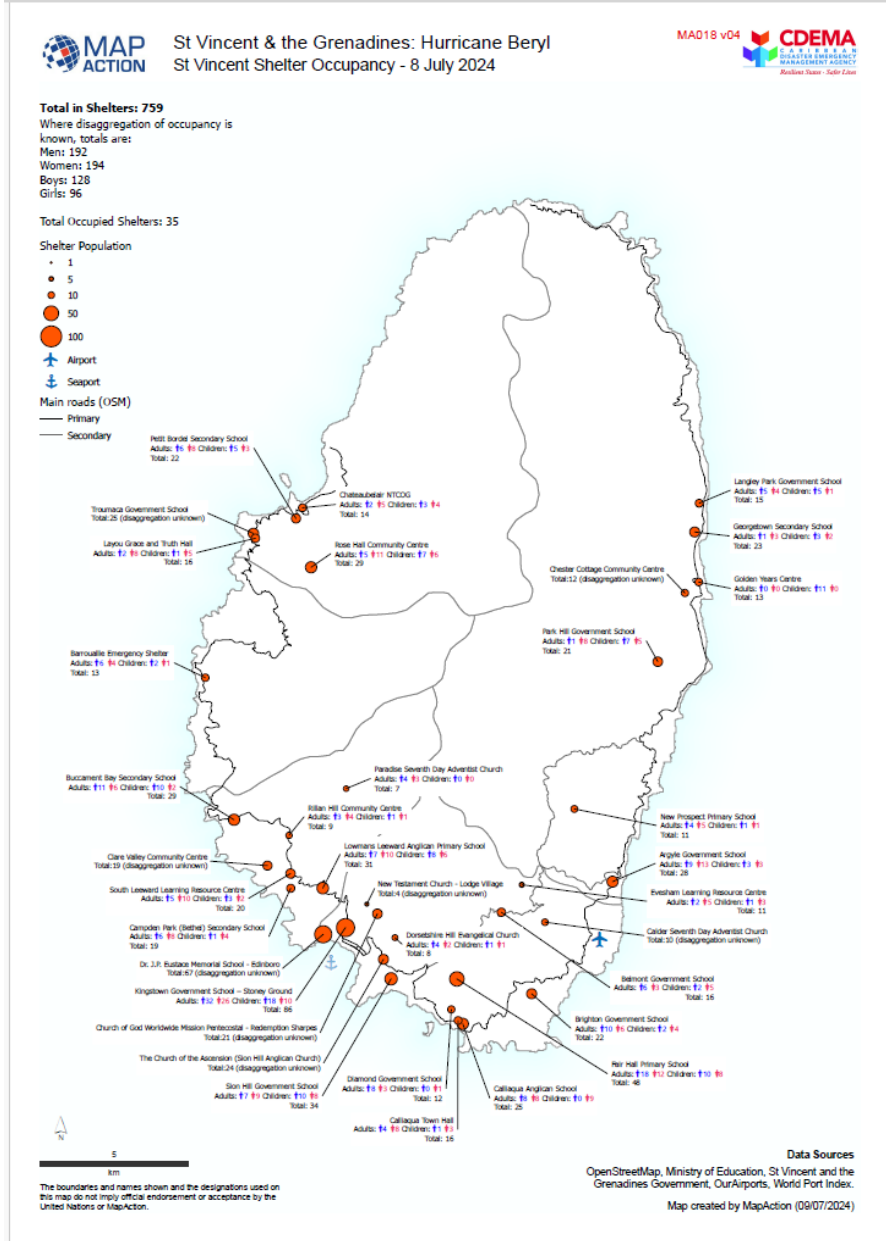
## **Limitations**

Time constraints and weather conditions affected the ability to thoroughly assess some of the affected areas.

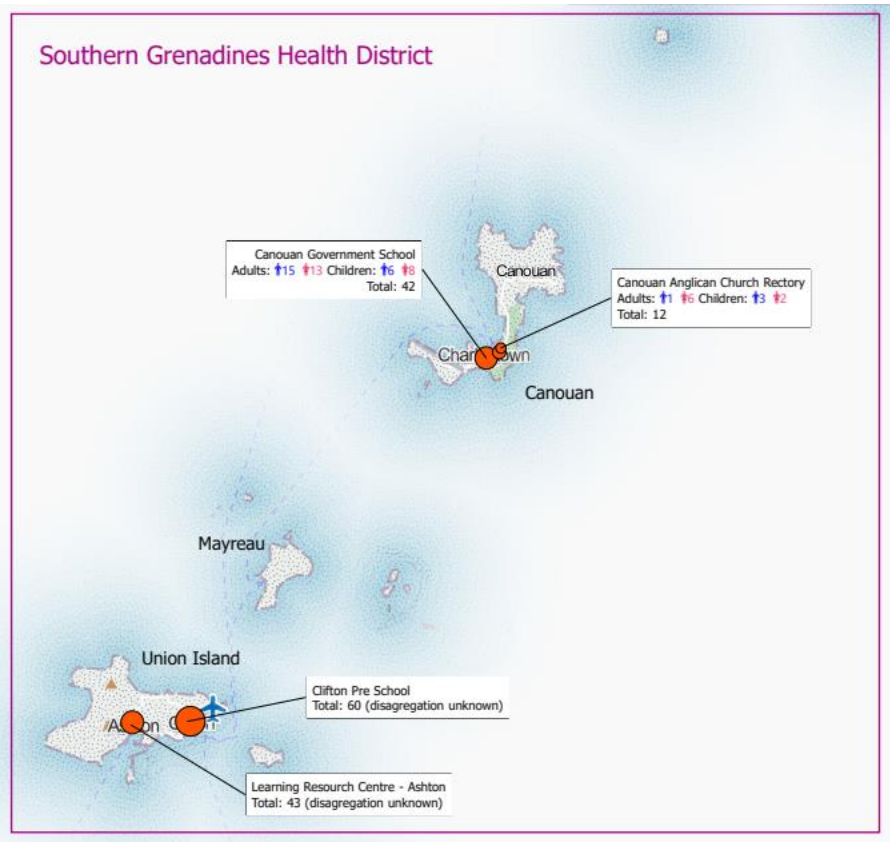
# Maps of the Emergency shelters covered in St. Vincent and the Grenadines

Map 1: Demonstrating Emergency shelter location and numbers in St. Vincent and the Grenadines

Source: Map Action

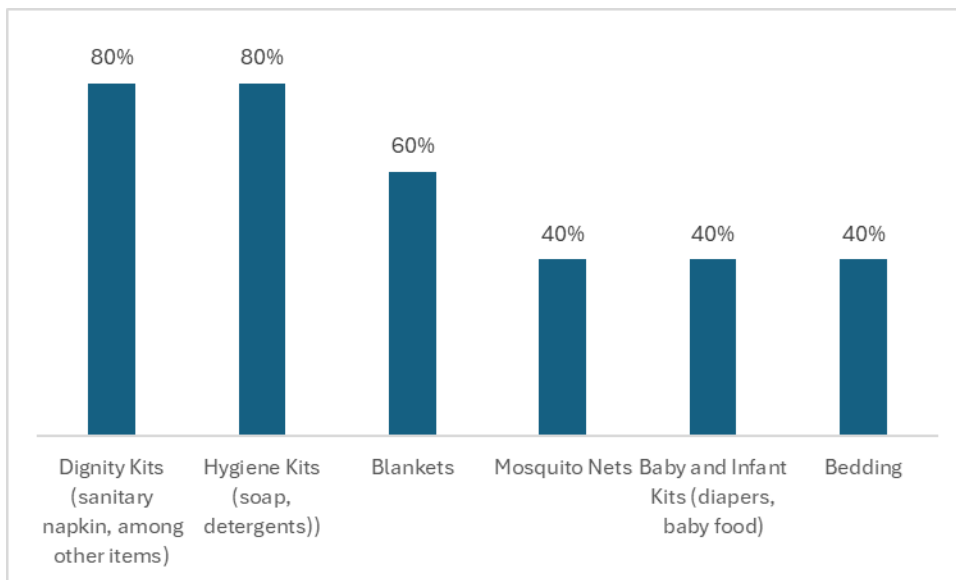


Map 2: Highlighting emergency shelters in Southern Grenadines



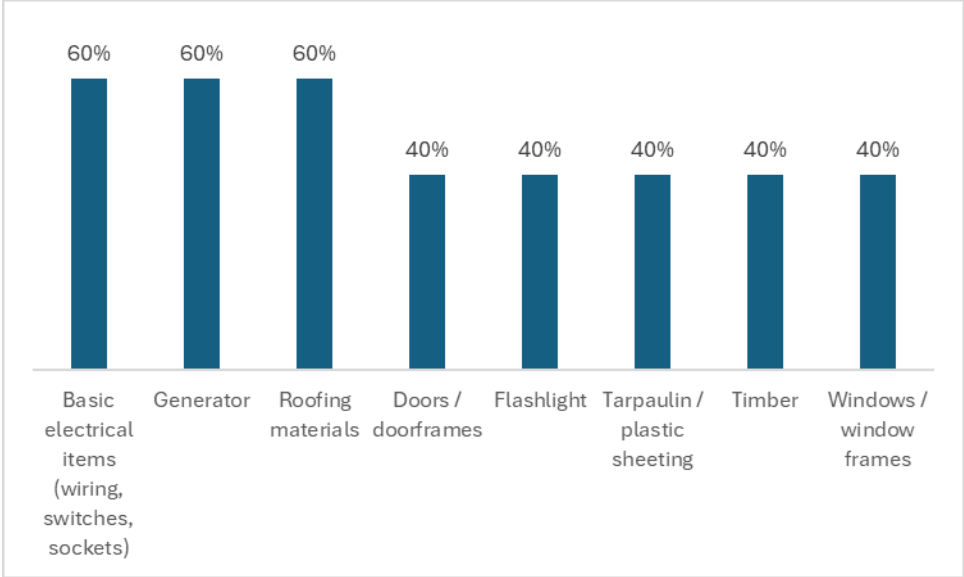
## Needs List

Table 4 Highlighting the main non-food items in collective shelter accommodation



Of the 5 shelters assessed, the graph above provides a detail breakdown of the non-food items identified by IDPs from the varying communities.

Table 5 Highlighting the shelter needs for people in collective shelter accommodation



Of the 5 shelters assessed, the graph above provides a detail breakdown of the shelter needs identified by IDPs from the varying communities

## **7 ANNEX C – WATER AND SANITATION AND HYGENE NEEDS ASSESSMENT REPORT**

### **7.1 Situational Overview**

#### **Main Island of St. Vincent**

The main island of St. Vincent is blessed with a 100% gravity-fed water supply system, and its distribution is not affected by power outages.

#### **Union Island**

In the absence of a public water supply system, the residents rely exclusively on rainwater for their water supply.

About half of households store rainwater in large concrete cisterns located under their house in varying sizes 10.000-20.000 USGls. The other half use 400-600-800 and 1000 USGls rainwater tanks.

People usually drink water from cisterns and tanks and buy bottled water. Water from the cisterns is used for washing and flushing toilets. People are frugal in their water use and conserve water, as supply is not guaranteed.

It is common practice for persons with very large water cisterns to sell water to persons with rainwater tanks at 200-300 EC\$/1000gls (to be confirmed) during dry season.

Ashton has an extensive rainwater catchment upon a hill, collecting rainwater into a 300.000 USgls cistern. However, the cistern is empty due to repair work which started before Hurricane Beryl.

Most concrete cisterns have electrical pumps for water access and a manhole allowing access with a bucket.

Most people with large water cisterns have flush toilets, connected to a septic tank and soakaway system. However, soil conditions have poor percolation.

Pit latrines are commonly available at houses with flush toilets and used during periods of drought, when the cisterns are nearly depleted or empty.

The rainwater systems are notorious mosquito breeding sites and the Vector Control Department of the Environmental Health Department of the Ministry of Health employs a three-prong approach to control mosquito breeding: Reduction of breeding sites; larvicolous fish (Guppies) in rainwater cisterns and fogging (pyrethroid).

Solid waste collection on Union Island is done once a week and disposed of in a landfill near Ashton Village.



## **7.2 Purpose**

The purpose of the WASH assessment is to determine the impact of the hurricane on the water supply, sanitation, and hygiene practises, to assess the risk to health, reduce the potential transmission of diseases, and protect public health.

## **7.3 Impacts Observed**

### **7.3.1 Physical Impacts**

Most tourists and also part of the population have left Union Island. How many persons remain is unknown to the WASH advisor, but 1000 is used for this report.

#### **Water supply**

95% of the roofs have sustained severe damage or have been completely blown off. Many of the rainwater tanks have been blown away and are destroyed beyond salvaging. Most cisterns are filled, but the water is contaminated with small debris and leaves.

In the absence of roofs and guttering, these cisterns will not refill and stored water will deplete within the next few weeks.

Post Beryl, people drink bottled water.

In the absence of a roof and guttering, the available storage facilities will not be refilled and will run dry soon, depending on usage.

#### **Sanitation**

Although most roofs are destroyed, many flush toilets are still functional, without running water and without electricity for the pump.

The superstructures of latrines have been destroyed, and the lack of privacy would prevent people from using these pits.

#### **Solid Waste disposal**

Access to the landfill was obstructed after the passing of the hurricane and could not be visited.

### **7.3.2 Functional Impacts**

#### **Water Supply**

In the short-term future, water will be available in the cisterns for washing and flushing toilets for immediate emergencies if people are willing to share it with neighbours whose storage tanks have blown away.

Water in the cisterns with electrical pump for extraction is nominally protected from water-related diseases; however, drawing water with a bucket from the cisterns increases the risk for water-related diseases significantly. Endemic water-related diseases such as diarrhea, and dysentery (?) are most likely to spread. The risk for Leptospirosis increases when animals share living quarters with people.

People informed the team that they don't drink the cistern water but bottled water. Especially, now manual drawing of water using buckets increases the risk of contamination.

#### **Sanitation**

Although most roofs are destroyed, many flush toilets are still functional but without running water in the absence of electricity for the pump and require pour-flush using a bucket with water from the cistern to discharge the fecal matter into the septic tank

The lack of privacy would prevent people from using pit latrines.

Open defecation has been reported in the aftermath of the hurricane

The WASH advisor investigated several reports that the toilets are non-functional and out of operation.

Inspection revealed that the flush mechanisms were inoperable or that the toilet's flush-cistern was empty of water. In all cases, the fecal matter could be disposed of into the sewer pipe and subsequent septic tanks by pour-flushing using a bucket.

From a public health point of view, these toilets fulfil their purpose of separating "infectious human waste" from further contact with people and spreading diseases.

#### **Hygiene**

The recent heavy rainfall and flooding by storm water spread fecal matter and pathogens from soak always and septic tanks into the environment, which is a serious public health threat.

#### **Solid Waste**

Collection and Disposal of domestic solid waste was halted in the direct aftermath of the hurricane.

The debris from Hurricane Beryl and uncollected domestic waste provides ideal vector breeding and feeding sites for vectors, including for rats.

### **7.3.3 Estimated damage and loss (where applicable)**

In the absence of a census on the number of water tanks, the WASH advisor could not provide a calculation on number of tanks lost and estimate damages.

The rebuilding of roofs and gutters should be included in the cost for rehabilitating the rainwater harvesting system.

## **7.4 Presentation on methodology**

### **7.4.1 Data collection**

The above assessment was carried out during a brief walk about of the RNAT team on Wednesday 4 July. During heavy downpour and in absence of transport, the team visited only Clifton, and did not reach Ashton.

The WASH advisor interviewed people in shelters and residents in their damaged homes.

The Environmental Health Department provided information on sanitary systems and CWSA provided the document SVG Hydrological Report Annexes 2009, including data on brackish water wells on Union Island.

### **7.4.2 Limitations**

In the absence of census data and the inability to reach the Environmental Health Office on Union Island, the exact number of households affected and the location and distribution of cisterns, water tanks, flush toilets and pit latrines could not be mapped.

### **7.4.3 Data Presentation and Analysis**

No census data was available. Information was sourced from personal conversations and observations in the field.

### **7.4.4 Challenges**

Remoteness of the main affected islands in the Grenadines and the severity of the impact.

Public health risks and outbreaks of water-related diseases require urgent attention.

## **7.5 Recommendations**

### **7.5.1 Short Term**

#### **Water Supply**

##### **Main Island**

Mr. Brian da Silva of the Central Water and Sewerage Authority (CWSA) informed WASH Advisor that the water supply as of 5 July on the main island St. Vincent is back to normal operation.

No assistance and supplies are required.

The Environmental Health Department could not perform its mandate of water quality monitoring and residual chlorine testing as it is out of reagents.

NEMO reported that as of Sunday, 7 July, thirty-eight (38) Shelters are in operation on the main island with 758 persons. No gender-ratio and age group data provided.

Shelter recommendations for Union Island apply to the main island, following the guidelines of the SPHERE Handbook 2018.

##### **Union Island**

The continued provision of bottled water for drinking is essential.

Alternatively, people could treat the water from rainwater cisterns before drinking, like boiling or treating it with chlorine tablets. Preferred chlorination tablets containing 33 or 67 mg Sodium Dichloroisocyanurate (NaDCC). (33 mg for 10 ltr of clear water to be treated.)

Such prepared drinking water needs to be stored in appropriate 2-4 gls (10-20 ltr) containers with a spigot, at least two per household.

Urgent mapping of houses with cisterns, water tanks, functional toilets and pit latrines

Urgent mapping of buildings that could function as shelters for remaining residents as well as for rebuilding crew and security staff

Identify buildings (hotels?) with operational toilets for shelters and homes for the rebuilding crew and use buckets for flushing, with water from cisterns

Install generators to provide electricity for pumps servicing cisterns for shelters and accommodation for rebuilding crews.

The repair to 300.000 USGls (estimated) public reservoir in Ashton should be completed as a priority.

High priority should be given to the repairs to the roof and gutters of those houses with cisterns. The rainwater stored at the existing cisterns will run out without replenishment from the rain in the absence of roofs and gutters.

In addition, as future rainfall is uncertain, the provision of water will be required in the near future. Assuming a population of 1000 persons (?) in Union during the reconstruction phase (?) at a minimum of 50 ltr/person/day, a production capacity of initially 50,000 ltr/day or 12,000 USGals/day. This capacity would need adjustment when the population increases as people return. The actual water consumption under this condition would need to be determined when operations are in progress.

The brackish water well near Ashton could be a site for the desalination plant.

A tanker truck will be required to distribute desal drinking water to fill existing cisterns.

Distribution points need to be set up according to the location of the existing cisterns to share water with community members who don't have cisterns.

The damaged rainwater tanks (800 gals) need to be replaced. Numbers unknown.

### **Sanitation**

People in houses with a functioning WC system and a flush toilet should use this toilet with a bucket for flushing, even if there is no roof. Provisions need to be made for privacy and rainwater control if so required.

People with access to their pit latrine and without a flush toilet (or damaged toilet), should use this pit latrine, providing cover for rain control and privacy using available material, tarpaulin, sheeting, etc.

Sanitary facilities also require security for women and the separation of male and female toilets at shelters.

Shelters should provide:

- 1 toilet for every 20 persons with double the number of toilets for women to men. (Schools used for shelter also provide urinals for men)
- 1 shower for every 50 persons.
- Toilets and showers should be gender specific and provide adequate lighting and security.

Follow the guidelines in the Sphere Handbook 2018

### **Domestic Solid Waste Removal**

However, the collection and proper disposal of refuse from the three villages on Union Island: Clifton, Ashton and Big Sands, should resume as soon as possible to reduce the spread of vectors. The large influx of bottled water and beverages will also produce much PVC waste. The WASH advisor is unaware of any pre-existing recycling programs on the island.

### **WASH Hygiene Education program.**

A vigilant WASH Hygiene campaign is required to reduce the risk to communicable diseases and adapt people's attitudes and habits related to personal hygiene under these emergency conditions. These campaigns need to take account of local customs and habits, and its messages and images require significant input from local health and environmental health authorities.

Emergency WASH and Hygiene education programs should consider the actual local conditions described above.

Hygiene kits need to be distributed, ensuring that all affected households have access to the minimum quantity of essential hygiene items:

- two water containers per household (10–20 litres; one for collection, one for storage);
- 250 grams of soap for bathing per person per month;
- 200 grams of soap for laundry per person per month;
- Soap and water at a handwashing station (one station per shared toilet or one per household)
- Potty, scoop or nappies to dispose of children's faeces.

Adapt hygiene items and hygiene kits to the culture and context. Prioritize essential items in the initial phase (such as soap and menstruation and incontinence materials) over the “nice to have” items (such as hair brush, shampoo, toothpaste, toothbrush). At Risk groups have specific requirements:

See Guidance notes, pg. 100-101 of the SPHERE Handbook 2018t-risk groups

### **Vector Control**

Intensify mosquito control program by intensifying adult trapping, fogging (perm X) and application of rat bait.

Use of treated bed nets to protect vulnerable populations.

### **7.5.2 Medium Term**

All WASH recommendations are urgent and require short-term interventions

### **7.5.3 Long Term**

All WASH recommendations are urgent and require short-term interventions.

## **7.6 Immediate Needs List/Requirements**

- 1) Hygiene kits with listed contents as above (1 per family)
- 2) Desalination plant (capacity 12,000 USgls/day)
- 3) Two Tanker trucks 4000 gls
- 4) Six Water Distribution Tap stand with six taps (UNICEF)
- 5) 2000 Residual Chlorine reagents HACH cat# 1407799 (20 packs of 100) (to check residual Chlorine in the water supply at shelters in Main Island of St. Vincent)
- 6) Rat bait (to be specified, CEHO)
- 7) Insecticide (Perm X, to be specified by CEHO)
- 8) Treated bed nets (500 Queen and 500 single)
- 9) Daily bottled drinking water 2 ltr per person/day
- 10) 600 and 800 gls water tanks and plumbing (estimated # 400 total, locations to be assessed by EHD)
- 11) Building material for repair roof and guttering for homes with rainwater cisterns

## **7.7 Further assessments required/Suggested**

Mapping of houses with cisterns, water tanks, functional toilets and pit latrines

Mapping of buildings that could function as shelters for remaining residents as well as for rebuilding crew and security staff

## **7.8 Conclude**

All WASH-related interventions are urgent and should be carried out immediately to prevent the spread of endemic communicable water- and vector-related diseases.

MV Dawn is in Port of Union Island and delivers 5000gls of water into the cistern of Bougainville Hotel, which is the hub where people get water. (6 July 2024). Not known for how long.

Water Mission is available to install a desalination plant with a capacity of 12,000 gls/day at existing brackish water wells in Ashton.

## **8 ANNEX D - HEALTH ASSESSMENT REPORT**

### **8.1 PURPOSE**

This Rapid Needs Assessment aims to evaluate the immediate health-related impacts of Hurricane Beryl on St. Vincent and the Grenadines, identify urgent needs, and provide recommendations for short-term and medium-term interventions to support the affected population and health system.

### **8.2 IMPACTS OBSERVED**

#### **8.2.1 Physical Impacts**

Health Facilities:

- Preliminary assessments indicate damage to 11 out of 49 assessed health facilities.
- Specific damages include roof and water damage at Canouan and Mayreau clinics.
- The Celina Clouden SMART Hospital in Union Island suffered severe roof damage, with 60% of the galvanized roofing gone and extensive wind and water damage.

Infrastructure:

- Significant damage to power infrastructure, with many health facilities operating without electricity.
- Water supply systems have been compromised, with many areas experiencing interruptions.

#### **8.2.2 Functional Impacts**

Health Services:

- All health facilities in the Southern Grenadines (Canouan Clinic, Mayreau Clinic, Ashton Clinic, Clifton Smart Hospital and Clinic) are currently closed due to damage.
- Compromised vaccine cold chain in the Grenadines, raising concerns about potential interruption of vaccination services.
- Establishment of an Emergency Medical Team (EMT) Type 1 field hospital by Samaritan's Purse in Union Island to supplement local health services.

Public Health:

- Increased risk of disease outbreaks due to compromised water and sanitation systems.
- Heightened surveillance needs, particularly in evacuation shelters.



### **8.2.3 Estimated damage and loss**

Preliminary reports indicate:

- Of 49 assessed health facilities, 38 (78%) are operational, but most have suffered damage requiring immediate attention.
- 16 healthcare workers are currently in need of housing - 11 in Union, 2 in Mayreau, 1 in Canouan.
- Over 600 persons in mainland St. Vincent reported damage to or loss of property.

## **8.3 PRESENTATION ON METHODOLOGY**

### **8.3.1 Data collection**

Data for this assessment was gathered through:

- PAHO/WHO Situation Reports
- Preliminary assessments conducted by local health authorities
- Reports from deployed Rapid Needs Assessment Teams
- Information from Emergency Medical Teams on the ground

### **8.3.2 Limitations**

- Ongoing nature of the disaster response, with some areas still inaccessible
- Limited data due to communication challenges in affected areas
- Rapid evolution of the situation, potentially outdated some information

## **8.4 DATA PRESENTATION AND ANALYSIS**

Health Facility Status:

- 38 out of 49 (78%) assessed health facilities are operational
- 11 out of 49 (22%) assessed health facilities are non-operational or severely damaged

## **8.5 DISCUSSION**

Data presented in this report has been collected from official sources including the Ministry of Health of St. Vincent and the Grenadines, assessment reports from persons on the ground, and PAHO/WHO situation reports. However, given the dynamic nature of the situation, all data should be considered preliminary and subject to change as more comprehensive assessments are conducted.

## **8.6 CHALLENGES**

- Limited connectivity impacting surveillance systems and timely reporting of diseases
- Risk of health worker burnout due to extended working hours and personal impact of the disaster

- Compromised water and sanitation systems increasing the risk of disease outbreaks.
- Damaged health facilities limiting the range of health services that can be provided.
- Logistical challenges in delivering supplies and personnel to affected islands.

## **8.7 RECOMMENDATIONS**

### **8.7.1 Short Term**

- Urgent repair of health facilities in Union and Mayreau.
- Provision of safe shelter/accommodation for health staff of the affected islands
- Deployment of additional healthcare workers to relieve exhausted staff.
- Intensification of disease surveillance, especially in evacuation shelters.
- Implementation of vector control measures to prevent mosquito-borne diseases.
- Implementation of mental health and psychosocial support programs for affected populations and healthcare workers.

### **8.7.3 Medium Term**

- Comprehensive assessment and repair of all affected health facilities.
- Restoration and strengthening of the vaccine cold chain system.
- Improving connectivity and strengthening of health information systems to improve data collection and reporting during emergencies.

### **8.7.4 Long term**

- Development of more resilient health infrastructure, utilizing the smart hospital principles and standards, including hurricane-resistant building designs.
- Enhancement of emergency preparedness and response capacities in the health sector.
- Strengthening of community-based health programs to improve local resilience.

## **8.8. IMMEDIATE NEEDS LIST/REQUIREMENTS**

- Repair materials for damaged health facilities, especially roofing materials.
- Essential medicines, medical supplies, and equipment to replace damaged inventory.
- Water purification tablets and water testing kits.
- Vector control supplies and equipment.
- Personal protective equipment for healthcare workers.
- COVID-19 vaccines and rapid test kits.

## **8.9 FURTHER ASSESSMENTS REQUIRED/SUGGESTED**

- Comprehensive structural assessment of all health facilities in affected areas.
- In-depth evaluation of water and sanitation systems, particularly in healthcare settings.
- Assessment of mental health and psychosocial support needs among affected populations and healthcare workers.

- Detailed analysis of the impact on essential health services including chronic disease management, sexual and reproductive health, and vaccination.
- Evaluation of the disaster's effect on vulnerable populations, including the elderly, persons with disabilities, and those with pre-existing health conditions.

## **8.10 CONCLUDE**

Hurricane Beryl has significantly impacted the health system of St. Vincent and the Grenadines, causing extensive damage to infrastructure and disrupting essential health services, particularly in the Southern Grenadines. The immediate focus should be on restoring basic health services, preventing disease outbreaks, and supporting affected healthcare workers. Medium to long-term efforts should aim at building a more resilient health system capable of withstanding future disasters. Continued support from regional and international partners will be crucial in addressing the identified needs and challenges.

## **9 ANNEX E – SOCIAL PROTECTION NEEDS ASSESSMENT REPORT**

### **9.1 Situational Overview**

The passage of Tropical Hurricane Beryl has significantly increased social vulnerability in St. Vincent and the Grenadines (SVG). Vulnerable populations, including the elderly, persons with chronic illness, Persons with Disabilities (PWDs), children and women, are among the hardest hit. As conditions worsen after natural hazards, such groups have fewer resources to prevent, cope with and adapt to disasters and also have less access to assistance from formal and informal networks. When considerations of age, location, and poverty levels are factored in, vulnerability is heightened.

Such vulnerability and related rising inequality exacerbate poverty and are associated with lack of social protection, impacts on access to healthcare, education, social services, and discrimination. Additionally, there is the potential for increased gender-based violence (GBV), conduct disorders, and lack of food security and livelihood opportunities. Self-employed persons and persons in the informal economy and households dependent on the fisheries and services sector may also be among those that bear the brunt of impacts over the longer- term.

Based on the pre-existing socioeconomic conditions revealed through a review of secondary data as well as rapid key informant interviews and observation in the field, the impact of Hurricane Beryl, generally, and in particular on various sub-population and vulnerable groups mentioned above, highlighted several needs and recommendations identified for the Government of Saint Vincent and The Grenadines' (GOSVG) consideration.

### **9.2 Purpose**

This section of the report is prepared to provide a rapid assessment of some social sector impacts and early estimates of the potential damage that may be caused by the impact of Hurricane Beryl. It also examines a number of social and gender considerations of the impact of the Hurricane to inform recommendations for gender-responsive and inclusive immediate; medium-term and longer-term recovery and/or resilience-building actions. As conditions continue to change, there remains uncertainty regarding the overall impacts of this event on the lives, and socioeconomic circumstances of the affected population.

Recommendations are not exhaustive, are based on available information and may be revised as additional information comes to hand.

### **9.3 Impacts Observed**

- Social Sector and Social Inclusion and Gender Impacts
- Increase in vulnerability
- Inadequate response to meeting/inclusive communication on the provision of basic needs – such as potable water and healthy foods
- Lack of/inadequate social protection
- Impacts on access to healthcare, such as services for Sexual and Reproductive Health (SRH) and Non-Communicable Diseases (NCDs), including medication

- Interruption of/strain on social services (such as child welfare; support for the elderly and persons with disabilities)
- Safety and security risks including increased fear of SGBV
- Increased burden of care, especially for women
- Lack of food security
- Livelihood loss
- Housing loss and damage and overcrowding in housing (public and private shelters)
- Self-employed persons and persons in the informal economy as well as households that depend on the fisheries and services sector among those most affected
- Mental Health and Psychosocial impacts

## **9.4 Presentation on methodology**

### **9.4.1 Data collection**

Data collection – of primary and secondary data - was undertaken over the period July 5-6, 2024, on mainland St. Vincent as well as on Union Island, Mayreau, and Canouan.

A modified methodology was employed – using observation and abbreviated open-ended key informant interviews including with affected persons, community leaders and shelter managers.

Some secondary information was gathered during briefing reports provided by Ministries, Departments and Agencies of GOSVG, including the Ministry of National Mobilisation, Social Development, The Family, Gender Affairs, Youth, Housing and Informal Human Settlement and the CDEMA Rapid Needs Assessment Team (RNAT).

In-depth key informant interviews have not yet been held and focus group discussions could not be undertaken given circumstances on the ground.

Sex-disaggregated data have been requested but are not yet available.

N.B. Respecting and promoting the rights and human dignity of affected persons was paramount.

### **9.4.2 Limitations**

- Limited time and transportation limitations on the ground resulted in significantly scaled back research
- Rapidly changing schedules -linked to short time in country – made it almost impossible to schedule meetings with key stakeholders including affected persons and representatives in GOSVG MDAs

## **9.5 Data Presentation and Analysis**

**June 5, 2024**

### **9.5.1 Union Island**

#### **Gender**

- Prior to the passage of Hurricane Beryl, several interviewees indicated that women did most household and caregiving duties; post-Hurricane Beryl, the roles and responsibilities are less clear cut. Women and men expressed concerns about jobs/livelihoods/incomes; women were more likely to report greater worry for children and other dependents.
- Groups of men and women were cleaning up. However, men and boys were more likely to take on greater risks – clearing galvanize sheets and wood (with nails) without personal protective equipment (PPE).
- Men were more likely to be ‘liming’ and there are anecdotal reports of (increased) drinking.

#### **Sexual and Gender-Based Violence (SGBV)**

- a) Some interviewees (women) - especially in centres - indicated fears regarding SGBV and stated that they would report incidents of SGBV to the police.

#### **Basic Needs**

- b) Deliveries of water, clothing and food have increased but there are still concerns regarding potable water distribution, and future issues regarding access to cash and food.
- c) Women were more likely to request pampers, hygiene kits and also requested clothing including underwear.

#### **Shelters**

- d) Many on Union Island expressed preference to stay in private homes, even if damaged and crowded.
- e) One respondent did indicate that she would have opted for the shelter, but it was overcrowded and no space was available.
- f) 1 NEMO-approved shelter was pointed out – issues of persons affected by extreme heat, safety and security concerns stemming from women accessing bathrooms at night in shelters without electricity, and poor sanitation and hygiene in toilets.

## **Housing**

- g) An estimated 98-99% of housing stock damaged/destroyed
- h) Many are uninsured

## **Livelihoods**

- i) Tourism (women and men) and fishery-related livelihoods (mainly men) are among the most affected
- j) Lack of insurance for fishing vessels

## **Mental health and Psychosocial Matters**

- k) High impact on women, including pregnant women and children and young people reported by men, women and children
- l) Men were less likely to indicate a need for support but expressed concern for women and children in their families

## **Other Key Issues**

- Women/mothers were more likely to identify/ think ahead about access to education
- Concerns over illness linked to the dark/heat/dengue as well as communicable diseases. Men were concerned about the stagnant pools of water as potential breeding grounds for mosquitos; women expressed concern over illness and issues regarding care
- Women with Non-communicable Diseases (NCDs) and caring for persons with NCDs raised matter of lack of access to required medicines for those with asthma and diabetes in shelters
- Potential for transactional sex and rise in sexually-transmitted infections.

## **June 6, 2024**

### **9.5.2 Kingstown –Kingstown Government School/Emergency Centre.**

The Kingstown Government School/Emergency Centre is located in the capital of St. Vincent and the Grenadines. Approximately 83 persons are sheltering there, and numbers increase daily. Of these 80% are displaced from Union Island and the others are from St. Vincent.

Prior to Beryl, approximately 3,844 persons were beneficiaries of long-term public assistance (for the elderly, persons with NCDs and PWDs across the mainland. Beneficiaries of short-term public assistance stood at 3,428 (uniform grants, utilities, families facing economic hardship, etc.). Given linkages between level of income and housing quality, persons more affected on the mainland are likely among the most vulnerable. Requests for public assistance will certainly increase.

## **Gender**

- Sex-disaggregated data for persons in the shelter are not yet available; however, of persons moving around the compound – interacting with and caring for children, assisting the elderly and doing laundry, the majority of adults were women.

## **Sexual and Gender-Based Violence (SGBV)**

- m) No reports of SGBV. However, SGBV risk is known to increase in such contexts.
- n) No SGBV training provided to manager or residents as well as persons providing help as yet.

## **Basic Needs**

- o) Deliveries of water, clothing and food have increased; the school Principal and Guidance Counsellor also lead targeted fund raising and mobilisation of in-kind and food donations.
- p) Additional items of clothing for women (including underwear) are needed.

## **Shelters**

- q) No reported concerns but security could be improved to manage/control access to persons in the shelter.
- r) Reports of adequate cots and bedding.
- s) It is not clear how long persons can continue to be housed there given school resumption in September.

## **Housing**

- t) Housing damaged or destroyed. One interviewee shared that her family had lost three houses on Union Island.

## ***Recommendations:***

- Options for categories of affected persons should be assessed and proposed with considerations for social housing.

## **MHPSS**

- u) High impact on women and children; anecdotal reports shared of displaced persons sharing their experiences during the passage of Beryl and uncertainty and fear of the future.
- v) One respondent still has had no word from Union Island regarding her brother's well-being. She expressed feelings of anxiety and sadness.



- w) Counsellor is trained in, *inter alia*, psychological first aid (PFA) and Return to Happiness – a psychological recovery programme developed by UNICEF for children 0-17 years old. Can call on counsellors from MoE/MoH and a range of development partners as needed. Counsellor has experience providing similar support during the volcano eruption and ensuring displacement in 2021.
- x) Children have outdoor courtyard space; more structured activities and activity books for young children were requested.

### **Other Key Issues**

- Several persons in interviews and persons moving around the shelter indicated that they lost all identification documents. Some had queued to reapply; others requested guidance on where this should be done. Bear in mind that some persons in shelters and elderly/have mobility challenges – assistance in replacing such documents may need to be decentralised.
- Women with Non-communicable Diseases (NCDs) and/or caring for persons with NCDs raised matter of lack of access to required medicines (cost and/or availability) for affected persons.

### **9.5.3 Mayreau**

Mayreau is located in the Southern Grenadines. Prior to the passage of Hurricane Beryl, the population was an estimated 360. It is estimated that around 300 persons remain, as elderly and persons with chronic illnesses have (been) relocated to mainland St. Vincent.

Just before the passage of Hurricane Beryl, there were 8 persons, living in Mayreau, receiving long-term public assistance. Across the Southern Grenadines, 2 persons benefited from short-term assistance.

### **Gender**

Pre-disaster – gendered livelihoods choices – men were engaged in fisheries and women, tourism.

Caregiving roles are shared in some instances – in the post-disaster context, children pass/split their time in homes of both parents – where they are separated and reside in different households or if there is a visiting relationship (a relationship where the persons live in different households but there are intimate relations).

Concern as some children are being sent to the shelter to sleep while parents remain in their homes. Responsibility for supervision falls to women in the shelters compounding burden of care.

Anecdotal reports of sexual exploitation of minors and concerns expressed about the potential for increase in SGBV; unwanted pregnancies; HIV/AIDS and STIs; substance use/misuse among men and boys.

## **Sexual and Gender-Based Violence (SGBV)**

- y) SGBV risk – especially for young girls – is identified as requiring attention to mitigate risk of unwanted pregnancy, HIV/AIDS and STIs.
- z) Overcrowding in homes and location of bathroom facilities as a standalone facility (in the public shelter) could increase SGBV risk.

## **Basic Needs**

- aa) Deliveries of water, clothing and food have increased but still concerns regarding potable water distribution and future issues regarding access to work/cash, shelter and food.
- bb) Use of candlelight and phones for lighting in shelters and private homes.
- cc) Need for clothing and hygiene products.

## **Shelters**

- dd) Anecdotal information suggests that many on Mayreau prefer to stay in private homes, even if damaged and overcrowded. However, a respondent cited extended families tiring of being housed with each other as a concern for the near future.
- ee) Only 1 shelter survived – 17 persons are now housed there. A larger number resided in the shelter in the days just post-Beryl. NB – Mayreau Government School is in use; the official centre collapsed with 26 persons inside; they all moved over to the Mayreau Government School. No-one was injured.
- ff) Issues with women and children accessing bathrooms at night in shelters without electricity and a distance from sleeping areas.
- gg) See note on unsupervised children being sent to sleep in the shelter.

## **Housing**

- hh) An estimated 90 % of buildings including housing stock damaged/destroyed
- ii) Overcrowding in homes even homes with damage to the roof
- jj) Many are uninsured

## **Livelihoods**

- kk) Tourism (women and men) and fishery-related livelihoods (mainly men) are among the most affected
- ll) All or the majority of fisher folk (men) - an estimated 30 - - are reported to have lost their vessels
- mm) Lack of insurance for fishing vessels
- nn) Fish was not only a source of income but food

## **MHPSS**

- oo) General feelings of safety but some worry about storms; anecdotal information suggests psychological reactions including grief; numbness and resilience.
- pp) Men were less likely to indicate a need for support but expressed concern for women and children in their families.

## **Other Key Issues**

- Heavy equipment required for clearing debris and waste to be removed to make way for rebuilding.

### **9.5.4 Canouan**

Estimates vary for population numbers.

17 persons received long-term public assistance and 2 persons across the Southern Grenadines received short-term assistance; these persons are likely among most affected and numbers would have risen.

One shelter intact – Canouan Government and Secondary School (houses students at primary and secondary schools) – was not designated - but official shelters were damaged.

## **Gender**

Women and men expressed concerns about jobs/livelihoods/incomes; women were more likely to report greater worry for children and other dependents.

## **Sexual and Gender-Based Violence (SGBV)**

No incidents reported but absence of security is an issue as security staff have not turned up (consistently).

## **Basic Needs**

- qq) Deliveries of water, clothing and food have increased but still concerns regarding potable water access and dry goods.
- rr) Requests were made for clothing including underwear.
- ss) Requirements included pampers for infants; cots/beds; dignity kits; first aid supplies; lighting.

## **Shelters**

- tt) Official shelters damaged but three in total house over 40 persons
- uu) While the Canouan Government and Secondary School was not a designated shelter, many were in need of shelter and 40 persons (17 m; 33 f) are housed there; down from 57.
- vv) Security officers are not reporting to work.
- ww) Children have some toys and a large area for play.

## **Housing**

### ***Findings:***

- xx) An estimated 98-99% of housing stock damaged/destroyed
- yy) Many are uninsured

## **Livelihoods**

- zz) Tourism (women and men) and fishery-related livelihoods (mainly men) are among the most affected
- aaa) Lack of insurance for fishing vessels

## **MHPSS**

- bbb) High impact on women and men as well as children and young people reported
- ccc) Frontline workers and families (spouses and children) are reeling under the impact of Beryl – psychological reactions include feelings of anxiety; numbness and fear.
- ddd) No counsellor assigned to persons in shelters; pastors may offer some support
- eee) Shelter manager/Principal has no training on PFA or return to happiness programme

## 9.6 Discussion on the validation and confirmation of the data

Validation is ongoing; further discussions with affected and displaced persons and stakeholders including representatives in MDAs; community leaders will be undertaken.

### 9.6.1 Challenges

- Access to and equity in provision of Basic Needs - potable water; dry goods; light; clothing including underwear.
- Safety and Security Concerns including (increasing) Risk of SGBV in shelters and private homes and child protection gaps.
- Potential for transactional sex and rise in sexually-transmitted infections.
- Gaps regarding Sexual and Reproductive Health.
- Mental health and psychological impacts – in communities and frontline workers and families (spouses and children) are reeling under the impact of Beryl – psychological reactions include feelings of anxiety; numbness and fear.
- Livelihood restoration – assets damaged. Concern of exclusion of women in rebuilding and reconstruction efforts.
- NCDs and access to medicines.
- Housing (roofs damaged/missing); lack of house insurance.
- Dengue Risk (endemic).

NB:

fff) Expressed concern from persons in Grenadines, regarding inequity in access, to resources before and post-disaster.

ggg) Pre-existing vulnerabilities and inequality will worsen. Vulnerable groups including women, children, PWDs; poor households; persons with chronic illness; elderly are among those that will bear the brunt.

hhh) Inclusive and gender-responsive communication and transparency in response and distribution of resources.

## 9.6.2 Recommendations

### 9.6.2.1 Short-Term

- Messaging regarding risks and safety in clean up – all communication (here and across the response) must be gender-responsive and include messaging for men and boys around wearing PPE to protect self and support family.
- Supply PPE and guidance for use.
- Provide/Improve lighting and security to reduce crime and violence risks including SGBV.
- Messaging in communities about SGBV prevention and individual roles (community leaders have a key role).
- Raise SGBV awareness and build capacity for SGBV risk reduction among shelter managers and those helping in shelters.
- Ensure awareness regarding safe SGBV services in communities and ensure accessibility.
- Speed up distribution of food and cash and in-kind assistance – establish and communicate transparent criteria and distribution approach.
- Identify persons in need of regular medication, e.g. those with NCDs, and seek to provide them with the medication
- Seek community input on communications channels that should be used.
- Increase lighting and security in public shelters
- Visits to private homes as well/include messaging on safety and security in homes.
- Use of shelter management guidelines and training of managers – expand guidelines to include social inclusion, NCDs, SGBV and mental health and psychosocial support (MHPSS).
- Integration of men and women seeking employment in paid aspects of clean-up.
- Approval of social protection framework.
- Ensure adequate MHPSS expertise (including external support).
- Establish safe space for children/childcare
- For those experiencing loss of community on Union Island and the Mainland support building of communal bonds.
- Provide counselling services to frontline workers.

### **9.6.2.2 Medium-Term**

Ensure capacity- building across stakeholders, for gender mainstreaming in disaster risk reduction.

GBV One-stop centre.

Multi-purpose inclusive and resilient facilities that can also serve as emergency shelters.

Update current shelter management guidance to include, *inter alia*, social inclusion, GBV and MHPSS issues.

Ensure MHPSS training for all frontline staff including police and shelter managers, nurses, pastors and social and community workers.

Bolster social and emotional learning and staffing in the education sector.

Establish/expand system of/for counselling services for frontline workers – ensure mainland programme is (consistently) delivered across Grenadines.

Consider reintroduction of cash grants for persons whose livelihoods have been affected.

Develop/adopt SOPs for integrating persons with NCDs in disaster response.

Operationalisation of social protection framework.

### **9.6.2.3 Long term**

Review policies to ensure gender mainstreaming and inclusion.

## **9.7 Further assessments required/Suggested**

- Systematic collection, analysis and dissemination of sex- and age-disaggregated data (informs gendered assistance)
- Livelihoods Assessments including assessment of educational programme to upskill women and men in building / construction (including masonry, carpentry, welding, electrical, plumbing etc.)

## 10 ANNEX F – COASTAL NEEDS ASSESSMENT REPORT

### 10.1 Situational Overview

The Grenadines of the Windward Caribbean islands are scattered between mainland Saint Vincent in the north and Grenada in the south.

Union Island is located midway between mainland Saint Vincent and Grenada (Figure 17). Although farming is an important means of survival, inhabitants are also known for their fishing and maritime skills, using their earnings to develop homes and the economy of the island. Desktop studies have shown that in Union Island, local piers and docks earn money by renting docking space to tourists who have chartered sailboats or yachts, charging them by boat length. Ferry services operate from Union Island five days a week.

Mayreau is the smallest inhabited island of the Grenadines, with an area of about 1 1/2 square miles and a population of about 350 persons. The island is populated mostly by fishermen and supported by tourism. The eastern side of Mayreau is demarcated as part of the Tobago Cays Marine Park protected area. On the leeward coastline there are three bays with large white sand beaches. Saline Bay in the south has a jetty and this is where the ferry between Saint Vincent and Union Island docks. Saltwhistle Bay in the north, is a popular anchorage for visiting yachts. On the windward coast there are two long white sand beaches that are protected by a series of offshore reef systems.

Canouan is around 25 miles south of Saint Vincent, to the north of Mayreau and the Tobago Cays, and to the south of Bequia and Mustique. It is around 3½ miles long by 1¼ miles at its widest points, with the whole of the northern half – some 1200 acres – privately owned. Residents live in and around the main settlement, Charlestown, which is also the location of the island's main wharf. The beach at Charlestown Bay (also known as Grand Bay), just off Charlestown, is popular with local people as well as with visiting sailboats. A barrier reef runs along the Atlantic side of the island.

The people of the Grenadines are significantly dependent on their coastal and marine resources for sustenance (Staskiewicz and Mahon, 2007).

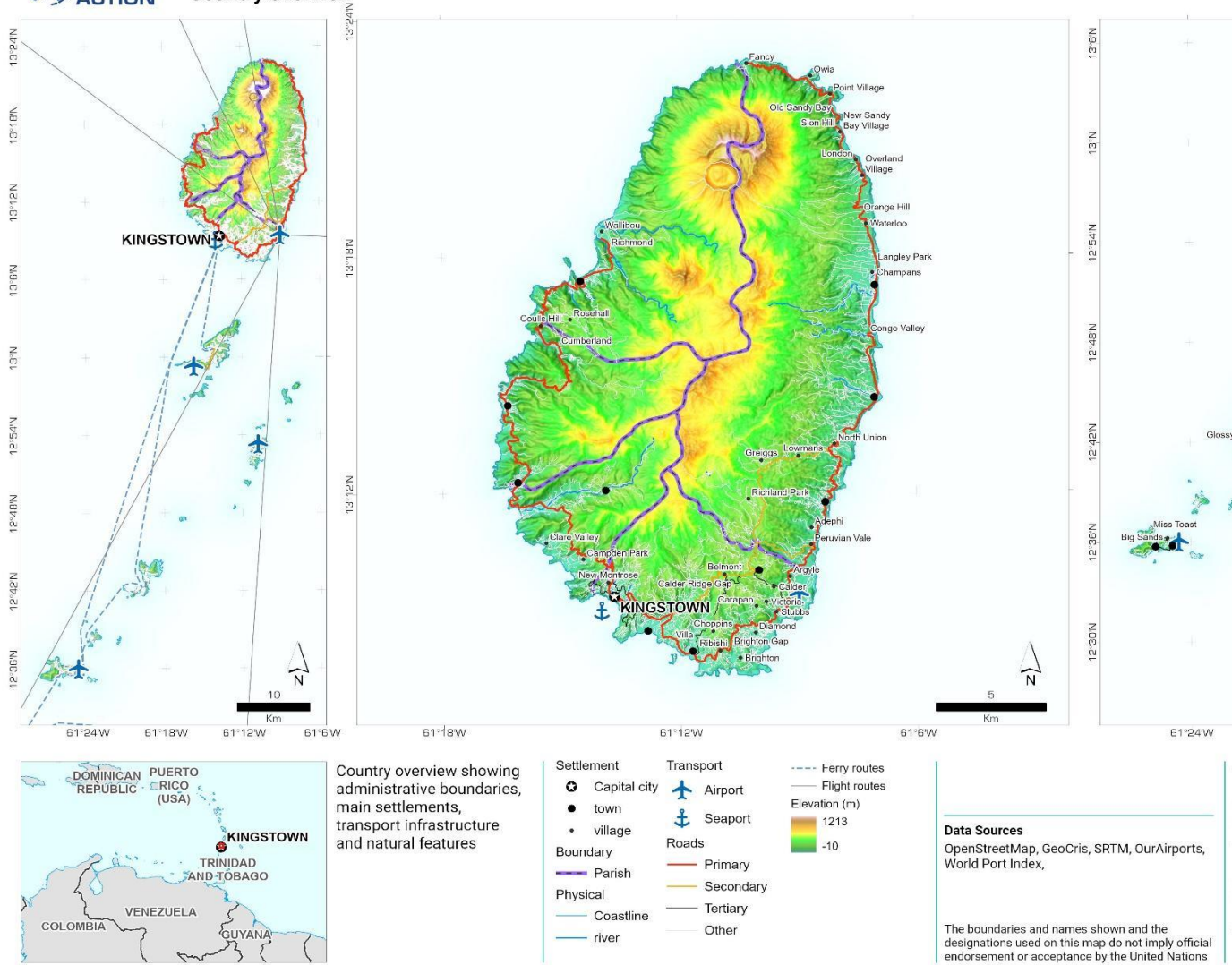
On Monday July 1st 2024, Hurricane Beryl impacted the country of Saint Vincent and the Grenadines as a Category 4 Hurricane and particularly devastated the Grenadine Islands of Union Island, Canouan and Mayreau.

The CDEMA CU (Caribbean Disaster Emergency Management Agency Coordinating Unit) deployed a Rapid Needs Assessment Team (RNAT) comprising two coastal specialists from the Coastal Zone Management Unit (CZMU) on Thursday July 4th 2024 via RSS Jet to assess the coastal and marine environment and infrastructure. The CZMU Team was composed of Technical Officer Shamari Cave and Research Officer Danielle Howell.



The Government of the Saint Vincent and the Grenadines via the National Emergency Management Organisation (NEMO), requested a Rapid Needs Assessment Team (RNAT) via the Caribbean Disaster Emergency Management Agency (CDEMA) Regional Response Mechanism (RRM). Due to the physical and functional coastal related damage across the islands and the mainland, a rapid coastal damage assessment was required, thus a request was made from the Coastal Zone Management Unit (CZMU) for coastal specialist. The CZMU deployed Technical Officer Shamari Cave and Research Officer Danielle Howell to provide a rapid assessment of the coastal and marine environments, which will assist the government in short, medium and long term response and recovery solutions. These assessments and further recommendations can be used to facilitate deeper studies and tangible and intangible solutions.

The CZMU Team was further deployed to Union Island via helicopter on Friday July 5th 2024 at 11:30 am to assess the coastal and marine environment.



**Figure 17** Showing Country Overview of the St. Vincent & Grenadines

## 10.2 Purpose

Hurricane Beryl was forecasted to produce extensive storm surge and coastal damage. Reports from the locals, credible media and observations on the ground confirmed these forecasted impacts. The coastal specialists were able to land in Union Island, Mayreau and Canouan via helicopter and conduct on the ground rapid coastal damage assessments focusing on “Physical Conditions” and “Functional Conditions” (Appendix 1). The extent and damage due to storm surge inundation was also assessed and recorded. However, due to time constraints, transportation constraints and minimal coastal damage reported on mainland St. Vincent, a desktop assessment utilizing photographs from various government departments (i.e. Ministry of Transport, Works, Urban Development and Local Government; NEMO) would need to be carried out to assess the damages.

The Physical Conditions criteria used to assess the coastal damage:

- Presence of beach scarp
- Erosion
- Fallen Trees
- Exposed Roots
- Presence and extent of Coastal Flooding
- Presence and extent of damage of mangrove stands or coastal vegetation

The Functional Conditions criteria used to assess the coastal damage:

- Road Damaged/ Blocked
- Beach Access Damaged/ Blocked
- Groyne Failure
- Breakwater Failure
- Revetment Failure
- Seawall Failure
- No Lateral Access on the Coastline
- Property Damage
- Drains blocked/ damaged

## 10.3 Impacts Observed

Information on the various impacts observed on the ground of the three islands throughout the deployment had to be gathered and catalogued, to ascertain what resources may be needed. These impacts are detailed below.

### 10.3.1 Physical Impacts

#### UNION ISLAND

##### Clifton Harbour

- There was presence of extensive **coral rubble** several meters inland in the Clifton area which indicated the extent of the storm surge which measured approximately 46 meters (Figure 18).
- Several **inland pooling** was also observed along the coastal areas.
- Extensive **erosion** was also discovered along the coastal areas as several tree roots were exposed. Most of these trees were coconut trees which are notably not good for trapping sand.
- In the area of the **mangroves**, there was not much notable damage to the beach as the mangroves provided protection to the beach and also held the sand in place.
- Fragments of live coral were noted along the beach particularly in front of the airport runway. This indicates possible damage to the coral ecosystem.

### 10.3.2 Functional Impacts

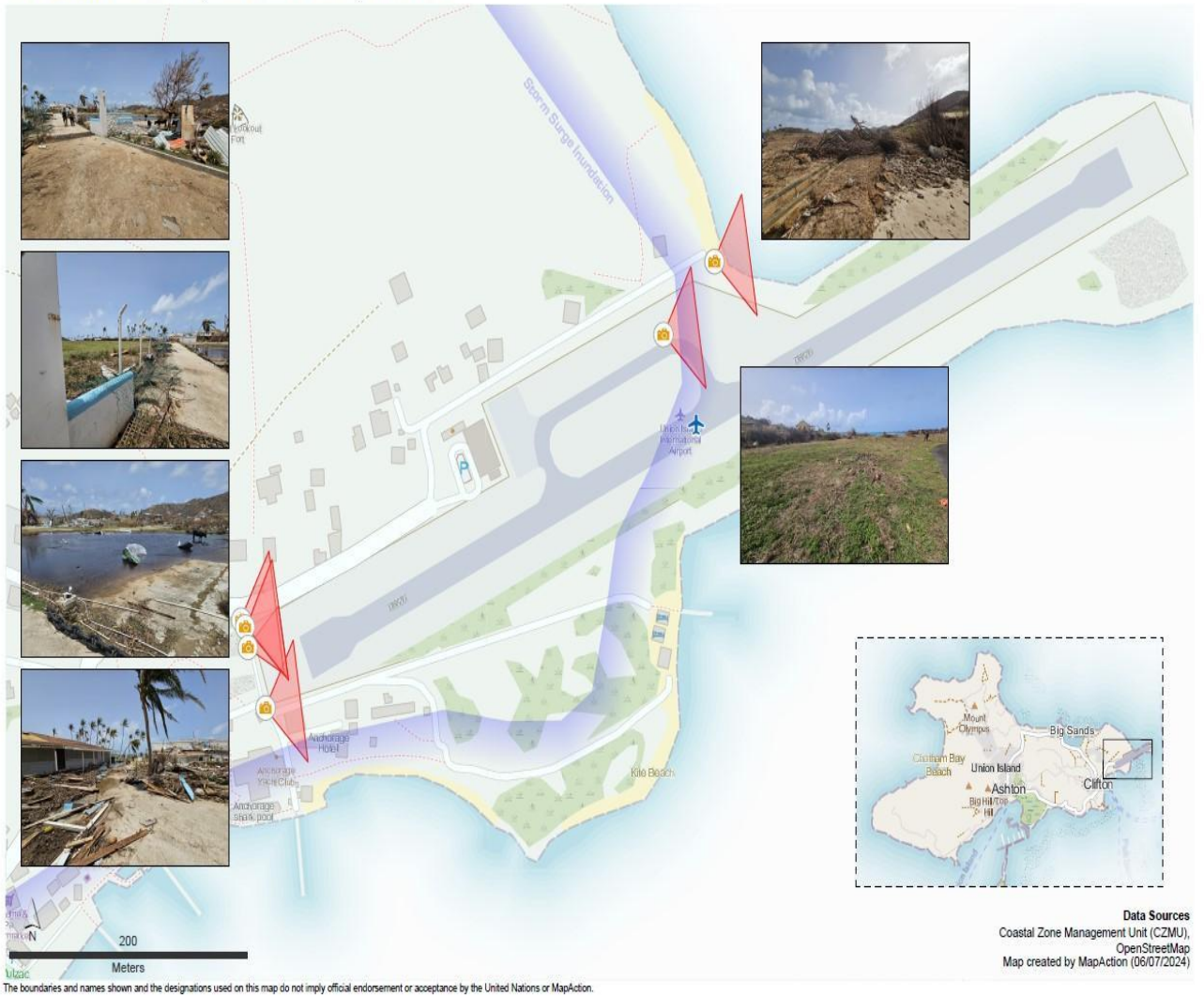
#### UNION ISLAND

##### Clifton Harbour

- It was observed and noted that the area of Clifton hosted seven (7) **Jetties**. Five (5) of these were wooden/ timber and two (2) were concrete. Of the five wooden/ timber jetties, two were completely destroyed and the remaining 3, 75% destroyed. The concrete jetties remained steadfast and operable with little to no noticeable damages.
- These concrete jetties were known to be designated for the Fisheries Sector and the other for the Cargo Boats/ Ferries.
- At Bougainvillea Hotel, Union Island part of the **bridge collapsed** due to storm surge, leaving the bridge inoperable.
- Local knowledge has indicated that 50% of the **water taxis** were destroyed.
- **Lateral access** was blocked by debris in several of the arteries to the coastline, between businesses etc.
- **Infrastructure** along the coastline in Clifton Bay such as restaurants, fisheries complex, port shed etc. were 80% destroyed. Armour stone revetments were also destroyed and rocks were out of place.



**Figure 18-** Extensive **coral rubble** several meters inland in the Clifton area



**Figure 19** Showing Storm Surge Inundation Map around Union Island Airport and Anchorage Yacht Club

## MAYREAU

### 10.3.3 Physical Impacts

#### Saline Bay

- At Saline Bay most of the coastal vegetation were noted to be palm trees and sea grape trees. 95% of this coastal vegetation was lost, but mostly to strong winds and not necessarily storm surge. This conclusion was made when noting the wind direction and the direction in which the trees fell which were towards the coast.
- The back beach at Saline Bay was heavily compromised with debris and some areas inaccessible.
- There was a noticeable scarp along the beach measuring approximately 0.9m.

#### Windward Bay

- At Windward Bay most of the coastal vegetation was also lost (95%) however, this was due to a combination of strong winds and storm surge.
- The storm surge was noted to have a run up of approximately 62 m.
- There was presence of coral ecosystems and marine invertebrates (conch shells) several meters inland at Windward Way which indicated the extent/ impact of the storm surge.
- The main beach access along this side of the island was inaccessible due to fallen vegetation.
- Agriculture (Cassava trees) in the back beach was also completely inundated and subsequently destroyed.
- Fragments of coral (mainly sea fans) were noted along the beach. This indicates possible damage to the **coral ecosystem**.
- Coastal Tourism such as a popular bar (The Ranch Escapade) was also destroyed.

### 10.3.4 Functional Impacts

#### Saline Bay

- It was observed and noted that Mayreau hosted three (3) **Jetties**. Two (2) of these were wooden/ timber and the remaining one was concrete. Of the two wooden/ timber jetties, one was completely destroyed and the second one was dismantled before the storm as a precautionary measure to preserve the wood. The concrete jetty remained steadfast and operable with little to no noticeable damages due to the hurricane. The damages on the jetty were structural damages that were observed before the hurricane. The concrete jetty was a public jetty and the wooden jetties were private.
- 100% of the beach infrastructure such as restaurants, bars and souvenir shops in this area was destroyed.
- Local knowledge said that approximately 60% of the boats were damaged or destroyed.

## **CANOUAN**

### **10.3.5 Physical Impacts**

- The storm surge at the airport was noted to have a run up of approximately 31 m. This storm surge inundated the edge of the run-way as evidence of sand was seen across the road onto the edge.
- At Charlestown, the storm surge was also recorded at approximately 31m. This storm surge inundated the restaurants in the area right up to the back kitchen at Sea Grape beach club.
- There were signs of beach loss and erosion at Charlestown which were confirmed by the locals.

### **10.3.6 Functional Impacts**

- The Fisheries Jetty at Rhemaurine was 90% destroyed.
- The private jetty at Soho was 50% destroyed.
- There were reports of two damaged boats in the marine and a cumulative approximation of 8% of the boating sector damaged.
- At Glossy Bay, there was extensive debris in the nearshore.
- Scruffy's Bar at Shell beach was noted to be completely destroyed, leaving debris in the water and along the beach making it inaccessible for persons to venture.



## ST. VINCENT

### 10.3.7 Physical Impacts

- From briefing at NEMO the team was notified of erosion in Shipping Bay.

### 10.3.8 Functional Impacts

- From the briefing at NEMO the team was notified of road damage due to storm surge erosion in the Shipping Bay area.

## 10.4 Estimated damage and loss (to come)

### UNION ISLAND

#### MAYREAU

#### CANOUAN

#### ST. VINCENT

## 10.5 Presentation On Methodology

### 10.5.1 Data collection

- A pacing method<sup>1</sup> was used to measure the distance of the storm surge inundation.
- A coastal assessment form, developed by the CZMU was also used to capture data and distances in the two sections “Physical” and “Functional”.
- Local Knowledge was also used to capture data such as pre vs post impact status of the community area. Locals were also able to tell the story of the surge event for a better understanding of impact.
- Photographs were also
- A condition ranking scale<sup>2</sup> of 1 to 5 was used to define the structural integrity of coastal structures.

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<sup>1</sup> Pacing is the process of walking the distance and counting the number of steps “paces” to cover the distance. The distance is determined by multiplying the number of steps taken between two points by one's pace factor.

<sup>2</sup>

## 10.5.2 Limitations

- In some areas the inundation reached further than the tape could measure, so the pacing method was used. The tape would have given a more accurate measurement.
- Access was blocked by debris to some of the coastal areas.
- Transport around the island was limited and the team was unable to get to Ashton to conduct a rapid assessment.
- Due to time constraints, transportation constraints and the distance to the road failure at Shipping Bay the team was unable to assess mainland St. Vincent.

## 10.6 Recommendations

### 10.6.1 Short Term

#### Physical

- There is a need for rapid coastal clean-up, as debris as well as oil and other chemicals from sunken boats will start to pollute the marine environment.
- There is a need to conduct a coral reef assessment to review damages to the marine protective ecosystem.

### 10.6.2 Medium Term

#### Functional

- There is a need to repair the wooden jetties as there is pressure on the two concrete jetties.

#### Shoreline protection

- Restoration and out plant of more mangroves are required along the coast.
- Armour stone revetments need to be repacked to continue protecting the shoreline.

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### **Condition Ranking Scale**

- 5 = excellent condition (structure integrity is pristine and functionality is total) > 90 % structural integrity (S.I)
- 4 = good condition (very little deterioration of elements and functionality almost completely intact) 70% < 4 < 90% S.I
- 3 = moderate condition (the structure shows some signs of deterioration but maintains functionality) 60% < 3 < 70% S.I
- 2 = advanced deterioration (structure is in partial disarray and functionality is in jeopardy) 30% < 2 < 60% S.I
- 1 = critical condition (complete disarray and non-functionality) < 30 % S.I

### **10.6.3 Long term**

Shoreline protection

- In the long term when “building back better”, there is a need to implement “coastal setbacks”.

### **10.7 Immediate Needs List/Requirements**

- Chain Saws
- Skid steers

## **11 ANNEX G – AGRICULTURE NEEDS ASSESSMENT REPORT**

### **11.1 Situational Overview**

The passage of Hurricane Beryl in St. Vincent and the Grenadines has significantly impacted the agriculture sector of St Vincent and the Grenadines. Initial assessments indicate that the fisheries sector has been impacted the most followed by banana and plantain farming, tree crop farming, root and vegetable crops farming, and livestock farming. There is an urgent need to restore fishing capacity in the Southern Grenadine islands to assist with immediate livelihoods and food security. For the island of St. Vincent, Banana, Plantain and Tree Crop farms need to be re-planted/ re-established alongside short cycle crops to help address the prolonged income loss associated with waiting for newly planted bananas, plantains and tree crops to mature. It is also important to provide temporary or alternative livelihoods and income support to the different actors or individuals who depend on the above affected value chains as their main livelihoods.

### **11.2 Purpose**

The rapid needs assessment aimed to obtain a coherent overview of the magnitude of the impacts, the initial impacts on the agriculture sector and immediate needs, mainly through direct observation, interviews and review of secondary data where possible. A sound rapid needs assessment can help ensure more effective interventions and serve as a good starting point for subsequent detailed damage assessments.

### **11.3 Methodology**

Given the actual situation on the ground and the prevailing weather conditions, the rapid needs assessment approach for agriculture involved ocular visits, community walks and informal interviews with fishers and community residents in Union Island and Canouan. On the other hand, the assessment in St. Vincent consisted of technical discussions and work sessions with the Ministry of Agriculture to assess initial crop sub-sector damages using baseline pre-disaster high resolution imagery and post-disaster imagery collected/produced by the Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, Industry & Labour (MAFFRTIL). This was based on a Hybrid Aerial-Ground based Rapid Disaster Needs Assessment Approach developed by the MAFFRTIL.

Additional data and verification are needed as part of subsequent detailed disaster needs assessments.

## 11.4 Impacts Observed

### Fisheries

*Union Island.* The assessment team found evidence of severe impacts on fisheries. Fisheries stakeholders interviewed indicated that over 90% of the fishing boats have sustained major damage and are not operational/sea-worthy. Fishers in Union Island are estimated at around 100 persons (to be verified). The Fisheries complex ice machine and cold storage were also severely damaged. These impacts are also expected to affect fish processors, fish cleaners and boat haulers.

Sediment run off to the coasts have also been observed and continue to occur due to the continued rainfall and loss of vegetation cover (e.g. trees and shrubs) due to hurricane wind damage. Nutrient and contaminant run off is also likely given the damages to drainage and other infrastructure, vehicles and various equipment on land. Increased runoff of sediment, nutrients and contaminants will affect coastal ecosystem health and dynamics. Sediment runoff will increase sedimentation on coastal reefs, will increase turbidity and restrict the growth of light-dependent plants and animals. Increased nutrient inputs can also stimulate algal growth on reefs and in reef waters.

Debris of various kinds have also been observed along the coasts. These can be an additional source of contaminants and can serve as vessel navigation hazards and make coastal clean-up activities riskier.

*Canouan.* The assessment team found relatively less extensive/severe damage than Union Island. Fishers interviewed have indicated that there are currently 30 active fishers on the island and 17 boats. Of the 17 boats, 7 have been reported to sustain major damage and are not operational/sea-worthy. Union Island plays an important role in the marketing and processing/storage of a portion of the fish catch of Canouan and the loss of processing and storage capacity of Union Island will also affect Canouan. Information about the impacts in Mayreau will follow after analysis of the NEMO drone footage but preliminary analysis indicate that the extent of impacts are in between that of Union Island and Canouan.

The above impacts will significantly affect Conch, Lobster and Inshore pelagic fisheries and Sea Moss farming in the Grenadine islands which are a major source of livelihood in the Grenadines and marine exports for St. Vincent and the Grenadines.

A detailed fisheries and coastal ecosystem disaster needs assessment will be needed to identify the most appropriate response and recovery/rehabilitation actions.



Union Island. Cold storage and fishing boats dislodged and damaged.



Union Island. Damaged containers and fishing boats along with other debris. The building on the left of the photo is the Tobago Cays Marine Park Centre.



Union Island. Evidence of sediment run-off.  
(View from Clifton-Ashton Road facing Frigate Island)

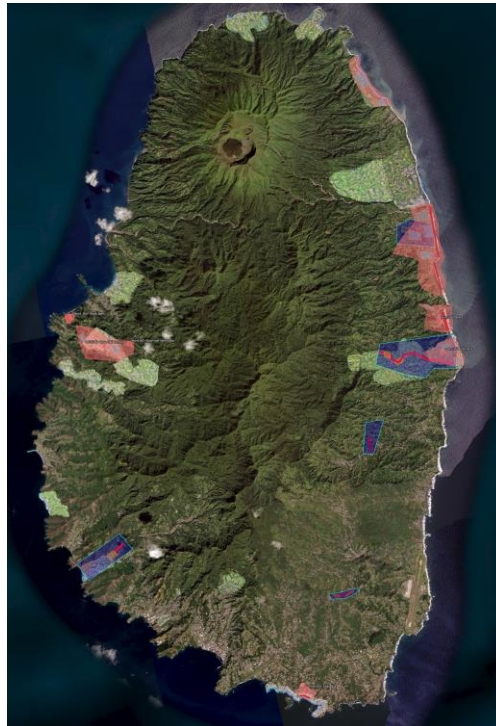
## Crops

The RNAT for the crop sub-sector complemented the rapid needs assessment of the MAFFRTIL where data was collected on the ground in accessible areas.

Drone imagery of affected cropping areas were also reviewed/analyzed from the following areas and were then visually compared with pre-disaster drone (average 5cm/pixel resolution) and satellite imagery (PlanetScope Monthly Analytical Basemap for St. Vincent coinciding with the peak production periods in 2023 and until February 2024 for target crops at 5m/pixel resolution).

<b>Leeward Side</b>	<b>Windward Side</b>
Boisden	Colonaire
Richmond	Langley Park
Rosehall	Orange Hill
	Park Hill
	South Rivers

The below map produced from February 2024 to May 2024 contains a Google Earth layer overlaid with pre-disaster drone basemaps and polygons indicating some of the most vulnerable areas to hurricane and storm damage as identified and evaluated by MAFFRTIL experts.





The drone image below from Colonaire is one of the several hundreds of acres of drone imagery (photos, 360 panoramas and videos) acquired by the MAFFRITIL drone and GIS mapping team.



Initial data collected by the MAFFRITIL Extension and Advisory Services Division reveal that *Musa* spp (e.g. Bananas and Plantains) have been the most impacted with 99% of the *Musa* fields assessed sustaining 100% damage. It is estimated that a little over 1000 acres of *Musa* spp is cultivated throughout the country. The combined analysis of farm-level data, known wind damage coefficients for bananas and plantains, and pre- and post- disaster drone imagery of representative areas identified by Ministry experts throughout St. Vincent indicate with a high degree of confidence 100% (or very near 100%) damage to *Musa* spp plants in the country. This will significantly affect the supply of banana and plantains as well as the income streams of banana and plantain farmers as it takes an average of 9 to 12 months from sowing a banana bulb to harvesting the fruit. Actors along the *Musa* Spp value chain will also be heavily impacted.

Tree crops were the second heavily impacted category to the *Musa* spp. Tree crop acreage throughout the country was estimated at 2000 acres. Tree Crops include Avocado, Citrus, Breadfruit, Nutmeg, Soursop, Guava, Golden Apple, Coconut, Mango, Plum Yellow and Cocoa. Assessments are on-going to estimate the actual acreage/tree stands affected but current initial data also suggest extensive damage based on the wind characteristics (both sustained and gustiness) of Hurricane Beryl, the known wind speed thresholds for tree crop twigs/branches breaking/snapping points and whole-tree failure, and the orographic characteristics of St. Vincent. The extensive damage to Tree Crops will affect a wide range of tree crop farmers as well as those who depend on tree crop value chains including women. Since tree crops help with slope stabilization and to some extent microclimate buffering, their extensive loss could also increase the risk for: landslides and erosion, sediment and nutrient run off (as tree crops are sometimes interspersed with other farms) to the coasts and localized extreme temperature swings.

Damages to Root Crops (Cassava, Dasheen, Eddoes, Ginger, Tannia, Sweet Potato and Yams), Vegetable Crops (Cabbage, Corn, Hot Pepper, Lettuce, Sweet Pepper, Tomato, Pigeon Peas, String Beans, Watermelon, Cucumber, Eggplant, Ochro and Christophene) and other crops (Peanut, Sorrel, Passion fruit, Papaya, Chive and Pineapple) have also been noted and are further being investigated. Damage to apiculture has also been documented. A dip in the production of Root Crops, Vegetables and Other Crops can also impact the Southern Grenadine Islands as they depend on St. Vincent for the supply of these crops.

### **Livestock**

Initial information from the MAFFRITIL indicate that the impacts to the livestock sub-sector has been mainly in terms of damage to livestock housing/pens for poultry, pigs and small ruminants. Lack of adequate livestock housing can increase the risk of exposure to environmental elements that can cause diseases and livestock loss. Overstocking of certain livestock can also occur if not all housing/pens are repaired and farmers start to stock up the limited repaired pens beyond what is recommended.

## **11.5 Challenges**

The conditions in the Southern Grenadines limited the movement of the RNAT team and made it nearly impossible to use the standard RNAT forms. Access has also been a challenge in some affected areas in St. Vincent. Best effort was nonetheless exerted by the RNAT team to collect as much key information as possible. Subsequent data collection rounds and field visits will surely expand the comprehensiveness of the assessment results.

## **11.6 Recommendations**

### **11.6.1 Immediate and Short Term**

- Restoration of fishing capacity/livelihoods by repairing/replacing fishing boats, repairing/replacing damaged/lost fishing and post-harvest gears/tools, repairing/replacing ice machines and cold storage equipment, and critical repairs to fisheries support infrastructure. Provision of income support to actors/workers along the fisheries value chains.
- Provision of planting materials to banana and plantain farmers as well as planting inputs for short-cycle crops that can be cultivated while waiting for the banana and plantain plants to be productive. Provision of alternative income support to actors/workers along the banana and plantain value chain.
- Provision of planting materials for tree crops as well as seeds, fertilizers and tools for short cycle crops and other crops that can be cultivated in the interim. Provision of alternative income support to actors/workers along the tree crop value chain.
- Ensuring ready access to planting materials and other inputs to ensure restoration or resumption of the cultivation/production of root crops, vegetable crops and other crops to prevent supply dips and price spikes.
- Facilitating access to basic needs of fishers and farmers through cash transfers and other mechanisms.
- Coastal debris clean up and restoration to enable safe coastal activities and facilitate ecosystem recovery.
- Support to critical repairs of livestock housing and continued monitoring for possible disease outbreaks.
- Detailed needs assessments to inform the specific design of emergency response interventions and ensure that the most affected and vulnerable will be reached.

### **11.6.2 Medium Term**

- Development and implementation of a recovery and rehabilitation plan that applies the latest thinking on risk and resilience including multi-hazard cascading impacts.
- Incorporating principles of Ecosystems Approach to Fisheries into emergency response and recovery.
- Strengthening land use planning and the implementation of ridge-to-reef approaches.
- Continued promotion and implementation of risk-sensitive agriculture (crops, livestock and fisheries) support infrastructure.
- Facilitating access to enhanced slope stabilization techniques/technologies to reduce run-off, erosion and landslide risks.
- Promotion of upgraded fishing boat designs that are safer, stronger and more fuel efficient. More extensive trainings on Safety at Sea. Facilitating increased access to lower-impact and more-selective fishing gear.
- Establishment of a ‘boat bank’ and/or construction of a ‘boat vault’ with the highest hurricane ratings to ensure protection of fishing boats and gears and enable immediate resumption of fisheries livelihoods. This can be linked to an innovative emergency boat hauling procedure that considers extreme weather dynamics such as rapid storm intensification.
- Promoting the sustained integration of short-cycle crop farming systems into banana, plantain and tree crop farming areas to diversify income sources and cushion the impacts of future extreme events that could again damage banana and plantain plants and tree crops that take time to mature and be productive.

### **11.6.3 Long Term**

- Ensuring that DRM, CCA and NRM aspects are collectively considered and integrated into investment, climate and environmental finance planning and implementation.

### **11.7 Further assessments required/Suggested**

- Detailed Damage Sectoral Assessment
- Post Disaster Needs Assessment

## **12 ANNEX H - FISHERIES ASSESSMENT REPORT**

### **12.1 Situational Overview**

Caribbean Small Island Developing States (SIDS) are identified as especially vulnerable to the impacts of climate change and variability; this includes extreme weather events such as hurricanes. The multi-island state of St. Vincent and the Grenadines is located along the Eastern edge of the Caribbean archipelago well within the Atlantic hurricane belt. There are 32 islands and cays of which St. Vincent is the largest (133 sq. km) and serves as the main socioeconomic and political hub. The inhabited Grenadine Islands are Young Island, Bequia, Mustique, Canouan, Mayreau, Union Island, Palm Island and Petit St. Vincent (44 sq. km). Like many SIDS within the Eastern Caribbean, St. Vincent and the Grenadines rely heavily on its tourism and agricultural sectors, therefore external shocks such as hurricanes can have devastating impacts to the country's economy, infrastructure and livelihoods.

Characteristically, small-scale and artisanal fisheries and aquaculture (a sub-sector within agriculture) are integral to livelihoods, economies and food security of Caribbean SIDS. Impacts to the coastal and marine environment, especially resulting from tropical storms can be debilitating. Disaster risk reduction within fisheries and aquaculture needs to be prioritized especially considering the recent destruction to have befallen St. Vincent and the Grenadines.

On July 1, 2024 hurricane Beryl made landfall in St. Vincent and the Grenadines. While the mainland of St. Vincent and the Northern Grenadine islands of Bequia and Mustique received some impacts, there was wide-spread devastation in the Southern Grenadines islands (Canouan, Mayreau, Union Island, Palm Island and Petit St. Vincent). There was complete loss of and access to critical infrastructure (e.g. electricity, water, telecommunication, sanitation) and a reported 90% loss and damage to buildings (e.g. homes, schools, churches, offices, businesses, government facilities) with resulting destabilizing impacts to livelihoods, the economy as well as social and cultural well-being.

In light of such devastation and in acknowledging the dependency on tourism and agriculture and the susceptibility and vulnerability of Caribbean SIDS such as St. Vincent and the Grenadines, a rapid needs assessment was conducted.

### **12.2 Purpose**

This rapid assessment report focuses on the impacts to fisheries and aquaculture in the Southern Grenadine islands of Canouan, Mayreau and Union Island. It was critical to begin to quantify the damage, loss and challenges associated with hurricane Beryl, especially within the most devastated islands, in order to have a targeted approach for focusing the much needed recovery and resilience-building efforts.

On July 13-15, 2024 the Rapid Needs Assessment Team (RNAT) was deployed to the Southern Grenadines. The team comprised of a Fisheries Representative – Ms. Sanya Compton with the Caribbean Regional Fisheries Mechanism (CRFM), two Tourism Experts – Ms. Amanda Charles and Mr. Kennedy Pemberton with the Caribbean Tourism Organisation (CTO) and Caribbean Disaster Emergency Management Agency (CDEMA) Representative Mr. Rasheed Pinder.

The Team was tasked with completing rapid assessments of the tourism and fisheries and aquaculture sectors. The goal was get as much relevant information on the impacts and challenges, and when and where possible conduct a few interviews with key stakeholders.

It should be noted that the Grenadine Islands of Palm Island and Petit St. Vincent were not a focus in this assessment since they were private island resorts and their relationship with fisheries and aquaculture was more indirect. However, mention was made of this indirect association. Their involvement in and contribution to tourism were detailed in the RNAT reports (for the Southern Grenadines) provided by CTO.

### **12.3 Methodology**

The methodology used for this rapid assessment was adapted from the “FAO’s Methodology for Damage and Loss Assessment in Agriculture” by Conforti et al (2020). Primary data were collected from site visits to the main fishing communities and/or fish landing sites on Union Island, Mayreau and Canouan. During the site visits visual inspections and vessel counts were completed, photographs were also taken to document damages. Selective and snowball sampling were used to collect data and information (using informal interviews, see Appendix 1) from fisher folk, boat owners, and community leaders with key insights and knowledge on the impacts and challenges to the fisheries sector, the fisher folk, fishing vessels (including gear, equipment and inventory) and the main fishing communities.

The data and information collected were then compiled, assessed and analysed in Microsoft Excel. Secondary data and information were used to validate the primary data collected. These secondary data were collected from desktop searches and verifying information with relevant authorities, namely the Fisheries Division in St. Vincent and the Grenadines.

### **12.4 Results: Impacts**

Data and information were collected from a total of 29 persons across the Southern Grenadine Islands of Union Island, Mayreau and Canouan. All the persons interviewed were boat owners operating within the coastal and marine space; the majority (62%) focused primarily on fisheries and aquaculture (fishers and sea moss farmers), 24% focused primarily on tourism (water taxi and tours) and 10% did both (fishers and taxi and tour operators) (Table 6). The majority of persons interviewed were male (86.2%) and were from Union Island (Table 6). Females represented 13.8% of persons interviewed, one female was a community leader (founder of a non-governmental organisation – We Are Mayearu Inc.), two were sea moss farmers (one from Union Island and the other from Canouan) and another was the owner of a fishing vessel.

**Table 6. Interviews conducted across the Southern Grenadine Islands of Union, Mayreau and Canouan\***

Islands	# of persons interviewed	#Male	#Female	#involved in Fisheries and Aquaculture	#involved in Tourism	#involved in both
Union Island	24	22	2	16	6	2
Mayreau	3	2	1	0	1	1
Canouan	2	1	1	2	0	0
<b>Total</b>	<b>29</b>	<b>25 (86.2%)</b>	<b>4 (13.8%)</b>	<b>18 (62%)</b>	<b>7 (24%)</b>	<b>3 (10%)</b>

\*See Appendix 2(a) for more details

Persons shared that the islands (i.e. Union Island, Mayreau and Canouan) experienced widespread damage and loss; there was loss of property (homes, businesses, equipment, materials), infrastructure (water, electricity, telecommunication, sanitation etc.) livelihoods and lives (there were at least five reported deaths on Union Island and reports of other deaths and missing persons on the Mayreau and Canouan).

Everyone interviewed suffered major losses to their homes, businesses and livelihoods; a few of the fishers owned shops and the two sea moss farmers lost their farm and all their equipment (e.g. sea moss (wet and dry), netting, ropes, pvc buoys for lines, standard floater buoys doe anchors etc.). Based on the information specific to the persons interviewed, the estimated damage to vessels within operating within fisheries and aquaculture was XCD \$1,004,635.00 and the estimated loss of gross earnings is \$1,015,310.00 (Table 7). It should be noted that these estimated costs in some instances included damage and loss to gear, engine, equipment and inventory, not all persons were able to share estimates specific to this because they were still clearing debris in order to make their assessments. Additionally, the estimated loss of gross earning does not include any operational costs (e.g. maintenance, salaries, fuel, supplies, fees, or any other expenses). See Appendix 2 (b and c) for more details.

**Table 7. Summary of Estimated damages and loss**

<i>Currency - XCD</i>	Involved in Fisheries and Aquaculture		Involved in Both	
Islands	Estimated damage to vessels (including engine, gear, equipment and inventory)*	Estimated gross earnings (loss)**	Estimated damage to vessels (including engine, gear, equipment and inventory)*	Estimated gross earnings (loss)**
Union Island	\$694,460.00	\$713,860.00	\$53,000.00	\$10,800.00
Mayreau	NA	NA	\$57,000.00	NA
Canouan	\$200,175.00	\$290,650.00	NA	NA
<b>Total</b>	<b>\$894,635.00</b>	<b>\$1,004,510.00</b>	<b>\$110,000.00</b>	<b>\$10,800.00</b>
<b>Combined</b>	<b>Vessels = \$1,004,635.00 Earnings = \$1,015,310.00</b>			

SUMMARY OF #of damaged boats/types and they type of fish associated, type of gears used/lost

This following section details the visual observations (i.e. number of damaged boats) made as well as information shared by interviewees on the impacts sustained specific to the fisheries and aquaculture on the Southern Grenadine islands of Union Island, Mayreau and Canouan.

## Union Island

Union Island, with a population of approximately 3,000 persons sustained significant impacts. It has been reported that over 90% of infrastructure and livelihoods were devastated. This was clearly visible on arrival; there were large amounts of debris littered across the island – from fallen trees, buildings, poles excreta. Among the debris were fishing boats, some of which were reportedly “lifted and tossed” during the hurricane (Picture 1).

**Picture 1:** *Fishing boat among the debris*



On Saturday, July 13, 2024 the rapid assessment was completed for Union Island. A few hours (4) were spent visiting the two main fishing communities in Clifton and Ashton. Short interviews were also conducted with 24 boat owners 18 of whom were involved in fisheries and aquaculture. The information share helped with understanding the level of impacts sustained and their immediate challenges.

It was reported by fishers that there were approximately 60 persons on Union Island that primarily focused on fishing as their means of income/livelihoods, with an additional ~60 who did some fishing (including sport fishing) and tourism (tours, taxis). Communication (post assessment) with the St. Vincent and the Grenadines Fisheries Division suggests that there are about 79 registered fishers with an additional few who were unregistered. The Fisheries Division has been working diligently on conducting a more detailed assessment and the CRFM will be providing support as needed.

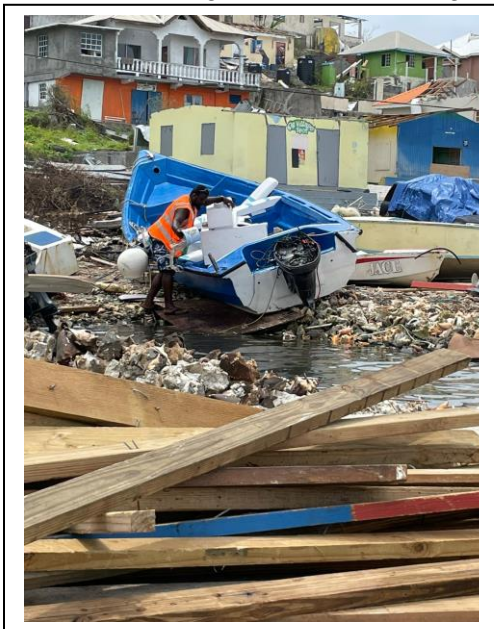
The majority of fishers plied their trade at least 5 days a week and targeted species such as tuna, snapper, conch and lobster; there was one person who did sea moss farming. As a result of the passage of hurricane Beryl there was a complete halt of the fisheries sector on Union Island. No fishing for commercial gain was done. This was due to the fact that the majority of boats/fishing vessels had sustained much damage or were completely lost. Additionally, the loss of key infrastructure (power, water) did not allow for the cleaning and storage of fish. A key factor to be considered was the psychological impacts resulting in the despondent disposition of many, including fisher folk.



## Ashton

The first fishing site visited was the one in Ashton. A total of 25 damaged boats were observed. Of these, approximately 12 were fishing vessels (this was verified by the fishermen on site). It was shared that the remaining vessels were water taxis (most of which were not involved in fishing in any way). The damages sustained to fishing vessels was moderate to severe; loss of parts of vessel and in some cases the entire boat was crushed or missing; severely damage engines, even in cases where the engines were removed, the magnitude of the damage to the island resulted in engines being destroyed; and damaged hulls (Picture 2-4). The majority of boats were classified as wooden and epoxy pirogues, sizes ranging from 18-30ft. Long line, seine net, dive and pot fishing for tuna, snapper, reef fish, lobster and conch were the key fisheries in Ashton.

**Picture 2:** *Damage sustained to boat engine*



**Picture 3:** *Damage sustained to boat*



**Picture 4:** *Damaged boats in Ashton*

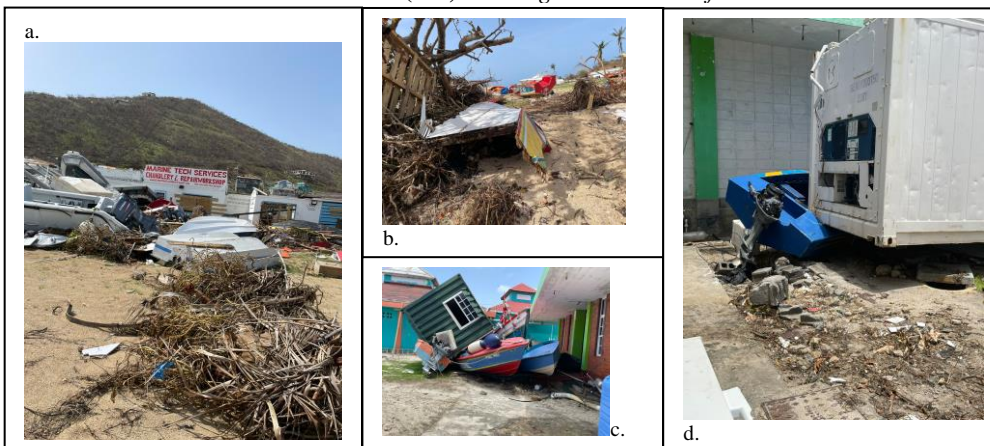


It should be noted that the fishing site at Ashton is located within a lagoon, which is enclosed by mangroves. Fishers shared that a few boats (fishing vessels as well as pleasure craft/yachts) were retrieved from the mangroves and in a few cases sustained less physical damage (mainly the pleasure crafts) when compared to those on land.

## Clifton

The second fishing site visited was Clifton. A total of 56 damaged vessels were observed. Of these 56, approximately 26 were fishing vessels (this was verified by the fishermen on site). As in Ashton, it was shared that the remaining vessels were water taxis (~20 some of which were involved in fishing) and pleasure craft (~10). The damages sustained to fishing vessels was severe; loss of parts of vessel and in some cases the entire boat was crushed or missing; severely damage engines, even in cases where the engines were removed, the magnitude of the damage to the island resulted in engines being destroyed; and severely damaged hulls (Picture 5 a-d). The majority of boats were classified as wooden and epoxy pirogues, with a few fiberglass boats, sizes ranging from 18-40ft. Long line, dive and pot fishing for tuna, snapper, reef fish, lobster and conch were the key fisheries in Clifton.

**Picture 5 (a-d): Damaged boats in Clifton**



Boat owners who used their vessel for fishing and tourism shared that their losses were especially great; one boat owner lost all four boats one of which he used for fishing the others were used for tours and taxi.

### 12.5 Estimated damage and loss

The main damages sustained were either damage and/or loss to boat and/or engine. From observation ~50% of the hulls did not appear to be damaged but due to the amount of debris in the vicinity of the fishing vessels it was difficult to fully assess/observe specific damages. Based on the information shared from boat owners, the majority of which were fishers, the estimated loss associated with damaged boats ranged from XCD \$3,000.00 to \$80,000.00 with engine repairs or replacement estimated anywhere between XCD \$5,000 to \$50,000.00. Another important consideration for assessing and quantifying loss and damage are the gears and equipment along with any inventory on board. While some of these costs were included in the overall boat damages, primarily because boat owners were still trying to assess their own losses, losses were reported for: seine nets, palang lines, fish pots, ropes, anchors, nylons, gas tanks, ice boxes, batteries, lights and switches, diving gear (e.g. snorkel gear, dive tanks), life jackets, steering wheels, buoys, radios and GPS'.

## Mayreau

Mayreau is the smallest and most sparsely populated (apart from the private resort islands) in the Southern Grenadines, with a population of approximately 300 persons. Fisheries and tourism are of vital importance to the islands economy, culture and livelihoods. Much like Union Island, Mayreau also sustained significant impacts (Picture 6-7). It has been reported that over 90% of infrastructure and livelihoods were devastated.

**Picture 6:** *Visual of damages in Mayreau, coastal*



**Picture 7:** *Visual of damages in Mayreau, interior*



On Sunday, July 14, 2024 the rapid assessment was completed for Mayreau. Only one hour was spent on island. The two main fishing sites Saline and Salt Whistle Bay were visited and three interviews completed. The observations made and the information shared gave a sense of the damage and losses sustained.

Information obtained suggested that there are ~60 boat owners who operated both as fishing vessels and water taxis. Similar to Union Island, tuna, snapper, conch and lobster were the main fisheries. It was stated that over 50% of the boats were severely damaged or lost while a total of 15 boats (~ 25%) were not damaged. The loss of key infrastructure (power, water), property and livelihoods rendered persons (including boat owners) incapacitated.

## Saline

The first fishing site visited was Saline. A total of 34 boats were counted, ~ 55% had visible severe damages (Picture 8 a-b), while ~25% appeared to have sustained little to no damages and the remaining ~20% were pleasure craft (some with major damages).

**Picture 8:** *Damaged boats in Saline*



Severe damages to boats included broken or missing sections of the boat, lost/missing/damaged engines. The majority of damaged boats appeared to be wooden pirogues. Information on boat size was limited since very few interviews were conducted. However, it was shared that the main type of fisheries targeted was the same as Union Island – tuna, snapper, reef fish, conch and lobster.

### **Salt Whistle Bay**

The second fishing site visited was Salt Whistle Bay. A total of 7 boats were counted. Of these, 5 were fishing vessels while the other 2 were pleasure craft. None of these vessels appeared to have sustained major damages.

### **Estimated damage and loss**

The main damages sustained was either damage and/or loss to boat and/or engine. There was not enough information to give a reasonable estimation of damages sustained to boats and/or engines. However, the assumption could be made that estimated range of losses would be similar to Union Island (i.e. estimated loss associated with damaged boats ranged from XCD \$3,000.00 to \$80,000.00 with engine repairs or replacement estimated anywhere between XCD \$5,000 to \$50,000.00.), considering that both islands target the same fisheries using similar vessel and gear. As with Union Island much consideration should also be given to assessing and quantifying loss and damage to gears and equipment and inventory.

### **Canouan**

Canouan, with a population of approximately 1,500 also sustained damages. Comparatively, these damages were slightly less devastating when compared to Mayreau and Union Island. Nevertheless, there were serve impacts to homes, other buildings and infrastructure. It was reported that more than 90% of buildings (including homes) suffered damages ranging from minor to severe.

On Monday, July 15, 2024 the rapid assessment was completed for Canouan. Only 45 minutes was spent on the island and during this time the main fishing complex in Friendship was visited and at least one fisher was interviewed. It was shared that ~ 50 fishing vessels operated out of the fisheries complex. However, these vessels were actually fishers from Bequia. Of these 50, ~20 left to secure their boats elsewhere before the hurricane and another ~15 left immediately after. The remaining vessels ~15 vessels were all secured at the Fisheries Complex and the damages sustained were reported to be minor and repairable.

The majority of vessels appeared to be wooden pirogues, their range of sizes could not be properly assessed due to the limited time spent on island. The main fisheries were the same as in Union and Island and Mayreau – tuna, snapper, reef fish, conch and lobster. It was shared that long lines and pot were often used. Similarly, fishing operations also ceased since the passage of the hurricane. The majority of fishers left and much focused was placed on clean-up efforts. The loss of key infrastructure has also hampered the ability for fishers, even with working vessels, to be able to store or clean their catch.

## Grand Bay

Upon arrival a few boats were observed in the Grand Bay area. A total of 15 boats were counted, 11 of which appeared to be either fishing boats or taxis; they were all wooden pirogues. The remaining boats (4) were pleasure craft/yachts. There was visible damage to the boats that appeared to be fishing vessels. These damages appeared to be mostly moderate (Picture 9). However, more time was needed to better assess damages and loss.



## Friendship

During the visit to the Fisheries Complex in Friendship, a total of 12 fishing vessels were counted. No major damages were observed (Picture 10). However, the one fisherman interviewed shared that his engine sustained damages and was not operating at full capacity/power. More information is needed to better understand the type of loss and damage that may have been sustained to fishing vessels.



## Estimated damage and loss

There was not enough information to give a reasonable estimation of damages sustained to boats and/or engines. However, the assumption could be made that estimated range of losses would be similar to Union Island (i.e. estimated loss associated with damaged boats ranged from XCD \$3,000.00 to \$80,000.00 with engine repairs or replacement estimated anywhere between XCD \$5,000 to \$50,000.00.), considering that both islands target the same fisheries using similar vessel and gear. As with Union Island much consideration should also be given to assessing and quantifying loss and damage to gears and equipment and inventory.

## **12.6 Limitations**

- Limited time
- Issues with transportation

## **12.7 Challenges**

- Complete loss of livelihoods (no boat or engine)
- No cold storage
- Limited fuel
- Limited access to fresh water
- Lack of motivation
- Limited access to the tools needed to repair damages
- No insurance or disposable income to replace severely damaged and lost vessels and the necessary gear and equipment

## **12.8 Recommendations**

- Better coverage for fishers (parametric insurance)
- Quick and improved access to needed supplies/tools for replacing and repairing damage vessels
- Empowering fishers by giving them something to do so that they can feel motivated and are helping to solve the problem.
- Exploration of alternative livelihoods
- Marine ecosystem assessment to gauge how the hurricane may have affected the environment and the fish stocks
- Better consideration for assessing impacts to aquaculture, especially sea moss which is a very viable fishery in the Grenadines.
- Comprehensive record keeping for the fisheries sector in the Southern Grenadines.
- Needs for a disaster plan for the fisheries sector
- 

### **12.8.1 Short Term/Immediate**

### **12.8.2 Medium Term**

### **12.8.3 Long term**

## **12.9 Immediate Needs List/Requirements**

## **12.10 Estimated Cost**

See tables

### **12.11 Further assessments required/Suggested**

- N. Grenadine Islands and Mainland (FD shared that there were serious impacts to the fisheries sector in the Northern Grenadine Island of Bequia and to key fisheries landing sites across St. Vincent.
- Marine Environment
- Psychosocial impacts

### **12.12 Conclude**

Fisheries and tourism are key sectors

Private resort islands and the Tobago Cays (managed out of UI) are critical to the livelihoods.

A full assessment of the value chain is needed – the assessment did reveal that most of the fish is sold directly to consumers, hotels and restaurants with very few vendors, scalers.

Men were the majority of boat owners; however, there were a few female owners (better understanding of gender equity and equality). There remains a need for a better understanding of the impacts on aquaculture, especially the sea moss industry, which is quite prevalent in the Grenadines.

## **13 APPENDICES**

### **13.1 Appendix 1: Informal Interview Guide**

#### **Informal Interview Guide**

1. Visit fish centers/communities/landing sites
2. How many boat hulls can be repaired?
3. Extent of damages to boat engines
4. Catch profile and gear used
5. Any lost or damaged gear
6. # of boat haulers?
7. # of fish cleaners?
8. Alternative livelihoods
9. Coping mechanisms (postharvest issues no cold storage-more drying, access to water, transportation and sale of fish; where and how they sell their fish; is it mainly subsistence fishing now?)
10. Challenges: more catch effort? (time, fuel); changes in catch composition? Coastal debris impacts to navigation...alternative routes?



### 13.2 Appendix 2 A: Estimated Vessel Damage Data

CRFM Damage Assessment Information																	
Completed by Sanya Compton Damage Assessment Forms Southern Greendines 13-15 July, 2024																	
No.	Name	District	Name	Contact Information	# of Boats Damaged /Lost	Name of boat	Est. Cost to Repair/Re place	# of Sm. Eng. Lost/Damaged	Est. Cost to Repair Replace Sm. Eng.	Gear Lost (Y/N)	Est. Cost to Replace	Inventory Lost (Y/N)	In value	Other equipmen t lost	In. Value	TOTAL	
1	Union Is.	Clifton	Asbert Ashton	7845939522	1	Mr.Best	\$18,000	1	\$18,000	N	Included in H	N	NA	Y	\$960	\$18,960.00	
2	Union Is.	Clifton	Paul Duncan	7845334467	5	Sea Lane Lion Heart Lioness Lion cub	\$80,000 \$77,000 \$45,000 \$20,000	4	\$222,000	Y Palang lines Tow lines Life jackets	Included in H	N	NA	N	NA	\$222,000.00	
3	Union Is.	Clifton	Alvin Thomas Ackee	7845308783	1	Hope II	\$50,000	1	\$50,000	N	NA	N	NA	Y	Included in H	\$50,000.00	
4	Union Is.	Ashton	Abdon White	7845264402	2	No names	\$80,000	1	\$25,000	N	N	N	NA	Y	Included in H	\$80,000.00	
5	Union Is.	Ashton	Kennedy Thomas	7845308561	2	Grey No name	\$40,000 \$6,000	1	\$40,000	Y	Included in H	N	NA	Y	Included in H	\$46,000.00	
6	Union Is.	Ashton	Ralphon Weeks	NA	1	Mr.Weeks	\$60,000	1	\$45,000	Y	Included in H	N	NA	Y	Included in H	\$60,000.00	
7	Union Is.	Ashton (from Chatham)	Timothy Galey	7845286960	1	Free Stu	\$14,500	1	\$14,500	Y	Included in H	N	NA	Y	Included in H	\$14,500.00	
8	Union Is.	Ashton	Jason Coy	7844988240	1	The Coy	\$5,000	1	\$5,000	Y	Included in H	N	NA	Y	Included in H	\$5,000.00	
9	Union Is.	Clifton	Jeffery Shotte	NA	2	NA	\$20,000	2	\$20,000	Y	Included in H	N	NA	Y	Included in H	\$20,000.00	
10	Union Is.	Clifton	Kimberly Tittle Alert	7844916822	2	Miss Anita Summertime Mr.	\$12,000 \$14,000	2	\$26,000	N	NA	N	NA	N	NA	\$26,000.00	
11	Union Is.	Clifton	Jadez Alexander	784300037	1	J-man	\$24,000	1	\$24,000	Y	Included in H	N	NA	Y	Included in H	\$24,000.00	
12	Union Is.	Clifton	Kathlin Weeks	7845276986	1	NA	\$3,000	1	\$3,000	Y	Included in H	N	NA	Y	Included in H	\$3,000.00	
13	Union Is.	Clifton	James Manix	7844549501	1	NA	\$23,000	1	\$23,000	N	NA	N	NA	N	NA	\$23,000.00	
14	Union Is.	Clifton	Marlon Jones	7845287480	1	NA	\$40,000	1	\$40,000	N	NA	N	NA	N	NA	\$40,000.00	
15	Union Is.	Clifton	Jamal Crag	7845287413	1	NA	\$30,000	2	\$30,000	N	NA	N	NA	N	NA	\$30,000.00	
16	Union Is.	Clifton	Albert Hanson	NA	1	NA	\$32,000	1	\$20,000	Y	Included in H	N	NA	Y	Included in H	\$32,000.00	
17	Union Is.	Clifton	Coris Denbers	7845307657	2	Ocean Panic	\$36,000	2	\$36,000	Y	Included in H	N	NA	Y	Included in H	\$36,000.00	
18	Union Is.	Clifton	Simon Alexander	7845304792	1	Kojack	\$30,000	1	\$30,000	Y	Included in H	N	NA	Y	Included in H	\$30,000.00	
19	Union Is.	Clifton	Kennick Peters	7845325848	2	NA	\$90,000	3	\$90,000	N	NA	N	NA	N	NA	\$90,000.00	
20	Union Is.	Clifton	Cletus Alexander	7844920787/ 7845305913	1	NA	\$25,000	1	\$25,000	Y	Included in H	N	NA	Y	Included in H	\$25,000.00	
21	Union Is.	Clifton	Anthony Fredrick (Ken)	7845931660/ 7844978543	1	NA	\$15,000	1	\$10,000	N	NA	N	NA	N	NA	\$15,000.00	
22	Union Is.	Clifton	Kenneth "Wily" Williams	7845327668	1	NA	\$28,000	1	\$18,000	N	NA	N	NA	N	NA	\$28,000.00	
23	Union Is.	Clifton	George Browne	7844301879	1	NA	\$13,000	2	\$8,000	N	NA	N	NA	N	NA	\$13,000.00	
24	Union Is.	Clifton	Nikol Simmons	7845311200	1	NA	\$40,000	1	\$40,000	N	NA	N	NA	N	NA	\$40,000.00	
TOTAL																Fishing (primarily) UNION	\$694,460.00
TOTAL																Tourism-based (primarily) UNION	\$224,000.00
TOTAL																Mixed UNION	\$53,000.00
GRAND TOTAL																	\$971,460.00
1	Mayreau	Salt Whistle	Delroy Ford	7844973198	1	NA	\$57,000	1	\$35,000	Y	Included in H	N	NA	Y	Included in H	\$57,000.00	
2	Mayreau	Saline	Owen Issacs	NA	1	Lowki	\$60,000	1	\$35,000	Y	Included in H	N	NA	Y	Included in H	\$60,000.00	
TOTAL																Fishing (primarily) MAYREAU	NA
TOTAL																Tourism-based (primarily) MAYREAU	\$60,000.00
TOTAL																Mixed MAYREAU	\$57,000.00
GRAND TOTAL																	\$117,000.00
1	Canouan	Friendship	Aswell Nichols	7845302612	1	Mystic Man	\$7,000	1	\$4,000	Y	Included in H	N	NA	Y	Included in H	\$7,000.00	
2	Canouan	Grand Bay	Shavom Stephens	7844923694	1	NA	\$3,500	NA	NA	Y	\$535	Y	140,000	Y	\$49,140	\$193,175.00	
TOTAL																Fishing (primarily) Canouan	\$200,175.00
TOTAL																Tourism-based (primarily) Canouan	NA
TOTAL																Mixed Canouan	NA
GRAND TOTAL																	\$200,175.00

### 13.2.1 Appendix 2 B: Estimated Gross Earnings Data

CRFM Damage Assessment Information Infrastructure													
Completed by Sanya Compton Damage Assessment Form - Southern Grenadines 13-15 July, 2024													
No.	ame/name of infrastruc	District/landing site	Contact Information	type of vessel	How often do you fish per month	types of fishing activities in the affected areas	average volume of daily capture lbs	Price	number of days fishing activities are suspended due to disaster	Inventory Lost (Y/N)	In. Value	Estimated Earnings per trip	Estimated Gross Earnings
1	Asbert Ashton	Clifton	7845939522	18ft Longliner "Mr. Best"	25	Lobster Snapper	500 1000	15 10	13	N	NA	\$7,500 \$10,000	\$17,500.00
2	Paul Duncan	Clifton	7845334467	a. 32ft fibre glass twin engine 350hp pleasure craft (sport fishing) "Sea Lane" b. 25ft fibre glass 25hp pleasure craft (tours and taxi only) "Lion Heart" <b>c. 22ft fibre glass 45hp (fishing vessel) "Lioness"</b> d. 12ft dingy 18hp "Lion Cub"	a. 9 b. 12 c. 14 d. 9	a. Tours and Sport Fishing b. Tours and Taxi (no fishing) c. Red fish, Snapper d. NA (tender for 32ft pleasure craft "Sea Lane")	a. NA b. NA c. 30 d. NA	10	13	N	NA	\$300.00	\$4,200.00
3	Alvin Thomas Ackee	Clifton	7845308783	~22 ft Wood and epoxy 150hp longliner "Hope II"	28	Conch	150	6	13	N	NA	\$900.00	\$25,200.00
4	Abdon White	Ashton	7845264402	40ft fibre glass	20	Conch	150	6	13	N	NA	\$700.00	\$18,000.00
5	Ralphon Weeks	Ashton	NA	30ft wood and epoxy palang 160hp "Mr. Weeks"	24	Snapper	200	10	13	N	NA	\$2,000.00	\$48,000.00
6	Timothy Galley	Ashton	7845286960	21ft wood and epoxy palang 75hp "Free Stu"	20	Jacks Robin Cavalli Baracuda	100 (4)	5 8 10 10	13	N	NA	\$500.00 \$800.00 \$1,000.00 \$1,000.00	\$60,000.00
7	Albert Hanson	Clifton	NA	28ft fibre glass 75hp pirogue	28	Conch	200	6	13	N	NA	\$1,200.00	\$33,600.00
8	Jeffery Shotte	Clifton	NA	16ft 40 hp and 25 hp wooden pirogues	NA	NA	NA	NA	13	N	NA	NA	NA
9	Kimmerly Tittle Allert	Clifton	7844916822	25ft 40hp pirogue fibre glass pirogue "Summer Time Mr." and 18ft 15hp pirogue "Miss Anita"	28	Conch Fish	150 NA	6	13	N	NA	\$900.00	\$25,200.00
10	Jadez Alexander	Clifton	784300037	Wooden 40hp pirogue "J-man"	28	Tuna Dolphin Fish	200	10	13	N	NA	\$2,000.00	\$56,000.00
11	James Momix	Clifton	7844549501	19ft wood and epoxy 75hp pirogue bottom long line	20	Tuna Dolphin Fish	200 300	10	13	N	NA	\$5,000.00	\$100,000.00
12	Marlon Jones	Clifton	7845287480	20ft wood and epoxy 60hp pirogue bottom long line	12	Tuna Lobster Conch	150 (ea)	10 30 7	13	N	NA	\$1,500.00 \$4,500.00 \$1,050.00	\$84,600.00
13	Jamal Crag	Clifton	7845287413	21ft 85hp and 20ft 25hp wood and epoxy pirogues bottom long line	12	Tuna Lobster Conch	150 (ea)	10 30 7	13	N	NA	\$1,500.00 \$4,500.00 \$1,050.00	\$84,600.00
14	Jason Coy	Ashton	7844988240	27ft fibre glass bottom longliner and house boat "The Coy"	28	Reel/Pot Fish Lobster	50 50	8 20	13	N	NA	\$400.00 \$1,000.00	\$39,200.00

CRFM Damage Assessment Information Infrastructure													
Completed by Sanya Compton Damage Assessment Form - Southern Grenadines 13-15 July, 2024													
No.	ame/name of infrastruc	District/landing site	Contact Information	type of vessel	How often do you fish per month	types of fishing activities in the affected areas	average volume of daily capture lbs	Price	number of days fishing activities are suspended due to disaster	Inventory Lost (Y/N)	In. Value	Estimated Earnings per trip	Estimated Gross Earnings
15	Coris Denbers	Clifton	7845307657	20ft fibre glass (2)two stroke engines pirogue "Ocean panic"	NA	NA (Water taxi and tours) operates 4/week \$1,768.96	NA	NA	13	N	NA	NA	\$7,075.84
16	Simon Alexander	Clifton	7845304792	18ft wooden 60hp pirogue "Kojack"	NA	NA (Water taxi and food vendor on Tobago Keys) operates 7/week \$1,890.00	NA	NA	13	N	NA	NA	\$7,560.00
17	Kennick Peters	Clifton	7845325848	16ft 40hp pirogue 29ft 115hp 4 stroke pirogue	NA	NA (Water taxi to the Tobago Keys) operates 5/week \$1,620.00	NA	NA	13	N	NA	NA	\$6,480.00
18	Cletus Alexander	Clifton	7844920787/ 7845305913	26ft fibre glass 75hp pirogue	NA	NA (Water taxi) operates 6/week \$7,000.00	NA	NA	13	N	NA	NA	\$28,000.00
19	Anthony Frederick	Clifton	7845931660/ 7844978543	20ft wooden 40hp pirogue	NA	NA (Taxi and operates a small bar) operates daily \$3,000.00/week	NA	NA	13	N	NA	NA	\$12,000.00
20	Kenneth "Willy" Williams	Clifton	7845327668	18ft wood and epoxy 60hp pirogue	NA	NA (Vendor in Tobago Keys) operates 5/weeks \$1,620.00	NA	NA	13	N	NA	NA	\$6,480.00
21	George Browne	Clifton	7844301879	Wooden 40hp and 15hp pirogues	28	Conch Tuna (Water taxi operator 7/week \$1,000.00)	120	6	13	N	NA	\$720.00	\$20,160.00
22	Nikai Simmons	Clifton	7845311200	28ft wood and epoxy pirogue bottom long line	a. 12 b. 16	a. Tuna Lobster Conch b. Water taxi (\$1,700.00/week)	200 150 150	10 30 7	13	N	NA	\$2,000.00 \$4,500.00 \$1,050.00	\$90,600.00 \$6,800.00
<b>TOTAL</b>												<b>Fishing (primarily)</b>	<b>\$708,860.00</b>
<b>TOTAL</b>												<b>Tourism-based (primarily)</b>	<b>\$67,595.84</b>
<b>TOTAL</b>												<b>Mixed</b>	<b>\$10,800.00</b>
<b>GRAND TOTAL</b>													<b>\$787,255.84</b>

CRFM Damage Assessment Information Infrastructure													
Completed by Sanya Compton Damage Assessment Form- Southern Grenadines 13-15 July, 2024													
No.	Name/name of infrastructure	District/Landing site	Contact Information	type of vessel	How often do you fish per month	types of fishing activities in the affected areas	average volume of daily capture lbs	Price	number of days fishing activities are suspended due to disaster	Inventory Lost (Y/N)	In. Value	Estimated Earnings per trip	Estimated Gross Earnings
<b>MAYREAU</b>													
1	Delroy Ford	Salt Whistle	7844973198	25ft Wooden pirogue 250hp	8	Baracuda Cavalli (Sport fishing) Water taxi	NA	NA	14	N	NA	NA	NA
2	Owen Issacs	Saline	NA	26ft pirogue 200hp	NA	NA (Water taxi) operate 3/week \$1,200.00	NA	NA	14	N	NA	NA	\$4,800.00
<b>TOTAL</b>													<b>NA</b>
<b>TOTAL</b>													<b>\$4,800.00</b>
<b>TOTAL</b>													<b>NA</b>
<b>GRAND TOTAL</b>													<b>\$4,800</b>
<b>CANOUAN</b>													
1	Aswell Nichols	Friendship	7845302612	21ft pirogue 75hp "Mystic Man"	28	Conch Lobster Reef Fish	200 200 100	6 25 10	15	N	NA	\$1,200.00 \$5,000.00 \$1,000.00	\$201,600.00
<b>TOTAL</b>													<b>\$201,600.00</b>
<b>TOTAL</b>													<b>NA</b>
<b>TOTAL</b>													<b>NA</b>
<b>GRAND TOTAL</b>													<b>\$201,600.00</b>

### 13.2.2 Appendix 2 C: Estimated Gross Earnings – Sea moss

No.	Name/name of infrastructure	District/Landing site	Contact Information	type of vessel	Type of aquaculture activity in the affected area	How often do you harvest per month	Amount harvested per month	Price	Estimated Earnings per month	Estimated Gross Earnings
1	Kaitlin Weeks	Clifton	7845276986	NA (small dingy)	Seamoss	20	5000lbs (wet weight) ~500lbs (dry weight)	10/lb (dry)	\$5,000.00	\$5,000.00
2	Shavorn Stephens	Grand Bay	7844923694	12 ft wood and epoxy 15hp pirogue	Seamoss	25	10,000lbs (wet weight) ~ 1,000lbs (dry weight)	35USD/94.5lb (US market) 40XCD/lb (local)	\$85,050.00 XCD (dry, US Market) \$4,000.00 (dry local)	\$89,050.00

## **14 ANNEX I -TOURISM ASSESSMENT REPORT**

### **14.1 SITUATIONAL OVERVIEW (SECTOR SPECIFIC)**

The passage of Hurricane Beryl has significantly impacted tourism industry assets in Saint Vincent and the Grenadines (SVG). Though most of the country was affected by the storm, its worst impacts were felt in the southern Grenadine islands, which are primary tourism drivers and whose populace are heavily dependent on the visitor economy. These include: Union Island, Mayreau, Canouan and the Petite Saint Vincent, and Palm Island Resorts. In the north, Bequia, Young Island and mainland Saint Vincent also noted damage to tourism infrastructure, but to a lesser extent than in the south.

By many local accounts, this storm was the worst to hit the affected areas in decades, such that the scale of damage received was simply unprecedented. The affected tourism plant includes accommodation stock, bars and restaurants, water-taxi transportation services, pleasure vessels and popular visitor sites. Resultant from the damage sustained by industry assets, the livelihoods of many solopreneurs and small business persons have been stalled, with economic and social vulnerability becoming real consequences of curtailed tourism activity.

Further, there is noted deterioration and trauma to the natural environment, which is a critical foundation for tourism activity. Compromised assets include reefs, dive sites, forested landscapes, biodiversity and wildlife habitats that support tourism demand. Those hardest hit are likely to be left without any economic means of survival in the short to medium term, and may find it difficult to cope with the reality of no longer being self-sufficient. As a result of the above, the Tourism RNAT have highlighted key needs and recommendations for tourism reactivation by the Government of Saint Vincent and the Grenadines.

### **14.2 PURPOSE (SECTOR SPECIFIC)**

This report provides a rapid assessment of potential impacts of Hurricane Beryl on tourism as a means of livelihood generation in Saint Vincent and Grenadines. It includes estimates of the damage caused by the storm as well as recommendations for reactivating the tourism industry in a responsible and sustainable manner that protects both the dignity of those affected and the quality of the visitor experience on offer.

It must be noted that this assessment is not exhaustive, relied on current available information and therefore should be updated periodically as progress towards recovery is made.

## 14.3 IMPACTS OBSERVED

### 14.3.1 Physical Impacts

Given the symbiotic relationship between tourism, local communities, a healthy natural environment and fair economic returns, the assessors noted the following physical impacts that include:

- Badly damaged mangroves with reduced capacity for hosting healthy ecosystems and biological diversity that are of keen interest to the Ecotourism Market;
- Stripped natural landscapes with lost forestry that diminish the tranquil and aesthetic appeal of destination SVG;
- Damaged accommodation stock across the highly tourism dependent Grenadines, where hotels, guesthouses, apartments, villas, and many Airbnb homes are no long fit for hosting visitors;
- Destruction of many restaurants and bars, particularly those near the coast and in major visitor hotspots;
- Compromised jetties and piers that make island/resort access difficult and dangerous for both locals and visitors;
- Destroyed fishing vessels, water taxis and pleasure boats that supplied fresh seafood, provided critical transportation services and facilitated provisioning and entertainment to both local and visitor markets;
- Demolished commercial and entertainment centres that previously hosted clusters of businesses that offer both essential and auxiliary services to visitors.

### 14.3.2 Functional Impacts (where applicable)

- Displaced wildlife that diminish overall biological diversity at the destinations e.g. cocorico birds and the Union Island gecko, which affect ecotourism and wildlife viewing;
- The closure of traditional fishing activity in the Southern grenadines which diminishes tourism food supply for local delicacies;
- The pause of water-taxi and tour operator services in affected territories e.g. yacht provisioning, visitor transportation, snorkel and dive operations, sightseeing tours etc;
- The dormancy of community groups, tour operators and tourism associations due to prolonged inactivity and staff displacement;
- Damage to critical passenger terminal and/or airport security equipment and the resultant cessation of commercial air traffic into Union Island, Canouan and Bequia Airports, which are gateways for tourism activity in the southern Grenadines, means limited access in the short to medium term;
- An overall short to medium-term cessation of tourism activity in the Grenadines, due to critical infrastructure damage and lacking tourism facilitation services like communication, electricity, fuel, food, water and accommodations.

### 14.3.3 Estimated damage and loss

Hurricane Beryl had a devastating impact on the Grenadine islands of Union Island and Mayreau. The hurricane inflicted considerable damage to the accommodation stock and related sub-sectors on Bequia and Canouan, as well as tourism assets on mainland St. Vincent. Significant destruction to the private resorts on Palm Island, Petit St. Vincent and Young Island were also evident. Consequently, approximately **70% of St. Vincent and the Grenadines tourism supply chain** was moderately to severely impacted by the passage of Hurricane Beryl, considering that historically and up to present, the majority of tourism activity has been concentrated in the Grenadine islands.

Damage to the tourism sector across St. Vincent and the Grenadines is estimated in the region of **XCD\$135 million or US\$50 million** (exchange rate US\$1.00 equivalent to XCD\$2.70).

Frontline clean-up, rebuilding, and recovery is expected to take between **6 months to 1 year** in moderately damaged islands, with full recovery in the more severely affected territories potentially taking up to **2 years (24 months)**, barring there are no further catastrophic events to the islands or mainland St. Vincent. An estimated **2000** plus tourism entrepreneurs and employees have been affected.

#### **14.4 Presentation on methodology**

##### **14.4.1 Data collection**

Primary data collection was undertaken during the period July 13-17, and documents Hurricane Beryl's impact on eight (8) islands to include mainland Saint Vincent as well as Union Island, Mayreau, Petite Saint Vincent, Palm Island, Canouan, Bequia, and Young Island.

A hybrid methodology was deployed, inclusive of observation and stakeholder interviews which were targeted at tourism business owners and managers, as well as leadership representatives from tourism organisations, charities and NGOs that contribute to the national tourism product. Respondents were selected by means of a convenience sample, which reflected personnel availability during site visits, and the willingness to share details about post-hurricane realities for their tourism establishment.

To support data collection, the team sought details to explore standardised themes, namely: (a) the names and institutional position held by respondents, (b) the names of impacted tourism entities (c) an overview of damage sustained, (d) the number of employees impacted by business disruption, (e) priorities for business reactivation, and (f) estimated values for damages sustained. Where possible, insights were supported by photographic evidence.

##### **14.4.2 Limitations and Challenges**

Many tourism business owners, in particular, in Union Island and Mayreau were not available for consultation as several stakeholders, in particular, Micro Small and Medium Tourism Enterprises (MSMEs) whose homes and business assets were extensively damaged or destroyed had evacuated to mainland Saint Vincent.

It should be noted that, on the advice of the SVG Coast Guard, the team was unable to dock at Palm Island due to surging tides and damaged jetties, which made it unsafe. Consequently, impacts were observed from offshore.

Additionally, it was not possible to visit the resorts of Mandarin Oriental and Canouan Estate on the northeast coast of Canouan. An update on impacts was provided by the General Manager of family property, the Soho Beach House. The team also conducted a brief aerial assessment via helicopter.

### 14.4.3 Key Learnings

The management and staff at the **Ministry of Tourism of St. Vincent and the Grenadines (MOTSVG) and the St. Vincent and the Grenadines Tourism Authority (SVGTA)** must be highly commended for their active participation and engagement. Their availability for the pre-assessment consultations to identify key tourism assets, introductions to key tourism stakeholders in the affected islands, and excellent arrangements made to facilitate the site visits, including assigning staff to accompany the team for the assessments in Bequia, northern SVG, and Young Island, were invaluable.

The assistance, collaboration, and support provided to the team of assessors is greatly appreciated and was instrumental in successfully completing the assessment. The collaboration and support received from the St. Vincent and the Grenadines Tourism Authorities in response to outreach, is recognized as a best- practice, and critical step for post-disaster missions.

It is therefore recommended that all sectors liaise with and engage the relevant counterpart National Ministries and/or Agencies, prior to and/or in tandem with the conduct of post-disaster assessments. This approach will ensure a more efficient and comprehensive assessment that is more accurately aligned with national mandates and sector priorities, notwithstanding the disaster impacts.



Pre-assessment Consultation with Kennedy Pemberton and Amanda Charles attended by Dr. Resa Noel-McBarnett, PS MOTSVG; Mrs. Jewelene Charles-Scott, Communication Manager; and Mrs. Avaneil Dasilva, Acting CEO, SVGTA



Site visits to SVG mainland and Young Island: Mr. Sternley Walker, SVG National Parks Rivers and Beaches Authority; Mrs Jewelene Charles-Scott and Mrs. Faylene King, MOTSVG with Assessment team

### 14.5 Data Presentation And Analysis

For purposes of this analysis, the Tourism sector was categorised as follows:

- **Accommodation:** Hotels, Resorts, Guest Houses, Apartments, B&Bs;
- **Food and Beverage:** Restaurants, Bars;
- **Transport:** Taxis, Car Rental Companies, Cruise Ports, Airports, Ferry Terminals;
- **Sites and Attractions:** Natural and Cultural Sites, Monuments, Attractions and National Parks;
- **Tourism Services:** Travel Agents, Tour Guides, Tour Operators, Marinas, Craft Markets, Gift shops, Dive shops, and other ancillary service providers.



The information which follows is presented by order of worst to least islands impacted by the hurricane, and following scale was used to assess Physical and Functional Impacts to the Tourism Sector, available tourism products and correlated tourism value chains.

**Categorisation and Scale of Damage:**

MINOR	MODERATE	SEVERE	DESTROYED
<p><b>Physical Impact:</b> Damage is minimal and mostly cosmetic. Structures and equipment remain intact and operational.</p> <p><b>Functional Impact:</b> Essential services such as electricity, water, and communication remain largely unaffected or can be quickly restored.</p>	<p><b>Physical Impact:</b> Damage is more significant and may affect the functionality of some structures. Partial infrastructural damage.</p> <p><b>Functional Impact:</b> Some essential services may be temporarily disrupted, requiring repairs.</p>	<p><b>Physical Impact:</b> Extensive damage to several structures / equipment, with some assets partially or completely unusable.</p> <p><b>Functional Impact:</b> Infrastructure damage is widespread. Utilities, and communication networks significantly impacted.</p>	<p><b>Physical Impact:</b> Complete destruction of structures and infrastructure. Require full rehabilitation / reconstruction.</p> <p><b>Functional Impact:</b> Essential services and equipment irreparably damaged, and impacted businesses /facilities face long-term displacement.</p>

## Union Island

Union Island, with a population of some 3000 individuals, is one of the main Grenadine Islands and is largely considered as the hub for tourism activity in the Southern Grenadines. The island boasts its own airport (Union Island Airport) and functionally serves as the gateway to the Tobago Cays as a prime visitor site within the multi-island state. In addition to offering the most southerly air access facilities, Union Island has several jetties and docking facilities that make it particularly appealing to Yachters as a provisioning station for their exploration. The island is pivotal as the last exit point for St. Vincent and the Grenadines immigration services in the south. Additionally, fisheries export in particular conch, heritage activities and an annual conch festival are key socio-economic drivers, which support tourism.

In accordance with the damage assessment scale, and supported by site visits, tourism stakeholder interviews and observation, Union Island's tourism industry impact ranges from severe to destroyed. In this case, newer facilities constructed with masonry blocks were best seen to withstand Hurricane Beryl's impacts, though in general, roofs were largely destroyed. Naturally, the best surviving tourism assets were seen to be accommodation providers, though significant losses were observed within this subsector. Specific findings on Union Island were as follows:

- There was moderate impact to the **Tobago Cays Marine Park (TCMP)** office building, with pending assessments to be undertaken on the state of coral reef and underwater moorings. Lesroy Noel, Manager of the TCMP who is also actively engaged in the community, indicated the office remains closed. With a staff complement of some 24 employees including administrative and janitorial personnel and park rangers, the manager indicated he was unable to account for or communicate with the staff as at present, and believed most of them may have evacuated to the mainland. The office building suffered moderate roof damage and the related loss of 7 computers. The office was flooded and looted. The main patrol vessel destroyed, and two (2) other boats were damaged one receiving severe damage and the other minor damage. In addition to office clean-up and purchase of new IT equipment, repair and replacement of Boats will be required for patrols, estimated at US \$250,000.
- The **Hugh Mulzac Square** was severely damaged as it lost the majority of its fencing, bank stand, seating benches, gazebo, lighting and palm trees that beautified the recreation park at the main harbour. The square traditionally functioned as a gathering point for both tourists and locals to catch water taxis, ferries and engage in community-based activities. Repairs to the square is recommended as a priority in the short-term, as a sign of hope and recovery. Estimated repairs costs are US\$37,000.
- The **Tourist Information Centre** sustained severe damage due flooding and destruction to the roof of the building, windows, doors, office equipment and furnishings. Stanton Gomes, Chairperson of the Union Island Tourism Bureau, a community leader estimated damages in the range of US\$50,000. There are 5 employees including beach attendants and office staff displaced.
- **Clifton Market/Downtown Area** was home to about 40 businesses, including boutiques, restaurants and bars, craft and supply shops, 15 vegetable stalls and visitor accommodation. Impacts to businesses ranged from severely damage to destroyed. Tourism related businesses were estimated at 10 bars and restaurants, a 12-room TJ Plaza Guesthouse, a 17-room Kings Landing Hotel, Campbell Beach Resort Sales and Villas, Marine Tech Services, and 1 Dive Shop. Bars and Restaurants were largely of wooden construction, including the newly opened and popular Just Right Restaurant and Bar, and were completely demolished, while other related businesses had significant roof damage and thus flooding. Estimated costs to refurbish tourism businesses are placed in the region of US\$2 Million, with more than 100 employees affected.
- **Happy Island** – The assessors were unable to visit the iconic 'Happy Island' Bar and Restaurant or make contact with the owners. The structure and facilities appeared severely damaged.

- **Union Island Airport** suffered moderate damage and is currently not open to commercial air traffic, and currently being used as the operational command centre for humanitarian relief. The control tower roof has been destroyed and there is visible damage to the terminal roof which may have affected equipment in the terminal building. Estimated damage is placed at US\$75,000.
- **Anchorage Hotel** was largely destroyed. Significant damage was noted to the main accommodation building, staff quarters, laundry, dining, docking and general facilities. This business requires extensive rehabilitation and damages are estimated at US\$1 Million.
- **Bougainville Hotel** received moderate to severe damage, mainly to its roof and docking facilities. All of its 13 rooms received water damage as a result of roof failure for the accommodation block, and the roof of the kitchen and dining areas was fully destroyed. The hotel is not open for business but is currently serving as a temporary shelter for displaced residents and hub for the World Central Kitchen. Some 20 staff will be affected by the temporary closure, and recovery support from insurance coverage is still being assessed. Damage is estimated in the region of US\$250,000.
- **Kite Surfing School** owner Jeremie Tronet reported damage ranging from severe to destroyed. The Tour Operator highlighted the destruction of nine (9) hotel rooms under its management at the Anchorage Hotel, and the loss of related room furnishings. Additionally, all 12 boats with engines and the kitesurfing equipment were destroyed. This was a key attraction for visitors and its closure will affect 15 – 20 employees. The owner indicated the business may not reopen given the extensive damage sustained and deterioration in the natural environment to include beach erosion and limited access to the Tobago Cays. Damage is estimated at US\$1 Million.
- **Union Island Environmental Alliance**, a local NGO focuses on regenerative tourism through the protection of the Chatham Bay Forest Reserve and biodiversity therein, e.g. Union Island Gecko and over 100 bird species, e.g. Cocorico/Chachalaca Birds. The newly built NGO campus building was destroyed including bicycles, compost toilets, tents for wardens, signs, wildlife cameras and eight (8) kayaks, which would need to be replaced to support surveillance activities. Forest Warden Supervisor Roseman Adams emphasised diminished freshwater sources facilitated by the forest, the loss of popular visitor hiking trails, and the need for greater climate change preparedness, resilience and adaptation on Union Island. A total of 9 staff including Forest Wardens have been displaced, and loss to the group is estimated at US\$90,000.
- **Richmond Bay Recreation Park** facilities need to be replaced as these were destroyed. The Park lost 15 benches, its volleyball court, kids playground and gazebo. There was also severe damage to the roof of the washroom facilities. Estimated damage is approximately US\$30,000.
- **Richmond Bay Mangroves** and **Belmont Salt Pond**, suffered moderate damage and will need time to rejuvenate, possibly supported by human-driven restoration. Many locals utilised the mangroves as a safe place for their fishing boats and water taxis, and the mangrove is credited with saving the vessels that survived Hurricane Beryl. Salt picking is a favourite activity for local consumption and export. An estimated US\$10,000 would support clean-up and restoration efforts.
- **Union Island Water Taxis Operators** generally suffered severe boat damage and engine loss. There were an estimated 56 vessels in Clifton, comprising 8 pleasure crafts, 24 fishing boats, and 24 water taxis. At least 50% of all vessels are completely damage and none are operational. In Ashton 25 damaged vessels were also observed. All operators have paused activity as they require vessel repairs and engine refurbishment / replacement. Resultant tourism industry seafood supplies, provisioning of supplies to yachts and charters, and water-based tours and activities have been halted. **At least 80% of all boats were wooden and uninsured.** Marcus Wilson, President of the Water Taxi Association, indicated the Association is not as strong or active as it should. It was also noted that there is need for **regulations and standardising water taxi operations** across the Grenadine islands. Damage is estimated in the range of US\$10,000 per vessel.
- **Sustainable Grenadines Inc (Sus Gren)** had its buildings and other access facilities completely destroyed. Damage is estimated at US \$700, 000.

- **Tentuna Eco Resort**, Chatam Bay was severely damaged and all 5 villas completely destroyed.
- **R & C Quality Bar and Guesthouse** sustained moderate damage to its roof and room furnishings. Proprietor Rondell Weeks shared that his property had a total of 5 rooms, and that he had made temporary repairs to his roof to help make the property inhabitable in the short term. The Guest House is currently serving as a temporary shelter providing free room and board for local families, with 4 out of 5 rooms in a usable condition. The last room is expected to return to circulation pending additional temporary roof repairs in the short term. Damage is estimated at US\$25,000.
- **David's Beach Hotel** received severe damage and is in need of refurbishment. Damage is estimated at US\$300,000.
- **Sparrow's Beach Club** was largely destroyed with significant damage to all buildings and facilities. Damage is estimated at US\$150,000.
- **General tourism services** were seen to include beach barbeques, yacht provisioning, dive supplies, and tour guiding, all of which have ceased at least in the short to medium term. The economic costs of these curtailed activities will be difficult to fully grasp, but moderate business losses are estimated upwards of US\$3 Million with more than 300 displaced industry employees.

### Union Island – Tourism Assets Impact Snapshot

Entity	Tourism Classification	Scale of Damage	Damage Estimate	Employees Affected	Special Considerations
<b>Tobago Cays Marine Park (Office + Facilities)</b>	Sites and Attractions	Moderate	US \$250,000	24	Marine damage assessments still pending as no vessels are available
<b>Hugh Mulzac Square</b>	Sites and Attractions	Destroyed	US \$37,000	Unknown	None
<b>Tourist Information Centre</b>	Tourism Services	Moderate	US \$50,000	9	None
<b>Clifton Market</b>	Food and Beverage + Accommodation	Severe - Destroyed	US\$2 Million	100+	Businesses were largely uninsured
<b>Union Island Environmental Alliance Facilities</b>	Tourism Services	Severe - Destroyed	US \$90,000	9	Small level of insurance coverage with settlement being negotiated
<b>Union Island Airport</b>	Transport	Moderate	US \$75,000	Unknown	Closed to commercial traffic and serving as the hub for humanitarian relief
<b>Anchorage Hotel</b>	Accommodation	Destroyed	Upwards of US 1 Million	Unknown	None
<b>JT Pro Centre Kite Surfing School</b>	Tourism Services	Destroyed	US 1 Million	15 - 20	May not reopen due to scale of damage and changes to optimal natural environment
<b>Bougainvilla Hotel</b>	Accommodation	Severe	US \$250,000	20	A current community shelter and operational base for World Central Kitchen
<b>Happy Island</b>	Food and Beverage	Severe	US 100,000	Unknown	No site visit – Structure appeared severely damaged
<b>Richmond Bay Recreation Park</b>	Sites and Attractions	Destroyed	US \$30,000	Unknown	None

<b>Richmond Bay Mangrove and Belmont Salt Pond</b>	Sites and Attractions	Moderate	US \$10,000	Unknown	Mangroves are fish nurseries and the salt is used locally and for export
<b>Union Island Water Taxis and Fishing Vessels</b>	Transport + Tourism Services	Severe - Destroyed	US \$280,000 +/-	100+	A critical aspect of tourism Services with many operators lacking insurance
<b>R &amp; C Quality Bar and Guesthouse</b>	Accommodation	Moderate	US \$25,000	At least 2	Currently operating as a shelter with free room and board for local families.
<b>Sustainable Grenadines Inc. (Sus Gren)</b>	Sites and Attractions	Destroyed	US \$700,000	At least 4	The facilities and access bridge destroyed, and road blocked with debris
<b>David's Beach Hotel</b>	Accommodation	Severe	US \$300,000	Unknown	None
<b>Sparrow's Beach Club</b>	Food and Beverage	Destroyed	US \$150,000	Unknown	None
<b>Tentuna Eco Resort</b>	Accommodation	Severe-Destroyed	US\$180,00	Unknown	Site visit not possible as area blocked
<b>General tourism services</b>	Tourism Services	Destroyed	Upwards of US 3 Million	100+	Most businesses don't have insurance coverage
<b>Total Estimated Damage</b>	<b>USD 9.5 MILLION XCD 24,300 MILLION</b>			<b>500+ Employees Estimated</b>	



**Downtown Commercial Area**



**Hugh Mulzac Square and Clifton Market**



**Union Island Airport**



**Tobago Cays Marine Park Office Building**



**Happy Island Bar and Restaurant**



**Damaged Water Taxis**

## Mayreau

Mayreau is the smallest inhabited island of the Grenadines of approximately 1½ square miles. With a population of 318, residents in Mayreau are primarily engaged in fishing and tourism with approximately 60 community members working as both fishermen and water-taxi and/or tours operators, servicing yachts and other vessels visiting the Tobago Cays. The tourism supply in Mayreau consists of small beach bars and restaurants in Salt Whistle Bay a popular beach and tourist hub, and Saline Bay, the main port of entry and cruise ship berth. Some of the main hotels include Mayreau Beach Club and Villas; Trade Winds Resort, Salt Whistle Bay Retreat Hotel, and the new Windward Mayreau Resort. Notable attractions include, the Mayreau Catholic Church with its iconic stone work dating back hundreds of years old to 1930.

The eastern side of Mayreau is demarcated within the protected boundaries of the Tobago Cays Marine Park. This area boasts several snorkeling and dive sites, including the Mayreau Gardens Reef, the Mopian Reef, and the historic Puruni Wreck, a 140-foot-long English ship that sank in 1918. The island also features the Mayreau salt pond, popular for salt picking, and a dry coastal forest, rich in avian diversity.

**Idyllic Salt Whistle Bay - Before Beryl**



**Salt Whistle Bay - After Beryl**



All above ground tourism assets and related businesses were impacted, ranging from Severely Damaged to Completely Destroyed. Underwater attractions and reefs were yet to be assessed at the time of the assessment. Businesses estimated that rebuilding and resumption of operations would take at least a year. There were concerns over loss of livelihoods and long-term reduction in income flows, in particular for the water taxi operators, restaurants, bars and various other MSMEs who by all accounts were uninsured. Electricity supply across the island has been lost and the need for alternative energy sources was highlighted as a critical need. As it relates to damage assessment, the following were observed:

- **Boats:** 34 boats were visible and salvaged in the Saline Bay entry port; 7 lay damaged in Salt Whistle Bay. It was reported that 15 boats were saved however not all functional/operational.
- **Saline Bay:** There were 5 Beach Bars and Restaurants - 4 were completely destroyed and 1 partially. The pier which functions as both a ferry and cruise ship berth had minor damaged.
- **Salt Whistle Bay:** There were 6 beach front bars and restaurants, which were all destroyed.
- **Accommodations:** Approximately 5 private homes function as visitor accommodation facilities. All habitable dwellings were however occupied by locals and being used as shelters.
- **Ancillary Services:** The 4 main Supermarkets all sustained damage. Notably across the island there were only 6 buildings with roofs undamaged.
- **Land-Based Attractions:** There was significant damage to the Salt Pond, Mangrove and Dry Coastal Forest, which are attractions for salt picking, bird watching and tourism. The Mayreau Catholic Church was also severely damaged and parts of the roof collapsed.

- **We Are Mayreau:** Marion Isaacs, Founder of this non-profit community-based organization, indicated, the Community Centre was severely damaged, Office and Dive equipment were looted, and the Boat used for conservation activities and tours was destroyed. The organization plays a key role in community education and training, supporting marine and terrestrial conservation efforts, including coral reef restoration, and also offers tours to visitors. It was indicated that a functional boat and dive gear are urgently needed to conduct assessments of dive sites and the coral nursery.

### Mayreau Tourism Assets Impact Snapshot

Entity	Tourism Classification	Scale of Damage	Damage Estimate	Employees Affected	Special Considerations
Tamarind Tree Restaurant and Beach Bar	Food and Beverage	Severe Damaged	US\$20,000	5	Owned by a local couple who are uninsured and need building materials, help for proper business set-up etc.
We are Mayreau	Tourism Services	Severe Damaged	US\$150,000	12	Boat and dive equipment urgently needed as well as building materials.
MSME's: 34 Bars and Restaurants across the island	Food and Beverage	Severe Damaged or Destroyed	US\$200,000	90	Popular spots Destroyed: D View sports bar Lolos Restaurant Jan Restaurant The Ranch Escapade
Windward Mayreau Resort	Accommodation	Minor Damage	-	-	Still under construction
Dennis Hideaway	Accommodation	Severe Damaged	US\$50,000	8	Significant roof damage
Boat and Water Taxi Operators	Tourism Services	Severe Damaged or Destroyed	US\$180,000	35	Engines range from US\$1,000 to 20,000 and up
<b>Total Estimated Damage</b>	<b>USD 600,000 XCD 1,620, 000</b>			<b>150+ Employees Estimated</b>	

**We are Mayreau – Damaged Boat in Salt Whistle Bay**



**Saline Bay – Damaged Boats, Bars and Restaurants**



**Mayreau Catholic Church - Before Beryl**



**Mayreau Catholic Church - After Beryl**





## Canouan

'Canouan' is derived from the Arawak word for 'turtle' and is famous for its resident red-footed tortoises. The island is known for its beaches, including Grand Bay Beach near the main town of Charlestown, Friendship Bay, located on the southern side of the island and Glossy Bay with calm waters and views of the southern Grenadines. With approximately 4000 residents, Canouan boasts several high-end resorts, a Marina, an Airport with a jetport, and a Ferry Terminal. Hurricane impacts across the island ranged from minor to moderate as follows:

- **Canouan Airport:** Sustained minor damage to the roof and it is currently closed to commercial traffic;
- **Soho Beach House:** The Assistant General Manager of this 40-room hotel in Glossy Bay was met on site, and indicated there were minor damages to buildings and landscaping. Clean-up and repairs are ongoing, with the aim of reopening in November or December 2024, in time for the peak tourist season.
- **Sandy Lane Yacht Club:** This exclusive yacht club in Glossy Bay comprises 18 high-end residences, 4 VIP villas, and a marina, all of which sustained moderate overall damage. The General Manager, who was met on site, reported 75% roof damage to buildings, sunken boats in the marina, and landscape damage, including fallen trees and debris. Reopening was estimated at 6 weeks for the Marina, and 4 months was projected for the Residences up to November or December 2024.
- **Northern High-end Resorts:** The northern half of the island, approx. 1200 acres, houses the privately owned Canouan Estate and Mandarin Oriental, including an 8-hole championship golf course. Due to time constraints, the team was unable to visit these resorts, however an update was provided by the Asst General Manager of the Soho Beach House, who reported that impacts were more severe due to the Atlantic Trade Winds in the north. Notably, all three properties are under the same management group.
- **Grand Bay:** The downtown residential area on the island was the location for numerous guest houses, holiday apartments, restaurants, bars and tour operators. Businesses sustained minor to moderate damage, and clean-up was evident and on-going.
- **Boat, Tour and Water-Taxi Operators:** Canouan has a higher-end tourism value chain and more affluent stakeholders. Notably, operators had fiberglass boats, catamarans and other pleasure craft, which were generally insured. This was in direct contrast to operators from Mayreau and Union Island who had mainly wooden boats, which did not qualify for insurance. Beryl's impacts were not as severe on the island and so these vessels generally sustainable only minor to moderate damage.

## Canouan Tourism Assets Impact Snapshot

Entity	Tourism Classification	Scale of Damage	Damage Estimate	Employees Affected	Special Considerations
<b>Canouan Airport</b>	Transport	Minor	US\$50,000	Unknown	Only open for relief flights
<b>Soho Beach House</b>	Accommodation	Minor	US\$100,000	88	Assessment ongoing and like most properties aim for Nov/Dec, 2024 reopening
<b>Sandy Lane Yacht Club</b>	Accommodation + Tourism Services	Moderate	US\$3 Million +	138	Many workers displaced and indicated willingness to assist rebuilding efforts
<b>Canouan Estate and Mandarin Oriental</b>	Accommodation	Moderate to Severe	Unknown	Unknown	Aerial view - No site visit
<b>Grand Bay Downtown Area</b>	Accommodation + Food and Beverage	Moderate to Severe	US\$50,000	Unknown	Many small MSMEs thus entrepreneurs and workers displaced
<b>Total Estimated Damage</b>	<b>USD \$3.2 MILLION XCD \$8.6 MILLION</b>			<b>200+ Employees Estimated</b>	

**Canouan Airport Terminal Building**



**Canouan Airport Tower**



**Canouan Ferry Waiting Area**



**Sea Grape Beach Club, Restaurant and Bar**



## **Bequia**

Bequia is the largest and most northerly Grenadine Island, with an economy largely dependent on tourism. The island has an approximate population of 4,500 persons and is a well-known laid back sun, sea and sand destination. Bequia is iconic for its villa-styled accommodations and is considered a yachter's playground as it is popular with high-income visitors, expatriates and locals seeking to escape the mainland for an upscale staycation. Notable tourism experiences in Bequia include the annual Easter Regatta and Music Festival.

Given its more northerly location, the island escaped the brunt of the impacts of Hurricane Beryl, but minor to moderate damage was observed across tourism industry assets. Joining the assessment team was Mrs. Kimisha Bailey-Browne, Quality Assurance Officer, SVGTA, and impacts to leading tourism businesses were as follows:

- **Bequia Airport** suffered an accumulation of debris on the runway which had largely been cleared, as well as the loss of several perimeter lighting fixtures. Overall, the facility received minor levels of damage, remains closed, except for humanitarian relief activities. Damage is estimated at US \$7,000.
- **Bequia Beach Hotel** had in-house guests who opted to remain on property at the time of the hurricane. Guests were immediately evacuated post Hurricane Beryl and operations closed. The property suffered moderate damage and is planning to reopen the first week of August, and awaiting insurance adjusters.
- **Firefly Estate** offering accommodation, estate tours, golf, a restaurant and bar, sustained minor roof damage to its rental cottage, loss of signage and moderate landscape deterioration due to uprooted and fallen trees. Damage was also reported to the bar and restaurant roof, gazebo, pool furniture, and property fencing, as well as the loss of a full inventory of food and wines due to power outage. Owner Liz Clayton noted that the 6-bedroom property (4 rooms + a 2-bedroom cottage) is currently closed, has no internet or electricity. All employees have been temporarily furloughed, except 2 gardeners and the front office manager who has been assisting with clean up. Damage was estimated at US\$50,000, and a 2-month goal has been set for property reopening.
- **Jack's Beach Bar** reported minor damage to its deck area with the loss of sun-shade canopies. Moderate damage was also observed to the restaurant jetty and nearby boardwalk. The restaurant has completed the replacement of lost roof canopies and is reopened for business with a staff complement of 13 employees. However the Jetty was unserviceable. Damage was estimated at US\$25,000.

- The **Old Hegg Turtle Sanctuary** a key attraction that supports tourism and conservation was completely destroyed given its proximity to the sea and wooden construction. By all accounts this small family owned operation would have been uninsured. Damage is estimated at US\$55, 000.



- **The French House** sustained moderate damage primarily to its roof, windows and upstairs gazebo areas, with related water intrusion into rooms and porch areas. The small 4-room property also suffered moderate landscape damage, lost its solar panels and communication connectivity, and remains without these amenities, though such have already been restored to most of the surrounding community. The property is closed for business at this time however its 5 permanent staff are still on payroll. Additional persons have also been hired to assist with clean-up. The General Manager and staff are using the facilities as a shelter, and shared that the use of a temporary portable generator and a rainwater catchment system ensure a moderate level of normalcy. The property has been up for sale, and plans to reopen by November 2024. Insurance claim processes have commenced to assist with the rehabilitation efforts.
- **The Liming** suffered moderate hurricane impacts with damage concentrated on its perimeter facilities like piers, jetties, sea walls, lookout decks and a property access road. The hotel also sustained damage to its 2 Gazebos, landscaping trees, and contamination of its pool with mud and silt. Property loss at the restaurant area was most pronounced, with gutted and sunken decks, blown-out windows, and destroyed piers and jetties. General Manager Arron Gwinnett reported likely floodwater damage to restaurant electrical equipment and a planned inspection of the main gas line given the potential hazard. This 12- room property is currently closed, and of its staff complement of 30 persons, the maintenance, landscaping and housekeeping staff are still employed to assist with clean-up, other staff members have been reassigned to sister properties, Plantation and Blue Lagoon. To date US\$25,000 was refunded in cancellations and US\$140,000 was due to suppliers although all food and beverage stock had to be disposed. Damage was estimated at a cost of US\$1 Million and awaiting insurance adjusters.



Top: Damaged deck and pier at The Liming  
 Bottom: Part of Damaged Roof at The French House

Top: Damage to Bequia Broad Walk Bottom:  
 Damage to Bequia Beach Hotel



### Bequia Tourism Assets Impact Snapshot

Entity	Tourism Classification	Scale of Damage	Damage Estimate	Employees Affected	Special Considerations
<b>Bequia Airport</b>	Transportation	Minor	US \$7,000	Unknown	None
<b>Bequia Beach Hotel</b>	Accommodation	Moderate	US \$500,000	50	Insurance claim initiated and August reopening
<b>The French House</b>	Accommodation	Moderate	US \$37,000	5	Insurance claim initiated and intends to reopen
<b>Old Hegg Turtle Sanctuary</b>	Sites and Attractions	Destroyed	US \$25, 000	5	An assessment of the impact on turtle population will be useful to inform the value of the sanctuary
<b>Firefly Estate</b>	Accommodation	Minor	US \$50,000	5	Insurance claim initiated 2-month goal for reopening
<b>The Liming</b>	Accommodation	Moderate	US 1 Million	20	Insurance claim initiated 2-month goal for reopening
<b>Jack's Beach Bar</b>	Food and Beverage	Minor	US \$15,000	5	Reopened for business.
<b>Total Estimated Damage</b>	<b>USD 1.6 MILLION XCD 4.3 MILLION</b>			<b>90+ Employees Estimated</b>	

## Mainland Saint Vincent

The island of Saint Vincent, is the commercial capital and ‘mainland’ of Saint Vincent and Grenadines. It offers an array of traditional tourism assets and visitor experiences. Given the island’s most northerly location within the country, minimal tourism industry damage was observed, with visited facilities expected to be fully functional after primary clean-up is completed. Assessment efforts on the mainland focused on natural sites of cultural and heritage value and included the Botanical Gardens, Layou Petroglyph Park, Walibou Heritage Park, Mt. Wynne Beach, and Villa Beach Facility. For the assessment of damage and needs on the mainland, the team of assessors was joined by: Mr. Sternley Walker, Site Service Supervisor, National Parks Rivers and Beaches Authority; Mrs Jewelene Charles-Scott - Communications Manager, Ministry of Tourism; Mrs. Faylene King, Director of Tourism, Ministry of Tourism. Specific findings on mainland Saint Vincent were as follows:

- **Botanical Gardens** suffered moderate damage, constituted by the loss of an estimated 5-10% of its foliage, including the uprooting of larger and more stately vegetation, and destruction of gazebos. Damage is also expected to the roof of the Craft Shop and Cafeteria building which was stuck by a fallen tree that is pending removal. According to Site Services Supervisor, Sternly Walker, the Gardens is currently closed and has a staff in excess of 30 persons that are working to restore normalcy to the operations. Mr. Walker emphasised that clean up and replanting efforts are on-going and suggested that donations of new saplings would be welcome including from neighbouring islands, to replace lost flora. Assistance is required through the provision of chainsaws to help manage fallen trees, and rebuilding of gazebos, as the park is targeted to reopen for the tourist season in November 2024.
- **Layou Petroglyph Park** sustained minor damage, primarily to surrounding vegetation and work is on- going to clear fallen debris. While there was no infrastructural damage, there is noted opportunity for product enhancements like the addition of signage/interpretation, a cafeteria, activities that utilise the river and experience-type transportation that allow for a better appreciation of the more rugged access roads and surrounding terrain. The park has 2 employees and it is suggested that at least one additional employee who could assist with suggested product enhancements. The park is managed by a Community Group, and various needs were expressed including repair to the access road and uniforms. Currently the entry fee stands at **XCD\$5 per person (for local and foreign visitors), and should be increased**, which will assist in meeting management and maintenance costs. Travel philanthropy is also untapped.
- **Walibou Heritage Park** also managed by the Barrouallie Tourism and Heritage Association, suffered minor damage to trees foliage and is operational with clean-up ongoing. The park is currently closed but can reopen shortly. Assistance through providing training in experience development, support for marketing and to enhance local and visitor awareness is recommended, as part of national programme to support community-based and heritage tourism. Clean-up costs were estimated at US\$10,000.
- **Mt. Wynne Beach**, had notable beach erosion with the significant loss of shoreline, unearthing of rocks, tree roots and fallen trees creating debris and beach hazards. Debris removal and management is on- going, and the beach remains open for enjoyment. Clean-up costs are estimated at US\$20,000 with further resources required for beach refurbishment at the discretion of the tourism authorities.
- **Villa Beach Facility** remains functional and open to the public though the facility suffered minor damage to its perimeter fencing and the boardwalk. Damage is estimated at US\$10,000.

- **Recreational Parks** sustained minimal damage, however most were closed to facilitate clean-up of debris and erosion and to effectuate needed repairs. Only 4 sites had been reopened to the public at the time of the assessment. Some of the more popular parks mentioned included Owia Salt Pond, La Soufriere Forest Cross Country Trail; Black Point Heritage and Recreational Park and Rawacou Recreational Park, among others.

### Mainland Saint Vincent Tourism Assets Impact Snapshot

Entity	Tourism Classification	Scale of Damage	Damage Estimate	Employees Affected	Special Considerations
Botanical Gardens	Sites and Attractions	US \$25,000	Moderate	30+	Greater tree management practices would improve damage resilience levels
Layou Petroglyph Park	Sites and Attractions	US\$10,000	Minor	2	There is good potential for tourism product extension
Walibou Heritage Park	Sites and Attractions	US \$10,000	Minor	2	Support needed for product enhancement and marketing
Mt. Wynne Beach	Sites and Attractions	US \$20,000	Moderate	2	The popularity of the beach makes it an ideal candidate for shoreline refurbishment
Villa Beach Facility	Sites and Attractions	US \$10,000	Minor	Unknown	The fencing foundation can be reinforced
Recreational Parks		US \$40,000	Minor	Unknown	No site visit as many closed for clean-up
<b>Total Estimated Damage</b>	<b>USD \$115,000 XCD \$310,500</b>			<b>40+ Employees Estimated</b>	

Damaged and uprooted Trees at Botanic Gardens



Fallen Tree on Visitor Centre at Botanic Gardens



**Layou Petroglyph Park**



**Mt. Wynne Beach**



**Villa Beach Facility**





## **Palm Island**

**Before Beryl**



**After Beryl**



Palm Island is an eco-friendly all-inclusive private island resort. The luxury 135-acre property offers a range of amenities, activities, dining options and accommodations. The award winning resort comprises 40 guest room cottages and suites, 4 villas and private residences for extended stays. Facilities include a fitness centre and spa, library, art gallery, several bars and restaurants, a tennis court, and a small golf course. An expansive swimming pool and 5 beaches adorn the landscape. The resort also has two jetties, a boutique, gift shop and various buildings for admin services.

During the assessment period, surging tides and damaged jetties made it unsafe to dock at Palm Island, therefore impacts were observed offshore. Of the two jetties only one remained which was damaged, and buildings, accommodations and facilities all appeared to be severely damaged with significant debris on the beach.

### **Palm Island Resort Tourism Assets Impact Snapshot**

<b>Entity</b>	<b>Tourism Classification</b>	<b>Scale of Damage</b>	<b>Damage Estimate</b>	<b>Employees Affected</b>	<b>Special Considerations</b>
<b>Palm Island Resort</b>	Accommodation	Severe - Destroyed	<b>US\$4 million +</b>	<b>100 +</b>	Access currently limited to helicopter or beach

## **Petit St. Vincent**

Petit St. Vincent markets itself as a luxurious eco-retreat. Featured in top tier magazines such as Vogue, Forbes and Conde Nast, the private island resort sprawls across 115 acres of lush tropical vegetation. The resort has a mix of 22 one bedroom cottages and two bedroom beach villas, and is surrounded by 2 miles of white-sand beaches. The resort is all-inclusive and comprises two restaurants, yoga pavilions, a Boutique/gift shop, a spa and wellness centre, and various land and water sports.

The General Manager Matt Semark and Assistant General Manager were available during the site visit, who indicated damages to the property as follows:

- Of the 22 cottages, all except 5 were completely damaged;
- There was severe landscape damage, which required major clean-up;
- The spa and spa rooms were demolished;
- Reception area building and equipment were severely damaged;
- The main dining facilities, kitchen and bar were completely destroyed;
- The resort had its own boat, they stashed in the Carriacou mangrove, and it sustained minor damage.
- There were 3 docks and only the staff and loading docks were left.
- The resort employs on average 87 persons and approx 60 were employed at time of impact.
- A team of 10 have been kept on to support clean-work.

Generally the resort went into seasonal renovation closure from July to 1 November and the last guests has left prior to the hurricane impact. Damage assessments were ongoing, and estimated to cost several million US dollars for rehabilitation. The Management team are working towards a small scale reopening by November 1.

### **Petit St. Vincent Island Resort Tourism Assets Impact Snapshot**

<b>Entity</b>	<b>Tourism Classification</b>	<b>Scale of Damage</b>	<b>Damage Estimate</b>	<b>Employees Affected</b>	<b>Special Considerations</b>
<b>Petit St. Vincent Resort</b>	Accommodation	Severe	US\$3 million +	85	Access currently limited to helicopter or beach

**Petit St. Vincent Resort - Before Beryl**



**Petit St. Vincent - After Beryl**



## **Young Island Resort**

Just 200 yards from St. Vincent’s mainland is the iconic Young Island Resort. With 13-acres of green landscapes and natural flora, this private island resort contains 29 cottages, an outdoor swimming pool, garden, restaurant and is designated a National Wildlife Sanctuary. The resort also features a private beach area with a floating bar.

The General Manager, Ms. Bianca Porter facilitated the damage assessment, and indicated as follows:

- There were 7 in-house guests at the time of hurricane impact, who opted to remain on property. The resort kept a skeleton staff of 7 employees for support services;
- Post hurricane, the guests were evacuated and the resort closed on 7 July. There was minimal damage to accommodation stock and staff quarters;
- The iconic Coconut bar (floating Bar) was completely destroyed, and there was significant debris and sand displacement to surroundings. In this regard, the need for sea wall defence and perimeter wall reinforcement were emphasised to mitigate storm surge.
- Immediate priority is a fully operational boat and a jetty for access. The two jetties to access the resort have been damaged badly and need extensive rehabilitation. Of the two boats owned by the property, one was on dry dock and damaged, the other was moored and disappeared.
- To date the property has refunded US\$24,000 in booking cancellations for July;
- Estimated repair cost of XCD \$1.5 million for repairs, and awaiting insurance adjusters.
- The property aims was to reopen on August 7, and restoration of internet service is a high priority to expedite business resumption and ensure seamless communication and operations.

### **Young Island Resort Tourism Assets Impact Snapshot**

<b>Entity</b>	<b>Tourism Classification</b>	<b>Scale of Damage</b>	<b>Damage Estimate</b>	<b>Employees Affected</b>	<b>Special Considerations</b>
<b>Young Island Resort</b>	Accommodation	Moderate	<b>US\$555,000</b> <b>XCD\$ 1,500,000</b>	<b>55</b>	Access currently limited as boat and docks compromised

**Young Island Resort - Before Beryl**



**Young Island Resort - After Beryl**



**Floating Coconut Bar - Before Beryl**



**Floating Coconut Bar - After Beryl**



## **14.6 DISCUSSION ON THE VALIDATION AND CONFIRMATION OF THE DATA**

Given the blended approach to data collection; the combination of site visits, visual inspection of sites and stakeholder interviews is felt to have resulted in reasonable levels of data accuracy. Validation is further corroborated given the profile and career experience of participating assessors as technical experts in Tourism Development, as well as the informed position of impacted entrepreneurs, owners and business managers that provided direct accounts of losses sustained. Damage estimates were deduced with consideration to reasonable investments that would support core resumption of tourism livelihood activity at a visitor safe level.

Data collection and validation should continue, facilitated by established mechanisms at the Ministry of Tourism and Tourism Authority.

### 14.6.1 CHALLENGES

- a. An inability to identify and engage MSME tourism operators that are not registered with the Ministry of Tourism or Tourism Authority may leave subsets of the sector lagging behind recovery efforts;
- b. Limited transportation options will curtail both visitor access to the Grenadines and resultant expenditures that support tourism operator livelihoods;
- c. Loss of critical amenities like safe drinking water, electricity, internet communications, and cellular service will deter a cross-section of potential visitors;
- d. On-going closure/inaccessibility of popular sites like the Tobago Cays, Chatam Forest in Union Island and the Mayreau Salt Pond, is likely to cause shrinkage in tourism revenue flows and exacerbate industry unemployment levels;
- e. Many bar and restaurant establishments were fully destroyed and may not reopen given their proximity to the coast, wooden construction and lack of insurance coverage. The cessation of these MSME services will make it difficult to provide reliable food and other provisions to visitors, including in the short term humanitarian volunteers, Vincentian residents and diaspora;
- f. Many boating vessels are of wooden construction, damaged beyond repair and lacked insurance. As such, shortages in seafood like fish, conch and lobster as delicacies for visitors to less- affected islands is likely to constrain visitor spending and lower the overall tourism experience;
- g. Inconsistent/weak messaging, as well as communication lags or mishaps could have tremendous negative ripple effects on the tourism market positioning of Saint Vincent and the Grenadines;
- h. The monitoring of employee stimulus payments and employer recovery incentives could prove difficult to track and may encourage abuse if resources are not dedicated to the design and management of a digital aid distribution system.

## 14.7 RECOMMENDATIONS

### 14.7.1 Short Term/Immediate (0 – 12 months)

- Install temporary water desalination facilities in Union Island, Mayreau and Canouan to support basic human life and some semblance of livelihood normalcy in tourism and related industries.
- Establish a **digital registration and monitoring system** for all recovery aid/effort flowing into the Grenadines, inclusive of local, regional and international agencies operating on the ground. This would allow for a more efficacious and coordinated deployment of support, possibly commencing with the most vulnerable.
- Identify and establish a network of **Local Tourism Liaisons (LTLs)** on each affected island to serve as coordination points for verified tourism recovery information and action. This could be supported by a WhatsApp Group to help LTLs design and articulate common recovery goals, as well as to manage verified information on critical needs, recovery progress, and desired and operational barter arrangements among industry stakeholders.
- Coordinate and offer assistance with boat repairs, and the replacement of boat engines for water taxi operators/fishermen to help restart major livelihoods in fishing and tourism in the Grenadines.
- Prioritise **energy security** for the severely affected islands to help drive disaster response, tourism recovery, and life normalisation. Efforts could include:
  - introducing solar generation and storage capacity for households and MSME tourism operators;
  - Establishing controlled access fuel farms to facilitate on-island vehicular transportation, recovery equipment operation, chilled food storage, and food preparation.
- Consider the design and deployment of a **stimulus package** for displaced tourism workers, as well as **concessions/incentives** for MSME tourism operators. Support could be designed as conditional upon meeting set criteria, which may include the mutual contribution of time, labour, effort, and facilities to aid wider industry recovery. This would encourage both tangible and intangible returns on investment by the state and other humanitarian agencies.
- Develop and maintain a **database of vacation rental and Airbnb properties** to factor into communication and visitor management protocols. Equally, as part of follow-up assessments it will be important to determine the number of hotels and vacation rentals, which are serviceable to host guests, considering that relief and aid workers will continue to need accommodation.

- Restart the transportation subsector as the backbone of recovery facilitation and tourism livelihood reactivation. Touch points for action should be multifaceted, with some consideration for setting a universal transportation fare for each segment in order to spur income generation:
  - i. **water taxis** to allow the critical human movement between the Grenadines for locals and volunteers as first-line visitors;
  - ii. **ferry services** to help move heavy equipment, food supplies, fuel and water resources;
  - iii. **garbage barges** for waste collection, sorting, accumulation, and eventual disposal, e.g. through the export of scrap iron for smelting;
  - iv. **heavy equipment** for driving clean-up and debris removal on affected islands.
  - v. Expedite **repairs to pier facilities and the reactivation of cruise berthing** on mainland Saint Vincent and Bequia. This will help maintain global tourism marketplace activity, as well as, local tourism livelihoods and revenue inflows, given lost income from the Grenadines.
  - vi. Prioritise the stable supply of **gasoline and portable generators** for use at tourism businesses. This would support the temporary resumption of business, even if on a limited scale, and could be particularly useful for accommodation establishments, which through mutual exchange, could help drive domestic tourism through the provision of temporary shelter to displaced individuals.
  - vii. Encourage and coordinate the reactivation of traditional **yacht provisioning** mechanisms in less affected islands like Mainland St. Vincent, Bequia, and Canouan, and publish a succinct guide on the availability and access procedures for relocated facilities. This will be critical to signalling that the country is still ‘opened for tourism business, and would help protect the country’s market share and reputation as a yachter’s paradise.
  - viii. Establish a **Tourism Emergency Management Committee (TEMC)** to provide broad oversight and coordination of crisis situations that impact the local tourism industry. The TEMC could become the first line of defence for industry response, and would lead visitor management processes, including, but not limited to guest quantification, location tracking, evacuations and housing, whether before and or after impact. Assistance for the establishment of a TEMC is available through the Caribbean Tourism Organisation.
  - ix. Reopen the **airports in Bequia and Canouan** to facilitate tourism activity for the upcoming tourism season. This should be part of a wider strategy to protect the country’s tourism market share through both targeted messaging that Saint Vincent and the Grenadines is ‘open for business’, as well as the promotion of experiences in more moderately damaged islands as ‘comparable alternatives’ that still make visiting the destination worthwhile. Unified and consistent messaging will be key.
  - x. Leverage rostered **Overseas Marketing Agencies** to conduct on-going market research on visitor perceptions of destination Saint Vincent and the Grenadines post Hurricane Beryl. This could help inform any national communication and messaging strategy.
  - xi. Launch a **willingness to stay/visit competition** to draw attention to the

destination while researching consumer views on negotiable versus non-negotiable needs and expectations of typical/potential SVG visitors.

- xii. Media to visit and/or contribute to the rebuilding efforts.

#### 14.7.2 Medium Term (1 – 3 years)

- Encourage the pursuit of **business and liability insurance** for MSME tourism operators, to include the possible negotiation of an umbrella parametric insurance policy with the Caribbean Catastrophe Risk Insurance Facility (CCRIF). This will add a layer of resilience to MSME operations and could aid in the provision of recovery resources during crises.
- Invest in the strengthening of **Community-Based Tourism Groups**. For example, tourism administrators could design and implement a system for community groups to co-manage cultural and heritage sites located in their villages. This could empower individuals to take greater ownership for the upkeep of these sites, leverage such assets for livelihood incomes, and contribute sweat equity to the upkeep and recovery of these assets in times of disaster/crisis.
- Develop initiatives to **promote/encourage entrepreneurship**, given loss of employment in the short to medium term. In particular displaced workers and unemployed youth can be trained as ‘guides’ and community ambassadors. Women and youth can also be hired for clean-up and beautification, and men to support the necessary reconstruction work.
- Develop and implement **tree management procedures** across national parks, beaches and historical sites to help curb overgrown foliage and minimise their potential to become dangerous missiles/debris. Such procedures could also lower the risk of damage to buildings and structures from falling trees and branches and would reduce the need for temporary closures at popular tourism sites.
- In the area of product development and product enhancement, activities such as sight-seeing tours, walking tours and facilitating day trips, would appeal to local Grenadians, visitors and members of the diaspora alike. It is also recommended to create **voluntourism packages**: volunteer tourism (voluntourism) initiatives which can support various aspects of the recovery and reconstruction efforts, working with diverse charity groups around the world.



### 14.7.3 Long Term (3 + years)

- Priority should be given to writing projects for **development grants** through for example the Green Climate Fund, UNESCO and the various nature based conservation organisations such as the Nature Conservancy etc. Innovative restoration and mitigation projects that offer an experiential component for tourists have the potential to become future attractions.
- There should be revisions to the **national building codes**, to include special criteria for tourism establishments and the strengthening of structured mechanisms for compliance monitoring. This is particularly applicable to wooden and older buildings with simple galvanise roofs, as these were seen to fare badly with the overall loss of sheeting, significant rafter damage and collapsed structures.
- Consideration could be given to the laying of **underground utility facilities** to support the prompt reactivation of livelihood activity and operational command centres after a crisis.
- There is need for an updated **Tourism Development Plan, Strategy** and established protocol for the tourism sector, including specific guidelines for managing foreign visitors in the event of a disaster. One recommendation is that a **Destination Stewardship Council/Committee** be established. Given the multi-sectoral and inter-connected nature of tourism, this council would facilitate more effective communication and collaboration between MOT, SVGTA and other relevant Ministries and Agencies involved in key ancillary sectors such as agriculture, fisheries, health, the environment, foreign affairs, and culture. The committee should convene for periodic updates and its members receive training in disaster risk management and response protocols.
- As part of preparations for an impending Natural Disaster, **radio announcements** should be made to communicate with the National Hotel and Tourism Association (NHTA) and other tourism stakeholders. All accommodation providers should be required to provide to the NTO a list of registered guests who are foreign visitors, indicating their names nationality and some form of registration ID. This will allow tourism Authorities to have an accurate count before- hand of all foreign nationals inclusive of their location and support evacuation as necessary. Additionally accommodation providers should be clearly advised of ‘what to do’ and who to contact following impact. Considering home/room rentals driven by Airbnb and such platforms, the MOT/SVGTA may consider mandating all such properties be **specially registered**.

## 14.8 IMMEDIATE NEEDS LIST/REQUIREMENTS

- a. An **Aid Registry segmented by sectors**, to better coordinate supplies, agencies and support flowing into affected islands and the NEOC.
- b. Boat repair services, boat engine repair services, and replacement boat engines to restart water taxi and fishing operations. Similarly, streamlined processes for **yacht provisioning services**.
- c. Contributory **employment stimulus packages** that cushion the economic impact of tourism staff displacement, while securing access to a captive pool of human capital ranging from basic manual labour to technical skills.
- d. Water desalination capacity and solar or use of electrical generators to facilitate some semblance of normalcy in the severely affected territories of Union Island, Mayreau and Canouan.
- e. Roof repair materials and services for tourism operators to stimulate reconstruction and subsequent reactivation of commercial activity at physical locations like sites and attractions, accommodations, food and beverage establishments and air/sea ports.
- f. A synchronised **National Tourism Messaging Campaign** that promotes Saint Vincent and the Grenadines as ‘open for business and supporting recovery in affected territories’. The campaign should guide visitor interest towards high impact tourism activities.
- g. Jetty and pier repair services that support visitor access to less affected destinations is essential, and the resurgence of tourism livelihood activity in time for the start of the peak tourism season in November 2024.

## 14.9 FURTHER ASSESSMENTS REQUIRED/SUGGESTED

- a. A preliminary **Market Study on visitor perceptions** of destination Saint Vincent and the Grenadines, including safety and security and visitor appeal post-Hurricane Beryl is recommended. This should help inform any national communication and messaging strategy.
- b. Launch a **willingness to stay/visit survey** to better gauge negotiable versus non-negotiable needs and expectations of primary target markers top needs and amenities.
- c. Determine the feasibility of hosting cruise visitors in Canouan, Mayreau and Tobago Cays for the 2024/2025 Cruise Season.
- d. A survey of visitor views on negotiable versus non-negotiable **needs and expectations** of destination SVG in a **post-hurricane** environment.

## 14.10 CONCLUSION

Tourism recovery will be driven by decisive action which both enables tourism assets reactivation, as well as the careful management of visitor expectations for destination Saint Vincent and the Grenadines in a post-hurricane environment. Industry reactivation faces a long road for the particularly hard hit islands of Union Island, Mayreau, Palm Island, Petite Saint Vincent and Young Island, and this will demand a coordinated effort to ‘systematically reintroduce’ these destinations and associated tourism products to the available experience profile of the country.

A commitment to resilience through ongoing training and education in climate resilience, disaster risk reduction and management is highly recommended, and targeted to residents, tourism business and related sub-sectors in particular Fisheries, across St. Vincent and the Grenadines.

Clean-up, rebuilding, and recovery will take some time, requiring careful planning to build back better. It is estimated that the full resumption of tourism activities and restoration of livelihoods in the severely affected territories may take up to **24 months**. It is estimated that over **2,000** plus tourism entrepreneurs and employees across the various tourism sub-sectors have been affected.

Damage to the tourism sector across St. Vincent and the Grenadines from the impact of Hurricane Beryl is estimated to be approximately **XCD\$67,500 million (US\$25 million** at an exchange rate of 2.70), based on the assessed subsectors of tourism. It is, therefore, reasonable to extrapolate given the extensive and wide-ranging impact on infrastructure and livelihoods, that actual damages to the sector, including nature-based and cultural tourism assets, businesses and employees, supporting infrastructure, buildings, equipment, and facilities, would be double this amount, totaling an estimated **XCD\$135 million (US\$50 million)**.

## 15 ANNEX J – TELECOMMUNICATIONS NEEDS ASSESSMENT REPORT

### 15.1 Impacts Observed

#### 15.1.1 Physical Impacts

- a. In Union, 98% of the island's power lines along with many electrical poles, are down. A similar situation exists in Myreau and Canouan.
- b. The Cabinet of the DMR Repeater located at Jerome, near the NEMO Warehouse on Union has no top/roof and the cabinet doors are wide open. The resident repeater and three (3) x 12 Volt batteries are exposed to the éléments.
- c. The Tait DMR Base station which is housed in the NEMO Warehouse in Union is in good working condition however there appears to be no outdoor antenna attached.
- d. A number of Telecommunications masts and antennas attached to them appeared to be damaged however closer inspections will be required by the NEMO (where these are under their care) and the terrestrial service providers.

The NEMO telecommunications capability was also assessed :

- e. The HF System – The Antennas, Cables and connectors were faulty due to extended exposure to the elements. The build up of corrosion within each has caused a high level of resistance within the cables hence the high VSWR found when they were tested. This may have contributed to the decreased power output of the HF Radio. The ATU attached is faulty and not allowing for receipt or transmission of communication.
- f. The VHF system which is paired with the Tait DMR system was partially disrupted due to the damage incurred by the Repeater in Union. The system also has some installation faults which need to be rectified as a matter of urgency.
- g. The Transportable Mobile DMR Repeater system is not connecting to the larger Emergency Communications Network (ECN) and has a number of faults to be rectified.
- h. The Internet service is not consistent. The increased load in the NEMO has caused significant service disruptions.
- i. Satellite Communication between the NEMO and the affected islands is minimal with the agency owning one Satellite Phone
- j. VSAT/Satellite Internet devices are not currently owned by the agency.
- k. NEMO functionality generally is limited by the inconsistency of the internet service provided.

#### 15.1.2 Functional Impacts

- l. The lack of electrical power severely restricts the ability of the general populace, emergency services and telecommunications service providers to communicate between islands and agencies.
- m. The NEMO Telecommunications staff have confirmed that the Repeater at Jerome, on Union Island is not responding. This has severely impacted communications on the ECN to Union. Communication is intermittent with instances of Point to Point communication or communication through the Bequia repeater.

- n. The absence of an antenna for the Base Station radio at the NEMO Warehouse on Union will prevent communication from the Warehouse to the other islands and within the island.
- o. These antenna masts and the attached antennas are critical infrastructure for the terrestrial service providers and will affect all entities residing on the island which require Internet connectivity.
- p. The NEMO will be required to establish communication with the islands using as many forms of telecommunications as possible. i.e the CDRU will be equipped with HF communication, The NEMO should be able to effectively respond to communication via this means however, noting the issues mentioned, this will not be possible. The same can be said for the VHF & ECN.
- q. The intermittent Internet connectivity has severely impacted effective communication between NEMO and the populace leading to negative feedback on the Disaster Management effort, affected the coordination of relief and the general activities within the daily operation of the NEOC.
- r. The Sat Phone on loan to NEMO
- s. VSAT/Satellite Internet is not available to the NEMO at this time and this limits redundancy in the event that the few means of communication should fail.

## **15.2 Challenges**

This will have a major influence on operations within the Island and will need to be addressed prior to or during the conduct of relief operations

1. The lack of electrical power (whether battery, generator, electrical) severely limits the prolonged use of telecommunications systems.
2. In the absence of electrical power, generators.
3. The timely conduct of comprehensive inspection of the NEMO Warehouse Base Station, Antenna Masts and antennas by NEMO and Terrestrial Service Providers will be required.

## **15.3 Recommendations**

1. It is recommended that at least 2 x Heavy Duty Portable Generators be placed in secured areas on each island to support emergency telecommunications and other security and operational requirements.
2. It is also recommended that the DMR Repeater and batteries located near the NEMO Warehouse on Union be removed as a matter of urgency to avoid further damage to the equipment, vandalism or theft. Also, that the Repeater be replaced as soon as possible using a more suitable storage and possibly secure area i.e the NEMO Warehouse.
3. That an inspection of the NEMO Warehouse Tait DMR Base station with ref to its antenna be conducted as soon as possible. This base station is critical to the local operations on Union and to NEMO's Disaster operations in SVG.
4. Inspections be conducted on NEMO managed Antenna masts and antennas in the 3 islands to support the restoration of terrestrial communications in the shortest possible time.

#### **15.4 Immediate Needs List/Requirements**

1. Alternate Power sources – 2 x Large Generators (Diesel/Gas), 4 x Portable Solar Power Stations at least 3kw.
2. 2 x Replacement Tait DMR Repeaters for the ECN (1 – Jerome and the second as back-up).
3. 10 x Tait DMR Mobile VHF Antennas.
4. 4 x Replacement Antennas for the NEMO Warehouse at Union and Canouan.
5. 3 x HF Radio systems – inclusive of antennas, antenna cables and power supplies.
6. 6 x Starlink Devices
7. 2 x Satellite Phones
8. 1 x Reel of RG58 Antenna Cable
9. 30 x N-Type Male Connectors
10. 30 x N-type Female Connectors