

# **Enhanced Vulnerability Capacity Assessment (EVCA)**

for

## **SEA COWS BAY, TORTOLA, BRITISH VIRGIN ISLANDS**



**Community** : Sea Cows Bay, Tortola, British Virgin Islands  
**Assessment Period** : 19<sup>th</sup> to 31<sup>st</sup> August, 2019  
**Report Date** : 31<sup>st</sup> October, 2019

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## **1. ACKNOWLEDGEMENTS**

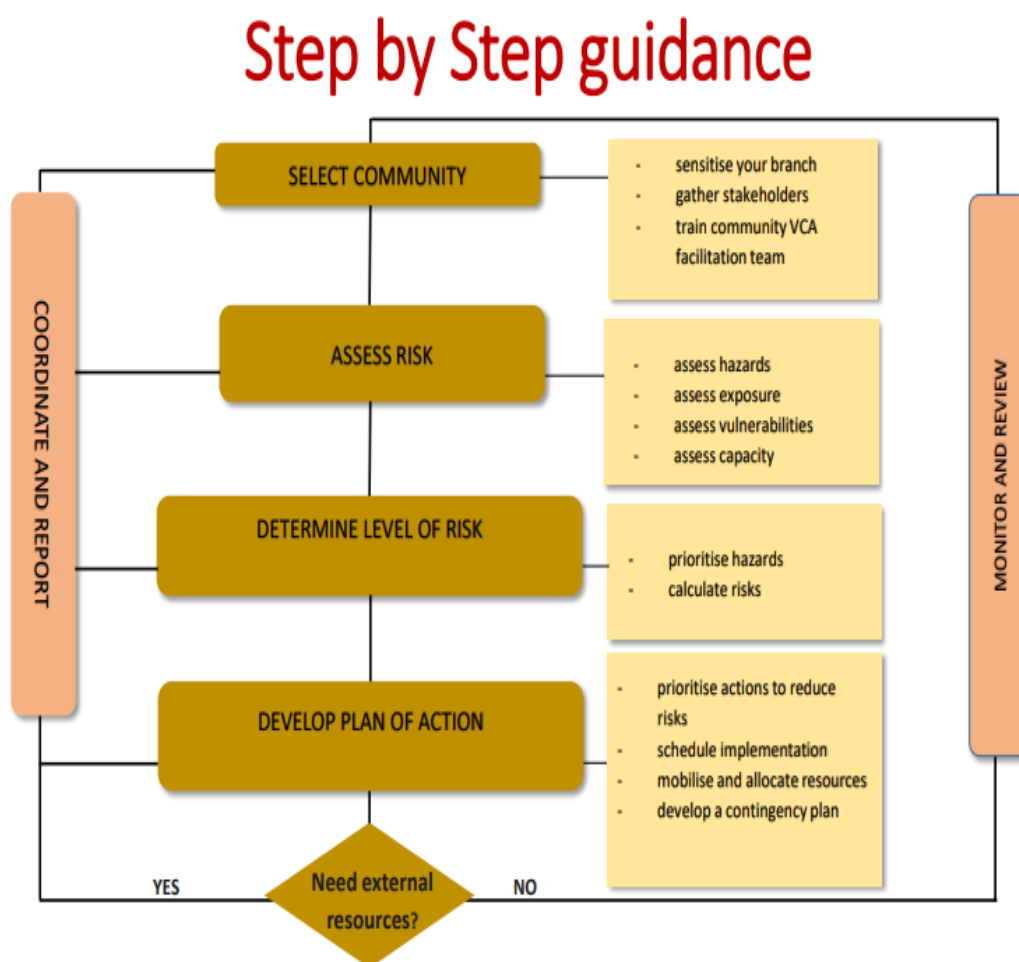
The enthusiasm and willingness of residents, faith-based organizations, business operators, community members and all others from the Sea Cows Bay Community, who attended our series of Community Meetings and Focus Group Discussions to support the EVCA process. To the District Representative – Hon. Julian Fraser for his blessing and support with facilitating community member’s participation. The valued assistance by the S.M.A.R.T Communities Project Team at the Department of Disaster Management (DDM). Additionally, we wish to thank the British Red Cross (BRC) team in the UK office, for their continuous support and guidance.

## 2. ENHANCED VULNERABILITY AND CAPACITY ASSESSMENT (EVCA) DATA

The Enhanced Vulnerability and Capacity Assessment (EVCA) is an approach of the Red Cross Red Crescent (RCRC) Societies. It is a participatory process developed to assist communities to become more resilient through the assessment and analysis of the risks they are facing and the identification of solutions to address these. It enables communities, with the support of the RCRC when needed, to explore where these risks come from, which members of the community will be the worst affected, what is available at all levels to reduce the risk, and what initiatives can be undertaken to strengthen the capacity of people at risk and reduce the risks they face.

EVCA includes climate change considerations as well as gender and diversity considerations.

*(The diagram below depicts a step by step guidance of the EVCA process, taken from the EVCA Manual toolkit, 2019)*



There are various assessment tools which can be utilized to carry out the EVCA process. For the Sea Cows Bay community, the following tools were used:

- Historical profile-** Historical profile is a way to build pictures of past events that had an effect on a community and stimulate discussion on what has happened in the past. In a historical profile, community members and the EVCA officers create a timeline of the different significant events and developments over the past several decades.
- Seasonal Calendar-** Helps in exploring the seasonality of events in a community over a one-year period. It can be used to show typical hazard patterns including when hurricanes, floods, droughts or diseases normally occur, when social and economic conditions including 'lean periods' and seasonal labour migration takes place, and public events such as holidays and festivals occur, and identify how the correlation between the different events might increase risks.
- Mapping-** Helps in visualizing the resources, vulnerabilities and hazards in a community.
- Direct Observation /Transect Walk-** This involves walking through the community to observe and discuss the daily activities, the surroundings and the risks and resources. It is used to note the sites and topography of the area, to understand interrelationships based on space, and to identify vulnerabilities, hazards, risks, and capacities.
- Venn Diagram-** Venn diagrams can be used to collect social data by using circles to show the links or relationships between different parts of a community or institution. In the context of a VCA, a Venn diagram is used to examine similarities and differences between institutions, partners, people and issues in a community and to identify problems and possible solutions.  
(EVCA Manual Tool Kit, 2019)

### 3. RISK ANALYSIS SUMMARY

*This is a summary of all **High Risk** areas in the community. A Risk is considered high if the community has:*

- *High Exposure to a Hazard,*
- *Have a High Vulnerability to the Hazard,*
- *Low/ Medium Capacities to deal with the effects of the Hazard.*

#### 3.1. HURRICANES

- **Exposure** – The gravity of exposure within the entire Sea Cows Bay community has been graded high. This is due to the low-lying regions being located on the flood plain, and because of the location and topography of the elevated regions within the community.
- **Risk Knowledge** – Community Based First Aid and Community Emergency Response Teams (CERT) are in need of re-training, and newer community members need to be given access to both First Aid and CERT training. There are many individuals in the community with vulnerabilities since the Irma and Maria Hurricanes of 2017; according to the results from the household survey; 14% of individuals stated that they do not know about the newly established shelters, and 4% stated that there aren't any, 20% expressed that they are not aware of the evacuation routes, while 8% said there weren't any, and 27% stated they do not know about the early warning system, while 20% stated that there aren't any.  
There are moderate capacities that exist, such as the schools within the community (B.V.I Seventh-day Adventist School, Ebenezer Thomas Primary School) that are certified SMART/SAFE Schools<sup>1</sup> (suggesting that resilience activities are carried out and supported). The community is informed about disaster preparedness by community based organizations and national information platforms. Some of the faith-based organizations and schools serve as shelters within the community.
- **Health and Basic Needs** – There is a high vulnerability, as there is little preparation to stock up on food prior to a hurricane season and a reliance on unhealthy, canned goods which can lead to illnesses, while after a storm cisterns can become contaminated. There are moderate capacities in the community – shops and markets stay open to allow people to stock up on items and the community centre houses a drop-in clinic 2-days per week, this clinic offers child health care services.
- **Infrastructure and Services** – The community centre and some homes are still damaged following hurricanes Irma and Maria and in need of repairs. Additionally, some house structures within the community are old and in need of repairing and upgrading to meet building standards. Moderate capacities include construction workers and trucking businesses.

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<sup>1</sup> Being certified as a SMART and SAFE School requires the completion of two steps; by obtaining the SAFE School certification; schools are to adhere to health and safety policy, and the plant must be in good condition. The second step involves using the Green checklist which ensures that the school meets the requirements for the Green building condition. The Green building condition states that there must be assess to water and energy consumption and the school must have actions put in place to reduce its carbon footprint. It also focuses on how chemicals and cleaning supplies are used and examines indoor air quality, lighting and recycling or reuse practices. SMART AND SAFE Schools certifications are valid for 3 years.

<http://www.bviddm.com/teachers-trained-to-apply-smart-schools-toolkit/>

### 3.2. **FLOODING**

- **Risk Knowledge-** Community members have expressed their concerns of the poor maintenance of drains and Ghuts (poor drainage system) that contributes to flooding, and homes/buildings that are constructed in Ghuts contribute to the blockage of water flow.
- **Connectedness-** Spanish speaking members living within the low-lying regions experience flooding and need assistance as a result, but due to the communication barrier, this sector of the community is not connected. Therefore, the entire community is not inter-connected, however, there are strong associations that exist for some of the social groups which can be used to bridge connectivity barriers.
- **Infrastructure and Services-** Some housing is out-dated and needs to be updated to include hurricane shutters. Areas surrounding some houses need to be cleared and maintained to ensure they do not contribute to flooding that will cause damage to homes and roads.

### 3.3. **MOSQUITOES**

- **Risk Knowledge-** Community members have stated that there has been an influx of mosquitoes after the 2017 Hurricanes. There is an increase of bulk waste and derelict vehicles in the community, and members believe that this contributes to the high prevalence of mosquitoes.
- **Social Cohesion-** The prevalence of mosquitoes has become a nuisance within the community which has affected the social interaction (where persons avoid areas with high prevalence of mosquitoes).
- **Connectedness-** Community members are willing to support clean-ups and other activities to improve poor conditions, however, they are discouraged because of lack of timely support from the community leaders to help with these clean-ups and other activities to improve the conditions of the community.

Capacities are moderate - the Environmental Health Division periodically conducts fogging to lower the number of mosquitoes within the area and also provides treatment for mosquito breeding sites. Governmental organisations and Community Base Organizations can support community members in helping to conduct clean-ups to lower the amount of waste within the community.

## **4. MITIGATION ACTIONS SUMMARY**

### **4.1. HURRICANE MITIGATION ACTIONS**

Promote Hurricane preparedness programmes, First Aid and CERT training. Government to enforce the standard building code. Hurricane preparedness courses will be conducted annually within the community.

### **4.2. FLOODING MITIGATION ACTIONS**

Community led project proposed to Government for installation of sediment traps into Ghuts and the regular clean-up of Ghuts. Repair and fixing of homes.

### **4.3. MOSQUITO MITIGATION ACTIONS**

Community to receive support from faith based organizations, schools, clinics, Red Cross, the Environmental Health Department (Vector Control Unit) of the Ministry of Health and Social Development and other organizations in conducting the different mitigation actions listed.

Fogging is conducted by The Vector Control Unit, this is only done when there are a lot of complaints from members within the community and/ or if there has been a lot of rainfall. Fogging schedule to be created to better support and control the number of mosquitoes within the community. The Vector Control Unit also provides treatment for mosquito breeding sites.

Improvement of waste management, regular clean-ups and community awareness to be done by conducting campaigns on dengue (and other mosquito borne diseases) and the importance of fogging, removing stagnant water, and other practices that will help lower the amount of mosquito breeding sites within the community.



## **5.1. COUNTRY CONTEXT**

The British Virgin Islands, an overseas territory of the United Kingdom, is self-governed by a democratically elected House of Assembly, with the Governor representing Her Majesty, the Queen.

The British Virgin Islands is a cluster of about 60 islands, cays, and rocks in the north-eastern corner of the Caribbean Sea, east of Puerto Rico and the U.S Virgin Islands. The British Virgin Islands' total land area is 59.4 square miles, of the 15 inhabited islands, the largest are Tortola (21.5 square miles), where Road Town, the capital, is located; Anegada (15 square miles); Virgin Gorda (8 square miles); and Jost Van Dyke (3 square miles).

Topography varies from extremely flat land in Anegada to mountainous and rugged terrain on Tortola, which has the highest point, Mount Sage, rising 1781.5 ft above sea level.

The territory has an extensive road network and a high rate of private vehicle ownership. Transportation between the islands are mainly via ferry, with limited air transportation, mainly to Anegada.

The British Virgin Islands lies in the path of the hurricane and tropical storms and is vulnerable to wind damage, flooding, and landslides; it is also at risk for earthquakes and tsunamis.

The territory's 2010 population and household census placed the resident populations at 28,054, with 83% residing in Tortola followed by 14% living in Virgin Gorda. The population of Tortola was 23,491, having 11,468 males, and 12,023 females. The average household size is 2.59 people. The population for 65 plus (elderly) for Tortola was 1,429. According to the territory's Central Statistic Office, in 2010 the male-to-female ratio was 1:1; with African descendants as the largest ethnic group.

The Sea Cows Bay community is located approximately 1.54 square miles west of the main commercial, financial and administrative hub of the British Virgin Islands, Road Town, Tortola. The boundaries of the community extend generally from the Pieces of Eight and Manatee Developments in the east, to Nanny Cay in the west, and from the sea inland to Threllfall and Nibbs Estate. The area measures 2.7 square miles. According to Island Resources Foundation, the name of the community refers to the West Indian Manatee or Sea Cow that once thrived in waters of the BVI and feed on the sea grass beds. The topography of the area is flatter towards the coast and steeper as you go further inland (DDM, 2018).

## **5.2. MAIN HAZARDS IN THE COMMUNITY**

The community is exposed to hurricanes, flooding, mosquitoes and droughts, additionally the community is also vulnerable to coastal impact from siltation, tsunami inundation, storm surges and landslides from the surrounding hillsides (DDM, 2018).

### **5.3. COMMUNITY SELECTION CRITERIA**

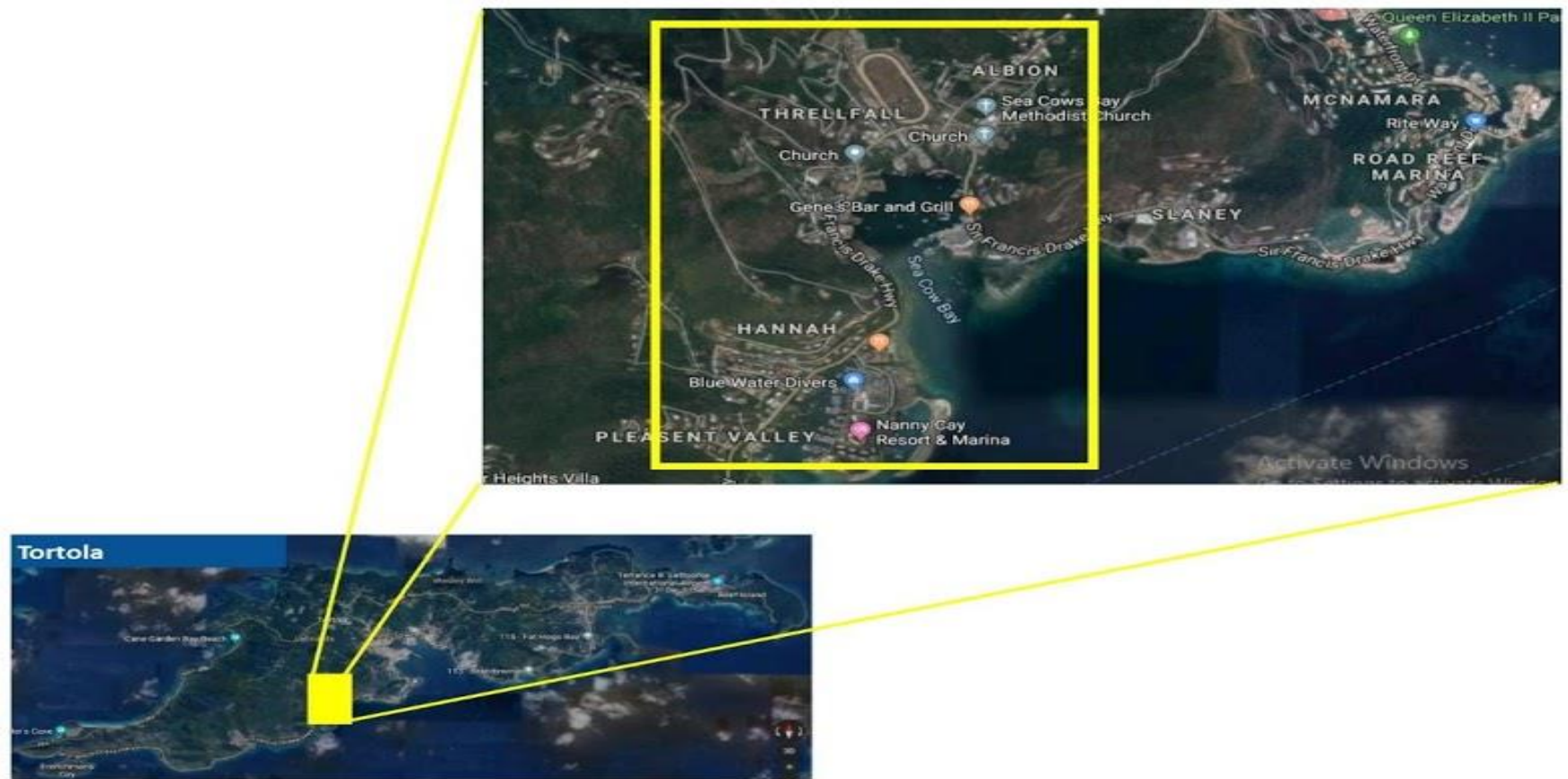
How and why was this community selected?

- In collaboration with the Department of Disaster Management, the British Virgin Island Red Cross used the Strategic Targeting Methodology Tool (STM) to select the Sea Cows Bay community. This tool is used to determine the most vulnerable communities in a country. It ensures transparent, consistent and unbiased decision-making that leads to the selection of communities.
- Three other communities in the territory were identified as being vulnerable, however, Sea Cows Bay community ranked as one of the highest on the Strategic Targeting Methodology community selection tool. It was the highest because of flooding and poor waste management problems. The community is also known for having a vulnerable population, which is predominantly the Spanish speaking members, in which many are migrants and live in vulnerable conditions.

#### 5.4. DESCRIPTION OF SEA COWS BAY AREA

Name of the community: Location: Sea Cows Bay

(Images were obtained from google maps and GIS-Imaging, 2019)



## 6. ASSESSMENT DATA

-Two community meetings were conducted, these meetings had a total of 18 participants, 10 males and 8 females. Participants fell under the age range of 15-50 plus.

-The first meeting was held on the 15<sup>th</sup> of August, 2019, and consisted of a total of eleven participants, 7 males, and 4 females, participants involved were tourism workers, business owners, and Government officers.

-The second meeting was held on the 11<sup>th</sup> of September, 2019, and consisted of a total of seven participants, 3 males, and 4 females, participants involved were a minister of Government, a principal, a teacher, a church minister, Government officers and students.

-The secondary data used was gathered from information from different websites consisting of limited demographic information, online information sharing the history of hurricanes in community, as well as information from the Central Statistic Office.

HAZARD	EXPOSURE	VULNERABILITY	CAPACITY
PRIMARY DATA	PRIMARY DATA	PRIMARY DATA	PRIMARY DATA
-Community Meeting -Household Survey -Direct consultation with Government officials	-Community Meeting -Household Survey -Direct consultation with Government officials	-Community Meeting -Household Survey -Direct consultation with Government officials	-Community Meeting -Household Survey -Direct consultation with Government officials
SECONDARY DATA	SECONDARY DATA	SECONDARY DATA	SECONDARY DATA
-Government and other websites	-Government and other websites	-Government and other websites	-Government and other websites
TOOLS USED	TOOLS USED	TOOLS USED	TOOLS USED
-Direct Observation - Mapping -Seasonal Calendar -Primary/ Secondary data	-Direct Observation -Mapping -Transect walk -Primary/ Secondary Data	-Direct Observation -Mapping	-Direct Observation -Mapping -Primary/ Secondary Data

## 7. POPULATION DATA

	Total population in Sea Cows Bay		
Breakdown of community population	Male	Female	Total
	1,085	1,118	2,203 (DDM, 2018-Central Statistic Office)
Elderly and single parents estimate	<b>65 year plus (Elderly)– 134</b> (2010 Census indicates that on Tortola there are 1,429 individuals (6.1%) 65 years and older. The value was calculated from this information.)	<b>Single headed household- 299</b> (2010 Census indicates that 13.6% of households on Tortola are single-headed. The value was calculated from this information.)	
Disability (estimate if data not available)	<b>312</b> (2010 Census indicates that 14.2% of individuals have some form of disability on Tortola, value was calculated from this information.)		
% of population that contributed to the VCA	<b>2.3%</b> (51 participants out of the 2,203 population within the Sea Cows Bay community contributed to the Disaster Risk and Preparedness survey of 2019)		
Type of context	Peri-urban area	Geophysical environment	Costal, highland
Livelihood activities: Agriculture, livestock, fishing, Government employees and officials, shops, restaurants, apartment complexes, hotel workers employed in tourism season.			

## 8. HAZARDS – WHAT IS AFFECTING THE COMMUNITY?

### HAZARD 1- HURRICANE

The hurricane belt includes the Caribbean Sea and Gulf of Mexico, thus Caribbean islands within this area are affected by hurricanes. The BVI lies within this area and is therefore exposed to hurricanes. Hurricane season begins on the 1<sup>st</sup> of June and extends to the 30<sup>th</sup> of November; however, the peak time is within the months of August and September. Strong winds, sea level rise, and rain clouds are some common warning signs that a hurricane is approaching. A hurricane watch is issued 48 hours in advance of the onset of tropical storm force winds, if conditions worsen an advisory following an alert may be issued. The Department of Disaster Management (DDM) in the BVI is responsible for issuing all warnings and information on natural disasters, they alert the public through the BVI app, and receives support from the Antigua Met Office. Since 1916 seventeen hurricanes have affected the Territory and impacted the community of Sea Cows Bay. The most recent and large impact hurricanes were Irma and Maria in 2017 (both Category 5). Communities were affected with flooding and property damage. In 2019 the effects from Hurricane Dorian caused flooding and minor property damage in some areas.

### HAZARD 2- FLOODING

During the hurricane/wet season the territory experiences frequent and heavy rainfall. Heavy rainfall can cause flooding within a community if proper measures are not put into place. The Sea Cows Bay community can be described as a coastland and highland, signifying that it may be at risk to flooding, especially within the coastal areas. Community members expressed major concerns on poor management of Ghuts and drainage routes, believing that this poor management has caused the community to be prone to frequent flooding. Once a hurricane warning has been issued heavy rainfall is expected, also, weather channels aid the public in knowing what to expect; with this information people should have enough time to prepare. Over the past years much data has been recorded on the high levels of rainfall that occurred within the community, the most recent one being in August 2017; 17 inches of rain was recorded for a tropical depression that occurred right before Hurricanes Irma and Maria (DDM, 2018).

### HAZARD 3- MOSQUITO BREEDING SITES

The Aedes Aegypti mosquito is found predominantly in tropical regions. There are many species of the Aedes Aegypti mosquito, and it is the main vector responsible for the spread of several viral diseases including chikungunya, dengue and ZIKA. Mosquitoes thrive in temperatures that are 80 degrees Fahrenheit and above. They are more active during the hot season/summer time. Stagnant/standing fresh water, trash cans, old items/accumulated garbage/bulk waste, gutters, tree stumps and mud piles are known mosquito breeding sites. The poor management of waste disposal and the high prevalence of stagnant water within the community makes the community a perfect breeding site for mosquitoes. Community members have expressed their concerns on the high levels of mosquitoes within the area. The mosquitoes are a nuisance and puts the community at risk of mosquito borne diseases.

## 9. CONSOLIDATED RISK INFORMATION

### 9.1. HAZARD 1 – HURRICANES

HURRICANE EXPOSURE- HIGH			
<p>The entire community stands to be affected by hurricanes.</p> <p>The low-lying areas of the community are mainly within flood prone areas. Small businesses and 30% of homes are within this area.</p> <p>The elevated areas within the community are exposed because of location and topography.</p>			
RISK KNOWLEDGE - HIGH RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<p><b>HIGH</b></p> <ul style="list-style-type: none"> <li>-There are older people, children, single parents, and people with disabilities in the community who are likely to need some level of assistance in the event of a hurricane or similar disaster.</li> <li>-School teachers at the institutions located in Sea Cows Bay are trained as Community Emergency Response Team (CERT) members and can provide first aid services (there is no information available on how many are trained at the moment); however, they require continuous training to maintain their status. More members within the community need to be trained as well.</li> <li>-There is a lack of knowledge on the newly established community shelters, and some individuals are not aware of the early warning system and evacuation routes.</li> </ul>	<p><b>MEDIUM</b></p> <ul style="list-style-type: none"> <li>-Schools are certified SMART/ SAFE schools (suggesting that resilient activities are carried out and supported).</li> <li>-Community is informed about disaster preparedness by community base organizations (faith based organizations, radio stations, social media).</li> <li>-Faith based organizations and schools serve as hurricane shelters.</li> </ul>	<p>It is determined that the high risk as a result of the high exposure to hurricanes and high vulnerability in which vulnerability level needs to be lowered, while the capacities are to be increased/improved. This will support building community resilience.</p>	<ul style="list-style-type: none"> <li>-Refresher CERT and First Aid training for school teachers, and other trained individuals.</li> <li>-Train new CERT members within the community.</li> <li>-Ensure that the community is informed on the new emergency shelters, evacuation routes and early warning system.</li> <li>-Government to enforce the</li> </ul>



			standard building code.
<b>HEALTH AND BASIC NEEDS - HIGH RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>HIGH</b> -Damaged homes, injuries, illnesses. Bad health was caused due to poor diets developed after the hurricane, consisting of mainly canned foods, which resulted in high blood pressure, cholesterol and diabetes. -During 'peacetime' there is not much stocking of foods and medicines, as many people choose to prepare a few days before the hurricane. -Majority of individuals within the community own cisterns. These can become a health risk as they can become contaminated after the hurricane.	<b>MEDIUM</b> -Shops/market places are available within the Territory. Before a hurricane, many people stock up on canned and dry foods as well as drinking water. -The community centre is used as the community Clinic. The clinic is only opened a few days weekly, however, free vaccinations and check-ups are given to children.	It is determined that the high risk as a result of the high exposure to hurricanes and high vulnerability (which needs to be lowered) places the community at risk. The moderate capacities needs to be increased/ improved because it highlights that the community is not holistically prepared for a hurricane.	-Hurricane preparedness sessions will be given so that community members are knowledgeable on better health practices for before, during, and after a hurricane, or similar natural disaster.
<b>SOCIAL COHESION – MEDIUM RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>HIGH</b> -Displacement which leads to persons living with neighbours, friends and family. -There is a known separation between the multilingual community and the locals/ residents due to differing culture and the language barrier.	<b>HIGH</b> Usually after a hurricane community members find comfort in being together and supporting one another. Members know that they can depend on each other when they need support.	It is determined that the risk is medium as a result of high exposure to hurricanes, high vulnerability and high capacity within the community. Separation within the community is mostly present between the multilingual members and locals/ residents.	
<b>CONNECTEDNESS – MEDIUM RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>

<b>MEDIUM</b> -Rules/laws (e.g. dumping of bulk waste) enforced within the community are not kept by community members. -Community tends to be neglected at times by the Government in terms of effective handling/managing of health and risk hazards.	<b>HIGH</b> Connected through faith-based organizations, Government Ministers and Governmental Department Directors, established connection with DDM through community Shelter, Red Cross volunteers, CERT's.	It is determined that the risk is medium due to the high level of exposure to hurricanes, medium level of vulnerability and high capacities within the community, highlighting that the community is connected, and that these connections must now fulfil their roles within the community.	- Improvement of waste management, regular clean ups and community awareness to be done by conducting campaigns on dengue (and other mosquito borne diseases).
<b>INFRASTRUCTURE &amp; SERVICES- HIGH RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>HIGH</b> -After the 2017 Hurricanes there were damaged electricity poles, galvanise in the street and in the bushes, damaged homes, vehicles (some were thrown off the side of hills due to the force of the wind), and damaged businesses. The community centre, schools and some churches were severely damaged. -In August 2019 about 30% of house structures are out-dated (e.g. no hurricane shutters). The community centre and other small businesses and homes are still damaged from 2017 Hurricanes and in need of repairs. Some individuals have started the process of repairing their homes.	<b>MEDIUM</b> Construction workers, trucking businesses	The risk to infrastructure and services within the community is considered high due to the high exposure to hurricanes, high vulnerability and medium capacities within the community at a high risk. Capacities are present, however, they are not being utilized to lower the vulnerability level within the community.	Provide training sessions where interested community members can become skilled workers, which will help build community resilience.

ECONOMIC OPPORTUNITIES – LOW RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<b>MEDIUM</b> Debt and unemployment for some individuals due to the aftermath of the 2017 Hurricanes.	<b>MEDIUM</b> -Economic opportunities (to fix and rebuild) were gained for some individuals.	It is a determined low risk due to the high exposure to hurricanes, vulnerabilities are medium due to unemployment which affects livelihoods and therefore, reducing the capacities to a medium as well.	
NATURAL ASSETS – MEDIUM RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<b>LOW</b> There are severely damaged mangroves and coral reef as a result of the passage of the 2017 Hurricanes.	<b>MEDIUM</b> Farm lands, fishing, shipwright and sanitisation cleaners available to help the community. The community slopes downhill, therefore, there are highlands surrounding the community that provides refuge in case of a rise in sea level.	The risk is medium, there is a high exposure to hurricanes and medium capacities, but the vulnerabilities are low. The mangroves and coral reef being damaged exposes the community to risk if a system passes the Territory.	
<b>Risk analysis</b>		<b>Total Risk Score</b>	<b>HIGH</b>
The entire population in the Sea Cows Bay community stands to be most affected by hurricanes because of their high exposure and vulnerability level caused by storms, poor infrastructure from buildings being built with galvanise roofing and weak/ out dated structures.			

## 9.2. HAZARD 2 – FLOODING

FLOODING EXPOSURE – MEDIUM			
The low-lying areas within the community are within the flood plain, these areas being the Sir Francis Drake Channel and Albion Estate. Homes/ buildings within the elevated regions in the community are constructed on Ghuts, the community also slopes downhill.			
RISK KNOWLEDGE – HIGH RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<b>HIGH</b> -Poor maintenance of Ghuts and drains contributes to flooding. -Many homes/buildings are constructed on Ghuts blocking water flow, the community slopes downhill causing water from higher areas within the community to flow through on its way to the sea. -Heavy rainfall causes landslides, rock fall and water flashing into homes.	<b>MEDIUM</b> Ghuts and drainage routes are present.	There is a medium exposure to flooding, and medium capacities within the community. However, there is high vulnerability and this places the community at a high risk. Drains/ Ghuts need to be properly maintained. Other vulnerability factors cannot be changed (houses being built on homes, community sloping downhill).	-Regular Ghut and drainage clean-ups. Installation of sediment traps in Ghuts. -Awareness raising with Community members on preparedness. -Standard building code to be addressed.
HEALTH AND BASIC NEEDS - MEDIUM RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<b>MEDIUM</b> Damaged homes, soil erosion, damaged crops, illnesses.	<b>MEDIUM</b> -Ghuts and drainage routes are present, community clinic and a hospital/ other health services are present on the island and operational to treat illnesses.	The risk is medium because vulnerability and capacity levels are medium as well. Community members often utilize the services from the community clinic, hospital	

	-Community members can repair and fix minor home damages.	and other health services located on the island.	
<b>SOCIAL COHESION – LOW</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>LOW</b> There is a known separation between the multilingual community and the English speaking community of differing culture and the language barrier.	<b>MEDIUM</b> Multilingual members within the community find togetherness among themselves.	The risk is low because social cohesion can be improved after residing in an area for a long period of time.	
<b>CONNECTEDNESS – HIGH RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>HIGH</b> Some individuals (multilingual) living within the low- lying regions who experienced flooding and need assistance are not connected with other members of the community and often suffer.	<b>MEDIUM</b> Majority of the members within the community are connected and usually help one another.	It is determined that the risk is high due to the medium exposure to flooding, high vulnerability and moderate capacities. Connectedness between multilingual members and other members within the community needs improvement.	-To engage the migrant populations within community meetings and other community events.
<b>INFRASTRUCTURE &amp; SERVICES – HIGH RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>

<b>HIGH</b> Damaged homes/ buildings and damaged roads.	<b>MEDIUM</b> -Construction workers, Government officials and community leaders are within the community. -The community has access to Government services.	There is a high exposure to flooding due to the high vulnerability and medium capacity aspects. Many homes/ buildings need repairing, this highlights that members within the community are vulnerable and do not have the sufficient funds for repairs. Furthermore, the community is at risk and is currently unable to respond or be fully prepared to withstand another system.	Government services and other organizations to assist in repairing and fixing of homes, also, connecting affected members with individuals who can help with repairs.
<b>ECONOMIC OPPORTUNITIES – LOW RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>LOW</b> Loss of income due to minor injuries, other expenses and loss of livelihoods.	<b>MEDIUM</b> -Community clinic and hospital on the island are present. -There are new job opportunities.	The risk is low because of the low vulnerability and medium capacity aspects. Health services are available and individuals can adapt and find new jobs.	
<b>NATURAL ASSETS – MEDIUM RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>LOW</b> Micro-farming crops and natural mangrove vegetation were destroyed.	<b>LOW</b> Some members within the community are knowledgeable on plant and agricultural husbandry.	It is determined that the risk is medium as a result of the low capacity and vulnerability aspects. The community consist of members who are knowledgeable in the area, however, it is only a small percent.	
<b>Risk analysis</b>		<b>Total Risk Score</b>	<b>MEDIUM</b>

The community stands to be affected by much flooding during the hurricane and rainy seasons, this is due to poor infrastructure of homes, poor management of Ghuts and drains, and the community's location.

### 9.3. HAZARD 3 – MOSQUITOS

MOSQUITO BREEDING SITES EXPOSURE- MEDIUM			
The exposure is medium due to the mosquito prevalence within tropical regions. There are many trees/plants, bulk waste, and stagnant water within the community, serving as the perfect conditions for mosquito breeding sites.			
RISK KNOWLEDGE - HIGH RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<b>HIGH</b> -Poor garbage disposal and waste management has caused an increase in bulk waste/derelict vehicles within the community. -Stagnant water is also common in the low-lying areas of the community creating the required environments for mosquito breeding sites.	<b>MEDIUM</b> -The Environmental Health Division conducts fogging periodically to lower the number of mosquitoes within the area. -Governmental organisations and NGO's can support the community to conduct clean-ups to lower the amount of waste. Community members can lead with support from NGOs to maintain cleanliness within the area.	The risk is high because the vulnerabilities within the community surrounding this subject is high. Capacities are moderate because they can be improved.	-Improvement of waste management, regular clean ups and community awareness to be done by conducting campaigns on dengue (and other mosquito borne diseases) and the importance of fogging, removing stagnant water, and other practices that will help lower the amount of mosquito breeding

			sites within the community.
<b>HEALTH AND BASIC NEEDS - MEDIUM RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>MEDIUM</b> Community is at risk of developing mosquito borne diseases.	<b>MEDIUM</b> Preventative measures are present (mosquito nets are available on the island) there is a community clinic and other health services on the island that offer treatment for symptoms of different mosquito borne diseases.	The risk is medium. If community members build on their capacities by practicing prevention then the risk will lower.	
<b>SOCIAL COHESION – HIGH RISK</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>MEDIUM</b> -Community members may avoid socialising and attending social events/activities because of the high number of mosquitoes within the area. -Small businesses (bars, restaurants etc.) may experience economic lost because of less customers using their services.	<b>LOW</b> Some community members are not concerned with the number of mosquitoes within the area.	The risk is high because the vulnerability can lower the cohesion within the community.	



CONNECTEDNESS – HIGH RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<b>HIGH</b> Lack of timely support from Government and other businesses to help with clean-ups and other necessary measures that need to be taken place.	<b>MEDIUM</b> Members within the territory's Government are in position to help and fulfil their role within the community.	There is a high risk because of the vulnerability aspects, the community has been experiencing the high mosquito prevalence and they feel as though no one is helping. They believe that for anything to be done, they will have to conduct these actions on their own.	-Community members to form a committee to advocate for help, and put actions in place to maintain cleanliness within the area.
INFRASTRUCTURE & SERVICES – MEDIUM RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions
<b>MEDIUM</b> -Many homes are in the vicinity of Ghuts, and stagnant water which causes a risk of persons being affected by mosquitoes. -Some homes do not have screen doors or window screens which allows a lot of mosquitoes to enter freely into their homes.	<b>MEDIUM</b> Some members in the community have screen doors and window screens, and for those who do not have, they can be found in stores on the island.	There is a medium risk because of the low vulnerability and the medium capacity aspect. There are only a few houses in the community without screen doors or windows and there are only a few houses that are built in a close proximity to open water.	-Consult with Environmental Health division about a schedule time for mosquito fogging. -Ensure community members are aware on what measures can be taken place to help lower risk.
ECONOMIC OPPORTUNITIES – MEDIUM RISK			
Vulnerability aspects	Capacity aspects	Summary of risk	Actions

<b>MEDIUM</b> High costing price for mosquito repellents, screen doors and windows. Cost of mosquito control measures. Cost of educational programs.	<b>MEDIUM</b> There is one clinic in the community and there are a few community doctors/nurses.	The risk is medium because there is a medium vulnerability in terms of economic opportunities and medium capacity levels.	
<b>NATURAL ASSETS –</b>			
<b>Vulnerability aspects</b>	<b>Capacity aspects</b>	<b>Summary of risk</b>	<b>Actions</b>
<b>Risk analysis</b>		<b>Total Risk Score</b>	<b>MEDIUM</b>
Majority of the community is affected by mosquitoes. Portions of the community where there are Ghuts and stagnant water are more exposed to mosquitoes than other parts of the community. Although not many people have contracted mosquitoes borne diseases, the community still constantly expresses deep concern for the mosquitoes.			

## 10. MITIGATION ACTIVITIES

	Hazard	Project/ Activity	Who will implement- Red Cross/DDM/ Community with RC support	Quant ity	Unit Price US	Tot al US	Month				How will it be implemented?
							WK 1	WK 2	WK 3	WK 4	
1	Hurricanes/ landslides and erosion	Hurricane preparedness programs, First Aid and CERT training	Red cross and the Government								-Get Red cross trainers to conduct a one-day Basic First Aid training.
											-Get DDM trainers to conduct CERT training.
											-Hurricane preparedness courses will be conducted annually within the community.
2	Hurricanes/ landslides and erosion	Enforce the standard building code	Government								-Government to enforce standard building code.
											-Workers to be educated on the standard building code.
3	Flooding	Installing sediment trap into Ghuts	Government								-Community to propose project to Government and receive their support.
		Repair and fixing of homes									-Government services and other organizations to assist in repairing and fixing of homes, also,

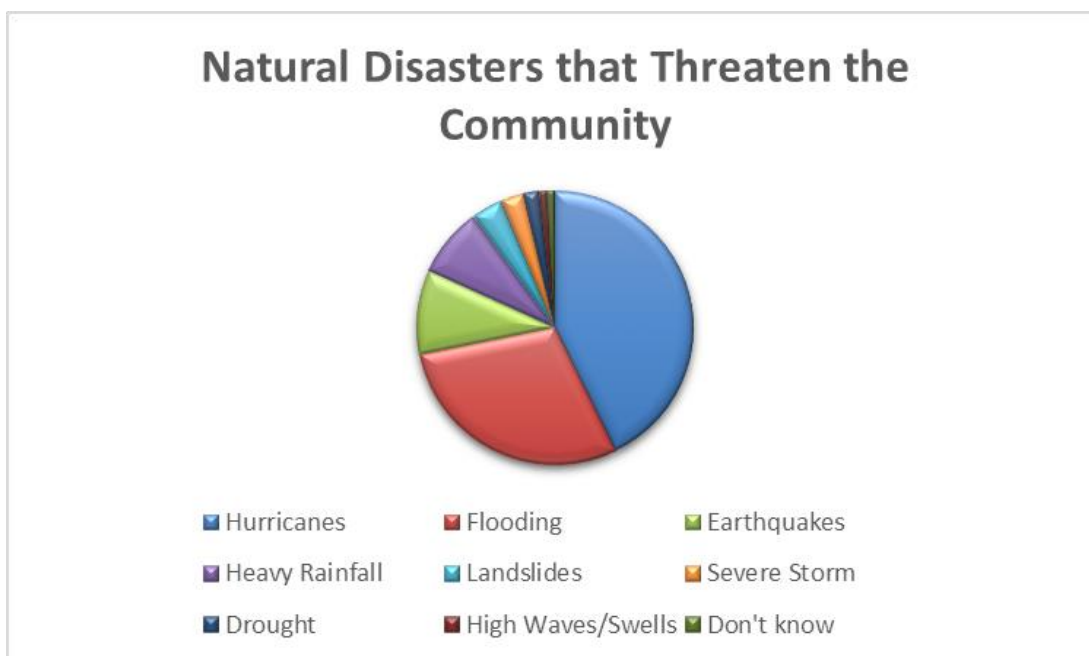
		Engagement of migrant populations									connecting affected members with individuals who can help with repairs.
											-Migrant members to be included in community meetings and community events.
4	Mosquito breeding sites	Engagement of Community Members	Red cross and the Government								-Consult with Environmental Health division about a schedule time for mosquito fogging.
											-Improvement of waste management, regular clean ups and community awareness to be done by conducting campaigns on dengue (and other mosquito borne diseases) and the importance of fogging, removing stagnant water, and other practices that will help lower the amount of mosquito breeding sites within the community.
											-Community members to form a committee to advocate for help, and put actions in place to maintain cleanliness within the area.
				Total							

## 11. COMMUNITY SURVEY & BASELINE SURVEY FINDINGS

Household surveys were conducted by the EVCA team to collect baseline data on disaster and disaster preparedness within the Sea Cows Bay community. This survey was created and analysed using the Kobo Toolbox; an online toolkit that allows one to collect and manage data in challenging environments, which is widely used in humanitarian contexts.

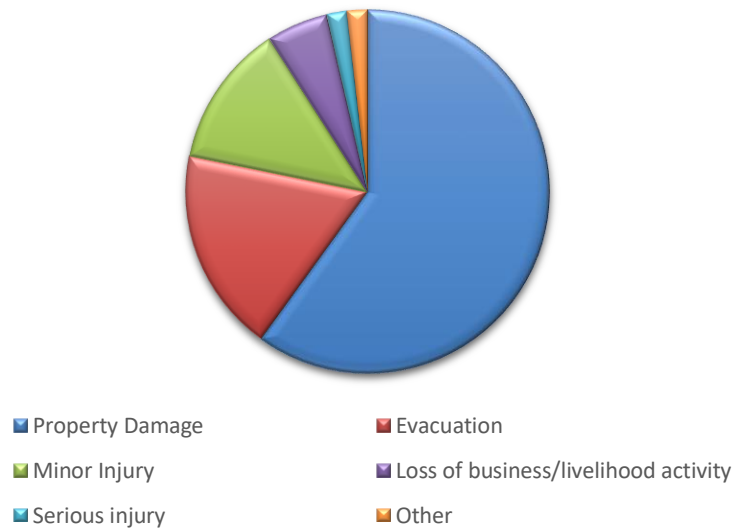
Thirty-one females and twenty males participated in the survey, totalling to fifty-one participants. Participants consisted of young people, individuals from the working class, and the retired. The Spanish speaking population (persons where English is not their first language) and persons with disabilities within the community were represented within the survey. Majority of the participants (84%) had a great concern on disasters and believed that the community could be affected by a natural disaster within the next five years.

According to the information gathered from the survey, the top four natural disasters that threaten the community are: hurricanes, flooding, earthquakes and heavy rainfall.



Community members recalled that the community was affected by two natural disasters; these being defined as hurricanes Irma and Maria. During these natural disasters 65% of the participants experienced property damage, 20% had to evacuate from their homes, 14% had a minor injury, and 6% experienced loss of business/livelihood.

### Effects Caused by Natural Disaster



Everyone believed that being prepared would help their family in a disaster. 60% said that they were somewhat prepared for a disaster, 26% were very prepared, 12% were not prepared, and 8% didn't know if they were prepared. 70% believed that after experiencing a major disaster they are more able to handle another one, however, 12% said they were less able because they are still in recovery and some families are worse financially than before because the cost of living has increased. 36% stated that they have not begun preparing for a disaster, but they plan to and 24% said that they are prepared for a disaster.

### Community Preparedness

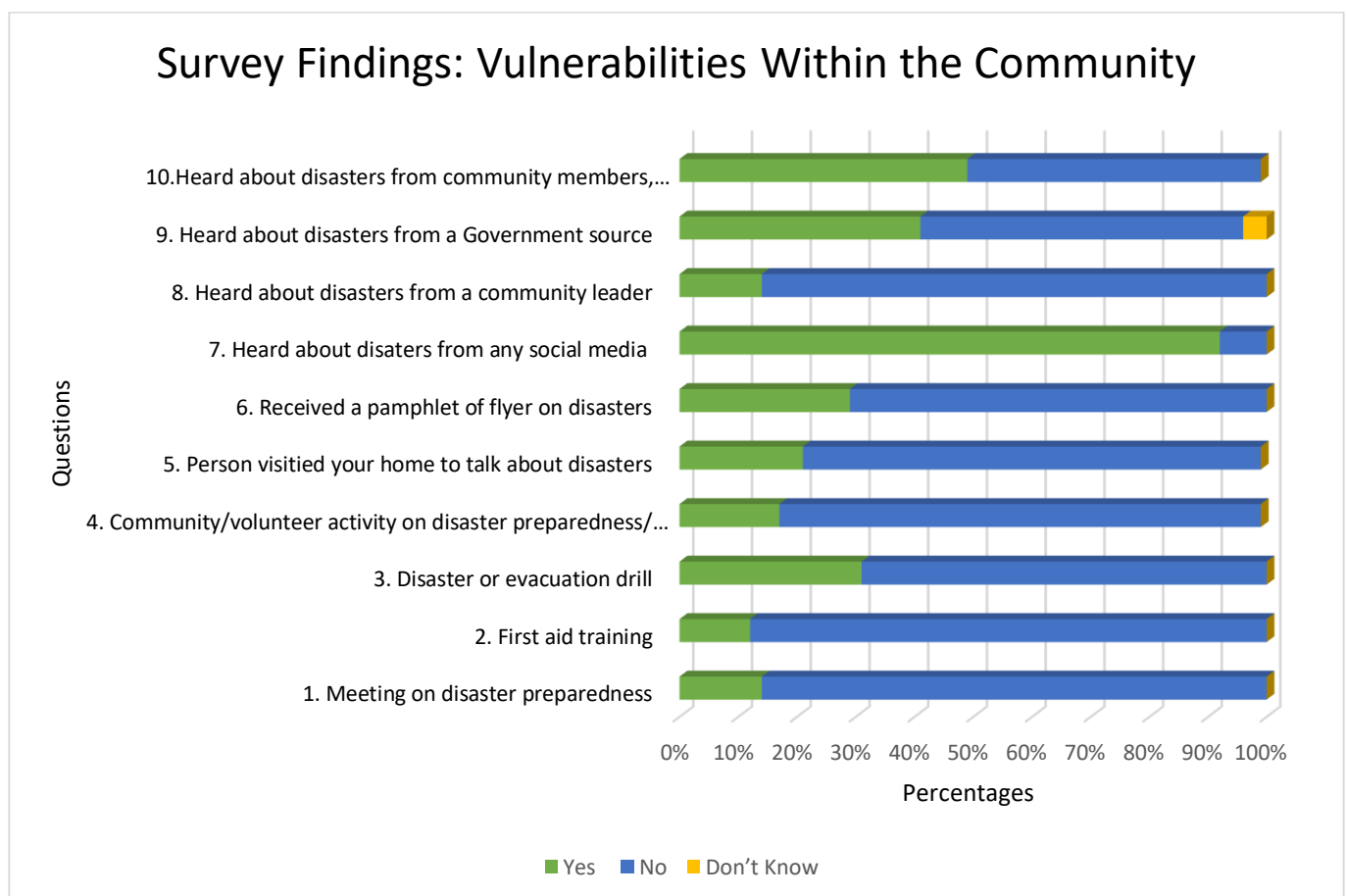


Majority of families have supplies at home for a natural disaster, the highest-ranking items being canned/package food, flashlight and drinking water. 50% of family members within the community have not spoken about or planned what they would do if a disaster occurred. 47% said they have spoken with and have a disaster plan. Topics of interest/concern within the families are: an evacuation plan, going to a shelter, and a planned list of items to take in case of an emergency.

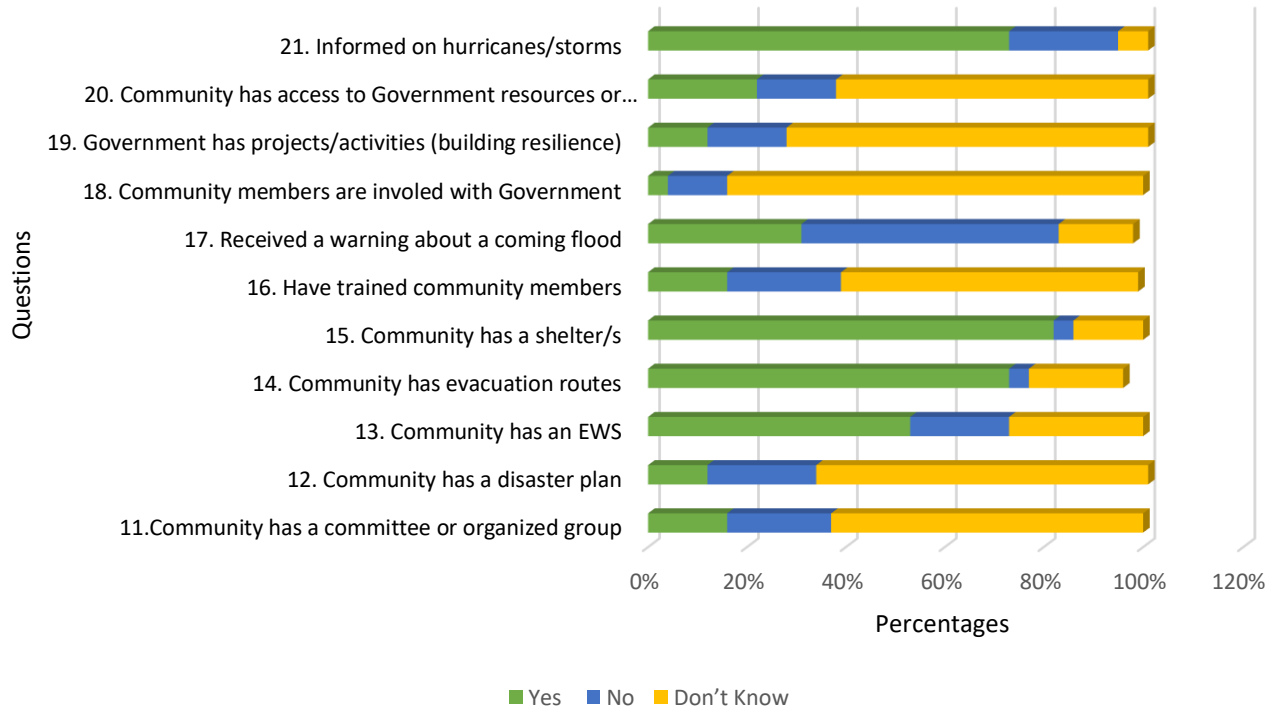
Based on the results it can be outlined that:

- A large percent of members within the community are lacking knowledge on disaster/disaster preparedness.
- Members are not aware of the hurricane shelters or the community's disaster plan.
- The community does not know if it is connected with the Government.
- Members do not know if the community has trained personnel's to help during a disaster.
- It is unknown if the Government has enforced any disaster prepared plans.
- Members have faith in the BVI Red Cross, their family and members within the community to provide assistance during a disaster

There are vulnerable people within the community, these being older people, children under 5 years and school-aged children, and persons with disabilities. Majority of the members within the community have the basic needs at home, however, some members within the community are in need and houses are poorly structured, lacking shutters, being made from sheet rock and are in flooding zones/landslide prone areas.



## Survey Findings: Vulnerabilities Within the Community





## 12. HISTORICAL PROFILE

The chart below provides a graphic diagram of the historical and visual profile of the Sea Cows Bay community. It showcases periods of historical, socio-economic significance which are tied to the evolution of the community as residential space. Importantly, it dates the **hazards** and disasters of significance as well as help with the identification of the elements at risk (exposure).

The community is exposed to hurricanes, the last recorded hurricane was Dorian in 2019, which caused flooding in the area. However, Hurricanes Irma and Maria in 2017 caused severe flooding and property damage, causing members to relocate. Many members within the community are still experiencing the effects of these two major disasters today (loss of homes, livelihoods, mental issues). The community is also exposed to severe weather winds and rains. The residents defined flooding as run off and pond flooding, hence, the low-lying areas flood during the rainy season and some houses on the high areas within the community flood mainly because of lack of proper run off sites, and poor housing structures. Every major disaster or severe weather that has occurred has caused flooding within the community.

HISTORICAL PROFILE: SEA COWS BAY		
Year	Events	Hazard Category
1916	Category 3 hurricane caused many deaths and flooding	Major Disaster
	St. Paul Anglican church was destroyed	Shelter
1917-1924	Territory experienced multiple hurricanes	Major Disaster
1937	St. Paul Anglican church was restored	Shelter
1969	Ebenezer Thomas School was developed	Community Event
1970's	Measles outbreak	Health
	Big Cay, Little Cay, & Miss Peggy was consolidated as Nanny Cay Marina & Resort	Community Event
1983	15 inches of rain was recorded in 24 hours	Severe Weather
1987	15 inches of rain was recorded in 24 hours	Severe Weather
1989	Hurricane Hugo (category 4) caused flooding and damage	Major Disaster
1996	Adventist school was granted permission to build	Community Event
1997	Sea Cows Bay harbour was designed as a marine shelter	Community Event
1999	Hurricane Jose (category 1) caused lightly damage to the territory.	Severe Weather
2000's	Valerie O. Thomas Community Centre was built	Community Event
2003	34 inches of rain was recorded in 5 days	Severe Weather

2003	Water plant was built	Community Event
2004	The Sea Cows Bay area experienced flooding	Severe Weather
2006	The Sea Cows Bay area experienced flooding	Severe Weather
2008	The Sea Cows Bay area experienced flooding	Severe Weather
2009	The Sea Cows Bay area experienced flooding	Severe Weather
2010	Sea Cows Bay Methodist church was rebuilt	Community Event
	25 inches of rain was recorded in a 5-day period 9 inches of rain in a 10-hour period in a single day	Severe Weather
2011	Little Lighthouse Development Centre was founded	Community Event
2012-2013	Major flooding in the community	Severe Weather
2017	Tropical depression caused 17 inches of rain to fall in 17 hours. Hurricanes Irma & Maria caused flooding and destruction to homes.	Major Disaster
2019	Hurricane Dorian (category 1) caused flooding in the community	Severe Weather

## 13. SEASONAL CALENDAR

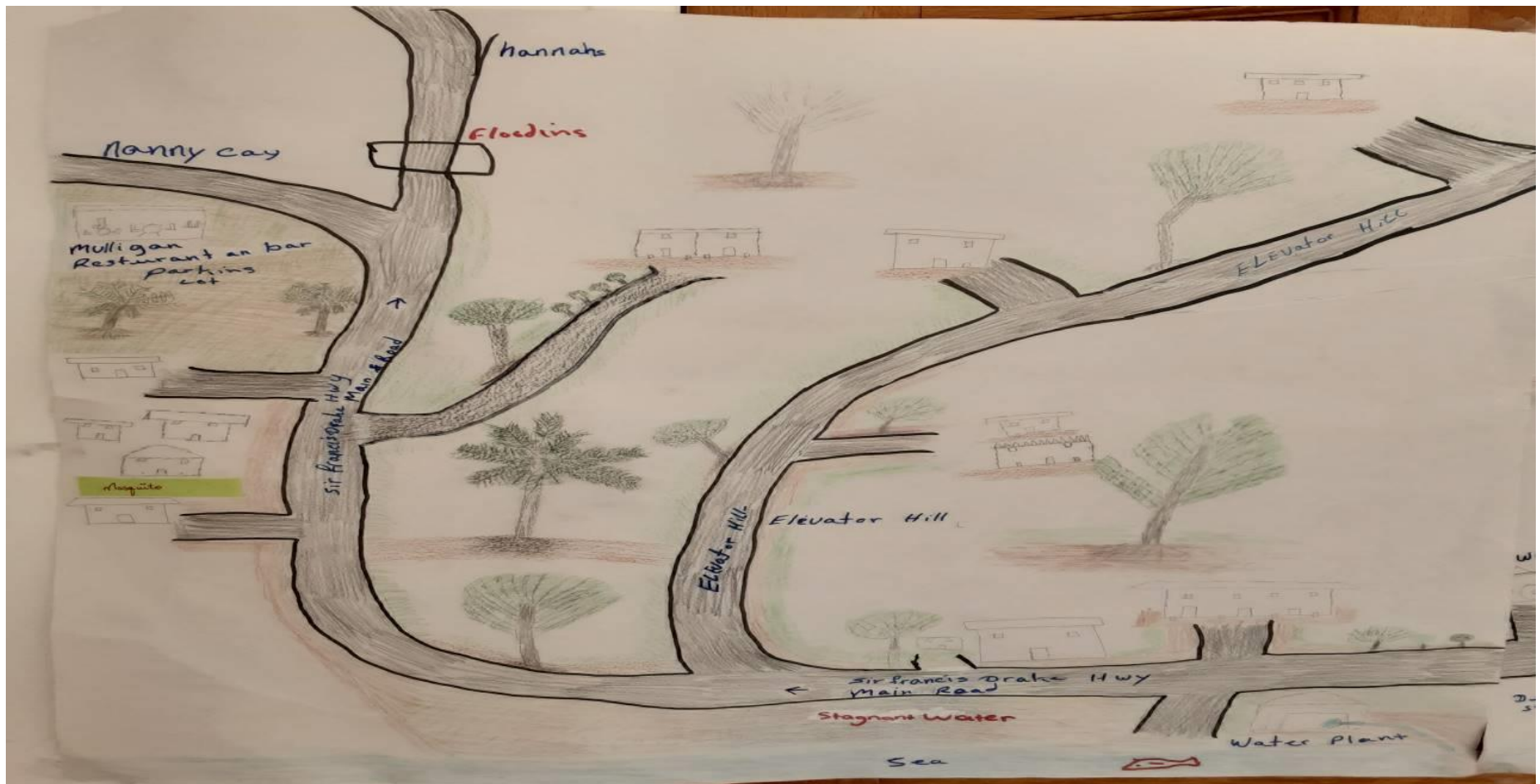
The chart below highlights the months in which events occur in the community of Sea Cows Bay. Based on the chart many of the events has high occurrence from the months of September to January. Some of the hazards in the community; such as: hurricane season and mosquito season have high occurrence a few months before summer and lasts until November. Poor garbage disposal has a high occurrence from November to April because of the festivities during that time. (Key: Yellow signifies Low Occurrences and Red signifies High Occurrences.)

Seasonal Calendar- Sea Cows Bay Community												
Events/Occurrences	J	F	M	A	M	J	J	A	S	O	N	D
<b>Festival/Holidays</b>												
Hamilton Lavity Stoutt Day												
Common Wealth Day												
Easter												
Queen's Birthday												
Territory Day												
Festival												
Ole/ New Year's Festivity												
Christmas Festivity												
<b>Social</b>												
Low Income (Tourism)												
High Income (Tourism)												
Immigration/Migration												
Fishing												
Crop Season												
School												
Sargassum												
<b>Health</b>												
Garbage Disposal (poor)												
Mosquitoes												
Flu, Coughs and Colds												
<b>Hazards/Disasters</b>												
Heavy Rainfall												
Drought												
Hurricane Season												

## 14. MAPPING

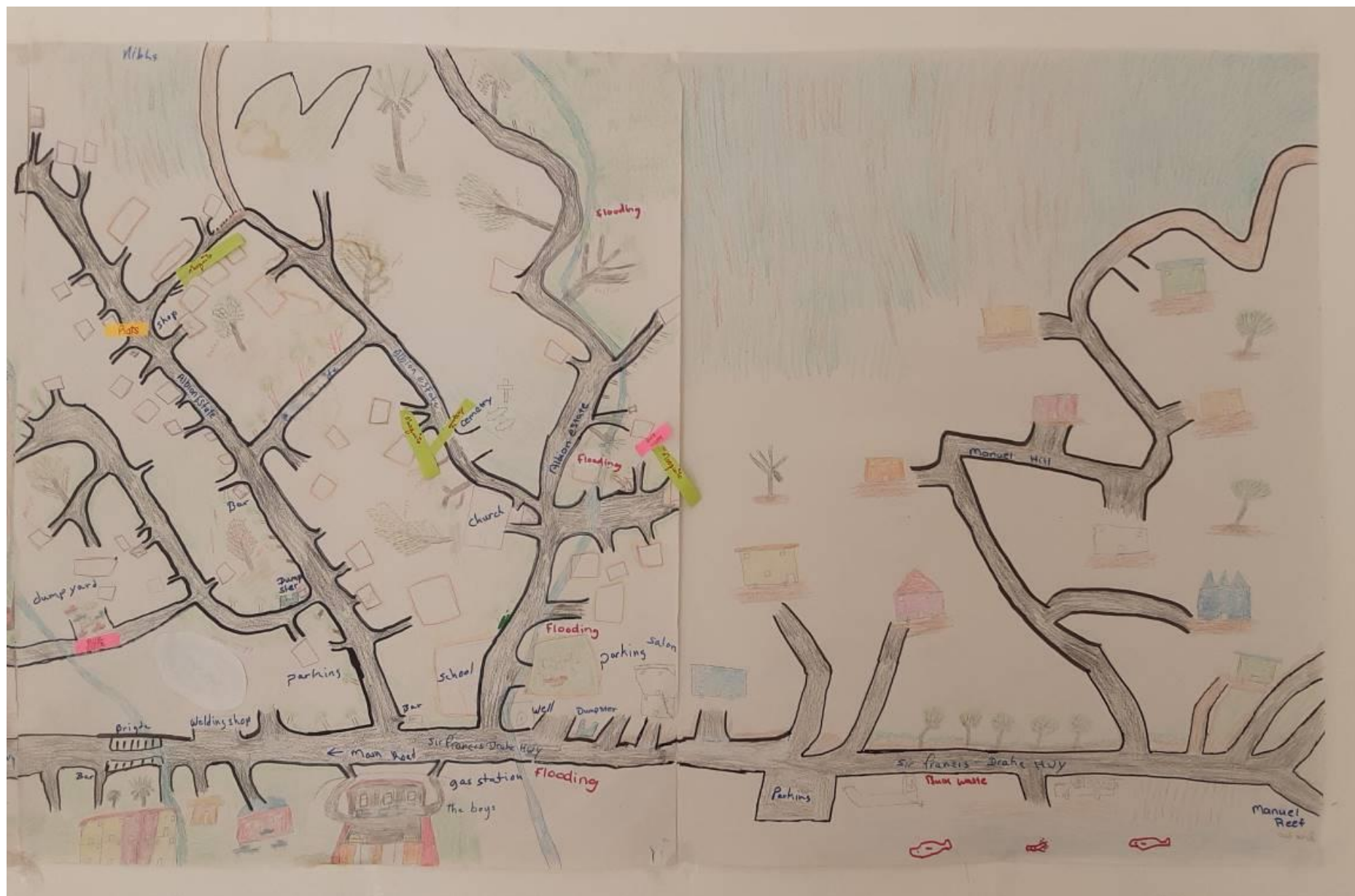
A map was used to identify the hazards, exposures, vulnerabilities and capacities within the community. The map shows the topography of the community, how it ranges from low land to high land, identifying the mountains, hills and other areas within the community. It points out the capacities, these being churches, schools, a clinic, businesses and small businesses all within the community. It shows the hazards and vulnerabilities; the areas that are prone to flooding, junk yards, bulk waste sites, and the areas where mosquito prevalence is high.

The map serves as a visual aid, highlighting the areas that should be of interest, and that will be focused on for the action plan.









## 15. DIRECT OBSERVATIONS

During the transect walk the EVCA team recorded their direct observations found within the community, categorising them under vulnerabilities, hazards, exposures, and capacities. The tables below show the recorded observations highlighted within the community, they coincide with the three identified hazards; hurricanes, flooding and mosquito breeding sites. These place the community at a high risk, however, the capacities within the community are also high and once they are utilised, they can lower the community's risk to the different threats.

### Number determines level of importance:

1 = Very important

2 = Medium importance

3 = Low importance

Rank	Direct Observations- Vulnerabilities
2	Galvanise roofs
2	Derelict buildings
2	Lack of economic opportunities
1	Persons not able to afford health care
1	Non-appropriate building codes (no hurricane shutters on some houses)
1	Vulnerable people- Pregnant women, older persons , Spanish speaking persons, persons with disabilities, unemployed people
2	Lack of community networking
2	Lack of connectivity
Rank	Direct Observations- Hazards
1	Un-clean drainage routes
2	Mosquito breeding sites
1	Bulk waste (derelict vehicles)
1	Hurricanes risk
2	Fire risk
2	Earthquake risk
2	Tsunami risk
1	Landslide risk
2	Stagnant water
1	Flooding
2	Stray animals (dogs, chickens)
Rank	Direct Observations- Exposure
1	Abandoned vehicles, which can harbour mosquitoes and rats resulting in diseases
1	Stagnant water
3	Dead animals
2	Loose debris
1	Galvanise in bushes

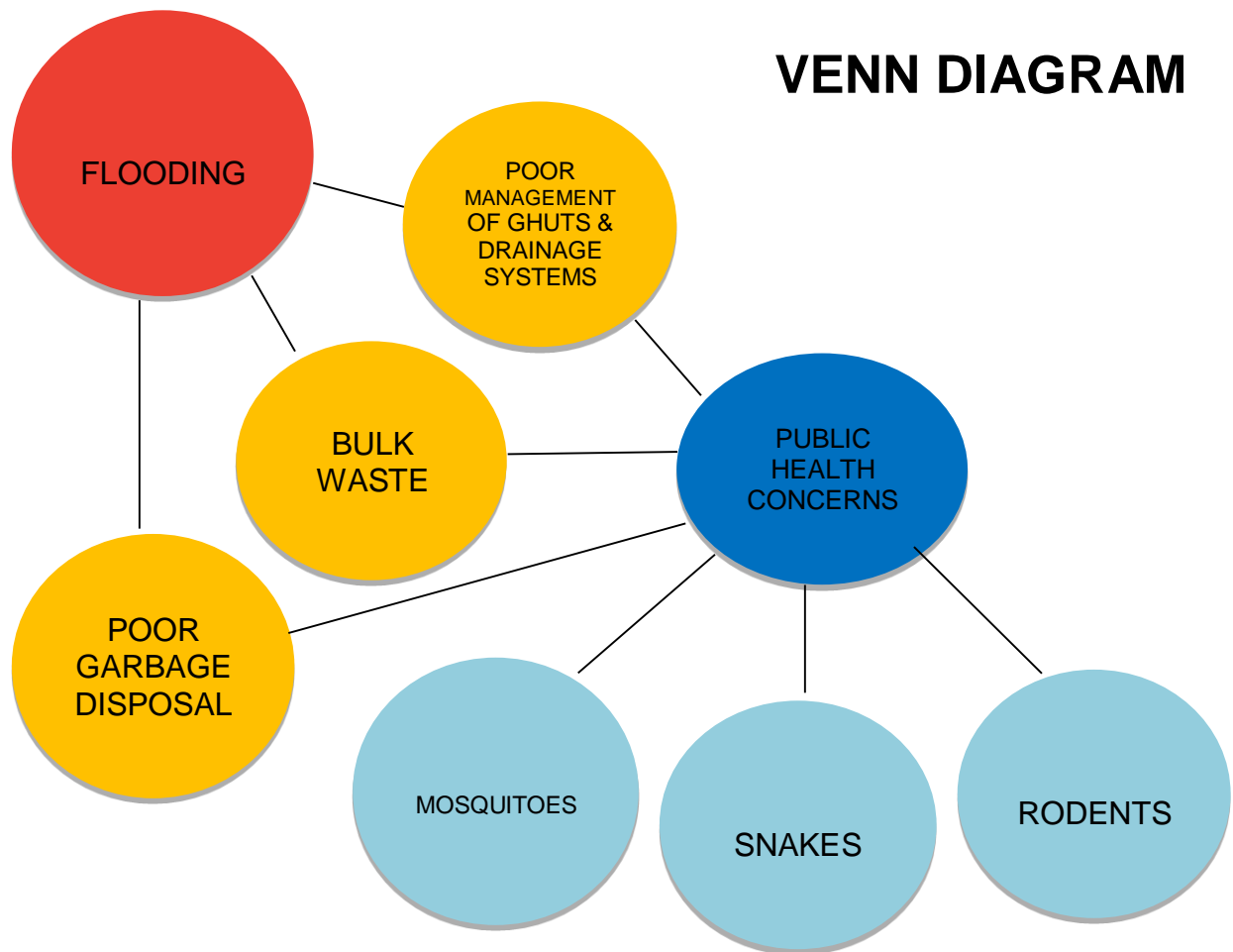
Rank	Direct Observations- Capacities
1	Nurses
1	Doctors
2	Teachers
1	Public clinic
1	Red Cross volunteers
1	Skilled people (carpenters, electricians, truck drivers)
2	Churches
1	Businesses (restaurants)
1	Gas station



## 16. VENN DIAGRAM

The diagram below highlights the major hazards in the community of Sea Cows Bay. Flooding is one of the main hazards, this occurs because of the poor management of the Ghuts and drainage systems within the community, bulk waste, and poor garbage disposal plays an important factor as well. Because of these poor practices within the community many public health concerns have risen, such as the presence of mosquito breeding sites, snakes and rodents that puts the community at risk in developing various diseases carried by these animals/insects.

### VENN DIAGRAM



## 17. CONCLUSION

There is an ongoing need for the Red Cross Branch to interact more effectively with vulnerable communities, Government and other key stakeholders in order to create more effective disaster risk reduction and climate change adaptation. The EVCA can provide both a greater understanding of local conditions of life and how effective organizations will be in raising the capacities of at-risk populations to cope with recurring shocks affecting their livelihood.

Having assessed the risks and priority areas, the community will be consulted to expand on the identified prioritized hazards, vulnerabilities and to help develop/improve existing mitigation strategies that were recommended by the BVI Red Cross EVCA team. The BVI Red Cross will continue its ongoing work with supporting public health campaigns with Ministry of Health which seeks to control mosquito breeding sites, while building community resilience for hurricanes and other natural disasters with CERTs from our partners at the Department of Disaster and Management (DDM) while fulfilling the BVI Red Cross mandate to provide First Aid training. Partnerships will continue to be built with other stakeholders, Government entities and interest groups, such as the Sea Cows Bay community group, and Environmental Health Division within the Ministry of Health and Social Development.

## 18. REFERENCES

Central Statistic Office (British Virgin Islands). *Virgin Islands 2010 Population and Housing Census Report*. Available from:

<http://www.bvi.gov.vg/content/virgin-islands-2010-population-and-housing-census-report>

Department of Disaster Management (British Virgin Islands). *Community Profile for Building Resilience* (2019).

Department of Disaster Management (British Virgin Islands). *Household Survey Tally Summary Sheet-Sea Cows Bay* (2010).

Department of Disaster Management (British Virgin Islands). *Hazard Vulnerability and Risk Profile-Sea Cow's Bay, Tortola British Virgin Islands* (2018).

Department of Disaster Management (British Virgin Islands). *Teachers Trained to Apply SMART Schools Toolkit*. 2018

<http://www.bviddm.com/teachers-trained-to-apply-smart-schools-toolkit/>

International Federation of Red Cross and Red Crescent Societies (IFRC) (2019) *Enhanced Vulnerability Capacity Assessment (EVCA) Training of Trainers (ToT) Resource materials*.

Pan American Health Organisation (2019). *Health in the Americas: British Virgin Islands*. Available from:

<https://www.paho.org/salud-en-las-americas-2017/?p=2541>

<https://www.dabur.com/odomosprotect/blog/what-are-the-most-common-mosquito-breeding-sites>

[https://simple.wikipedia.org/wiki/Hurricane\\_belt](https://simple.wikipedia.org/wiki/Hurricane_belt)

Wikipedia (2019). *List of British Virgin Islands hurricanes*. Available from:

[https://en.wikipedia.org/wiki/List\\_of\\_British\\_Virgin\\_Islands\\_hurricanes](https://en.wikipedia.org/wiki/List_of_British_Virgin_Islands_hurricanes)