



La Soufrière Volcanic Eruption Executive Summary

SAINT VINCENT AND THE GRENADINES



August 2021



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Acronyms

AIA	Argyle International Airport
BBB	Building Back Better
BOP	Balance of Payment
BRAGSA	Buildings, Roads and General Services Authority
CARDI	Caribbean Agriculture Research and Development Institute
CARICOM	Caribbean Community
CCCCC	Caribbean Community Climate Change Centre
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CDM	Comprehensive Disaster Management
CDRU	CARICOM Disaster Relief Unit
CEMP	Comprehensive Emergency Management Plan
CERMES	Centre for Resource Management & Environmental Studies
CIA	Central Intelligence Agency of the United States of America
CITES	Convention on International Trade in Endangered Species
CLS	CDEMA Logistics System
COST	CARICOM Operational Support Team
CPA	Country Poverty Assessment
CREED	Centre for Research on the Epidemiology of Disasters
CUBiC	Caribbean Uniform Building Code
CWSA	Central Water and Sewerage Authority
DDSA	Detailed Damage Sector Assessment
DFID	Department for International Development
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECCB	Eastern Caribbean Central Bank

ECLAC	United Nations Economic Commission for Latin America and the Caribbean
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ENSO	El Niño Southern Oscillation
EOC	Emergency Operations Centre
EU	European Union
EWS	Early Warning System
FAO	United Nations Food and Agriculture Organization
GAR	Global Assessment Report on DRR
GBV	Gender Based Violence
GDP	Gross Domestic Product
GEF	Global Environment Facility (GEF)
ICT	Information Communication Technology
ICZM	Integrated Coastal Zone Management
IFRC	International Federation of Red Cross and Red Crescent Societies
IICA	Inter-American Institute for Cooperation on Agriculture
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IWCAM	Integrating Watershed and Coastal Areas Management
IWRM	Integrated Water Resources Management
Met Office	Meteorological Office
MAFFRTIL	Ministry of Agriculture, Forestry, Fisheries, Rural Transformation Industry and Labour
MENM	Ministry of Education and National Reconciliation
MFEPIT	Ministry of Finance, Economic Planning and Information Technology
MHWE	Ministry of Health Wellness and the Environment
MNMSDF-GAYHIS	Ministry of National Mobilization, Social Development, Family, Gender Affairs, Youth, Housing and Informal Settlement
MoNM	Ministry of National Mobilization, as part of the MNMSDFGAYHIS
MTCASDC	Ministry of Tourism Civil Aviation Sustainable Development and Culture
MTWLPP	Ministry of Transport Works Lands and Physical Planning
MUDEAP-SPGALG	Ministry of Urban Development, Energy, Airports, Seaports, Grenadines Affairs and Local Government

MSMEs	Micro, Small and Medium Sized Enterprises
NBS	National Biodiversity Strategy
NEEC	National Emergency Executive Committee
NEMO	National Emergency Management Organization
NEOC	National Emergency Operations Centre
NPRBA	National Parks, Rivers and Beaches Authority
OECS	Organisation of East Caribbean States
PAHO	Pan-American Health Organization
PAHO/ WHO	Pan American Health Organization (PAHO)/World Health Organization (WHO)
PDNA	Post Disaster Needs Assessment
SDR	Special Drawing Rights
SIDS	Small Island Developing States
SMU	Soufriere Monitoring Unit
SVG	St. Vincent and the Grenadines
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific & Cultural Organisation
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNISDR	United Nations Office for Disaster Risk Reduction
USGS-US- AID	US Geological Survey-US Agency for International Development
UWI - SRC	University of the West Indies Seismic Research Centre
VDAP	Volcano Disaster Assistance Program
VINLEC	St. Vincent Electricity Services Limited,
WASH	Water, Sanitation and Hygiene
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization

1. Introduction



This document presents the background, context, effects, impact, recovery needs and recovery strategy of the devastation of the La Soufrière Volcanic Eruption on St. Vincent and the Grenadines (SVG) within the context of a Post Disaster Needs Assessment (PDNA). It represents a response to a formal request that was received by UNDP on the 25th of May 2021 from the Government of St. Vincent and the Grenadines for technical support in conducting a PDNA. It is anticipated that the findings of the PDNA and the specific strategic interventions proposed therein will be utilized as the main blueprint for developing a detailed recovery programme for the country as well as an instrument for facilitating access to technical and financial resources for the reconstruction and rehabilitation efforts over the short, medium to long term.

Following the initial support request, on the 1st of June 2021, the Government further advised that Mr. Edmond Jackson, Director General Finance and Planning, would be the government lead for the PDNA and requested that the assessment focuses on the following sectors:

- Agriculture, Forestry and Fisheries
- Housing
- Tourism
- Public Infrastructure
- Health
- Education
- WASH
- Electricity
- Construction and Transport

The first planning meeting was convened with the government on the 7th of June 2021 where it was further agreed that the cross-cutting sectors of Environment, Livelihoods and Social Protection, Gender and Disaster Risk Resilience, as well as the macroeconomic impact of the volcanic eruption on the country, should also be assessed. Subsequently, the detailed planning of the PDNA exercise occurred during the period 7th to 25th of June 2021, with the initiation of the actual PDNA process on the 29th of June 2021. A decision was taken to include a PDNA Methodological Refresher Training Programme for all the team members with a particular focus on participants from the various institutions in SVG.

This document therefore presents the purpose and methodological approach of the PDNA and highlights the devastating effects of the event on the social, productive, infrastructure and cross-cutting sectors. It also highlights the impacts of volcanic eruption on the key macroeconomic variables of Gross Domestic Product (GDP), the balance of payment (BOP), fiscal sectors (budgets), inflation and employment. The implications of the event on the socioeconomic and human development at the meso and micro levels are also examined, with considerations given to the impact on poverty (particularly rural poverty), food and nutrition security, the Sustainable Development Goals (SDGs) and on households and personal income.

The document also identifies and prioritizes the recovery needs, which are quantified by the three time horizons (short, medium and long terms). The broad elements of the recovery strategy are formulated by following the Results-Based model and are presented to include a Vision Statement,

Guiding Principles and Intervention Strategies. The recovery strategy is built on the **Vision** of *“Rising out of the ashes as a resilient, climate-responsive society that equitably stimulates human capabilities, sustainable opportunities and an improved quality of life for all”* and is based on the following guiding principles:

- Build resilience and reduce risks, Promote green/blue economies and energy efficiency.
- Ensure equity and accessibility and promote gender equality in decision making, service delivery and recovery
- Rebuild people’s livelihoods

Within the context of the above, the following **Strategic Line of Interventions** were identified as the basis for the development of the Recovery Initiatives:

- Re-engineering economic growth
- Enabling increased Human and Social

Development

- Improving Physical Infrastructure, Preserving the Environment and Building Resilience to Climate Change.

Five (5) broad next steps have been identified to provide the blueprint for ensuring an efficient and effective recovery process, namely:

- Development of an actionable plan for recovery considering the overlapping effects of ongoing Covid-19 and hurricane season early effects.
- Identification of resources gap for funding for the recovery programme.
- Harmonization of the reconstruction process from humanitarian response to recovery.
- Improvement of data collection and management system.
- Capacity strengthening for recovery.



2. The Context Analysis

2.1 Background

St. Vincent and the Grenadines (SVG) is an archipelagic State in the Eastern Caribbean. The country comprises the main island of St. Vincent and a chain of 32 islands and cays - the Grenadines, of which only seven are inhabited: Bequia, Mustique, Canouan, Mayreau, Union Island, Palm Island and Petit St. Vincent. The total area of the country is 389.3 km² (the main island is 344 km²) and it has a population of 110,608.¹ The country lies approximately 61° west and 13° north: approximately 2,427 km south of Miami, Florida, 667 km north of Venezuela and 175 km east of Barbados.

SVG has a tropical marine climate characterised by a marked dry season, from mid-December to mid-May, and a rainy season from mid-May to mid-December. In the drier months, higher than normal atmospheric pressure results in dryness and drought conditions in coastal areas of St. Vincent and the other Grenadine islands. The wet season is characterised by tropical waves, depressions and hurricanes. Hurricanes are perennial hazards related to the atmospheric conditions of the region in the wet season. Temperatures average 27 degrees Celsius all year due to the moderating influences

of the ever-present trade winds. Rainfall is highest in the north-central portion of St. Vincent (150 inches) and decreases on the coast (around 60 inches).

The country has a territorial sea of 12 nautical miles and an Exclusive Economic Zone (EEZ) and continental shelf of 200 nautical miles. The marine space is over 70 times the land area. The terrain of the main island and several of the Grenadines is mountainous. Forests cover between 25 per cent and 30 per cent of the country.

SVG is a Commonwealth Member and a founding member of the Organisation of Eastern Caribbean States (OECS), whose members have a common currency and some common institutions (such as in central banking, civil aviation and the judiciary).

In the past, St. Vincent and the Grenadines relied almost exclusively on agriculture, but within recent times, tourism and related services, construction, transport and other sectors have become increasingly important contributors to the national economy.

¹ SVG Statistical Office, data for mid-year 2019

2.2 The Event: La Soufrière Volcanic Eruption

La Soufrière, a stratovolcano on the island of SVG, began an effusive eruption on 27 December 2020. On 9 April 2021, there was an explosive eruption and the volcano “continued to erupt explosively” over the following days, with pyroclastic flows. The activity pattern of the ongoing eruption is comparable to that of the event that occurred in 1902, which had a Volcanic Explosivity Index (VEI) of 4. The volcano is known to have erupted 23 times in the last 4,000 years.

The Eruptive Process

Figure 2.1 shows the panoramic evolution of

the La Soufriere volcano eruption focusing on the 2020-2021 eruption event. Over time, the morphology of the summit crater of the volcano had a great dynamic change. Four typical stages can be observed in Figure 2.1 below

- Before the current eruption: a dome with a fairly good vegetative cover;
- Effusive eruption: a new growing lava dome near the previous one;
- Explosive eruption: colossal plumes of ash reaching thousands of meters in height; and
- Post-eruption: a new crater without new lava dome.

Figure 2.1. Panoramic Evolution of La Soufriere Volcano Eruption



a) Before eruption (Photo by iWitness News)



b) Effusive eruption (Photo by Loop Caribbean News)



c) Explosive eruption (Photo by the Caribbean Alert)



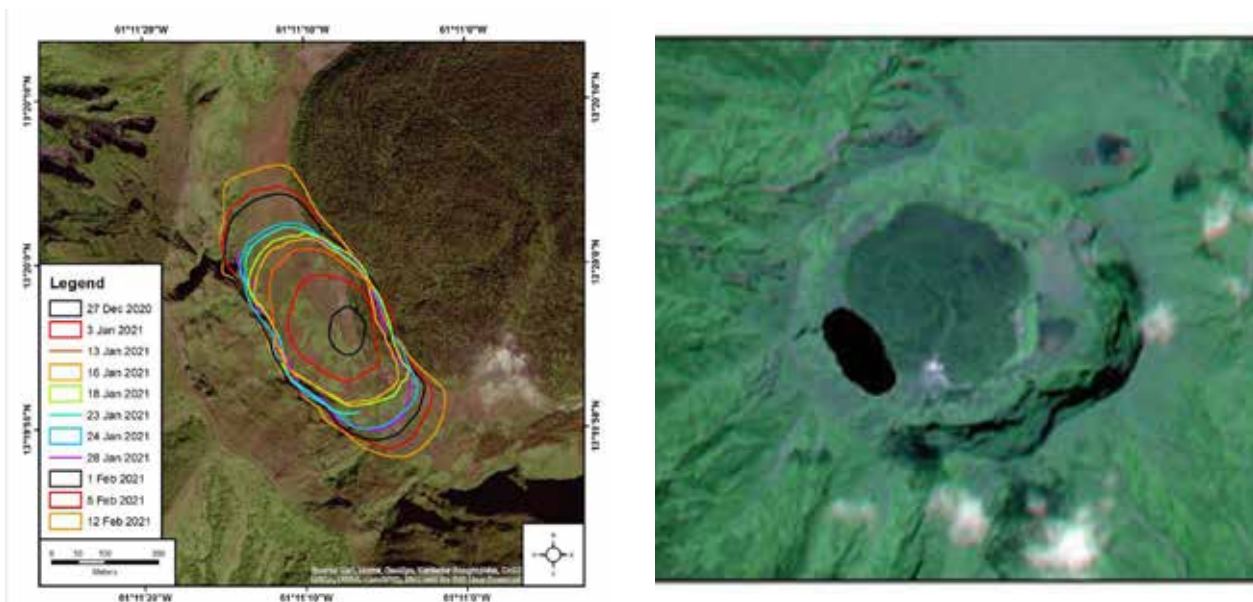
d) Post eruption (Photo by: NEMO)

A more detailed description of each stage of the evolution of the volcanic eruption, obtained largely from Scientific Advisories issued by the UWI SRC, is presented below.

On 27 December, UWI-SRC and NEMO reported that an effusive eruption had begun from the only live volcano on the island of St. Vincent, the La Soufrière. A new lava dome was located on the west-southwest sector of the summit, adjacent to an earlier dome that had formed during the 1979 eruption. UWI-SRC team of scientists and technicians were deployed to SVG on 31 December 2020 and Scientists at the center commenced the process of working with

NEMO to augment the monitoring system. The effusive eruption was accompanied by increased seismicity and gas-and-steam emissions and the mass was confined in the crater of the volcano. The main hazards were in the crater itself and on the immediate rim of the crater due to the configuration of the crater. UWI-SRC provided a map (Figure 2.2) showing the growing lava dome at La Soufrière from 27 December 2020 to 12 February 2021. By 12 February, the lava dome was 618m long, 232m wide and 90m tall, attaining a volume of 6,830,000m³ (the latest report of 19 March with an estimated volume of 13.13 million cubic meters.²

Figure 2.2: Map showing the growth of the new 2020/21 lava dome at Soufrière St. Vincent from 27 December 2020 to 12 February 2021. (Resources: UWI-SRC)



Over the years, the La Soufrière has been monitored by the UWI-SRC and assisted by the Soufrière Monitoring Unit (SMU) of NEMO. As of 2004, the monitoring network consisted of five seismic stations, eight GPS stations, and several dry tilt sites. Seismic data are transmitted from field sites

to the UWI SRC in Trinidad. On 1 January 2021, a new seismic station was installed at Georgetown; on 10 January 2021 one was installed in Owia. In addition, other seismic stations were installed, including on 15 January on the upper S flank; on 18 January 2021 on station SSSA at the summit;

2 LA SOUFRIÈRE BULLETIN: THE AFTERMATH. National Emergency Management Organisation. Government of St. Vincent and the Grenadines

and on 21 January in Fancy. In February 2021, the USGS-USAID (US Geological Survey-US Agency for International Development), through the Volcano Disaster Assistance Program (VDAP), donated equipment to build three more seismic stations³ plus a SPIDER frame. Weekly measurements of SO₂, which is an indicator of degassing of fresh magma with a deeper source, were conducted by helicopter or by boat.

It is important to note that increased seismicity was detected as early as November 2020, and on Sunday, 27 December, the SRC staff received an alert from NASA FIRMS that a hotspot was detected in the crater of the volcano. During January 2021, gas-and-steam effused from the top of the dome as well as along the contact of the old and new domes. Plumes were also visible from Belmont Observatory. The area of burnt vegetation gradually expanded and the growth of the lava dome continued into April 2021. On 23 March, the monitoring network recorded a swarm of small low-frequency seismic events that lasted about 45 minutes, which was likely associated with magma movement beneath the volcano. Some of the activity was felt by nearby communities, including Fancy, Owia, and Sandy Bay. A swarm of volcano-tectonic earthquakes with an average rate of about 50 earthquakes per hour, with increased intensity, began on 5 April. On 8 April, after a sustained increase of volcanic and seismic activity over the preceding days, an explosion was deemed to be imminent. The volcano eventually entered an explosive eruptive phase with an initial explosion taking place on April 9.

The earliest explosive eruption occurred at 8.41 a.m. on 9 April 2021 followed by another two explosive eruptions which were reported at 2.45 p.m. and 6.35 p.m. during the day. **Table 2.1**

shows the explosive eruptions recorded in the days following until April 22, 2021. Since the last eruption of 22 April 2021, seismicity at La Soufriere has remained low: only a few long-period, hybrid and volcano-tectonic earthquakes were recorded and there was no further tremor, i.e., the pattern of seismic activity is typical of the growth and destruction of lava domes. Even though volcanic activity has been on a steady decline, the volcano continues to be in a state of unrest, following the explosive phase, due to the continued presence of near-surface hot spots, daily seismic activity and substantial degassing.

Starting from 27 April 2021, several lahars signals (mudflows) were recorded during and after a period of rainfall. Due to the ash deposits after explosive eruptions, lahars have taken place in all the valleys that drain from La Soufriere and caused considerable erosion and damage, e.g., many trees were brought down by the lahars. These lahars, which are a fast-moving, dense mixture of rocks, ash, vegetation and water originating from a volcano, have become an increased risk during the rainy and hurricane season. It is therefore important that specific caution should be taken in the valley areas around the volcano, especially in areas that had significant ashfall. On 2 July, six lahar signals were recorded by the monitoring network, associated with heavy rainfall from the passage of Hurricane Elsa. Hence, lahars will be one of the biggest concerns that must be monitored among the hazards associated with the post-eruption.

The current state of volcanic activity is consistent with a period of unrest following eruptive magmatic activity, which can continue for weeks to months. There is a small, but not insignificant, possibility that magmatic activity may restart with little warning, should there be an influx of new

3 Most Recent Bulletin Report: March 2021 (BGVN 46:03), Smithsonian Institution, Global Volcanism Program

magma from depth. Although there is no evidence of a lava dome, there are significant changes inside the new crater. Dr. Adam Stinton, a Volcanologist attached to the UWI–SRC, has however stated that it is not necessary to have a lava dome to lead to an explosive eruption.⁴ As indicated earlier, **Table 2.1** presents a summary of the progression of the volcanic eruption activities recorded at La Soufriere.

Table 2.1. Volcanic Eruption Activities Recorded in La Soufrière, St. Vincent

Date	Descriptions		
	Eruptive States	Seismic activities	Eruptive forms
4/9/2021	Initial explosion	After the initial explosion, seismicity increased again at approximately 11.30 am with a swarm of earthquakes lasting until 2.40 pm.	Vigorous ash venting resumed, Lightning can now be seen in the ash column, with an ash plume reaching approximately 10,000 m (32,000 ft) and drifting eastward towards the Atlantic Ocean.
4/11/2021	Second explosion	Short episodes of high-amplitude seismic tremor, each lasting around 20 minutes and with gaps between them from one to six hours.	Thunder and lightning were experienced, ashfall was also reported to have occurred in most areas of the island overnight and neighbouring islands: the Grenadines, Barbados and Saint Lucia, steaming in the upper parts of the Rabacca valley.
4/12/2021	Third explosion	The pattern of seismic activity changed again, with the end of the episodes of high-amplitude tremor 2-8 hours apart.	Pyroclastic density currents, ground-hugging flows of ash and debris; the explosive eruptions thus far have destroyed the pre-existing domes (1979 and 2020-21), a new crater has been created.
4/13/2021	Small to moderate explosive eruptions	Short bands of continuous seismic tremor interspersed with long-period earthquakes.	Audible venting, ash columns can be up to 11 km (35,000 ft) in height PDCs have reached the sea in every valley extending from Larikai to Wallibou. Lahars (mudflows) were reported in the Sandy Bay Area.
4/18/2021	Forth explosion	Occasional small volcano-tectonic earthquakes were still being recorded; an explosion generated a period of high-level tremor starting at 4.49 pm	The resulting eruption plume rose to above 8km and drifted to the south and southwest of the island
4/22/2021	Last explosion	High-level seismic tremor started at 11.09 am, generated by explosive activity, and lasted for about 20 minutes.	A vertical explosive eruption plume rose slowly above the crater eventually reaching a height of about 8 km (26,200 ft.).

Sources: Scientific Updates ⁵ provided by UWI-SRC

⁴ Seismic activity at La Soufriere declining further. Searchlight News.

⁵ Latest Scientific Updates. Seismic Research center, The University of the West Indies.

2.3 Social and Economic Context

2.3.1 Introduction

It is important that the Post Disaster Needs Assessment (PDNA) of the effects and impact of the La Soufrière volcanic eruption in SVG be viewed and interpreted within the following context:

- The ongoing COVID-19 and dengue outbreak health crises;
- The passage of Hurricane Elsa, which impacted the country in July 2021; and
- The prevailing social and economic situation in the country.

There is no doubt that the **COVID-19 pandemic** has had a major effect on St. Vincent and the Grenadines and continues to pose a major challenge to this Small Island Developing State (**SIDS**). The tourism sector, a key driver of economic growth in the country, has come to a complete halt with ripple effects across the economy. Lower tourism receipts, coupled with decreased foreign direct investment, have highlighted the need to urgently address the country's Balance of Payment, given rise to an urgent balance of payments need. The economy is now projected to contract by 5.5 percent to 7.8 percentage points below pre-COVID-19 projections. A drop in fiscal revenues, combined with additional direct health and social expenditures, has increased the fiscal deficit and financing needs.

The Government has responded to the pandemic by swiftly implementing containment measures and a fiscal package, which included an increase in funding for the health sector, various public construction projects to generate jobs, financial support to the agriculture and fishery sectors, and programmes to support displaced workers and the

most vulnerable. The Eastern Caribbean Central Bank (ECCB) also took measures to facilitate the provision of credit and safeguard financial stability.

In addition, the International Monetary Fund (IMF) approved a disbursement of Special Drawing Rights (SDR) 11.7 million (US\$16 million) to St. Vincent and the Grenadines following the country's request. This financial support from the IMF was provided under the Rapid Credit Facility (RCF) mechanism and was programmed to help cover the country's balance of payment and fiscal needs stemming from the outbreak of the COVID-19 pandemic. In addition the World Bank also approved and disbursed a US\$50 million Development Policy Credit and the government of St. Vincent and the Grenadines also exercised the USD\$20 million IDA funded Catastrophic Deferred Drawdown Option.

At the time of the volcanic eruption, SVG was experiencing the most severe **dengue fever outbreak** in its recent history. The last outbreak of dengue fever in the country was in 2012 when 200 cases were reported. Latest available data shows that as of 20 January 2021, there were 1,790 confirmed cases with 8 deaths, an 11% increase in the number of cases since the last published Surveillance Report in October 2020.

Dengue Fever is transmitted mainly by the *Aedes Aegypti* mosquito. This mosquito-borne disease continues to affect all health districts, but most cases have been reported in the Pembroke, Kingstown, Calliaqua and Georgetown Health Districts. Children under 15 years old remain most affected, with approximately 55% of laboratory-confirmed cases falling in this age group.

The direct and indirect costs of dengue illness

and vector control programmes represent a substantial economic burden on both the health sector and the overall economy of SVG. This is occurring at a time when the country is being significantly impacted by the current COVID-19 global pandemic.

SVG was also impacted by **Hurricane Elsa** which struck the island on the 2nd of July 2021. Many households experienced power outages. There were down power lines and poles in the communities of Cedars, Point Village, Riley, Mesopotamia, and on the Grenadine island of Bequia. The communication network monitoring La Soufriere volcano was also affected by the passage of Hurricane Elsa.

Public infrastructure and private homes also sustained damage as a result of the weather system. Several roads and bridges were made impassable by fallen trees. Three police stations sustained damage. The Sandy Bay and Owia Police Stations both sustained damage to their roofs while the Georgetown Police Station lost several windows.

The Northern community of Owia took a beating, where the Government Primary School and Health Clinic sustained significant structural damage. Several buildings in Sandy Bay lost their roofs. This community, which was already devastated by the eruption of La Soufriere, had to contend with multiple mudflows. In the South of the island, Belair resident Patel Gibson was made homeless after a fallen tree flattened his wooden-house structure. According to a situation report from the National Emergency Management Organisation (NEMO), a total of 43 homes reported roof damage.

2.3.2 Demographic and Social Indicators

Table 2.2 presents statistical disaggregated demographic and social data on the population, maternal mortality, life expectancy, male and female-headed households, employment and poverty, and health and nutrition.

Based on the latest available data, the SVG population is estimated at 110,608⁶, with marginally more males than females (51.3% and 48.7%, respectively). Based on available Sex and Age disaggregated data on a population of 101,390⁷, as presented in **Table 2.2**, the country has a relatively young population, with some 35.0% under the age of 25 years. Overall, children under 15 years account for 20.15% of the population, while persons 65 years and older constitute 10.72%. Based on the age structure of the population, the overall dependency ratio is 46.6%, approximately 32.1% for youth and 14.5% for elderly. Approximately, 69.1% of the entire population is of working age (15-64 years old), with 68.2% of the total female population of working age. The spatial distribution of the population in the country shows that more people live in the urban area (53.5%) than in the rural area (46.5%).

The 2017 Saint Vincent and the Grenadines Labour Force Survey indicates that of a total of 41,790 individuals employed, 44.5% were women and 55.5% were men. It also shows that the distribution of women and men differs substantially across industrial groups. Of the total employment, the accommodation and food services industry (a proxy for the tourism sector) engaged 11.2% of female and 5.2% of male workers. Similarly, the wholesale and retail industry employs approximately 20% of female workers, but only

6 SVG Statistical Office, data for mid-year 2019.

7 CIA World Fact book, 2020.

around 15% of their male counterparts. The reverse is true in construction and agriculture, fishing and forestry which together employ approximately 40% of males and around 9% of females.

At last estimate,⁸ the country's unemployment rate was 23%. Unemployment is especially high among women (30.1%) and youth (ages 15-29), where joblessness is twice the national rate. Due to the difficulty of securing employment in the formal sector, many of the residents are engaged in informal employment. This increases their vulnerability, as informal employment is often more volatile and social security coverage in this type of employment is low. The informal sector represents approximately 38.1% of the entire economy and includes family businesses and self-employed owners of the businesses. An estimated 18% of women in Saint Vincent and the Grenadines are employed part-time.

Poverty level indicators for Saint Vincent and the Grenadines in 2008⁹ show that nearly one-third of

the population is poor, with another 3% indigent. Nearly half of the population is vulnerable, as noted by a vulnerability Index of 48.2%. Vulnerable women tend to outnumber vulnerable men and the number of women on public assistance is higher than that of men. The country has a Poverty Gap Index of 7.5, which is notably higher at 10.2% among children up to 16 years, The Gini coefficient of inequality (a measure of wealth or income inequality) of the country is 0.4.

The 2020 Human Development Index (HDI) and related components for SVG is also presented in **Table 2.2**. As can be observed from the table, the country HDI in 2020 was 0.738, which ranked SVG at 97 out of a total of 185 countries. The disaggregated data on the HDI shows the level of equality in life expectancy, education and income.

The health statistics available shows the country has fairly high levels of access to improved water sources and sanitary facilities. The average annual health expenditure is approximately 4.5% of GDP.

8 SVG Statistical Office, *Employed Population by Industrial Group and Sex, 2015 and 2017*

9 St. Vincent and the Grenadines Country Poverty Assessment, 2007/2008

Table 2.2: Demographic and Social Indicators

Demographics								
Population	Age Structure					Dependency Ratio (%)	Urban/Rural (%)	% Male or Female-Headed Household
	0-14 Years	15-24 Years	25-54 Years	55-64 Years	65 Years and Over			
101,390	(20.15%) T: 20,430 M: 10,309 F: 10,121	(14.83%) T: 15,033 M: 7,582 F: 7,451	(42.63%) T: 43,219 M: 22,395 F: 20,824	(11.68%) T: 11,839 M: 6,136 F: 5,703	(10.72%) T: 10,869 M: 5,167 F: 5,702	Total: 46.7 Youth: 32.1 Elderly: 14.5	Urban: 53.5 Rural: 46.5	M: - 52% F: - 48% (CPA 2007/08)
Human Development Index and Components								
	Human Development Index (HDI)	Life Expectancy at birth (Years)	Expected Years of Schooling (Years)	Mean Year of Schooling (Years)	Gross National Income/ Capita (PPP)	HDI Rank		
	0.738 M: - 0.750 F: - 0.724	72.7 M: - 70.3 F: - 75.1	14.1 M: - 14.0 F: - 14.2	8.8 M: - 8.7 F: - 8.9	12,378 M: - 15,776 F: - 8,880	97		
Social Indicators								
Labour Force Composition (%)								
• Male							55.5	
• Female							44.5	
Unemployment Rate							23.0	
• Male							20.7	
• Female							30.1	
Poverty Rate							30.1	
Global Health Security Index Ranking							123/195	
Health Statistics								
	Maternal Mortality Rate (Deaths/100,000 live births)	Infant Mortality Rate (Deaths/1,000 live births)	Drinking Water Source (%)	Sanitation Facility Access (% of Population)	Hospital Bed Density (Beds/ 1,000 population)	Health Expenditure (% of GDP)		
	98	T: - 13.16 M: - 14.9 F: - 11.38	Improved: 95.1 Unimproved: 4.9	Improved: 90.2 Unimproved: 9.8	4.3	4.5		

Sources: CIA World Fact book 2020; UN Human Development Report 2020; CPA 2007/08; SVG Statistical Office, data for mid-year 2019

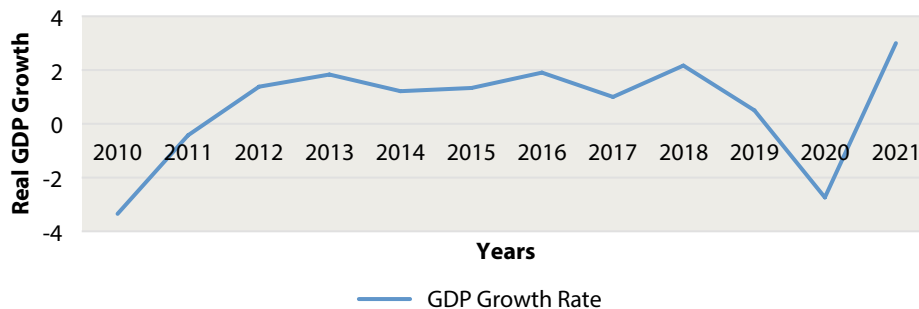
2.3.3 Economic Performance

Real GDP Growth

The real growth of the economy of SVG has fluctuated over the last decade (2010 – 2020), albeit with an upward tendency, especially between 2010 and 2018, as can be observed from **Figure 2.3**. In 2018, real GDP grew by 2.2 percent but declined to 0.49 percent in 2019 as a result of contraction of the construction and manufacturing sectors. Notwithstanding, the overall economic performance of St. Vincent and

the Grenadines (SVG) was expected to improve in 2020 driven by expansions in tourism arrivals, construction activities and an increase in exports of non-traditional crops. As a result of the spread of the Covid-19 pandemic, there was a sharp decline in economic performance in 2020 as borders closed and lockdowns were implemented by several the country’s main trading and tourism partners. Real growth of the economy in 2019 was 0.49% and in 2020 was negative -2.73%. Before the volcanic eruption, the economy was projected to grow in real terms by 3.01% in 2021 (ECCB).

Figure 2.3: Real GDP Growth Rate in the SVG Economy, 2010 -2021

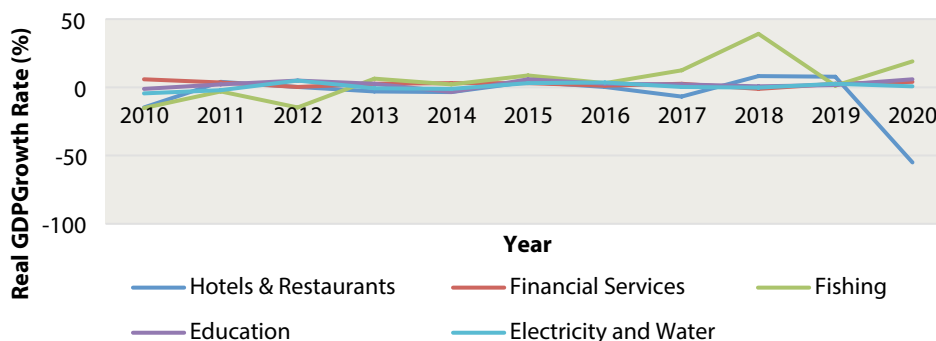


Source: Eastern Caribbean Central Bank ECCB Database

Over the 2010 to 2021 period, growth has been driven mainly by hotels and restaurants, public administration, financial services, agriculture (including fishing), education and electricity and water sectors. **Figure 2.4** presents the real growth

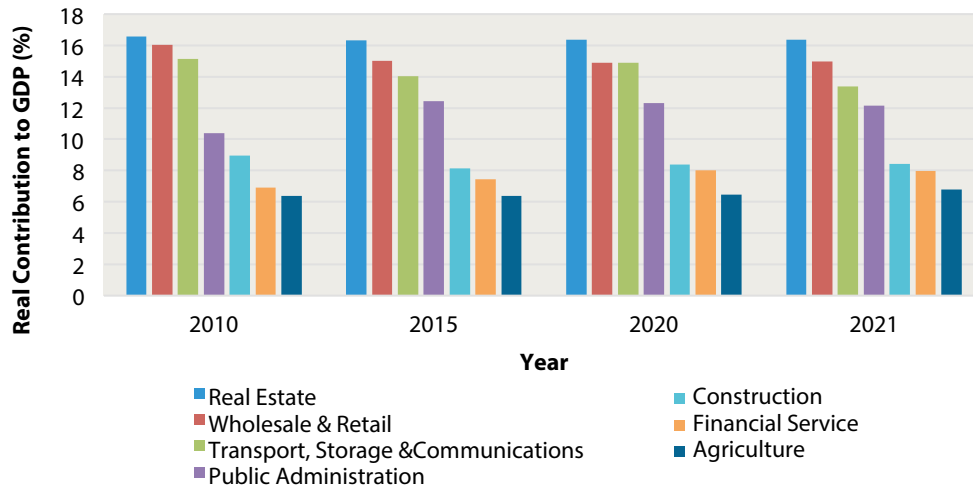
rates of those sectors between 2010 and 2020, while **Figure 2.5** presents the real contribution of the main sectors to GDP for the years 2010, 2015 and 2020 with a projection for 2021.

Figure 2.4: Real Growth Rate of the Sectors Driving GDP Growth (%), 2010-2020



Source: Eastern Caribbean Central Bank ECCB Database

Figure 2.5: % Contribution of Main Sectors to Real GDP Growth



Source: Eastern Caribbean Central Bank ECCB Database

Detailed annual data on the contribution of all the sectors to real GDP for the period 2018 through 2020 are presented in Table 2.3. Being a services economy, wholesale and retail trade amount to more than 14% of GDP, based on their average contribution for the period 2018-2020. The contribution of the agricultural sector to GDP has essentially declined from 6.5 percent in 2018 to 5.8 percent in 2020 representing a decrease of 11.38 percent. Basic services (comprising electricity and water) contribute to less than

4.5%, while construction weighs more than 8%. Tourism, despite its contribution to foreign exchange and marketing strategies; (hotels and restaurants) account for 2.1% of GDP. While hotel and restaurants share of GDP is relatively small, the direct effects on the non-tradable sectors such as construction, transport and real estate are much larger accounting for 8.2 percent, 12.2 percent and 17.1 percent respectively. Public administration represents slightly more than 12 percent of GDP.

Table 2.3: Main sectors' contribution to GDP in St. Vincent and the Grenadines (2018-2020)

SECTOR	2018	2019	2020	2018-2020	
	Revised	Preliminary	Projected	Average	%
Agriculture, Hunting & Forestry	101.72	102.31	98.45	100.83	6.74%
Mining & Quarrying	3.66	3.70	3.62	3.66	0.24%
Manufacturing	66.98	57.82	51.59	58.80	3.93%
Electricity & Water	61.98	64.07	65.01	63.69	4.26%
Construction	126.21	122.97	120.51	123.23	8.24%
Wholesale & Retail Trade	225.02	206.53	204.20	211.91	14.17%
Hotels & Restaurants	34.64	38.40	20.75	31.26	2.09%
Hotels	23.18	24.94	9.98	19.36	1.29%
Restaurant	11.47	13.47	10.77	11.90	0.80%
Transport, Storage & Communications	196.64	208.83	145.63	183.70	12.28%
Financial Intermediation	115.16	117.64	123.14	118.65	7.93%
Real Estate, Renting and Business services	252.21	257.43	260.01	256.55	17.16%
Renting of machinery and equipment	7.90	9.70	9.80	9.14	0.61%
Computer related services	4.37	4.60	4.65	4.54	0.30%
Business services	29.46	30.58	30.88	30.31	2.03%
Public Administration , Defence and	176.77	182.36	189.48	182.87	12.23%
Education	73.47	74.15	77.46	75.03	5.02%
Health & Social Work	44.27	48.40	51.76	48.14	3.22%
Other Community, Social & Personal services	39.65	40.44	41.05	40.38	2.70%
Private Households with Employed Persons	3.38	3.42	3.45	3.42	0.23%
TOTAL/OVERALL	1,516.41	1,520.59	1,448.99	1495.33	100.00

Source: Ministry of Finance, Economic Planning and Information Technology

External sector and balance of payments

An analysis of trade statistics for SVG for the period 2017 to 2020 shows positive balances for trade in services. This positive performance of trade in services is largely attributed to good performances in the travel category, valued at more than 70% of GDP over the period under consideration. It is consistent with the structure of most small open economies, highly dependent on the export of tourism services. Trade in goods, on the other hand, recorded negative balance of trade for the period 2017 to 2020.

The trade in services for Saint Vincent and the Grenadines (SVG) over the period resulted in a positive balance of trade in services (**see Figure 2.6 and Table 2.4**). Total exports of services surpassed total imports for 2017 to 2020. This is reflective of the country's classification as a predominantly service-based economy. Whilst there were small fluctuations, both imports and exports generally trended upwards from 2017 to 2019, after which they both declined in 2020.

"Transportation" and "Other Business and Services" maintained their position as SVG's highest-valued imported services over the period, accounting for an average of 35.48 and 21.32 percent respectively of total imports over the period. Travel remained the highest-valued exported services over the

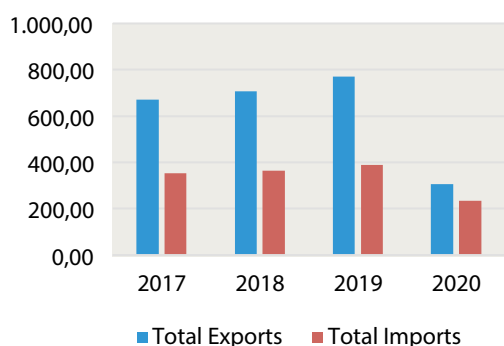
period, accounting for an average of 85.95% of total exports from 2017 to 2019 before falling to 72.58% in 2020.

Trade in goods presents the opposite image of trade in services, maintaining a negative balance of trade for the period under consideration (**see Table 2**). Total imports exceed total exports over the period. Imports trended upwards from 2017 to 2018, largely because of a 64.17% increase in the category of "Mineral Fuels & Related Materials". Subsequently, total imports trended downwards from 2018 to 2020 (**see Table 2**), attributed to declines in most of the categories but particularly "Food and Live Animals" which registered the largest decrease. A similar dynamic was observed for exports which trended upwards over the period 2017 to 2018 before declining in 2019 and then spiking to 146.4m in 2020. The 2020 spike is largely attributed to an increase in the category of machinery and transport equipment while the upward trend in 2018 was largely attributed to increases in "Beverages and Tobacco" and "Manufactured Goods".

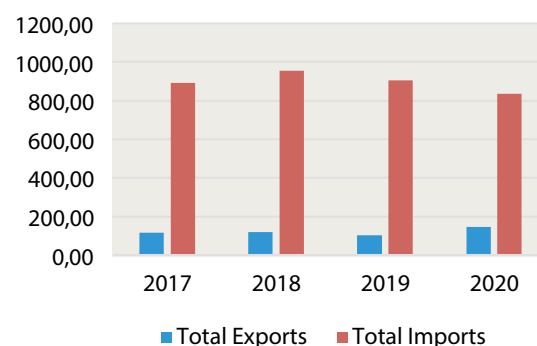
Total goods exported as a percentage of GDP trended upwards from 5.36% in 2017 to 8.08% in 2020 (**see Table 2.4**). Total goods imported as a percentage of GDP trended downwards from 49.99% in 2017 to 46.18% in 2020.

Figure 2.6: External trade of St. Vincent and the Grenadines

Trade in Services 2017 to 2020 (in Millions of Eastern Caribbean Dollars)



Trade in Goods 2017 to 2020 (in Millions of Eastern Caribbean Dollars)



Source: Trade in Services Data, Eastern Caribbean Central Bank

Table 2.4: Summary of Trade in Goods and Services 2017 to 2020

Trade in Services in Millions of Eastern Caribbean Dollars				
Description	2017	2018	2019	2020
Total Exports	672.48	707.73	771.16	307.22
Total Imports	354.32	364.36	388.77	234.37
Balance of Trade (Services)	318.16	343.37	382.39	72.85
Trade in Goods in Millions of Eastern Caribbean Dollars				
Total Exports	114.70	117.90	103.18	146.41
Total Exports as % of GDP	5.36	6.47	5.58	8.08
Total Imports	890.87	954.84	905.16	836.94
Total Imports as % of GDP	49.99	52.40	48.98	46.18
GDP at current market prices	2,138.88	2,190.51	2,226.74	2,186.14
Balance of Trade (Goods)	-776.17	-836.94	-801.98	-690.53

Source: Trade in Service, Visible Trade Statistics and GDP Data, Eastern Caribbean Central Bank

Trends in Total Remittances

Total inbound remittances trended upwards for the period 2017 to 2020 (**Table 2.5**), with the USA the main source country for the largest inbound remittances over the period 2017 to 2020, with an average share of 42%, followed by Canada and the UK. Total outbound remittances declined at a reducing rate over the period 2017 to 2020, registering declines of 11.27%, 9.65% and 7.15% for 2018, 2019 and 2020 respectively.

Table 2.5: Total Remittances 2017 to 2021

Total Remittances for SVG 2017 to 2021 in Eastern Caribbean Dollars (XCD)				
Description	2017	2018	2019	2020
Total Inbound	120,014,764.95	131,799,850.16	136,389,513.92	160,252,480.58
% change (Inbound)		9.82%	3.48%	17.50%
Total Outbound	28,694,991.21	25,460,730.43	23,003,312.99	21,358,032.28
% Change (Outbound)		-11.27%	-9.65%	-7.15%

Source: SVG FSA

Inbound remittances as a percentage of GDP trended upwards from 5.61% in 2017 to 7.33% in 2020, while outbound remittances as a percentage of GDP trended downwards from 1.34% in 2017 to 0.98% in 2020 (**Table 2.6**).

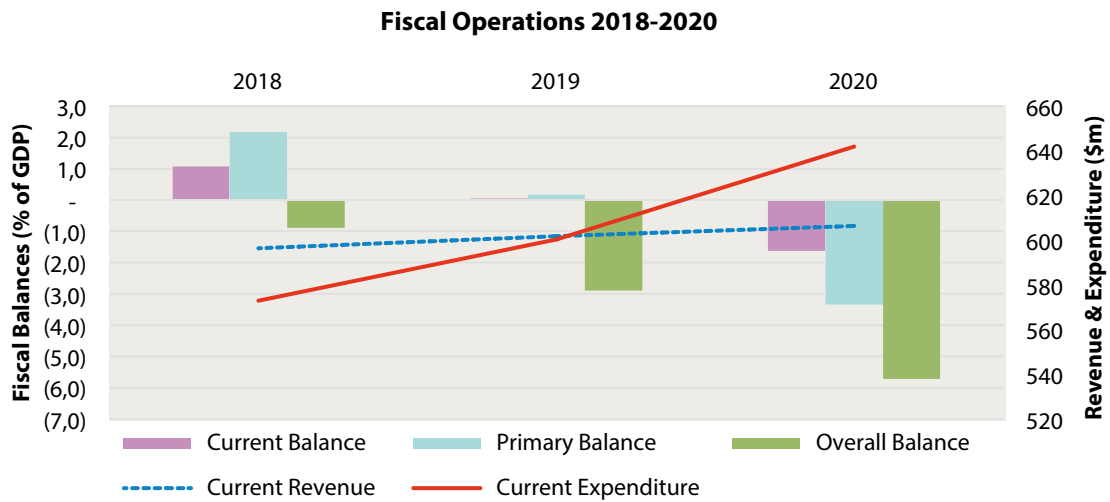
Table 2.6: Total Remittances as % of GDP - 2017 to 2021

Description	Year			
	2017	2018	2019	2020
Total Inbound Remittances (IB)	120.01	131.8	136.39	160.25
Total IB as percentage of GDP	5.61%	6.02%	6.13%	7.33%
Total Outbound Remittances (OB)	28.69	25.46	23%	21.36
Total OB as percentage of GDP	1.34%	1.16%	1.03%	0.98%
GDP at market prices (Current)	2,138.88	2,190.51	2,226.74	2,186.14

Public Finances

Over the last three fiscal years, the overall fiscal position of the government has deteriorated from year to year, from a deficit of 0.9% of GDP in 2018 to a deficit of 5.7% of GDP in 2020. This performance reflected the growth in recurrent and capital expenditure. Annual increase in revenues moderated the impact of the rising expenditure on the overall balance. Corresponding with the worsened overall deficit, the level of Public Debt also increased over the period. The fiscal operation for SVG for the period 2018 to 2020 is presented in **Figure 2.7**.

Figure 2.7: St. Vincent and the Grenadines Fiscal Operations 2018- 2020



Source: Ministry of Finance, Economic Planning and Information Technology

Current Revenue for St. Vincent and the Grenadines grew by less than 1.0% annually over the period 2018-2020, moving from XCD 596.40 million in 2018 to XCD 601.72 million in 2019 and XCD 606.27 million in 2020. On the capital side, a notable increase in revenue was recorded as it moved from XCD 40.65 million in 2018 to XCD 78.30 million in 2019, and XCD 109.41 million in 2020. The growth in capital revenue in 2019 was mainly on account of an increase in grants which went up by 86.7% in 2018 to XCD 74.09 million in 2019. In 2020, capital revenue grew by 39.7% mainly driven by the sale of the Buccament Bay Resort for XCD 34.30 million and an XCD 10.00 million drawdown from the contingencies fund to aid in financing the Government’s Covid-19 response package.

Growth in Recurrent Expenditure outpaced that of Current Revenue, moving by 4.4%, on average, per annum. Outlays increased from XCD 572.96 million in 2018 by 4.8% to XCD 600.44 million in 2019 and a further 6.9% to XCD 641.81 million in

2020. The growth in expenditure from 2018 to 2019 was mainly reflective of a 5.6% increase in Compensation of Employees which was influenced by salary enhancements during the period along with changes in allowances and increments. An increase of 6.9% in recurrent expenditure from 2019 to 2020 was mainly on account of a 6.4% growth in spending on Compensation of Employees and a 47.6% increase in Social Assistance Benefits. Compensation of Employees was positively impacted by a 2.0% salary increase paid to public servants from January 2020. This was a result of filling critical posts across the public sector and changes in increments and allowances during the period. Higher amounts were expended on Social Assistance Benefits as part of the government’s COVID-19 response package.

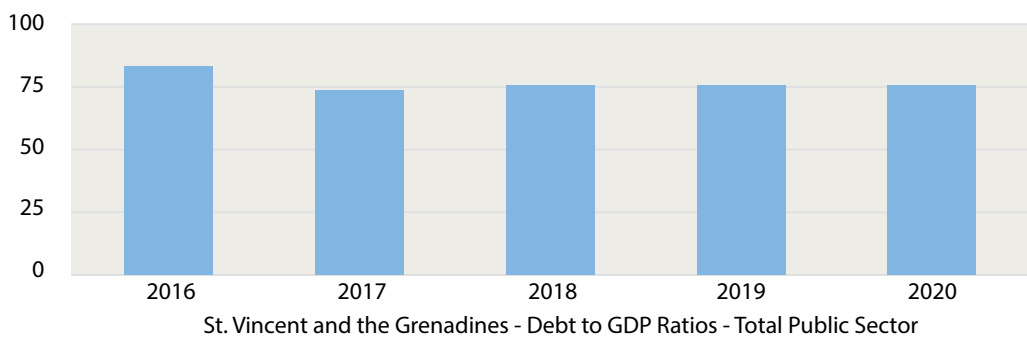
Spending on the Public Sector Investment Programme expanded significantly between 2018 and 2020. Capital Expenditure increased by 61.3% from XCD 98.89 million in 2018 to XCD 159.56 million in 2019 and by 32.4% to XCD

211.18 million in 2020. The increase was mainly on account of spending for the following projects:

- Geothermal Project (XCD 32.88m) in 2019
- Regional Disaster Vulnerability Risk Reduction Programme (XCD 21.73m) in 2019
- Regional Disaster Vulnerability Risk Reduction Programme (XCD 44.06m) in 2020
- Acquisition of Buccament Bay Resort (XCD 31.44m) in 2020

The country has a large Public Sector indebtedness, which increased substantially from XCD 1.66 billion in 2018 to XCD 1.87 billion in 2020, a 12.7% increase over the 2-year period. The public sector debt to GDP ratio which stood at 75.7% in 2018, declined in 2019 to 73.6%. However, the ratio returned to a higher level in 2020 (84.9%) largely due to the resources required to cushion the effects of the economic fallout as a result of the Covid-19 pandemic (**Figure 2.8**).

Figure 2.8: Public Sector DEBT to GDP (%)



The majority of Public Debt is external amounting to 65.1%, 70.7% and 68.9% of obligations, for the periods 2018, 2019 and 2020 respectively. The increase in debt was mainly attributed to disbursements on existing external loans, most notably, the World Bank’s Regional Disaster Vulnerability Project for XCD 41.09 million and a Fiscal Reform and Resilience Development Policy Financing in the amount of XCD 54.00 million. Financing from the IMF amounted to XCD 43.13 million in the form of a Rapid Credit Facility specifically to aid in the response to Covid-19. CDB also disbursed XCD 12.69m for Covid-19 emergency response support.

Total securities issued amounted to XCD 99.22 million and Domestic Borrowing was from BOSVG and ECCB in the amounts of XCD 20.00 million and

XCD 10.00 million, respectively.

Total securities issued amounted to 99.22 million and Domestic Borrowing was from BOSVG and ECCB in the amounts of XCD 20.00 million and XCD 10.00 million, respectively.

Price Fluctuations

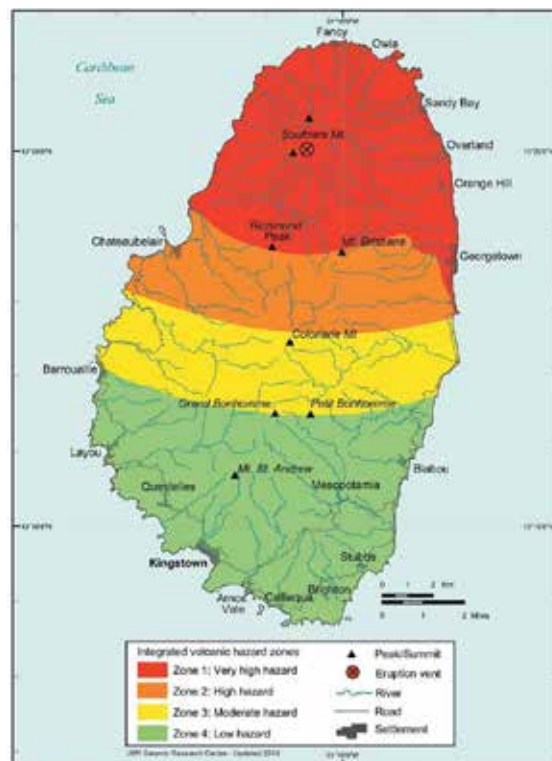
The Consumer Price Index for the years 2018, 2019 and 2020 showed that the annual average “point-to-point” inflation rates were 2.3%, 0.8% and negative 0.5% respectively. For all months of 2018 and 2019 positive values were recorded. Overall changes in the inflation rate were driven mostly by movements of prices of food and non-alcoholic beverages, housing, water, electricity, gas and other fuels and transport.

2.4 Initial Efforts Made to Address the Effects and Impact of the Volcanic Eruption

The efforts that NEMO has made to prepare the **general** population and the Government Structure for **the explosive eruption of the volcano**, from the national level to district levels, have been extraordinary and worth mentioning. Extensive communication strategies and permanent dialogue with the scientific teams from the Seismic Research Center (SRC), at UWI made it possible to swiftly mobilize the population located in the area of influence of the volcanic eruption

to safer grounds. A permanent instrumentation network monitors La Soufriere volcanic activity and provides timely information for authorities to make informed decisions. Such is the case of the mandatory evacuation undertaken by authorities to protect the life of the most at risk. To this end, a hazard zoning map was widely disseminated and has also been the basis for the post-disaster needs assessment. A detailed description of the hazard zones is shown in **Figure 2.6** below.

Figure 2.6: Saint Vincent Volcanic Hazard Zone Map



Hazard Zone 1 (Red Zone) - Very High Hazard

This includes all areas expected to experience maximum damage in the short term and is the zone where all hazardous events have their greatest influence. It is defined by the zone of expected total destruction from pyroclastic flows, surges and mudflows and by the zone of maximum expected damage from all projectiles. This zone is likely to experience more than 30 cm of ash. During an eruption, this zone would be unsuitable for human habitation.

Hazard Zone 2 (Orange Zone) - High Hazard

This includes all areas of moderate pyroclastic flow and surge hazard, areas within the 5km projectile zone and areas likely to experience between 10 and 30cm of ashfall. These areas will be affected similarly to Zone 1 during large scale eruptions.

Hazard Zone 3 (Yellow Zone) - Moderate Hazard

This zone will be free from the effects of flows and surges but will be affected by 5 to 10 cm thick ash

falls, minor earthquakes and lightning strikes. This zone will experience significantly less physical damage than Zones 1 and 2.

Hazard Zone 4 (Green Zone) - Low Hazard

This zone includes areas likely to be relatively safe from hazardous events, except for minor ash-fall of less than 5cm. Crop damage and disruption of water supply due to ashfall will be the main effect but other physical damage will be minimal.

It should be noted that the map only shows hazard zone on land. However, lahars and pyroclastic falls, flows and surges will also impact areas offshore to varying degrees, and as such, the hazard zones must be envisaged as extending some distance offshore. The major policy, institutional, fiscal and international efforts made to date by the Government of SVG to address the fallout from the disruptive effects and impact of the volcanic eruptions are discussed under the relevant sections of this report.



3. Assessment of Disaster Effects

3.1 Methodological Approach

The methodological approach utilized in conducting the assessment of the impact of the volcanic eruption on SVG is that of the Post Disaster Needs and Assessment (PDNA). It is a process in which the effects and impact of a disaster on a set of sectors are analysed to identify recovery needs and develop a comprehensive, multi-sectoral recovery strategy. The PDNA process covers three main sectors: 1) Social; 2) Infrastructure; and 3) Productive along with several cross-cutting themes that are addressed across all sectors.

In the execution of the assignment, utilizing the

PDNA methodology, the following four main sequential and related phases were employed:

- Collection of pre-disaster and post-disaster data and information.
- Assessment of the disaster effects.
- Assessment of the disaster impacts.
- Preparation of a recovery strategy that determines the recovery needs for all sectors

The main variables assessed are summarized in **Tables 3.1 and 3.2** below.

Table 3.1: The Assessment of Disaster Effects of the Volcanic Eruption

Damage	Description
Effect 1: Damage to infrastructure and physical assets	The quantification of partial or total destruction of public and private infrastructure and physical assets both in terms of number of units and their monetary value.
Losses	An estimate of the changes in economic flows arising from the disaster based on the following three categories of effects:
Effect 1: Disruption of service delivery and availability/ access to goods and services	Availability: the availability and quality of goods and services needed for production. Access: household access to basic goods and services essential to the sectors (livelihood opportunities, markets, services, inputs, credit and loans, etc.).
Effect 2: Disruption of governance and social processes	An assessment of the impact on governance/policy environment, including government capacity for response/recovery in the sectors. An estimate of the effect on assets: human, social and political.
Effect 3: Increased risks and vulnerabilities	An assessment of immediate risks to sectors (livelihoods, markets, services, inputs, credit and loans, etc.) that may deteriorate unless addressed. An Identification of the underlying risks and the measures needed in the recovery process to protect the sectors, reduce vulnerability and build resilience

Table 3.2: The Assessment of Disaster Impact of the Volcanic Eruption

Impact	Description of Impact Assessment
Macro-economic impact	<p>An estimate of the likely impact of the disaster on macro-economic variables, particularly:</p> <ul style="list-style-type: none"> • Gross domestic product (GDP); • Balance of payments (BOP); • Fiscal sector (budget); and • Inflation. <p>Includes disaster-induced changes in exports, increased imports, higher than normal government expenditure and lower tax revenue.</p>
Human development impact	<p>An estimate of the human development impact (at the macro and micro levels), particularly the impact of the disaster on:</p> <ul style="list-style-type: none"> • Poverty (particularly rural poverty). • Overall levels of food and nutrition security. • Sustainable Development Goal. • Employment. • Household and personal income

In addition, particular considerations were given to cross-cutting issues in the economy, with a view of examining how these issues could be addressed in the recovery process, including the determination of the requisite institutional arrangements. The cross-cutting issues examined were:

- Disaster Risk Reduction (DRR): - Resilience and building back better (BBB); Technologies and practices that build resilience; Safe location and design of infrastructure; and Strengthening of DRR management processes.
- The Environment and Natural Resources.
- Gender and Social Equity.
- Employment and Livelihoods.

Based on the estimation of total effects, the Recovery Needs of the country were determined and prioritized to include:

- Service delivery and production, and access to services and goods to be restored.
- Governance restoration and strengthening.
- Risks: Addressing pre-existing and new risks related to the disaster, and reducing the risks and vulnerabilities to future disasters, including those related to service delivery and production, access to services and goods, and governance.

Finally, the recovery strategy for the country was underpinned by guiding principles and objectives derived from a consultative process. The strategy is aligned to national laws and as well as existing national and sectoral development policies and strategies and has adopted current best practices¹⁰. The recovery strategy includes the following core components:

- The agreed vision and guiding principles for the sector recovery process.
- An outline of reconstruction and recovery needs to restore and resume the country to pre-disaster levels of economic development related economic activities, along with build-back-better measures to strengthen the resilience of the government and communities and reduce risks and vulnerabilities to future disasters.
- An outline of a results-based recovery plan for the country.

3.2 Main Findings of the PDNA

The economic valuation of the total effects of the La Soufriere Volcanic Eruption, utilizing the PDNA Methodology, found significant damage and loss to the economy of the SVG's economy. The total effects was estimated at XCD 634,654,692, comprising damage of XCD 416,079,487 and loss of XCD 218,575,205 (**Table 3.3**).

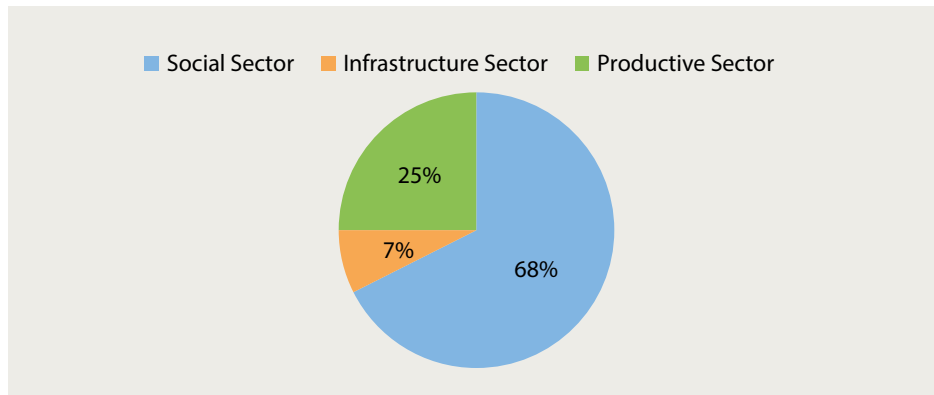
Table 3.3: Total Effects of All Sector

Sector	Damage (XCD)	Loss (XCD)	Total Effects (XCD)
Social	281,286,577	33,421,158	314,707,735
• Housing	263,542,495	32,333,364	295,875,859
• Health	3,151,203	358,150	3,509,353
• Education	14,592,879	729,644	15,322,523
Infrastructure	30,414,030	46,612,510	77,026,540
• WASH	304,530	1,337,596	1,642,126
• Transport	30,000,606	44,363,134	74,363,740
• Electricity	108,894	911,780	1,020,674
Productive	104,378,880	138,541,537	242,920,417
• Agriculture, Forestry, Fisheries	103,848,380	126,296,910	230,145,290
• Tourism - Accommodation	-	11,810,000	11,810,000
• Tourism - Parks	530,500	434,627	965,127
Total	416,079,487	218,575,205	634,654,692

- 10 Some of the current best practices include: Responding to the needs and priorities of the affected population; Focusing on the most vulnerable and most affected; Restoring capacities and capabilities; Ensuring national ownership and leadership of the of the recovery process; Working in partnership with civil society, donors, NGOs, World bank and other UN agencies; Maintaining synergies with humanitarian actions and development goals; and Reenforcing national and local plans for DRR.

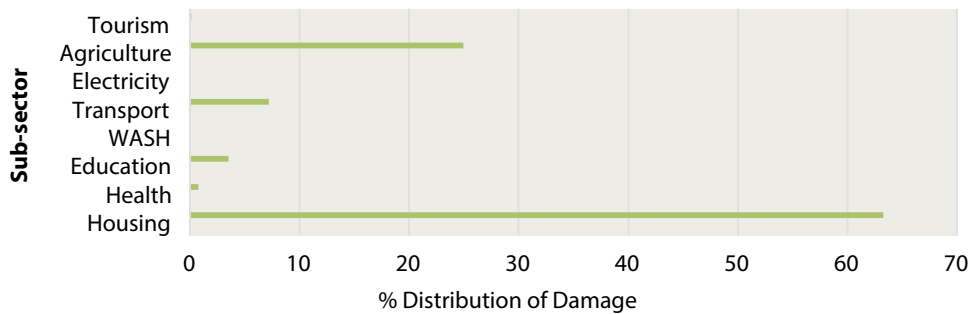
The social sector accounted for XCD281,286,577 or 67.6% of total damage of XCD416,079,487. The distribution of damage by sector and key sub-sectors are presented in **Figures 3.1 and 3.2**¹¹, respectively.

Figure 3.1: % Distribution of Damage from Volcanic Eruption



As can be gleaned from **Figure 3.2** below most of the damage occurred in the Housing (63.3%) and Agriculture (25.0%) sub-sectors.

Figure 3.2: % Distribution of Damage by Sub-sector

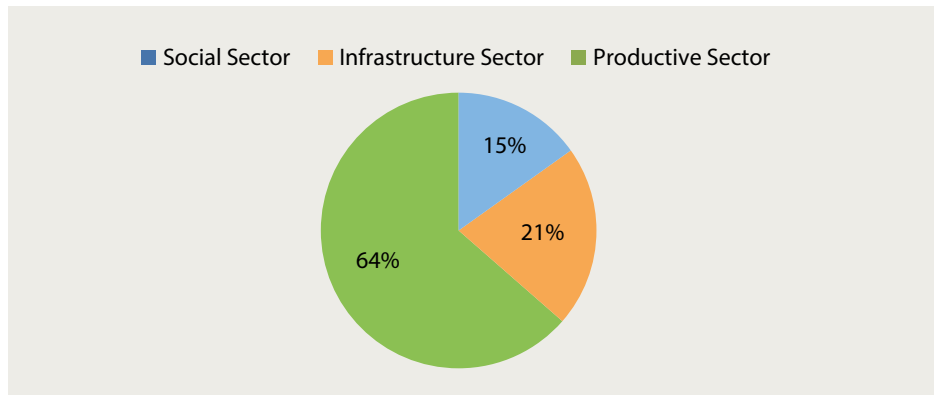


The distribution of loss by sector and key sub-sectors are presented in **Figures 3.3 and 3.4**¹² respectively. As per **Figure 3.3** below, of the total loss of XCD218,575,205, the productive sectors of tourism, agriculture, forestry and fisheries accounted for XCD138,541,537 or 63.39%.

11 Source: PDNA Assessment Team

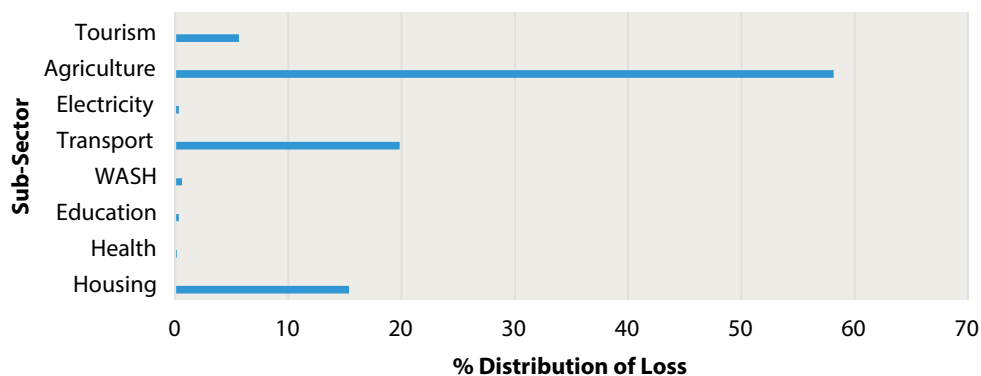
12 Source: PDNA Assessment Team

Figure 3.3: % Distribution of Loss by Sector



As can be gleaned from **Figure 3.4** most of the loss occurred in the Agriculture (57.78%) and Transport (20.30%) sub-sectors..

Figure 3.4: % Distribution of Loss by Sub-sector



3.3 Social Sector

The social sector, comprising of housing, health and education sub-sectors, accounted for the highest level of effects from the volcanic eruption (49.6%), when compared to the productive and infrastructure sectors, of 38.3% and 12.1%, respectively. The overall effects on the social sector was estimated at XCD 314,707,735, comprising damage of XCD 281,286, 575 and loss of XCD 33,421,158 (see Table 3.3). Of the social sector, housing was severely impacted by the

volcanic eruption, with the effects on this sub-sector estimated at XCD 295,875,859 or 94.0% of the overall effects on the social sector.

3.3.1 Housing

According to the 2012 Housing and Population Census, Saint Vincent has a total population of 109,991, including 56,419 males and 53,572 females. According to their living conditions,

the population in the islands comprise 109,188 people living in private dwellings, 85 people living in a state of homelessness and 718 living across various institutions. Approximately 18% of all the dwellings in the country are in the red, orange, and yellow zones.

The Housing Sub-sector is one of the most affected by the eruption of La Soufriere. The damage

within this Sub-sector from this event is estimated at XCD263.5 million to private property, while loss and additional costs amount to XCD32.3 million, including XCD30.47 million in the public sector and XCD1.86 million in the private sector (**Table 3.4**). The materials used in the construction of the houses and the radial proximity of the houses to the volcano.

Table 3.4: Damage and loss summary of Housing (XCD)

Description of Effects	Private	Public	Total
Damage	263,542,495		263,542,495
Loss	1,859,095	30,474,269	32,333,364
Total	265,401,589	30,474,269	295,875,858

Source: Housing sector evaluation team

The construction materials of houses are an important factor to consider due to their vulnerability to different natural hazards that may impact the country. Figures taken from the census indicate that 90.8% of the houses on the island are built with metal-sheet roofs, while 7.3% are built with concrete and 1.8% are built with other types of materials. Metal-sheet roofs, which are the most prominent in the islands, are most susceptible to suffer the greatest impacts when facing ashfall from volcanic eruptions, given the additional loads that they will need to withstand.

The additional weight of ash on the roofing impacted the structure of the houses, resulting in the high level of disaster effects observed in the housing Sub-sector. The damage to the houses resulted in the production of large amounts of debris, comprised mainly of metal sheets and wood that had to be collected and disposed. The debris produced represents an additional clean-up cost that this Sub-sector had to bear, along with those associated with the cleaning of the volcanic ash accumulated on the roofs and surrounding areas.

There is no doubt the several houses will have to be relocated given the possibility of further volcanic eruptions and related ashfall, as well as additional risks created by the eruption of mudflows during periods of heavy rainfall.

Reports available show that during the volcanic eruption, houses on the main island St. Vincent were affected and the degree of impact was correlated to their radial proximity to the volcano. A classification was established ranking areas from the greatest to the least affected using four colours: a) red identifying the most affected, b) orange identifying the moderately affected, c) yellow identifying the mildly affected, and d) green identifying the minimally affected.

It is important to mention that the most affected area (Red Zone) is also the area with the fewest dwellings, while the least affected area (Green Zone), which also has the highest concentration of houses, shows that dwellings were only lightly affected (less than 5% of the house with some level of damage). Therefore, the percentage of housing damage

with relation to the total number of houses in the country is not concentrated in the area closest to the volcano but rather is spread out. Notwithstanding, all the houses that were moderately or severely damaged are in the Red Zone (Georgetown and Sandy Bay), Orange (Chateaubelair) and Yellow Zone (Colonaire). In addition, 91.5% of the houses in the Red Zone are constructed with metal-sheet roofs, 92.3% in the Orange Zone and 92.2% in the Yellow Zone, compared with the national average of 90.8%.

Loss estimates in the housing sector are grouped under three main categories: a) costs for removal of debris, b) costs associated with the provision of temporary housing/shelters, and the related operation and maintenance of shelters, and c) foregone income from rental housing. The total loss amounts is estimated to be valued at XCD32.3 million, of which XCD12.3 corresponds to debris removal, XCD18.1 million to the operation and maintenance of shelters (public sector loss), and XCD1.9 million to rental housing (private sector loss). Therefore, in terms of the total loss, XCD30.4 million represents loss to the public sector while only XCD1.9 million corresponds to the private sector.

In terms of human impact, the displaced population as a result of the impact on the housing sub-sector is another important factor to consider. During the emergency, a total of 5,535 households were displaced which represents about 19,914 individuals (18% of the population). This displaced population had to adapt to new living conditions in government-led or private shelters. From the beginning of the emergency to the date of this report, 1,981 individuals from 1,227 households were recorded as being in government shelters, including 647 children and 1,137 persons from vulnerable groups.

Recovery needs in the sector were estimated based on the analysis of damage and loss. The concept of

building back better was applied to counteract not only the damage caused by the volcanic ash fall, but to mitigate the impacts any future catastrophic events, including hurricanes and storms. In this context, an additional 20% was applied to the replacement values to cover the cost of inflation of construction materials and technical improvements in building constructions to ensure the adherence to national building codes and standards. The total recovery needs amount to XCD355.9 million, out of which XCD296.4 million corresponds to home improvement, XCD30.4 million for incurred expenses and XCD29.1 million for the construction of new houses that must be relocated.

In the short term, recovery needs is estimated to be valued at XCD190.1 million while in the medium term, recovery needs is estimated at XCD165.8 million, which includes improvements required to those homes located in the green zone that were affected by the volcanic eruption.

In efforts to lower the risks of susceptibility of some houses to future disaster events, it is necessary to relocate 375 homes that are in highly prone volcanic areas that to a large extent are not suitable for housing construction. In fact, these houses would have already suffered severe damage during the last volcanic eruption. This relocation effort represents a cost of XCD29.1 million.

3.3.2 Education

The education sector in Saint Vincent and the Grenadines is comprised of 223 schools ranging from early, primary and secondary education. Presently, there are one hundred and twenty-eight (128) early childhood centres. Of these institutions, 117 are privately operated while the remaining eleven are (11) operated by government institutions. Pupils within the primary school system are accommodated in sixty-eight (68) primary institutions. Of these institutions, 57 are public and the remaining 11 are government

assisted or private institutions. Secondary Education in St. Vincent and the Grenadines is provided by 27 institutions, 19 of which are public. The remaining eight schools are owned by churches but operate with substantial financial assistance from the Government.

In terms of exposure to the volcano, 22 percent of the education buildings are in the red, orange, and yellow zones as defined in the volcanic hazard map. In terms of the physical vulnerability of the school buildings, the weakest constructive typology is the one that has metal sheet roofing, due to its inability to withstand additional vertical load added by the weight of ash, especially if wet.

While it may be said that the Education Sector in Saint Vincent and the Grenadines was not the most severely sector impacted by the volcanic eruption, the costs to repair and replace the affected infrastructure turns out to be significant. The total assets value of the school buildings in the country was estimated at XCD135.2 million. The damage in terms of the costs to repair and replace the affected infrastructure represents 10.8% of that total value of the school building assets, which is significant for the education sector. Due

to the importance of maintaining the education system, this should be one of the priority sectors in the reconstruction process.

During the volcanic eruption, educational facilities on the main island of Saint Vincent were affected and the effects were directly correlated to the radial proximity to the volcano. A classification was established, ranking areas from the greatest to the least affected using four colours: a) red identifying the most affected, b) orange identifying the moderately affected, c) yellow identifying the mildly affected, and d) green identifying the minimally affected.

A total of 177 schools were impacted, comprised of early childhood centres (106), primary schools (52) and secondary schools (19). Of the total number of affected schools, 139 were mildly affected, and 19 each were moderately and severely affected. Total damage is estimated at XCD14.6 million where XCD7.8 corresponds to private property, and XCD6.8 million correspond to public property. Other losses and additional costs amount to XCD0.73 million, including XCD0.34 million in the public sector and XCD0.39 million in the private sector.

Table 3.5: Damage and loss summary of Education (XCD)

Description of Effects	Private	Public	Total
Damage	7,829,723	6,763,156	14,592,879
Loss	391,486	338,158	729,644
Total	8,221,209	7,101,314	15,322,523

Source: Education sector evaluation team

For this assessment, loss has been estimated at XCD0.73 million and this reflects the additional costs incurred to collect, remove, and dispose of debris mostly associated with the partial or total destruction of roofs. Other costs related to the cleaning of ash are significant but are not included in these costs; those costs have been captured globally in the Transport Sector. The impact on the environment has been significant due to the fall of ashes. This has been compounded by a large quantity of debris linked to the partial or total destruction primarily of roofs in this and other sectors such as housing and health for example.

In terms of human impact, students who were studying from home due to the ongoing pandemic were displaced substantially. This displacement forced them to change their daily activities since they had to adapt to new conditions in government-led and private shelters. During the emergency, a total of 20,915 students were displaced: 12,025 from primary schools and 8,890 from secondary schools.

The recorded damage and loss figures were used as a basis to estimate the recovery needs. Concepts of building back better and disaster risk reduction were applied to counteract effects caused by the volcanic ashfall in a potential new eruption, but also any future catastrophic event including hurricanes and storms. To this end, an additional 20 percent in the replacement values was applied. Total needs amount to XCD18.2 million, which corresponds to XCD17.5 million for building improvement and XCD0.7 million for incurred expenses.

In the short term, the recovery needs amount to XCD11.8 million, while in the medium run, which includes improvements on educational facilities located in the green zone of the hazard map, amounts to XCD6.4 million.

3.3.3 Health

The impact of the volcanic eruption on the Health Sector was significant. **Figure 3.5** indicates the health facilities in the Red, Orange and Yellow Zones.

Figure 3.5: Health Facilities in the Red and Orange zones



Source: Ministry of Health

The April 9, 2021, volcanic eruption of La Soufrière found the Health Sector in Saint Vincent and the Grenadines in an already difficult situation. Pressure for an effective response to COVID-19 had already demanded additional human and financial resources to contain the spread of the virus, but also to manage the increased rate of infections especially at the beginning of the year. In April 2021, infection rates had fallen, and the authorities had started a vaccination campaign that required good planning, management and delivery.

An IFRC report on the dengue outbreak in the country showed the Dengue Fever was present in all the health districts in the country, with 58% of cases reported occurring in persons who live in the Pembroke, Kingstown, and Calliaqua Health Districts of the Green Zone. As of 20 January 2021, there were 1,790 confirmed cases with 8 deaths, an 11% increase in the number of cases since the last published Surveillance Report of October 2020.

In this context, the volcanic eruption further compounded the health situation in the country by adding to the demand for health services as reported by PAHO¹⁴. In the afternoon of 8 April 2021, the Prime Minister issued an order to evacuate over 20,000 individuals from the volcano red zone due to an imminent explosive eruption, the next day, evacuations of the orange zone also started. The National Emergency Management Organization (NEMO) of VCT activated a network of 76 emergency shelters. Due to community spread and the asymptomatic spread of COVID-19 on the island, the public health risk involved in gathering in a shelter was significant.

The health sub-sector did not record any major collapse in the facilities, due to the additional weight of ash in their roofs. However, one facility, the temporary Clinic in Sandy Bay, a building that was refurbished to carry out clinic functions, was severely damaged and all content was lost. In addition, medical stock, furniture and IT Equipment were affected. Eighteen health care centres, located in hazard zones - red and orange, were closed and their services were moved to safer districts. This included two district hospitals – Chateaublair and Georgetown, the medical center and the attached dialysis unit. Health services were redirected towards the Milton Cato Memorial Hospital in Kingstown while the Barbados Defense Force was on standby to provide a field hospital. The surge in demand for health services following the eruption

overwhelmed the capacity of the health services to provide emergency and essential care to the affected populations by both this natural event and the COVID-19 pandemic. The Ministry of Health also reported a shortage of sexual and reproductive health commodities and supplies to manage the health consequences of sexual violence, and to prevent unintended pregnancies, as well as HIV and other STIs. The amount of ash covering main roads especially in Owia, Sandy Bay and Overland, exceeded in many places the 30cm expected in the red zones from the hazard map released by NEMO (*see Figure 3.5*).

Table 3.6 presents the damage, loss and recovery needs of the Health Sector. Damage to the health sector, which includes the cost to repair and rebuilt infrastructure and physical assets, amounted to XCD3.151 million. This amount includes the cost to replace medical stock, furniture and IT equipment that were affected. In terms of change in economic flows, estimates of income loss due to the closure of the hospitals were not able to be captured, neither the additional costs due to services provided in shelters. A total loss of XCD0.358 million was recorded as per this report which takes into account forgone income to the Government for services it would have provided, due to the closure of health facilities in the red and orange zones, salaries of non-medical personnel and replacement of medical records only. This loss figure could be increased as additional information is provided. Total recovery needs are estimated at XCD10.329 million that includes additional costs to reduce the existing vulnerability of the health facilities, especially at the roofing, to ensure the safety of water provision, monitoring of the quality of air, provision of psychological support to families and other basic improvements in the provision to health services and access to health services, including for sexual and reproductive health.

Table 3.6: Recovery Needs of Health

Description	Public (XCD)
Damage	3,151,203
Loss	358,150
Recovery Needs	10,329,105

3.4 Productive Sector

The Productive Sector, within the context of the PDNA, is comprised of four (4) sub-sectors: Agriculture, Tourism, Commerce and Industry. Agriculture includes Crops, Livestock, Fisheries, Forestry and Apiculture. In the conduct of this PDNA, the focus is on the Agriculture and Tourism Sub-sectors.

3.4.1 Agriculture

The volcanic eruptions have affected agriculture, forestry, fishing, apiculture and agricultural infrastructure throughout the country resulting in damage and loss ranging from as low as 7% in the Green Zone to 100% in a substantial number of commodities in the Red and Orange Zones. Table 3.7 summarizes the estimated damage and loss by sectors.

Table 3.7: Total Effect of La Soufriere Volcanic Eruption on the Agricultural Sector

Description Sub-sector	Total Damage (XCD'000')	Total Loss (XCD'000')	Total Damage and Loss (XCD'000')
Crops	17,350.96	98,685.58	116,036.54
Livestock	1,509.01	1,653.62	3,162.63
Fisheries	718.10	5,013.76	5,732.86
Apiculture	217.30	377.30	594.60
Forestry	84,053.01	20,566.65	104,619.66
Total	103,848.38	126,296.91	230,145.29

Source: Agriculture Evaluation Team

The assessment report indicates the estimated value of total damage and loss sustained by the crops, livestock, apiculture, fisheries and forestry sectors is approximately XCD230.145 million.

The total effect of the volcanic eruption on the agricultural sub-sector is presented graphically in **Figure 3.6** below. The Figure shows the crops and forestry sub-sectors accounted for the highest levels of total effects within the agricultural sector, reporting 50.4% and 45.4%, respectively.

Figure 3.6: Total Effect (Damage and Loss) of the Volcanic Eruption on Agriculture by Sub-sector

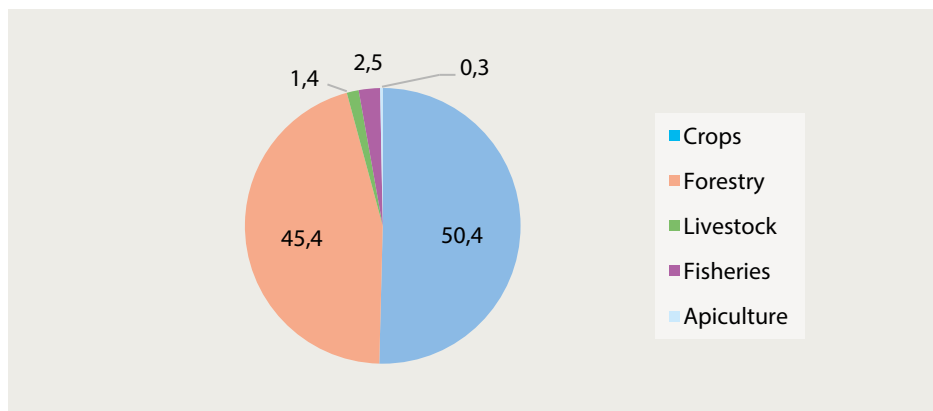


Table 3.8 provides a summary of the *total effect* and *damage and loss* of the volcanic eruption on the various sub-sectors, with the effects on the agricultural infrastructure integrated into the sub-sectoral estimations. Notwithstanding, the main agricultural infrastructure impacted are identified and the damage estimated. Damages to farm roads are not included in the estimates as this is addressed under the Transport and Works sector.

Geographically, the impact of the Volcanic Eruption on the agricultural sector, although widespread throughout the country, was concentrated in the Northern part, inflicting substantial damage to the sector. The damage was most severe in Agricultural District 8 of Agricultural Region 3 and District 1 of Agricultural Region 1.

Table 3.8: Summary of Total Effect of La Soufrière Volcanic Eruption on the Agricultural Sector

Description	Private	Public	Total (XCD'000')	%
	XCD'000'	XCD'000'	XCD'000'	%
Total Damage	17,148.15	86,700.23	103,848.38	45.1
Crops Sub-sector	15,465.24	1,885.72	17,350.96	16.7
• Plantains	3,585.82	340.25	3,926.07	
• Banana	5,589.88	561.96	6,151.84	
• Other Fruit Tree Crops	3,611.90	350.25	3,962.15	
• Roots and Tubers	1,490.63	511.86	2,002.49	
• Fruits and Vegetables	1,187.01	121.40	1,308.41	
Livestock	835.51	673.50	1,509.01	1.5
Fisheries	630.10	88.00	718.10	0.7
Apiculture	217.30		217.30	0.2
Forestry		84,053.01	84,053.01	80.9
Total Loss	105,385.91	20,911.00	126,296.91	54.9
Crops Sub-sector	98,685.58		98,685.58	78.1
• Plantains	16,096.89		16,096.89	
• Banana	10,458.13		10,458.13	
• Other Fruit Tree Crops	40,969.05		40,969.05	
• Roots and Tubers	17,746.31		17,746.31	
• Fruits and Vegetables	13,415.20		13,415.20	
Livestock	1,399.27	254.35	1,653.62	1.3
Fisheries	4,923.76	90.00	5,013.76	4.0
Apiculture	377.30		377.30	0.3
Forestry		20,566.65	20,566.65	16.3
Total Effects - Damage and Loss	122,534.06	107,611.23	230,145.29	100.0

Source: Agriculture Evaluation Team

Crops Sub-sector

The overall effects of the volcanic eruption on the Crops Sub-sector were significant, representing 50.4% of the total effects in Agriculture, representing 16.7% of the overall damage in Agriculture and 78.1% of overall loss. A total of 4,151 acres of crops were totally destroyed or damaged, comprised of tree crops (3,045 acres, roots and tubers (693 acres) and fruits and vegetables (413 acres).

Bananas and Plantain

It is estimated that 1,028 acres (543 bananas and 485 plantains) were damaged in the entire country, of which 764 acres (433 bananas and 332 plantains) were in the red, orange and yellow zones. Apart from the physical damage to the plants, the fruits are unmarketable. Total damage to both crops is estimated at XCD10.08 million, while the loss is assessed at XCD 26.56 million.

Tree Crops

Tree crops across the country have been impacted with ash resulting in the breaking of branches and stripping of some trees; in some cases, the snapping of trees is evident. The entire fruit tree crop industry has been impacted ranging from 7% damage in the green zone to up to 100% damage in the red zone. Cocoa, coconuts, avocado, breadfruit and mangoes have all been severely affected. It is estimated that approximately 2,017.9 acres of tree crops were damaged, with total effects estimated at XCD44.92 million (damage at XCD3.96 million and the loss at XCD40.96 million). Of the tree crops, the coconut industry suffered severe damage and loss, where 1,350 acres were impacted at a total damage and loss value of XCD23.04 million.

Root Crops

Over 693 acres of root crops were estimated as damaged (sweet potatoes, eddoes, yams, cassava, arrowroot, turmeric and ginger). The damage was valued at XCD2.00 million and the loss of XCD17.75 million. There was 80% damage to these crops in the red and orange zones and whatever survived the impact of the ash also suffered indirect damage from the livestock that are let loose and currently ravaging any remaining plants in the area.

The Arrowroot crop is grown predominantly in the north windward area located in the red zone. Total production for 2020 was estimated at 440 metric tonnes. An estimated 98 acres that were unharvested was totally damaged due to ashfall ranging from 4 to 6 inches in some cases. Apart from the damage to the arrowroot crop the roof at the factory in Owia also collapsed resulting in the loss of starch estimated at XCD0.512 million. The total arrowroot damage and loss (including the crop plus tubers and starch in storage) is estimated at XCD2.00 million.

Fruits and Vegetables

There was 100% damage to fruits and vegetables in the red and orange zones as this was primarily the peak season for tomatoes, sweet peppers and cabbages in the north windward and north leeward areas (red and orange zones). These areas produce up to 73% of the over 568 acres of vegetables produced in the country. The crops are produced primarily for the domestic market and the loss has resulted in some levels of food shortage and increased prices of some commodities. The total damage and loss for fruits and vegetables are estimated at XCD14.73 million (damage being XCD1.31 million while losses accounted for XCD13.42 million). While

there is total damage to all vegetables in the red and orange zones, there have been reports by farmers and Extension Officers of total damage to leafy vegetables across the country. Considerable damage was done to a portion of greenhouses across the country, especially in the red and orange zones.

Livestock Sub-sector

There was extensive loss of vegetation (pasture and other forage on which to graze animals) in the red and orange zones. All classes of livestock from the two zones are currently let loose based on prior advice from the MAFFRIL given the nature of the emergency. The damage to the livestock sub-sector is estimated at XCD1.51 million in all zones and the loss is assessed at XCD1.65 million. There are significant costs associated with the protection, feeding and veterinary support of these animals and their relocation to the safe zones. The estimated number of livestock farmers affected in country is 3,110, comprised of poultry (2,872), sheep (54), goats (98), pigs (69) and cattle (17). The number of livestock by category affected in the red and orange zones is estimated 1,233 animals, the composition of which were not available at the time of the report.

Fisheries

The fishery sector in the red, orange and yellow zones has been significantly impacted. Approximately 800 fishers island-wide have been affected with 278 relocated. Due to prior advice provided by MAFFRIL to fishers to safeguard their vessels, many fishers took the advice and protected their vessels from the effects of the volcanic eruption. In this context, this mitigating effort ensure that most of the protected vessels were able to escape the damaging effects of the volcanic eruption. It has been reported that eleven (11) vessels with their engines and other equipment have been damaged. The estimated damage and loss for fisheries is XCD5.73 million,

with XCD0.72 million representing damage and XCD5.013 million loss. International export of fisheries products was temporarily interrupted due to the closure of the airport and the Owia Fisheries Centre in the red zone.

Apiculture

The thriving apiculture industry with 713 hives across the country was not severely impacted since less than 10 percent (10%) of the hives are in the red and orange zones. The total damage was estimated at XCD0.217million and loss at XCD0.377 million.

Forestry

The established plantations and the natural forest suffered an excess of 65% damage in the Red, Orange and Yellow zones. The estimated damage to the forestry industry is XCD84.053 million and loss is XCD20.567 million. The ecosystem services value has been calculated based on an estimate of 65% damage to the 13,000 hectares of natural forest in SVG. The calculated value of US\$1,000 per acre was determined by the use of the 'Economics of Ecosystem biodiversity Manual' for evaluating the economic value of ecosystems.

The assessment of Ash-fall by Volcano Hazard Zone of forestry is as follows:

- Red Zone - Pyroclastic Density Clouds and very heavy ash fall flows
- Orange zone - Heavy ash deposits
- Yellow Zone - Heavy to moderate ash-fall
- Green - Moderate to light ash-fall

Pyroclastic flows resulted in the destruction of the landscape destroying both flora and fauna around the crater's rim and on the western slopes of the volcano. The vegetation on the top 1/3 of the mountain was also destroyed from the edge

of the crater. Mudflows destroyed vegetation in some valleys in the east to southern slopes extending to the coast. These pyroclastic currents and mudflows changed waterways and built-up coastal delta-like formations.

In the orange and yellow hazard zones, heavy ash-fall caused breakage of branches and some falling of trees. Damage also included the middle and ground stories of the forest while plantation forests also had damage to trees similar to the natural forest.

Effect on ecosystem function:

The effects on the forest ecosystem include:

- Impacts on evapotranspiration and photosynthesis in severely damaged trees may die however other trees produce new foliage
- Sever impact on the habitat of the faunal species
- Some animals may have been killed during the eruptions
- Heavy ash cover on the forest floor disrupts the functions of the forest floor in the nutrient and water cycles

Impact on Ecosystem Services (Biodiversity, Soil and Water Conservation)

Approximately 70% of the terrain in St. Vincent is made up of slopes over a 30% gradient which makes exposed young soils vulnerable to soil erosion in heavy rainfall. The forest ecosystem that covers the interior mountainous areas covers and protects the soil from the erosive power of rain and allows for percolation of the water and storage and gradual release thus maintaining sustainable sources of surface water for human use and maintenance of aquatic ecosystems in the many streams and rivers that originate in the

16 watersheds found in St. Vincent. With the loss of this protective cover, due to the impact of the volcano with ash covering the forest floor, there are concerns of erosion and downstream impacts from debris-laden floodwaters.

The loss of biological diversity due to the explosive eruptions is also a concern with several endemic species being destroyed. With natural regeneration, these ecosystems and habitats will return once protected from negative human impacts. The endemics will recolonize from neighbouring ecosystems, however, this relies on minimizing the negative impact such as the introduction of invasive species. An effective forest management programme will assist with protection, monitoring and enhancement being the main outputs to protect the regeneration and succession process.

The forestry Recovery needs include the implementation of the Forest and Wildlife Recovery Programme, which will be achieved through reforestation, soil conservation, clearing of water ways and stabilisation of river and stream banks. Affected plantation forests in the lower slopes will be replanted, especially in areas such as Orange Hill. The forestry recovery needs also include the protection and conservation of gullies in areas where housing once existed, the planting of agro-forest trees in these areas for the generation of livelihoods for displaced residents, and the provision of support for the cleaning of rivers and streams, especially in the upper watersheds in red and orange zone.

Agricultural Infrastructure

Substantial damage was done to agricultural infrastructure in the Red and Orange zones since most of the agricultural investments are in this area (Agricultural Biotechnology Center, arrowroot and cassava factories, fisheries complex, CARDI

Field Station, Ministry of Agriculture Livestock Centre, Langley Park Palletisation Centre, and Perseverance Agricultural Station). The damage to the public agricultural infrastructure is identified and presented in Annex 3. Information on the extent of damage and loss to private sector infrastructure (shade houses, farm sheds, animals housing and equipment) have been integrated into the sub-sectoral damage assessments. Concerning roadways in agricultural areas in the red and orange zones, reports indicate that some bridges and feeder roads have been affected. The damage to the bridges and roads is an indirect result of erosion due to heavy rains, lahars and pyroclastic flows. It is anticipated that the assessment of the total effects of the volcanic eruption on agricultural roads will be conducted by the Ministry of Transport and Works.

Recovery Needs

The total recovery needs for sector are estimated at XCD258.85 million, with XCD103.85 million

(40.1%) to cover damage, XCD126.30 million (48.8%) to cover loss and XCD28.71 million (11.1%) for building back better (BBB).

3.4.2 Tourism

The tourism sector report centers its analysis on the effects of the eruption of La Soufriere volcano on the tourism sector of SVG. However, the analysis is conducted under the assumption of simultaneous disasters, which is any estimated impact associated with the eruption of the volcano will be added to the baseline scenario of the ongoing disaster of the pandemic of COVID-19.

According to information provided by the Ministry of Tourism, Sports and Culture of SVG, there are 167 registered and licensed¹³ accommodation establishments of which 32% are on the island of Saint Vincent (**Table 3.9**).¹⁴ Those establishments include hotels, apartments, guest houses, inns and resorts. Additionally, 37 rental properties have 125 rooms. Most accommodation establishments in Saint Vincent are in the south of that island.

Table 3.9: Registered and Licensed Accommodation Establishments (2020)

Location	Accommodation Establishments	Rooms
St Vincent	53	696
Bequia	94	255
Mustique	2	24
Union Island	11	90
Petit St Vincent	1	22
Palm Island	1	43
Mayreau	1	9
Canouan	4	60
	167	1,199

Source: Ministry of Tourism, Sports and Culture

¹⁵ Additionally, there are 32 accommodation establishments that are registered but not licensed. They have 241 rooms.

¹⁶ These establishments have 1,199 rooms of which 57% were on the island of St Vincent.

The SVG Hotels Association informed that there was no major damage to the sector's infrastructure. Minor damages were reported but no specific information was provided to the association. Most of the hotel infrastructure of the country is located out of the range of the volcanic eruption, thus damage to accommodation establishments of the archipelago was expected to be minor or non-existent.

The La Soufriere Volcano eruption caused an estimated total effect of XCD11.81 million on the tourism sector. Most of the effects are concentrated in foregone revenues and estimated at XCD9.2 million. The additional costs, mainly cleaning of ash, are estimated at XCD2.61 million (**Table 3.10**).

Table 3.10: Summary of Effects on Tourism (Millions of XCD)

Description	Private	Public	Total
Losses			
Foregone revenues	9.20		9.20
Additional costs		2.61	2.61
TOTAL	9.20	2.61	11.81

Source: Assessment team

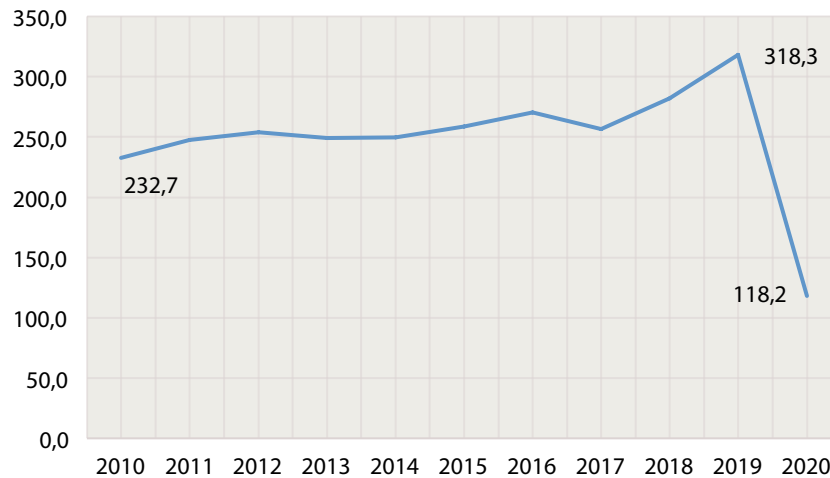
Estimates of Damage and Loss to the Tourism Sector

The baseline scenario for this report/analysis is based on the estimated losses for SVG due the COVID-19 pandemic, which is included in CEPAL, 2020. The estimation of losses caused by the pandemic of COVID-19 in the tourism sector of Saint Vincent and the Grenadines is done comparing the baseline or counterfactual that reflects what would have happened

without the volcanic eruption (ECLAC, 2014); the second, the modelled trajectory of the future flows of tourism with the simultaneous events (COVID-19 and the Volcanic Eruption: Damage and Loss are estimated as the difference between the two scenarios.

Figure 3.7 shows the combined fall of international expenditure for tourism due to the simultaneous disasters in SVG.

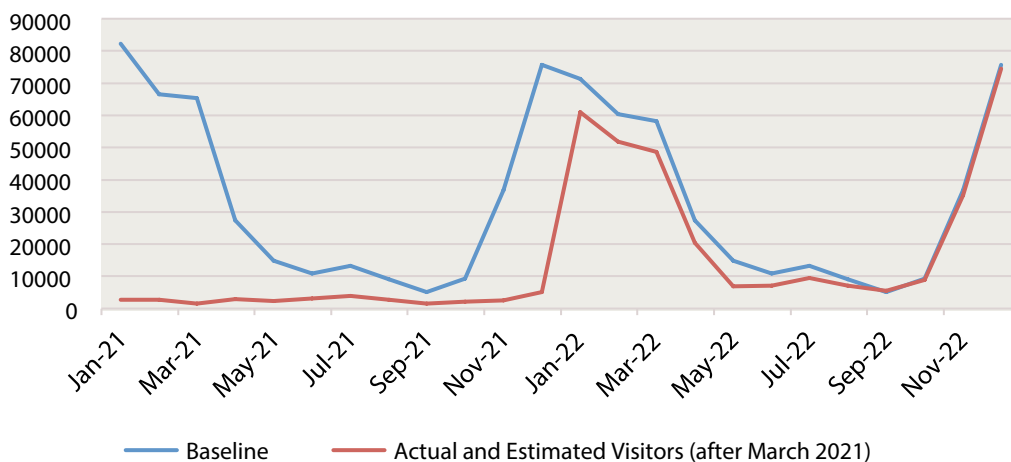
Figure 3.7: Total expenditure from international visitors (millions of XCD)



Source: ECCB

Finally, international arrivals are projected to converge to baseline levels at the end of 2022 (**Figure 3.8**).

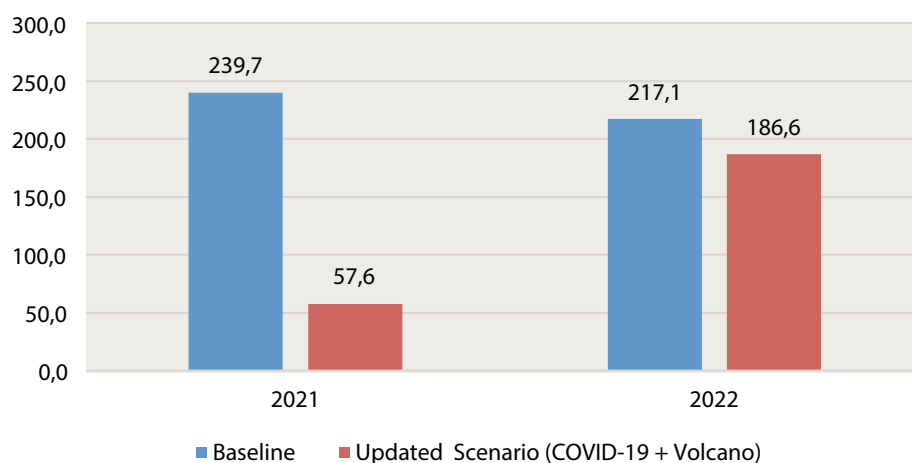
Figure 3.8. Total international visitors arrivals. Baseline vs Estimated Arrivals



Source: Assessment team

The fall out in the tourism sector because of the simultaneous disasters are determined by multiplying the annual arrival of visitors by the average actual and, where applicable, projected per visitor expenditure. This fall out in tourism is estimated to be XCD54.8 million for 2020 (March-December), XCD182.0 million for 2021 and XCD30.5 million for 2022, for a total of XCD266.2 million for the complete period 2020-2022 (**Figure 3.9**).

Figure 3.9: Estimated expenditure by international visitors. Baseline vs Estimated Scenarios (millions of XCD)



Source: Assessment team

Table 3.11 presents a breakdown of estimated fall out in the tourism sub-sector due to both disasters is presented. The total foregone revenue attributed to the eruption of La Soufriere volcano is estimated to be XCD9.2 million.

Table 3.11: Breakdown of estimated losses due to simultaneous disasters. Baseline vs Estimated Scenarios (millions of XCD)

Year	COVID19 Updated	COVID19 + Volcano
2020	54.8	54.8
2021	172.8	182.0
2022	30.5	30.5
2023 (end-feb)	0.0	0.0
Total	258,1	266,2

Source: Assessment team

The relatively small impact found in this report is a consequence of two factors: first, the volcano eruption occurred in April 2021, which is the beginning of the low season of tourism for SVG and which imply relatively low counterfactual income, to begin with. Secondly, the simultaneous disasters approach means that the effects of the volcano are modelled in addition to the baseline

scenario under COVID-19, scenarios that were projecting government revenues/incomes near zero for most of 2021, even before La Soufriere eruption.

As mentioned, this report is assessing the impacts of the La Soufriere volcanic eruption as a simultaneous disaster that builds upon a deep and

long-lasting COVID-19 disaster used as a baseline. The direct impacts of the volcanic eruption are mostly concentrated in the red and orange zones with no significant destruction of private or public infrastructure or services. The effects are assumed to be concentrated only in the second and third quarters of 2021. However, these effects are expected to be translated mostly in a delay in the recovery process of the already depressed international tourist arrivals due to COVID-19. In

Approximately 20,000 persons were evacuated from the red and orange zones as a precaution against the effects of the eruption, a fraction of whom were temporarily located in a group of 22 hotels and lodging properties in the southern zone of St Vincent. According to official figures, between April and June, a total of XCD1.091 million were expended for accommodation and meals for the persons using those 22 hotels as shelter. Note that the information provided was for April to June. As usual in disasters, this situation will last for a few more months until all the people return home. It is estimated that through December this may involve an additional XCD1.6 million; these are additional costs. Notice that in terms of tourism, it partially compensates for the foregone revenues. There are other additional costs related to the eruption of the volcano, such as cleaning costs for buildings and swimming pools. The SVG hotel association informed that these costs were small and therefore they had not collected this information.

Recovery Needs and Strategy

It is imperative that the Government of SVG continues to aggressively implement its COVID-19 Recovery and Stimulus Package, especially those related to the tourism sector. Given that the lodging infrastructure was mostly untouched by the simultaneous disasters, a swift recovery is expected after international travel resumes to pre-pandemic levels.

The SVG tourism sector should build upon its strengths, for instance, promoting the arrival of people of highly vaccinated countries (USA, Canada and UK), and promoting the resilience of the yachting industry and resorts of The Grenadines, both as an opportunity to construct health bubbles offering reassurances to visitors. St Vincent and the Grenadines has natural health bubbles as it is an archipelago comprised of 32 different islands, islets, and cays. This must be promoted.

In the medium term, the eruption event can be considered as a point to further promote the La Soufriere volcano as a tourist attraction. To generate added value, tours could be promoted to explain the recent eruption, boat trips where visitors? can appreciate the view of the volcano from the sea and promote viewpoints from nearby that have various amenities, as is done in other countries that have volcanoes.

3.5 Infrastructure

3.5.1 Water, Sanitation and Hygiene (WASH)

The damage and loss experienced by the Water, Sanitation and Hygiene (WASH) sector as a consequence of the la Soufrière volcanic eruption were relatively low, coming in at XCD1.64 million, which represents approximately two percent of the total effects, in terms of cost, to the infrastructure sector. The physical damage amounts to XCD0.305 million, while the loss incurred is approximately XCD1.34 million. Damage in the WASH sector includes the cost for repairs such as rebuilding catchment areas, intake structures, pipework and damaged access roads while the costs associated with the loss in the WASH sector includes water service interruption, cleaning and ash removal activities, the use of trucks for delivering water to households, quality water testing to note a few.

Although the economic consequences of the volcano eruption have been relatively low for the WASH sector, there has been intermittent and even suspension of the water supply, especially in the red and orange zones. According to estimations of the Central Water and Sewerage Authority (CWSA), as of the date of this report, in the red zone, 1,380 inhabitants are still offline from the water network and 2713 inhabitants suffered 91 days of water interruption. In the case of the orange zone, 6,241 inhabitants have undergone disruption in water services for about 35 days, while 25,000 inhabitants for 7 days. In the green and yellow hazard zones, the disruption of water services ranged from 1 to 3 days and impacted around 60,000 inhabitants. Lack of water forced the population to reduce their water use which would have impacted personal hygiene, including handwashing practices, which is critical for coping with the COVID-19 pandemic.

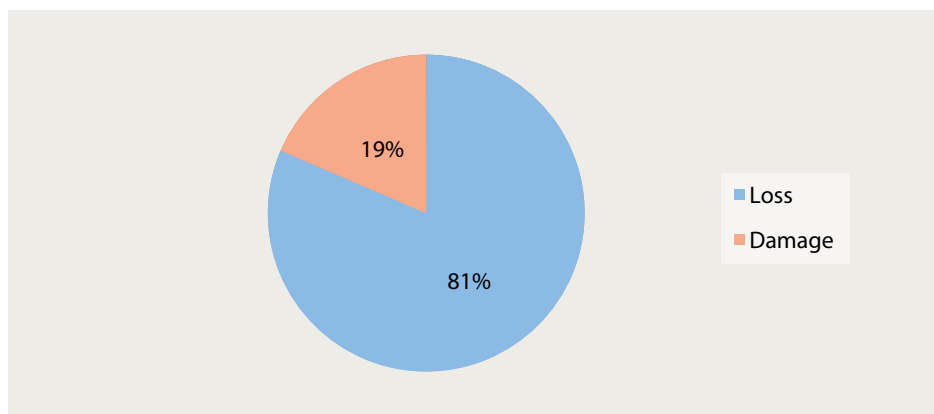
Furthermore, the relocation of people from the red and orange zones to the green and yellow zones caused a shift in the water demand to the water supply systems in some areas. For instance, extremely high usage from all coastal villages initially prevented water from reaching higher elevation inland villages such as Stubbs, Carapan, Diamond State, Biabou, Cedars, Bridgetown, Reeves Level, South Union, Choice village, Lower Calder, Park Hill, South Rivers, Chester Cottage, Colonaire.

The total recovery needs were estimated to be XCD1.89 million, with XCD365,400 required to cover the needs generated by the damage to physical infrastructures, XCD435,000 required to cover the needs related to cleaning interventions and losses incurred by trucking water, and XCD1 million required to improve the local technical capacities and the purchase of 2 tankers. The recovery cost related to damage includes a suggested 20% increase to account for the improvements and modernizations required to increase the resilience of the WASH sector to future catastrophic events (that is, build back better).

As expected, the priority of the intervention is given to the repair/reconstruction actions and ash removal to the water supply systems (WSS) located in the red zone (Fancy, Sandy Bay and Owia WSS) and those located in the orange hazard zone (Perseverance, Jennings and Hermitage WSS). At the time of writing this report, 1,380 inhabitants in the red zone were still offline from the water network as a consequence of the disaster. Thus, restoring the water systems, maintaining water quality to acceptable WHO standards, testing, chlorination and the implementation of public education and awareness campaigns and starting with the upgrade of the system for the collection,

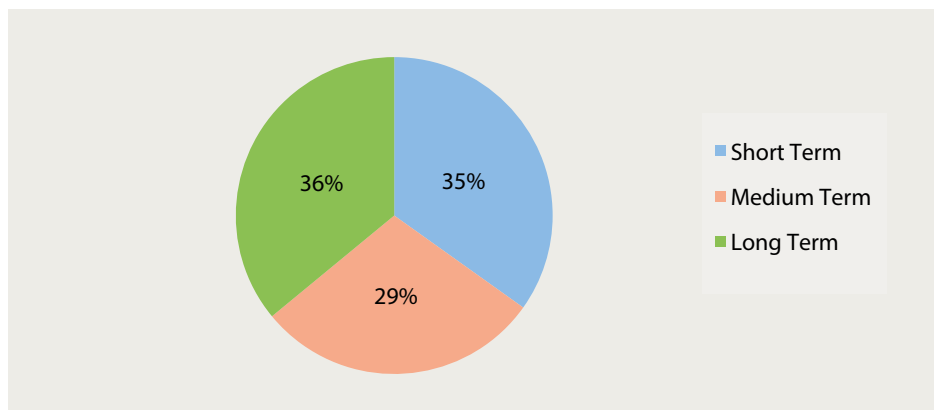
monitoring and management of hydrological and other data on water resources are the priority actions for the short term. The medium to long term needs is more related to targeted assessments to increase the capacity for water trucking/distribution, developing/enhancing the necessary legislation, codes and options for testing, storage and treatment of water. Based on this prioritization, the cost of the short-term recovery needs is estimated to be XCD659,000; for intermediate actions, it is estimated to be XCD551,300 and for long term actions, XCD680,000.

Figure 3.10: % Distribution of WASH Total Effects



Source: WASH Evaluation Team

Figure 3.11: % Distribution of Recovery Costs

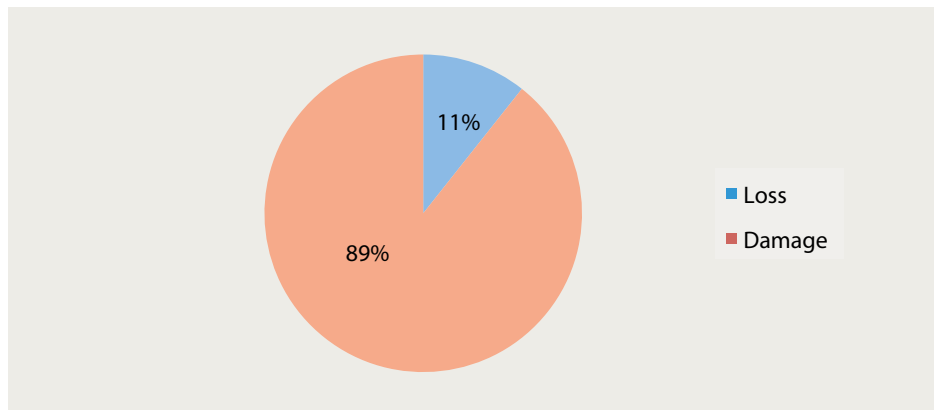


Source: WASH Evaluation Team

3.5.2 Electricity

The La Soufrière 2021 volcanic eruption did not cause significant damage/loss to the electricity sector of the country. The effects were very low in comparison to the ones felt in other economic sectors such as transport, housing or agriculture. The total cost of disaster effects in this sector was estimated at XCD1.021 million, being the lowest within the whole infrastructure sector and of which, XCD0.109 corresponds to damage, and XCD 0.912 million encompasses the loss. **Figure 3.12** presents the percentage distribution of total effects of the volcanic eruption on the electricity sector.

Figure 3.12: % Distribution of Electricity Sector Total Effects



Source: Electricity Evaluation Team

According to VINLEC and the Detailed Damage Sector Assessment (DDSA) report carried out by the Government of SVG and CDEMA, the most relevant damage from the volcanic eruption on the power system was caused by the accumulation of ashes on transmission, distributions lines and other equipment. The total cost of the damage was mainly due to faults of poles and repairs made in transmission and medium voltage distribution network within the un-evacuated and evacuated area on the island. In the determination of loss, under the PDNA methodology, several factors were taken into consideration, including foregone incomes and additional costs generated by the disaster as cleaning, reductions of electricity generation and/or reductions of electricity sales, fluctuations in the electricity prices, increment of tariffs paid by the customers and reconnections, among others.

At the time of writing the report, the power network in the red zone is still inaccessible and therefore maintenance personal cannot enter to restore the operation of the network. Fortunately, most of the relevant power generation stations

are not located in the red zone.

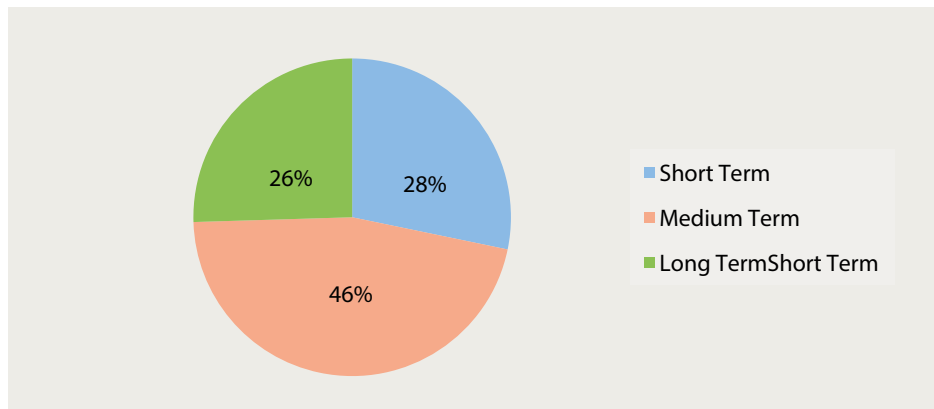
The provision of electric services to 43,525 households was the main effect caused by the eruption. The event caused an island-wide blackout of approximately 4 hours, while in the North-East of mainland St. Vincent, the power outage was sustained by almost 2 days affecting more than 9,000 households. There are around 1,231 households located in the red zone that are still without electricity since April 9th, 2021. Furthermore, as reported by the housing sector, there are some houses with poor electrical installations highly vulnerable to be damaged by ashfall.

Recovery needs in the electricity sector cover the costs to overcome the identified damage and loss generated by the disaster. The total recovery needs amount to XCD1.2 million¹⁷ of which, XCD0.131 million corresponds to the need for repair/reconstruction of physical assets and XCD1.09 million to cover the loss. Note that 40 percent of the total recovery needs are associated with the provision of electric services to new

¹⁷ As discussed with VINLEC at report preparation, some of the damages to electricity components related to distribution lines in the north east of Saint Vincent which were unable to be estimated given the inaccessibility to certain areas

developments as some houses in non-mitigable risk sites have to be relocated. In terms of prioritization and sequencing of recovery needs, the following breakdown has been suggested; XCD0.344 million as short-run interventions, XCD0.563 million for the intermediate run and XCD0.310 million for the long term (Figure 3.13).

Figure 3.13: % Distribution of Recovery Cost for the Electricity Sector



Source: Electricity Evaluation Team

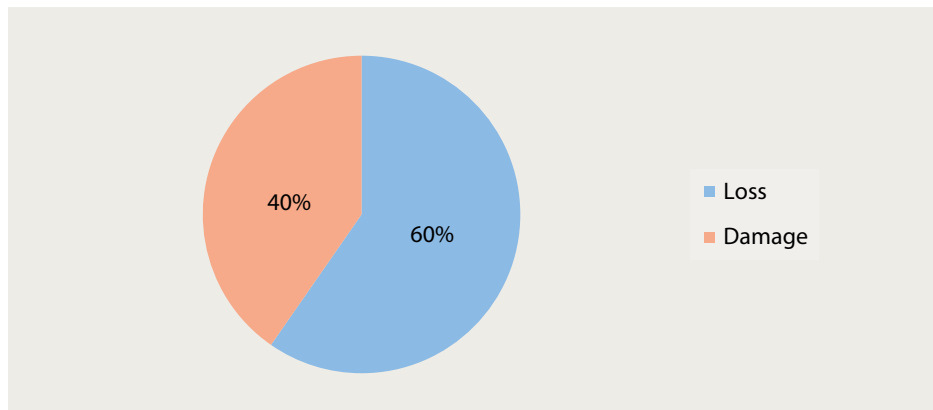
Most urgent interventions include repair/reconstruction and ash removal on electrical facilities. The second one has to do with repairing the grid in the affected zone as the displaced population is relocated to their place of residence. Electrification of new development (relocation) site, reconnection /isolation of building and other customer services follow the priority order. Finally, the proposed interventions are based on the build back better principles, and therefore, the sector will seek to establish a resilient robust network to withstand geophysical and climate change hazards using the appropriate technology in vegetation management to protect the network. The interventions proposed also include the strengthening of institutional capacities and improving knowledge and procedures with respect to legal contracts with users.

It was suggested by Infrastructure Sector Team Members that some of the recovery needs associated with improved knowledge and technical

capacities in the sector could be incorporated/ overlapped with the ongoing project entitled: “*St. Vincent and the Grenadines: Building Resilience of the Electricity Sector Infrastructure to Geophysical and Climate-Related Hazards*” managed by the Caribbean Development Bank, CDB.

3.5.3 Transport

Transport has been the most affected within the whole infrastructure sector. The total cost of damage and loss as a consequence of the la Soufriere volcanic eruption to this sector has been estimated to be XCD74.4 million. The physical damage was estimated at XCD30 million, corresponding mainly to partial repair and rebuilt (intermediate damage level) of roads and river crossing infrastructure such as bridges and fords, while the cost associated with loss include changes in economic flows, ash removal and cleaning activities amount to XCD44.4 million (Figure 3.14)

Figure 3.14: % Distribution of Transport Sector Total Effects

Source: Transport Evaluation Team

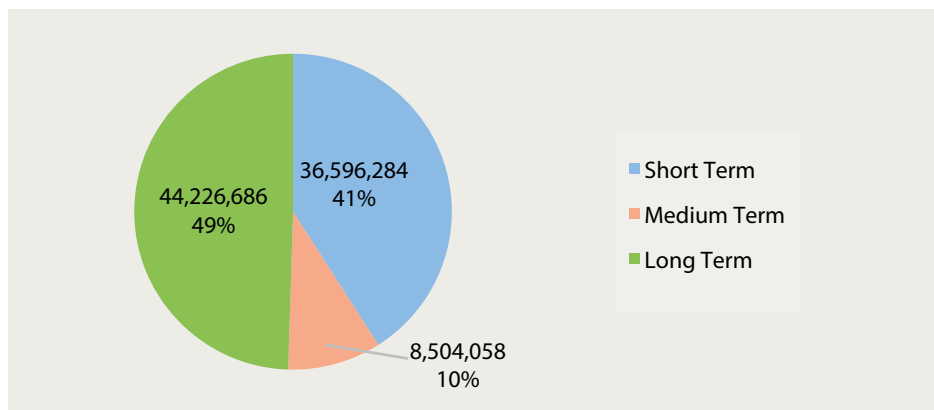
One of the most relevant losses in the transport sector caused by the disaster is associated with cleaning and ash/debris removal from the road network of mainland Saint Vincent. The Buildings, Roads and General Services Authority (BRAGSA) estimated a total clean-up cost of the road network of XCD 12.514 million in the red zone, and XCD1.1 million; XCD1.14 million; and XCD0.812 million in the green, yellow and orange zones respectively. Cleaning interventions were also required in the airports, especially in the Argyle International Airport with a cost of XCD0.350 million. The ashfall partially closed the road network of St. Vincent triggering interruption of traffic, delays and a lack of inputs to other economic sectors, among others. It is estimated that a loss of profit in land transport of passengers and cargo by traffic interruption is around XCD1.3 million. Other costs associated with business interruption issues are integrated into the corresponding sectors.

Total recovery needs were estimated at XCD89.3 million, with XCD36 million to cover the needs generated by the damage of physical infrastructure and XCD53.3 million to account for the losses, especially those for cleaning and ash removal needs. The recovery cost related to damage includes a suggested increase of

20% to account for all those improvements and modernizations to increase the resilience not only to volcanic hazards but also to other future catastrophic events. Note that approximately XCD79.6 million of the recovery needs come from the red zone. The volcanic eruption triggered a need for a cleaning program with a focus on addressing roads, river mouths and drains that have ash deposits that may become problematic with rains. The programme also predicted that periodic cleaning would be necessary with the onset of future rainstorms

Based on the recovery needs identified in the analysis, as expected, the recovery strategy suggested the prioritization of the cleaning and removal of ash and debris from the roads, bridges, ponds and airports, starting for the region most affected, Georgetown and Sandy Bay. It was proposed a short-term and medium-term budget of XCD36.6 million and XCD8.5 million to cover the mentioned cleaning interventions. The long-term budget, XCD44.2 million, considers repair/reconstructions of transport infrastructure and the continuity of cleaning of Georgetown, Sandy Bay and Chateaubelair Districts; 81 percent is designated to repair/recovery and 19 percent for cleaning (**Figure 3.15**).

Figure 3.15: % Distribution of Total Recovery Needs by Time Horizon



Source: Transport Evaluation Team

The development and adequate maintenance of road networks are critical for achieving regionally balanced economic growth as well as promoting inclusive growth by enabling people to access public services and opportunities for advancement. Moreover, roads are vital for rapid response with support services in the event of a disaster.

The information contained in this report is based on data that was provided by the Ministry of Transport, Works, Lands and Physical Planning (MTW) of SVG, the Roads, Buildings and General Services Authority (BRAGSA) and the Argyle International Airport.

4. Assessment of Disaster Impact

A photograph of a volcanic eruption site. In the foreground, a white bucket sits on a sandy surface. The background shows a hillside with some vegetation and a building. The image is overlaid with a large, semi-transparent blue circle and a dark blue geometric shape in the bottom left corner.

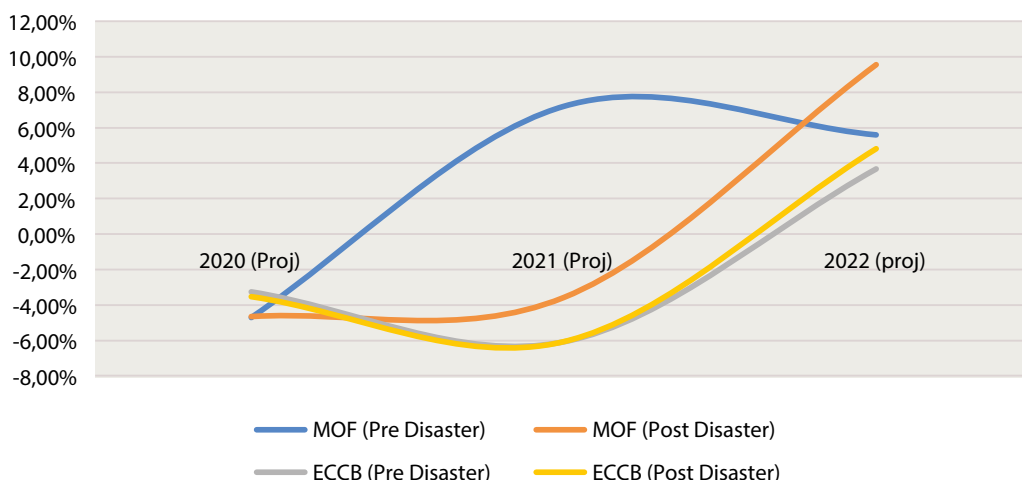
4.1 Macroeconomic Impact

The La Soufriere Volcanic Eruption had a pervasive and substantial impact on St. Vincent and the Grenadines economy, with a total sum of damages of XCD416.07 million and losses of XCD218.57 million which cumulatively is equivalent to 18.1% of the country's 2020 GDP.

This is estimated to negatively affect the economy with a decline projected to be of -3.58% up to -6.07%, depending on the underlying assumptions from the Ministry of Finance (MOF) and the Eastern Caribbean Central Bank (ECCB) relative to the respective baselines in 2021 and 2022 (**Figure 4.1**)

Table 4.1. GDP Alternative performance scenarios

GDP alternative performance projections



This disruption to economic output is projected to continue for at least 24 months as the country recovers, though Volcanic activity continues to pose a threat to the island's economy and presents a source of uncertainty for planning. Sectors most affected in terms of losses were the agriculture, livestock and forestry which are expected to decline further following the previous year's contractions.

In terms of damages, the most affected was the housing stock of 18 percent primarily on the mainland. Most homes were affected by ash accumulated on roof structures. Notably, even after the eruptions subsided, red and orange zone communities were still being affected by lahars. The housing sector has the largest estimated

recovery needs of XCD356 million or 48.8 percent of the total recovery needs.

Also, severely affected in terms of damage and losses were the Agriculture and Transport sectors with estimated total damages and losses of XCD230.1 million and XCD74.4 million, respectively. Physical damages to road structures and bridges accounted for 42.1 percent of the total damage while the rebuilding of road, river crossing infrastructure, bridges and changes in economic flows and removal of ash accounted for 57.9 percent of the total loss. Recovery needs for the transport sector amounted to XCD89.6 million.

Fiscally, both the decrease in GDP and the necessary recovery expenditures are projected to have a short-term negative impact. In the period

Quarter 1 period, January to March 2021, Current Revenue decreased by 4% compared to the same period in 2020. The Fiscal Outlook for the remainder of 2021 projects that Current Revenue will grow by XCD17.14m. In 2021, Recurrent Expenditure is projected to increase by 3.4 percent of GDP. As a result, the Overall Deficit is anticipated to increase from -5.7 percent of GDP for the year 2020 to -10.0 percent of GDP for the year 2021, and the Primary Deficit is expected to move from XCD72.85m -3.3 percent of GDP to -7.9 percent of GDP.

Externally, the eruption has also led to a disruption in trade, mostly in goods: Exports in the category of "Food & Live Animals" for the period January to June 2021 fell by 8.50% relative to the similar period of 2020. This is largely attributed to the fact that 27.5% of all registered farmers are in the "Red and Orange Zones" where mandatory evacuations were conducted for several months prior to and after the volcanic eruptions. Additionally, damages to the crop sub-sector accounted for 56.9% of the damage to the agricultural sector.

Exports of travel services were not seriously affected as most of the island's accommodations

are located in the "green zone" where no significant damages were recorded in this regard. However, several tourist sites were inundated with ash and would need rehabilitative efforts. Therefore, SVG's capacity to attract its regular tourism travellers, in the near to medium term, may be diminished if most were attracted by the touristic sites. Given the importance of travel to SVG's trade in services, the trade balance is likely to deteriorate in the near to medium term. In the longer term, SVG may be able to target a niche of travellers who are interested in the after-effects of a volcanic eruption.

In the short term, the negative impact of the balance of trade on the external sector is being compensated by inbound remittances which generally trended upwards for the first five months (January to May) for 2018 to 2021. Increases in 2020 and 2021 are possibly attributed to remittances spurred by COVID-19 stimulus grants in source countries such as the USA as well as the diaspora's efforts to mitigate the financial burden inflicted by COVID-19 and the volcanic eruptions in SVG. Additionally, outbound remittances for the period January to May 2018 to 2021 trended downwards leading to a lesser flow of resources to the exterior.

4.2 Human Impact

The Human Impact analysis of the effects of the la Soufrière Volcanic eruption presents a number of areas for concern. Among those are the loss of income resulting in possible increases in income poverty; the loss of access to the backyard economy and the increase in food insecurity; the invisible yet present psychosocial trauma suffered by the population at large. Poor women who are heads of households will be particularly affected along with their families, thereby exacerbating the structural inequalities and persistence of intergenerational poverty.

The government has put in place an established social protection programme that could benefit from enhanced coordination and streamlining for greater efficiency and effectiveness. It needs to be repurposed to serve as a tool for social transformation not just as a safety net. Additionally, the population needs capacity-building at all levels, to better enable them to participate in and contribute to the building of a more resilient society.

Effects

Of the 110, 608 persons who comprise the population of SVG, females comprise account for some 49 % and males 51 %. According to data from *The Displaced Family Household Verification Assessment*, coordinated by the Ministry of National Mobilization (MoNM) in collaboration with the World Food Programme (WFP), some 21 % of the population or 23,032 persons were evacuated from the red and orange zones, as a result of the eruption of La Soufriere volcano (**See Table 4.1**). The NEMO was pleased to report that there were no deaths or injuries as a direct result of the eruption¹⁸. It should be noted, however, that the entire population has been affected by the eruption: either through damage suffered to their homes, shortages of water supply, through interruptions of power supply, or loss of livelihoods, or food insecurity resulting from the loss of backyard gardens¹⁹.

Less visible but no less significant is the psychosocial trauma suffered by large segments of the population which may linger over an extended period²⁰. Of those evacuated households, some 77% indicated that they were in private residences with relatives or friends (**Figure 4.2**).

Of those evacuated households, some 77% indicated that they were in private residences with relatives or friends (Figure 4.2). This level of generosity is not unexpected in the Caribbean nor SVG.

Accommodation centres/shelters were established under the MoNM to accommodate persons who

were displaced and were not accommodated in private homes with NEMO having overarching responsibility for those persons who were placed in public shelters. Figure 1 illustrates the distribution of evacuated households as a result of the volcanic eruption. Some 19,390 individuals were relocated to private residences. Twenty percent or 4,606 individuals stayed in Government shelters, 2% or 460 persons stayed in hotels and 1% or 230 persons, stayed within informal shelters. Through the MoNM some 22,033 Food Packages were distributed to displaced families in private homes. It should be noted that some 2,817 families or 9,426 individuals from the orange zone were able to return home after the 'All Clear' was issued by Government.

Gender Relations and Gender-Based Violence

In disasters, all vulnerable groups such as the elderly, LGBTQI+, persons living with HIV/AIDS are at risk for Gender-Based Violence (GBV). However, women and girls were more at risk of GBV as a result of the La Soufriere volcanic eruption. There were several reported cases of GBV within the shelters from April to July and in all cases, women were the victims.²¹ Survivors of GBV to a greater extent, victims of domestic violence were at risk of increased violence due to tensions arising from displacement, trauma, lack of finance and/or unemployment and grief and loss. Given societal pressures on men to be providers and protectors, their inability to fulfil either role compounded their difficulty in adjusting to the conditions. It was reported that 80 percent of the shelters are not registering, and 29 percent are not registering single women and girls.

18 DDSA SVG_ Soufriere_ REPORT Jun 2021

19 PDNA Sector reports provide details of the disruption in access to good and services as a result of the eruption of the la Soufriere volcano.

20 DDSA SVG_ Soufriere_ REPORT Jun 2021

21 Gender Affairs Division

A GBV safety audit was conducted by the Gender Affairs Division in collaboration with UNFPA and this indicated the prevalence of GBV within the

shelters. **Figure 4.3** illustrates and highlights issues arising from the audit regarding gender relations and GBV.

Figure 4.3: Issues of Gender Relations and GBV



Employment Livelihoods and Social Protection

Displacement was not the only effect of the eruptions, as loss of employment and livelihoods were also significant resulting effects of the eruption. Prior to the volcanic eruption, Labour Force data indicated a 24.9 % unemployment rate with female unemployment (30%) significantly higher than that of males (20.7%). Youth unemployment was almost double that of the adult population at 40%. Interestingly, some 80% of Medium, Small and Micro Enterprises (MSMEs) can be found in the informal sector, which employs large proportions of women.

Due to the COVID-19 pandemic, a significant proportion of those persons in the labour force and employed both in the formal and informal sector have lost jobs. Some 48 % of those persons interviewed who had been evacuated indicated

that they were unemployed.

Loss of income during a disaster is sometimes the weight that tilts vulnerable households and individuals from being just above the poverty line to falling below the line, and those who were surviving in poverty to falling into indigence, with significant consequences for wellbeing. **Table 4.2** presents estimates of income lost in three sectors as a result of the volcanic eruption, amounting to some **XCD56 million**. The loss represents the income forgone for the seven months following the eruption.

Loss of income during a disaster is sometimes the weight that tilts vulnerable households and individuals from being just above the poverty line to falling below the line, and those who were surviving in poverty to falling into indigence, with significant consequences for wellbeing.

Estimates of income lost in the three sectors as a result of the volcanic eruption amount to some XCD56 million. The loss represents the income forgone for the seven months following the eruption.

The three sectors, Agriculture Forestry and Fishing, Wholesale and Retail Trade and Accommodation and Food Service activity were severely affected as a result of both COVID-19 and the volcanic eruption.

The survey undertaken by the MoNM with the support of WFP, noted that some 17% of those who reported being unemployed as a result of the volcanic eruption gave as reasons either loss of job (12%) or closure of business (5%). In Agriculture, Forestry and Fishing, men comprise the majority of the workforce (21%), while women comprise the smaller share (7.8%). The personal income loss amounted to some XCD33 million. The loss of livelihoods due to displacement, particularly in the agricultural sector, was felt deeply by women, who participated in farming, many of whom were single heads of households.

In Wholesale and Retail Trade, where women make up the largest share (21.1%) and men the smaller share (14.6%), the personal income loss amounted to some XCD10.3 million. In the Accommodation and Food service activity (which is often used as a proxy for the tourism sector), where women have the larger share (11.25%) and men the smaller (5.2%), the loss of personal income amounted to XCD12.46 million. The data suggests that more women have suffered a disproportionate loss of income relative to their male counterparts as a result of the volcanic eruption, except in Agriculture, Forestry and Fishing.

The volcanic eruption presented additional

challenges for women's employment as it created instability in the sectors which were already fragile as a result of COVID19 impacts and where women engaged in low-income employment in large numbers. Small businesses in the red zones (shops, stores, etc.) that women heavily relied on for employment, felt the effects due in part to looting and the physical destruction of buildings.

Women also suffered the hardship of loss of income due to the receipt of lower remittances from countries such as the United Kingdom, the United States of America and Canada. Data suggests that 11% of males depend on non-employment income from abroad, compared to nearly 20% of females. For females, in particular, remittances are the most important source of non-employment income.²²

The government responded to the hardship experienced by the population through its social protection programmes and other interventions delivered with the support of development partners.

In response to the need for psychosocial support, a Psychosocial Family Life Education Programme, funded by UNICEF and implemented by MoNM - Social Protection Division, commenced on August 1, 2021, for 500 Displaced Families from the Red Zone. It will be a three-month-long programme focused on modules of coping skills development, parenting education and awareness-building. The awareness-building will comprise child abuse awareness, gender role development, disability awareness and hygiene education. In response to the reported cases of domestic violence the Gender Affairs Division also provided a three (3) month engagement on Gender-Based Violence in the shelters that are more prone to domestic violence. This engagement served as awareness

building for evacuees, while at the same time educating them on the services available for victims and how to safely access these support services. A psychosocial component was also included along with a skills training programme to build the technical capacity of person within the shelters.

Data from the Soufriere Relief Cash grant programme administered by the MoNM and the World Food Programme (WFP), with additional cash transfers provided by the Adventist Development and Relief International (ADRA), CARITAS International and The Red Cross provided the estimated value of transfers to be provided by WFP was expected to be US\$2.9m (cash transfers) with USD 670,000 in vouchers over a four-month period, reaching some 3,539 families and representing 17,492 individuals. The other three programmes supported an additional 585 families.

Approximately 5,100 households were surveyed for potential inclusion through the Displaced

Family Household Verification Assessment Survey. The Soufrière Relief Grant will assist people's well-being as they cope with and recover from the disaster and lay groundwork for longer term support through social assistance.

The social protection programmes target indigent persons, those with disabilities, children, the elderly and insured National Insurance Scheme (NIS) contributors. The Social Protection Division provides a range of specialized services, catering primarily to the needs of the poor, indigent and vulnerable persons in society. The objective of the array of social safety nets available is to improve the social and economic conditions of the most vulnerable and to enhance their standards of living.

Table 4.2 presents Government expenditure on social protection measures through MoNM, suggesting that the 2021 expenditure, which represents mid-year expenditure, is likely to be greater than that of 2020.²⁰

Table 4.2: Government expenditure on Social Protection Measures (XCD)

2019	2020	Actual to date 2021
17,382,790	20,388,082	12,113,611

Ministry of National Mobilisation, Social Development, Gender, Youth, Housing and Informal Human Settlement.

4.3 Cross-Cutting Sectors

4.3.1 Environment

Forests cover about 25-30% of St. Vincent and the Grenadines' total land area. This includes the Montane Rainforest, Coastal Dry-woodlands,

Littoral Forest and the Elfin Woodlands forest types. Some of these forests are important for to timber production, including high-value species such as the Blue Mahoe and Mahogany. The forests also provide important ecosystem services such as livelihoods or supplementary income to households; capture and supply of water

²³ Expenditure on programmes administered by the National Insurance Scheme have not been included.

for drinking, irrigation and hydroelectricity; and attraction for eco-tourism activities.

St. Vincent and the Grenadines has a rich biodiversity with multiple endemics. There are 1,523 species listed on the IUCN Red List for St. Vincent and the Grenadines. Another 97 species are of great concern, with 1 extinct, 7 critically endangered, 14 endangered, 43 vulnerable, and 33 near threatened²¹. Of the 21 critically endangered and endangered species, five are endemic to St. Vincent and the Grenadines.

There are 17 **recreational sites** managed by the National Parks Rivers and Beaches Authority, of which six are located within the red and orange high-risk zones. **Surface water** is the major source of potable water and water for irrigation and industrial supplies. The average annual rainfall on the main island, St. Vincent, has so far been sufficient to

meet local requirements (100m m³/year).

The mining and quarrying sector plays an important role in the country's overall development as these resources are vital inputs in the construction sector in the form of sand, aggregates and rocks. Boulders are mined at several points across the country; aggregate and sand are mined at Rabacca and Richmond.

Land has traditionally been a major resource for development in St. Vincent and the Grenadines. Major land-use activities include agriculture, mining (quarrying) and construction (housing and tourism development). These activities coupled with population increase have placed great demands on the limited available land. The major environmental resource and volcanic impact is presented in **Table 4.3**.

Table 4.3: Major Environmental Resource and Volcanic Impact (Source MSEA Chapter 5)

Natural Resource	Volcanic Impact Damage or Loss
Water	80%< supply loss during eruption
Fisheries	Richmond and Wallibou seine hauling sites destroyed
Agriculture	(see agriculture sector)
Real Estate	Damage to homes, loss of access to lands
Hotel/Restaurant	Business closure and infrastructural damage
Mining	Aggregate mining sites at Richmond and Rabacca damaged
Protected areas & Parks	Damage to facilities and loss of trails, signage, etc.
Forests and Biodiversity	Destruction of approximately 23,000 acres of forest

Source: Cross-Cutting PDNA Assessment Team

Disaster Effects

Damage to Environmental Resources

The total effects of the eruption of La Soufriere on the Environment Sector are still to be fully assessed. Because of its cross-cutting nature, elements of the environment such as forest, fisheries and soil have been captured under the Agriculture Sector while water resources were captured under the WASH Sectors. Elements of great significance but less ventilated include Biodiversity, Protected Areas and their supporting

structures (habitats and ecosystems), Soil, Air quality, and Ecosystems Goods and Services are the main focus of this section of the report. Cost relating to damage or loss for these elements are only mentioned in qualitative terms because of the absence of baseline values and the absence of proven quantitative approaches. Many of these are informal but significant economic streams for rural people who are not captured in the national economic assessment but their loss results in great economic hardship. **Table 4.4** summarises the direct effects of the volcanic eruption on the environment.

Table 4.4: Damage to Environmental Resources

Resource/ Topic	Damage	Loss	Extent of Impact	Data needed to Estimate Cost*
Forests and Biodiversity	Habitats of endemic and endangered species destroyed. Plant and animal species lost.	Income streams from bird watchers, tours and forest products. Loss of access to non-timber forest products	Moderate	Annual loss in ecosystem services before natural regeneration Annual cost of restoration and monitoring initiatives Value of non-timber products
Protected Area	Forest Reserve in Colonarie, Cumberland and Richmond; Recreational areas including Owia Salt Pond, and Rabacca River Recreational Park have been severely damaged. All forest trails on the Soufriere hill have been destroyed.	Income streams for Ministry of Tourism, livelihoods for parks personnel and tour operators, recreational opportunities disrupted.	Moderate	Loss of net income for all stakeholders over a given period; rebuilding costs
Soil and Water	Loss of topsoil due to Lahars/mud flows eroding slopes, blocking and or destroying water ways and infrastructure; ash severely restricting water infiltration on farmlands	Income from agriculture and water resources. Economic cost of importing water	Severe	Data on extent top soil loss and impact on existing soil conservation measures (drains, grass barriers, bench terraces etc.); cost for their reestablishment
Sand Mining	Aggregate source at Rabacca and Richmond damaged.	Loss of construction material, livelihood opportunities and income from sale of aggregate.	Mild	Data on the income from sand and aggregate mining

Air Quality	Closure of roads and airports	Ash fall forcing persons indoors, health impacts, loss of air aviation services	Mild	Lost productivity due to business closures
Solid Waste Management	Large volume of mixed solid waste including potentially hazardous substances		Moderate	Costs for hazardous waste management Ash clearing and disposal costs

Cross-Cutting PDNA Evaluation Team

4.3.2 Disaster Risk Reduction

Coordination

Coordination through the National Emergency Operations Centre (NEOC) for the event was satisfactory with evidence of adequate strategic leadership built on the governance arrangements provided in the legislation. Support was also provided through CARICOM Operational Support Team (COST) of four (4) persons deployed over 3.5 months. Nonetheless, spaces for improvement were identified which include²⁵:

- Improved congruence between the National Emergency Executive Committee (NEEC) and day to day reporting lines
- Ensuring that the Executive level of the NEOC structure is activated through the National Emergency Executive Committee to facilitate improved information flow between the policy and operational levels of the NEOC (DDSA report)
- Improved integration of NGO, private sector entities and international actors within the NEOC subcommittee structure

Moreover, coordination of the volcanic emergency response was undertaken in a multi-hazard environment - amid the global COVID-19 pandemic and a subsequent rainfall event. The

complexity of coordination of multiple hazards occurring simultaneously with cumulative and cascading impacts, for a prolonged duration, cannot be ignored. Material deposited on the flanks of the volcano which can be remobilised by heavy rainfall producing lahars now poses an ongoing threat over the next few years. Additionally, the COVID-19 pandemic required adjusted protocols and procedures for EOC and shelter management due to social distancing measures. Coordination arrangements have also focussed significantly on shelter management with thirty-three (33) shelters housing one thousand, four hundred and eight-three (1,483) persons still being managed as of 13 August 2021. Providing safe shelter for the persons displaced by the volcanic emergency during the hurricane season remains a priority and thus limits the options for providing hurricane shelter for other vulnerable members of the general population on mainland St. Vincent.

Relief Distribution

This focused on an end-to-end relief management system and was generally satisfactory. However, the influx of supplies overwhelmed the port system and challenges were noted in the coordination of movement of supplies and loopholes which could create accountability challenges. Some areas will therefore need

²⁵ Detailed Damage Sectoral Assessment 2021

attention during the prolonged period. The Arnos Vale Logistics Hub was considered good practice for sorting, organizing, storing, coordinating and transporting relief supplies destined to shelters or beneficiaries throughout St. Vincent. The CDEMA Logistics System (CLS) software was live-tested and enhanced through this emergency event. Support was provided by the CARICOM Disaster Relief Unit (CDRU) deployed for six (6) weeks working in collaboration with the World Food Programme with the financial support of USAID.

Information Management

Information Management in the NEOC guided by plans and procedures was satisfactory with public information facilitated by the assignment of a lead within the NEOC. The prolonged duration of the emergency quickly highlighted some challenges including the availability of adequate human resources and the tedium of operating a manual information management system, which led to delays in access to and processing information for NEOC briefings, decision-making, public information and situation reports. Lack of IT equipment, access to data over IT networks and inconsistency in data for shelters, for example, resulted in challenges in information flow and management

Resilient Pathways

With reference to the CDM Blue-Print, efforts to finalise the Country Work Programme process in keeping with the established criteria were derailed by the response efforts but also reinforced the need to advance the resilience agenda in keeping with the resilience framework.

Early Warning Systems

Concerning early warning system performance, the onset of the eruption was predicted thanks

to the upgraded seismic monitoring system and analysis by the scientist according to established protocols. The effusive nature of the eruption from December 2020 allowed sufficient time for the installation of necessary additional seismic monitoring equipment with warning information being shared by NEMO. This provided residents and tourists with the necessary information (such as assembly points etc.) to make informed decisions, which could save lives and properties. The information was relayed through the cap system, the NEMO Facebook page and API. At the community level, NEMO convened a series of meetings with residents in the areas most likely to be affected, to update them on the present situation and outline the official sources of warning information.

Warning information for subsequent eruptions from the volcano was also shared using the EWS with this being further bolstered through a daily radio programme convened with the Prime Minister and the SRC lead scientist outlining scenarios, warning information and more importantly what persons can expect from the volcano. It was mentioned that there is no feedback mechanism to measure the effectiveness of the warning messages disseminated at the time of writing the report, although it must be noted that the island has reported no deaths due to the volcanic eruption to date. While the population received early warning of the impending explosive eruption, the mode of disseminating warning information to the most vulnerable including those differently abled revealed some gaps which affected response times

Evacuation

Heightened volcanic activity prompted evacuations of persons from communities in the Red and Orange zones on mainland St. Vincent prior to the commencement of the explosive

eruptions. The official evacuation order was received at 4 pm on 8 April 2021. This commenced a mass evacuation from communities in the northeast and northwest of the island from the hazardous zones (red and orange) to public and private dwellings in safer zones located in the south of the country. The National Emergency Management Organization (NEMO) indicates that close to 20,000 persons were evacuated.

When advised to evacuate, residents in the Red and Orange zones gathered at pre-designated assembly areas and those needing further assistance were provided with vehicle support offered by the government for land and sea evacuation. Some persons, however, fearing that their possessions may be stolen once they left, did not evacuate immediately and only accepted the

need to evacuate following the explosive volcano eruption revealing low-risk perception based on previous experiences.

Sea evacuation was also possible on the Leeward side of the island and, as identified in the plans, this element was ably led by the SVG Coast Guard. It was also reported that some persons believed the government-offered transportation would be readily available once they reached the designated assembly area even though it was advised by NEMO that the transportation will be mobilized a minimum of 2 to 3 hours after the evacuation order, revealing a gap in communication and contributing to some frustration of individuals. While there were no deaths recorded directly related to the eruption and evacuation, some transportation injuries did occur.



5. Disaster Recovery needs

The recovery needs for the country as a result of the volcanic eruption is estimated at XCD739.72 million, reflecting the interventions required to repair/rehabilitate or rebuilt infrastructure and physical assets. It includes enhanced measures that are in line with the principles of building back better and disaster risk reduction to ensure future resilience.

The social sector represents the highest percentage of needs to be financed (51.98), of which XCD355.99 million are required for housing; XCD18.24 million for education and XCD10.33

million for health. These financial requirements are linked to the need to relocate and rebuild safe housing, and to repair existing houses using the build back better principles.

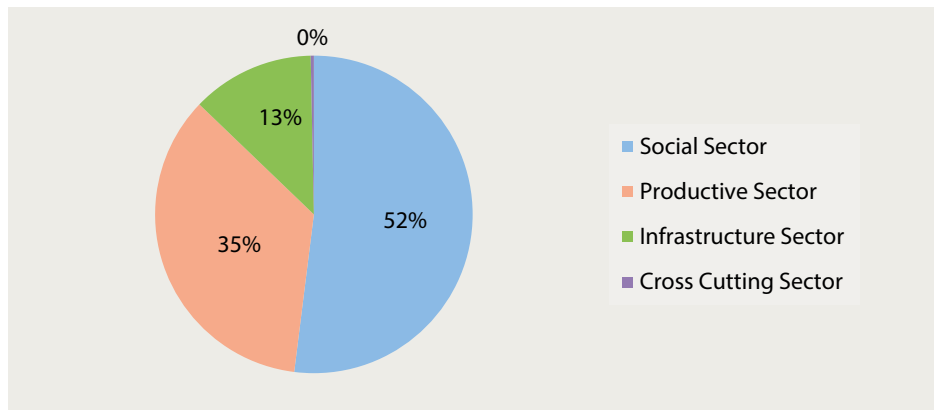
The agriculture sector (including crops, livestock, fisheries, apiculture and forestry sector) represents 35.20% of the recovery needs or XCD260.35 million, most of which are for the rehabilitation and replacement of impacted assets in the sector and income support. Table 5.1 and Figure 5.1 present the summary and distribution of recovery needs by sector respectively.

Table 5.1: Summary of Recovery Needs by Sector

SECTOR	Recovery needs (XCD'000')
Social	384,565.07
• Housing	355,994.87
• Health	10,329.10
• Education	18,241.10
Infrastructure	92,434.21
• Wash	1,890.43
• Transport	89,327.03
• Electricity	1,216.75
Productive	260,353.54
• Agriculture, Forestry, Fisheries	258,855.29
• Tourism - Accommodation	-
• Tourism - Parks	1,498.25
Cross-Cutting	2,375.27
Total	739,728.09

Source: PDNA Assessment Team

Figure 5.1 - % Distribution of Recovery Needs by Sector



Source: PDNA Assessment Team



6. Elements for Disaster Recovery Strategy

6.1 Introduction

The **St. Vincent and the Grenadines Recovery Strategy** presents elements to be considered as a road map for the country to rise from the ashes caused by the La Soufriere volcanic eruption as a resilient, resilient, climate-responsive society that equitably stimulates human capabilities, sustainable opportunities, and improved quality of life. The recovery strategy promotes inclusive growth, builds the adaptive capacities of households and communities, increases the resilience of vulnerable sectors and communities, and optimizes disaster mitigation and climate change opportunities with a view to promoting the welfare and security of the population.

The recovery process is to be guided by good governance principles within the context of poverty alleviation and environmental protection. It recognizes the need for partnerships for effective delivery of support to the people of the country - that is, working together through the complementation of resources. In this context, the Government, engaging the participation of civil society organizations (CSO), regional and international organizations, the private sector and volunteers in the government's resilience-building programmes is part and parcel of the national recovery strategy.

The Recovery strategy highlights the need for institutionalizing resilience-building policies, structures, coordination mechanisms and programmes with continuing but greater budget appropriation on DRM and CCA from national to local levels. Thus, the strategy outlines the activities which shall strengthen the capacity of personnel of national government, district and local government units and partner stakeholders and build the disaster resilience of communities. It also outlines institutionalized arrangements and

measures for reducing disaster risks, including projected climate risks, and enhancing disaster preparedness and response capabilities at all levels.

The recovery strategy also highlights the importance of mainstreaming DRM and CCA measures in the development processes such as policy formulation, socio-economic development planning, budgeting and governance, particularly in the area of environment, agriculture, water, energy, sanitation and hygiene (WASH), health, education, poverty reduction, land-use and urban planning and public infrastructure and housing among others. Mainstreaming also puts forth the need to develop common tools to analyse the various hazards and vulnerability factors that expose the communities and people to harm.

Competency and science-based capacity building activities are likewise incorporated into the recovery strategy, along with the nurturing of continuous learning through knowledge development and management of good DRM and CCA practices on the ground.

A critical component of the recovery strategy will be the need to establish measurable, quantitative and qualitative targets for achievement, which should be phased to facilitate optimal sequencing of activities and to ensure complementarities, within a specific period.

Finally, the recovery strategy incorporates systemic risk and systemic opportunity into the recovery interventions of policies and critical investments in infrastructure and physical assets. This is a recognition that current approaches to risk measurement and management are inadequate to meet the challenges of the

multifaceted interconnectedness of hazard, the barely understood breadth of exposure, and the profound detail of vulnerability; this inadequacy must be addressed if we are to do more than simply treat the symptoms. The era of hazard-by-hazard risk reduction is over; present and future approaches to managing risk require an understanding of the systemic nature of risk. This entails quantum improvements in our understanding of anthropogenic systems in nature to identify precursor signals and correlations to better prepare, anticipate and adapt.²³

The critical link between disaster management and sustainable development is also recognised as a holistic approach to managing multiple risks from all hazards, which is necessary to achieve resilient development. DRR ought to be a critical component of development planning, as well as sectoral strategies, programmes and work plans. Although the damage and losses in some sectors are more visible than others, the recent increasing scale and frequency of hazards in the region have further shown that all sectors should develop an effective approach to reducing disaster risk and Building Back Better (BBB) in the post-disaster recovery realm. For SVG, resilience also connotes

being able to bounce forward quickly in a manner that reduces susceptibility (increased liability to additional harm) to the impact of the same hazard. In the context of the Lines of Action (pillars of resilience) identified, it should be recognised that the recovery strategy is predicated on addressing issues related to systemic risks in SVG. This approach is further demonstrated by the nature of the intervention strategies that are proposed.

Through a participatory process involving approximately 65 team members from the public and private sectors, key regional and international organizations and the civil society that participated in the assessment, the key elements that will form the basis for the formulation of a comprehensive recovery strategy were discussed and agreed upon. This framework agreed upon includes a vision statement, three guiding principles and three strategic intervention lines, in which all the sectoral needs and their cost were determined and integrated into a holistic framework of actions. The recovery strategy is aligned to all relevant national and sectoral policies, strategy and development plans.

6.2 Vision

As indicated above, through a participatory process the below Vision Statement was agreed upon, which has provided the foundation for the formulation of a recovery strategy for the country.

*“Rising out of the ashes as a resilient, resilient, climate-responsive society that
Equitably stimulates human capabilities, sustainable opportunities,
And an improved quality of life.”*

26 UN, 2019. Global Assessment Report (GAR) on Disaster Risk Reduction, 2019

6.3 Guiding Principles

The following three principles were selected to guide the development and implementation of the Recovery Strategy:

- Build resilience and reduce risks, promoting green/blue economies and energy efficiency.
- Ensure equity and accessibility and promote gender equality in decision making, service delivery and recovery.
- Rebuild people’s livelihoods.

6.4 Strategic Lines of Action

The alignment of the objectives and outcomes of the recovery strategy three strategic lines of action with identified objectives of the National Economic and Social Development Plan of St. Vincent and the Grenadines is presented in **Table 6.1** below.

- Re-engineering Economic growth.
- Enabled Increased Human and Social Development.
- Improving Physical Infrastructure, Preserving the Environment and Building Resilience to Climate Change.

Table 6.1: Alignment of the Recovery Strategic Lines of Action with National Economic and Social Development Plan 2013-2025

RECOVERY PLAN STRATEGIC LINES of Action		NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT PLAN
Objective	Outcomes	Objective Number (OBJ #)
Strategic Line of Action #1: Re-engineering Economic Growth		
To enhance the country’s economic development agenda in an inclusive and comprehensive manner, by ensuring the sustainability of the productive value chains that incorporate new and better technologies, through the development of effective and efficient governance mechanisms, human capacities and support services, and the strengthening of the financial sector.	1.1 Financial sector mechanisms strengthened and financial and/ or material resources for economic activities required for recovery were provided.	OBJ #1.1; and OBJ #1.4
	1.2 Economic activities that expand and diversify production chains, save/earn foreign exchange, create employment and expand demand are promoted.	OBJ #1.2; OBJ #1.3; OBJ # 1.5; OBJ #1.8; OBJ #1.9; OBJ #1.10; and OBJ #1.11
	1.3 Governance mechanisms strengthened, and disaster risk management (DRM) and climate change adaptation (CCA) mainstreamed within national, regional, community and sectoral policies, strategies and plans.	OBJ #1.2; OBJ #1.3; OBJ #1.8; and OBJ #1.11 Gaps identified in the Objective matrix for BBB and Building Forward Better (BFB).
	1.4 Operational readiness and recovery frameworks strengthened.	Gaps identified in the Objective matrix for BBB and BFB.

RECOVERY PLAN STRATEGIC LINES of Action		NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT PLAN
Objective	Outcomes	Objective Number (OBJ #)
Strategic Line of Action #2: Enabled Increased Human and Social Development		
To enhance inclusive human and social development in SVG aimed at increasing the quality of life for the entire population, especially the poor.	2.1 Poverty reduced through the creation of jobs, promotion of income and gender equality, development of an adaptable, functional and literate population, facilitation of cultural and economic development at the community level, and the empowerment of youth to participate meaningfully in and contribute to national development.	OBJ #2.1; OBJ #2.1; OBJ #2.3; OBJ #2.5; and OBJ #2.6
	2.2 Self-care intervention and healthy lifestyle practices promoted	OBJ #2.4
	2.3 Social protection promoted for marginalized and vulnerable groups	OBJ #2.8
Strategic Line of Action #3: Improving Physical Infrastructure, Preserving the Environment and Building Resilience to Climate Change		
To reduce the risk and vulnerabilities of the physical infrastructure to natural disasters and climate-related disruptions by building resilience, and to conserve the natural resources of the country through climate-smart utilization and management	3.1 Risk reduction and resilient infrastructure are promoted in the reconstruction efforts to reduce vulnerabilities to future disasters	OBJ #4.2; OBJ #4.4; OBJ #4.10
	3.2 Resilience fostered through the safeguarding of physical infrastructure and assets from planning to functional operations and management.	OBJ #4.5; and OBJ #4.9

Details of the recovery strategy, with their respective objectives, outcomes and intervention strategies are presented in the matrix of Table 6.2 under three broad areas:

- Re-engineering Economic growth.
- Enabled Increased Human and Social Development.
- Improving Physical Infrastructure, Preserving the Environment and Building Resilience to Climate Change.

It is important to note that the recovery strategy is aimed at adding value to the National Economic and Social Development Plan by building back better (BBB) and building forward better (BFB) in the aftermath of the La Soufriere volcanic eruption.

6.5 Next Steps

The Post-Disaster Recovery Needs Assessment (PDNA) provides a solid foundation for quantifying damage and loss and estimating recovery needs. However, it also offers the opportunity to go beyond estimating the costs required for recovery: It provides the basis for the formulation of a realistic recovery framework, based on national priorities and capacities.

The vision, guiding principles and the intervention strategies proposed under the three strategic lines, together with the budgeted recovery needs are the starting point for the formulation of a solid action plan. It is important to note that another critical aspect of the recovery framework is the identification of an entity to lead the recovery process, which may be a line ministry, or an agency created expressly for that purpose.

In the context of the above, five (5) broad next steps have been identified to provide the blueprint for ensuring an efficient and effective recovery process namely:

- Development of an actionable plan for recovery considering the overlapping effects of ongoing Covid-19 and hurricane season early effects.
- Identification of resources gap for funding for the recovery programme.
- Harmonization of the assessment process from humanitarian response to recovery.
- Improvement of data collection and management system.
- Capacity strengthening for recovery.

Table 6.2: Elements of St. Vincent and the Grenadines Volcanic Eruption Recovery Strategy Matrix

Strategy: To provide a re-engineered landscape that promotes economic growth through diversification of the economy, strengthening of the enabling environment and alleviation of structural constraints that hamper growth potential.

OBJECTIVE	OUTCOMES
To enhance the country's economic development agenda in an inclusive and comprehensive manner, by ensuring the sustainability of the productive value chains that incorporate new and better technologies, through the development of effective and efficient governance mechanisms, human capacities and support services, and the strengthening of the financial sector.	0.1 Financial sector mechanisms strengthened and financial and/ or material resources for economic activities required for recovery were provided.
	1.2 Economic activities that expand and diversify production chains, save/earn foreign exchange, create employment and expand demand are promoted.
	1.3 Governance mechanisms strengthened, and disaster risk management (DRM) and climate change adaptation (CCA) mainstreamed within national, regional, community and sectoral policies, strategies and plans. ²⁷
	1.4 Operational readiness and recovery frameworks strengthened.

Outcome 1.1: Financial sector mechanisms strengthened and financial and/ or material resources for economic activities required for recovery provided

OBJECTIVE	OUTCOMES
1.1 Financial Sector strengthened to provide a range of Financial Services to Support the Disaster Risk Management Cycle	1.1.1 Enhance the provision of microcredit for recovery for Small and Medium Enterprises
	1.1.2 Strengthen the risk transfer products and mechanisms especially with the domestic insurance industry to improve the national capabilities for serving the country.
	1.1.3 Improve the range of financial services provided through strengthening the banking technology, including mobile banking to enhance the speed of the recovery process.
	1.1.4 Explore the potential for the establishment of Village Savings and Loan Associations (VSLAs) to improve the availability of resources at the community level for recovery. ¹
	1.1.5 Provide financial support to the Ministry of Health to develop a comprehensive long-term storage or warehousing solution to accommodate both routine and emergency supplies

²⁷ Village Savings and Loan Associations (VSLAs) – a type of local financial institution that has been standardized by CARE and is increasingly being promoted by a host of different organizations – take many of the elements of rotating savings and credit associations (ROSCAs) and add more flexibility in savings and loans, standardize the governance structure and reinforce accountability elements.

Outcome 1.2: Economic activities that expand and diversify production chains, save/earn foreign exchange, create employment and expand demand are promoted

OBJECTIVE	OUTCOMES
1.2 Strengthened national economic environment in place that enhances production and contributes to the achievement of the targets established for key macro and microeconomic variables for recovery process.	1.2.1 Provide income support to producers of goods and services in all sectors based on income loss and additional cost incurred as a result of the volcanic eruption
	1.2.2 Promote education reform that adequately prepare people for entrepreneurship through the incorporation of business and innovation in the curriculum.
	1.2.3 Provide technical support to the productive sectors (agriculture, tourism, manufacturing and trade) to increase their productivity, cost efficiency and competitiveness.
	1.2.4 Stimulate growth in the tourism industry by promoting the resilience of yachting industry and resorts of The Grenadines.
	1.2.5 Promote the Volcanic Site as a tourist attraction by reinforcing the hiking sites around the Volcano.
	1.2.6 Develop and implement a comprehensive plan for recovery and rebuilding of a modern, competitive agricultural sector, including land reform to address critical issues of land use, tenure and distribution.
	1.2.7 Provide the policy framework and related fiscal incentives, and necessary infrastructure and market intelligence to build a modern agricultural sector
	1.2.8 Strengthen the institutional support and coordination framework (e.g., through contract farming, nucleus/satellite framing) and infrastructural facilities (central collection, grading and packaging) to link farmers to market and ensure consistency in quality and quantity of agricultural products supplied to the growing tourist market
	1.2.9 Implement alternative livelihoods initiatives for displaced farm and fisher families and illegal uses of the forest.
	1.2.10 Optimize the contribution made by the blue economy, especially the fisheries sub-sector
	1.2.11 Provide support for agriculture-related production input (Planting materials, fertilizers, chemicals, feeds, veterinary drugs and supplements, etc.).
	1.2.12 Provide temporary employment for the cleaning and removal of ashfall, debris and boulders from private and public properties.

Outcome 1.3: Governance mechanisms strengthened, and disaster risk management (DRM) and climate change adaptation (CCA) mainstreamed within national, regional, community and sectoral policies, strategies and plans

OUTPUT	INTERVENTION
<p>1.3 Clear vision, plans, competence and coordination are in place within SVG, that foster collaboration among institutions in the implementation of disaster risk management and climate change adaptation measures.</p>	1.3.1 Institutional mechanisms for the efficient and effective coordination of DRM and CCA tasks within SVG, including those related to emergency and disaster response issues, strengthened at the national, regional and local/community levels
	1.3.2 Define with clarity, roles and responsibilities across all relevant organizations involved in resilience building to ensure better coordination of pre-event planning and preparedness, event response and post-event activities
	1.3.3 Strengthen the institutional regulatory frameworks
	1.3.4 Develop protocols to guide the involvement of publicly owned, managed or regulated services and the co-option of infrastructures.
	1.3.5 Promote and provide incentives, as relevant, for actions by persons, households, communities and businesses in resilience building.
	1.3.6 Establish/strengthen the necessary mechanisms and incentives to ensure high levels of compliance with the existing safety-enhancing provisions of sectoral laws and regulations, including those addressing land use and urban planning, building codes, environmental and resource management and health and safety standards, and update them, where needed, to ensure an adequate focus on resilience building.
	1.3.7 Enhance the data capture and information management systems at the national, sectoral and institutional levels, to include Sex-and-Age disaggregated data points.
	1.3.8 Implement communication and information dissemination strategies on issues related to risk mitigation and develop and implement national-level training programmes in risk assessment, management and administration within the context of a multi-sectoral approach and from a multidisciplinary and multidimensional lens.
	1.3.9 Enhance the Information and Early Warning network, including expanding the PAHO and CARPHA supported Early Warning and Response System (EWARS), which is currently being implemented and tested, in the intermediate and long term to boost the existing surveillance mechanisms
	1.3.10 Conduct a technical assessment of several logistics supply chain information systems in place in the country, including a pharmaceutical and medical supplies management system, to determine the most practical option to be implemented.
	1.3.11 Mainstream DRM and CCA into national, sectoral, district and local development policies, strategies, plans and budgets

	1.3.12 Strengthen the existing sustainable sources of fund for resilience building, to include a provision in the DRM policy guidelines of a % of both public and private institutions’ budget dedicated to resilience-building activities
	1.3.13 Implement contingency planning and training and establish a Contingency Fund for post-disaster recovery (a “rainy day” fund).
	1.3.14 Promote innovative risk transfer tools and instruments to better manage the fiscal impacts of disasters, such as catastrophe bonds and parametric insurance products, as well as alleviate the key constraints to the access of international insurance and capital markets.
	1.3.15 Review and integrate DRM and CCA considerations integrated into cross-cutting issues such as environmental management and gender equality policies, plans, programs and projects.
	1.3.16 Develop training materials and build national and institutional capacities (private and public sectors) in business continuity protocols and plans.

Outcome 1.4: Operational readiness and recovery frameworks strengthened

OUTPUT	INTERVENTION
1.4 The Recovery Capacity Assessment process advanced and the National Recovery Framework accelerated in order to guide recovery actions and strengthen the institutional mechanisms to advance the recovery process which is being offered through CDEMA.	1.4.1 Update relevant Plans, including National Response Plan and conduct a review of the recently updated National Volcano Emergency Plan for robustness
	1.4.2 Maintain seismic network across the island to improve monitoring and forecasting capacity for volcanoes and seismic activity
	1.4.3 Update risk and vulnerability assessments for flooding, lahars and landslides
	1.4.4 Review and enhance national evacuation plans
	1.4.5 Provide training in PDNA and DRM at the national and community level
	1.4.6 Review DRM Legislative (National Emergency and Disaster Management Act), with a view to update
	1.4.7 Conduct Scenario-based simulation exercises to identify gaps and improve procedures



Strategy: To promote the design, plan, implement and sustain an inclusive and equitable economic **development agenda that unlocks the full potential of the economy by dismantling barriers and expanding opportunities for all, including the vulnerable and poor**

OBJECTIVE	OUTCOMES
2 To enhance inclusive human and social development in SVG aimed at increasing the quality of life for the entire population, especially the poor.	2.1 Poverty reduced through the creation of jobs, promotion of income and gender equality, development of an adaptable, functional and literate population, facilitation of cultural and economic development at the community level, and the empowerment of youth to participate meaningfully in and contribute to national development.
	2.2 Self-care intervention and healthy lifestyle practices promoted
	2.3 Social protection promoted for marginalized and vulnerable groups

Outcome 2.1: Poverty reduced through the creation of jobs, promotion of income and gender equality, development of an adaptable, functional and literate population, facilitation of cultural and economic development at the community level, and the empowerment of youth to participate meaningfully in and contribute to national development.

OUTPUT	INTERVENTION
2.1 The level of poverty reduced among the population, especially among the vulnerable poor groups	2.1.1 Exploit the opportunities available in building a resilient society to create decent jobs within the context of DRM and CCA programmes and projects
	2.1.2 Promote gender equality in the recovery process as it relates to access to resources (land, labour and credit), production inputs and markets
	2.1.3 Increase the rate of implementation of capital projects, including those related to the recovery process.
	2.1.4 Develop and implement adaptable curricula consistent with the development needs of the country, including the use of ICT in the delivery of the curricula
	2.1.5 Facilitate increased social, cultural and economic development at the community level as it relates to the agriculture, forestry, fisheries and tourism and natural parks sectors/sub-sectors, fish fries, agro-ecotourism and health/organic product solutions.
	2.1.6 Empower the youth to participate more meaningfully in and contribute to national development, including the development and implementation of a programme of incentives (increased marketable skills through training, and access to land and credit) to encourage young people into farming
	2.1.7 Scale-up community water harvesting, storage and use, including irrigation

Outcome 2.2: Self-care interventions and healthy lifestyle practices promoted

OUTPUT	INTERVENTION
2.2 Increased health and productivity of the country's population	2.2.1 Reassess the primary health care and services with a view for improvement
	2.2.2 Review the human resource strategy for nurses and health staff to engage persons trained and unemployed
	2.2.3 Promote OECS regional approach to health worker training and exchange along with regional risk-sharing to reduce evacuation and overseas health care costs
	2.2.4 Promote the use of telemedicine for sharing key specialists between the islands
	2.2.5 Improve the housing and living conditions of the population by increasing homeownership, decreasing homelessness and sub-standard living conditions, reducing the number of squatter settlements, and making the homes more resilient hurricanes and other natural disasters
	2.1.6 Reduce the incidence of NCDs by establishing exercise facilities in public and private spaces to increase the wellness and physical fitness of the nation

Outcome 2.3: Social protection promoted for marginalized and vulnerable groups²⁸

OUTPUT	INTERVENTION
2.3 Enhanced social protection program (SP) designed to build resilience to disasters and climate shocks and natural disasters	2.3.1 Promote effective formal communication channels and linkages among social protection, disaster management, and relevant sectoral ministries/agencies, including those responsible for early warning systems to ensure that a coordinated institutional platform is in place for delivery of benefits
	2.3.2 Establish clearly defined roles and responsibilities of all ministries/ agencies and other implementing partners, including international, non-governmental, civil society, and private sector organizations to ensure efficiency and effectiveness in the delivery of benefits
	2.3.3 Promote linkages and information-sharing arrangements with the broader humanitarian response system, such as the United Nations-led emergency cluster system
	2.2.4 Promote scalability and flexibility in the administrative mechanisms used to mobilize and deploy contingency financing and human resources, transfer benefits, manage fiduciary risks, and identify and register affected people
	2.2.5 Establish a mechanism to ensure the targeting of households that are most vulnerable to natural disasters and climate change-related risk, using a combination of targeting strategies to ensure efficiency and effectiveness in the process
	2.2.6 Promote the effective participation in decision making by communities and vulnerable groups

- 2.2.7 Promote greater community involvement in the design and implementation of inclusive policies and social safety-net mechanisms
- 2.2.8 Ensure food and nutrition security
- 2.2.9 Support viable livelihood enhancement programmes at the community and household levels

Strategy: To plan, design, build and operate physical infrastructure in a way that anticipates, prepares for, and adapts to risks and vulnerabilities to future natural disasters and related changing climate conditions

OUTPUT	INTERVENTION
3. To reduce the risk and vulnerabilities of the physical infrastructure to natural disasters and climate-related disruptions by building resilience, and to conserve the natural resources of the country through climate-smart utilization and management	3.1 Risk reduction and resilient infrastructure are promoted in the reconstruction efforts to reduce vulnerabilities to future disasters
	3.2 Resilience fostered through the safeguarding of physical infrastructure and assets from planning to functional operations and management.
	3.3 The protection of the natural environment is promoted.
	3.4 Digital and connectivity gap reduced by strengthening human capital, facilitating connectivity and access to information, raising awareness and generating an innovation culture to promote human, technological, and social development



Outcome 3.1: Risk reduction and resilient infrastructure are promoted in the reconstruction efforts to reduce vulnerabilities to future disasters

OUTPUT	INTERVENTION
<p>3.1 Risks to physical infrastructure reduced by locating assets in areas that are less exposed to hazards, and by making the assets better able to cope with disaster impacts when they materialise by making trade-offs between risk minimization and cost, where it becomes more expensive and increasingly technically challenging to prepare for events that are very unlikely to occur.</p>	<p>3.1.1 Repair/rehabilitate, reconstruct and maintain the physical infrastructure of the social sector (education, housing, health), productive sector (Agriculture and Tourism/natural Parks), and infrastructure service networks (Electricity, Water, Sanitation and Hygiene, Transport and Works), with improved resilience to potent new risks and vulnerabilities, utilizing affordable technologies, within the context of building back better.</p>
	<p>3.1.2 Specifically for the Transport and Works sector, repair the road infrastructure (Sandy Bay, Chateaubbelair Districts) and river crossing infrastructure in (Georgetown, Sandy Bay and Chateaubbelair Districts)</p>
	<p>3.1.3 Develop and where applicable, implement guidelines for the relocation and resettlement of communities located in high risk and vulnerable areas to address issues such as lands, housing, related infrastructure and services, including electrification of new development (relocation)</p>
	<p>3.1.4 Develop and implement a plan of action for the rehabilitation/ relocation of agricultural stations/ germplasm plots (Assets and operations)</p>
	<p>3.1.5 Implement the Forest and Wildlife Recovery Programme through reforestation, soil conservation, clearing of waterways and stabilisation of stream banks. Replanting of plantation forests in the lower slopes, such as in Orange Hill. Protection and conservation of gullies where housing existed, to include agroforestry for the generation of livelihoods for displaced residents.</p>
	<p>3.1.6 Update the building codes to account for ashfall during a volcanic eruption as an additional load factor to consider in roofing.</p>
	<p>3.1.7 Conduct research and development of agro-ecological models for sustainable commercial agriculture in the red and orange zones.</p>
	<p>3.1.8 Introduction of new and appropriate resilient technology and innovation in sectoral assets and production systems</p>
	<p>3.1.9 Scale-up community-level water harvesting, storage and irrigation</p>
	<p>3.1.10 Implement the interventions outlined in Outcome 1.3 above to strengthen governance mechanisms and mainstreaming disaster risk management (DRM) and climate change adaptation (CCA) within national, regional, community and sectoral policies, strategies and plan</p>
	<p>3.1.11 Promote innovation as a fundamental pillar for social and productive transformation, through coordinated and multi-sectoral actions that allow problem-solving through research and development of technologies, among other aspects, such as new materials, adapting production methods and social interactions during disasters</p>

Outcome 3.2: Resilience fostered through the safeguarding of physical infrastructure from planning to functional operations and management²⁹

OUTPUT	INTERVENTION
3.2 Infrastructure safeguarding is established as part of the planning process, designed to ensure that assets that have been identified for major infrastructure projects are protected from conflicting developments	3.2.1 Accelerate the national and regional building codes enhancement, adaptation and implementation processes
	3.2.2 Implement a process of constant review of the teaching and training programmes for built environment services by Higher Education Institutions (HEIs) and selected experts
	3.2.3 Consolidate for application the efforts of HEIs and others for materials testing and certification systems
	3.2.4 Review Built Environment legislation and regulations to address issues of market surveillance, enforcement and accountability
	3.2.5 Create incentives for research and development of new materials and services for SMART development, alternate energy, energy efficiency, water resources management, greening and associated areas
	3.2.6 Enhance public education and information on safe and resilient communities

Outcome 3.3: The protection of the natural environment is promoted

OUTPUT	INTERVENTION
3.3 Natural resources and the existing natural environment are conserved and, where possible, damage is repaired and trends are reversed through the rebuilding of natural assets, restoring access to environmental goods and services, restoring environmental resources that support livelihoods systems, and addressing new and existing challenges	3.3.1 Restore forests and biodiversity through more effective management of invasive species, the development of effective valuation system for forest and biodiversity products, and the incorporation of forest and biodiversity contribution to national budgets.
	3.3.2 Support the forests and biodiversity restoration process through the cleaning of rivers and streams, especially in the upper watersheds of the red and yellow zones
	3.3.3 Enhance soil fertility through the incorporation of ash into the soil, where ash-fall was light; Sustainable application of fertilizers, soil amendments and compost; and Establishment/re-establishment of grass barriers, contour drains, bench terraces
	3.3.4 Ensure availability of environmentally sustainable, high-quality and affordable construction materials (sand, aggregate, pumice stone/rocks) through the identification of alternative mining sites and establishment of appropriate transportation infrastructure, and production of fine to coarse sands by improving crushing and screening equipment at new and existing mines.
	3.3.5 Restore and protect damage marine habitats through the identification of habitats that were affected by the volcanic eruption and the institution of moratorium/temporary no-take areas while the necessary restoration work and monitoring are being undertaken.

²⁹ Based mainly on CEDMA, 2018. Building a Caribbean Pathway for Disaster Resilience in the Caribbean Community (CARICOM)

	<p>3.3.6 Restore and protect aquatic habitats through the conduct of rapid biological assessment of the impacts of the eruption on aquatic life; the initiation of stakeholder engagement plan including education and capacity building to restore tri-tri industry; the identification of harvesting areas, removal logs and derelicts; and the placement of a temporary ban on aquatic fisheries (crayfish) to allow for regeneration</p>
	<p>3.3.7 Restore access to forest and non-timber products through the strengthening of forest management and the reintroduction of non-timber products lost to the eruption. Restore trails and access roads.</p>
	<p>2.2.8 Protect pollinators and other keystone species to ensure proper ecosystem functioning through the conduct of biodiversity inventory/census and the promotion of apiculture</p>
	<p>3.3.9 Development and enhancement of Ecotourism Product in Rural Communities through capitalizing on unique geological (e.g; through a natural field guide), and the rebuilding of trails and amenities at protected areas/ecotourism sites.</p>
	<p>3.3.10 Restore access to prime fishing ground and identify alternatives, where necessary, through surveying of fishing grounds, target cleaning of the seabed, and coral restoration.</p>
	<p>3.3.11 Strengthen environmental governance by improving the effectiveness of environmental decision-making, improving transparency in the environmental decision-making process, improving environmental awareness and stewardship amongst the general public, and enhancing the legal and institutional framework to combat the environmental drivers of risk and vulnerabilities</p>
	<p>3.3.12 Improve waste management, including waste and debris management (removal, transportation, and disposal of debris); ash removal and recovery; hazardous waste separation and establishment of systems for transportation and disposal (especially for e-wastes, ash and rubble); and introduction of incentives for increased recycling of plastics and other recyclables.</p>
	<p>3.3.13 Improve surface water management through mapping of changing surface water flows adjusting to new flood zones; monitoring of groundwater quantity, quality and availability; and investigating change in soil stability and water retention</p>
	<p>3.3.14 Monitor the quality of the air during the implementation of recovery activities</p>
	<p>3.3.15 Strengthen the capacity of the Ministry of Health for monitoring environmental conditions and undertaking actions to mitigate against outbreaks of food-water-and vector-borne diseases, including the provision of additional environmental health and vector control officers, vehicles, insecticide application equipment, insecticides, rodenticides, PPEs and communications materials for dissemination of information to the public.</p>

	3.3.16 Promote improved enforcement through the development of new and/or the updating of existing legislation in the critical areas such as environmental impact assessment (EIA), waste management and land use, for example phasing out the use of single-use plastics by 2025/2030, and integrated water resource management
	3.3.17 Promote greater integration of environmental information in informal education, which is targeted to key groups of stakeholders
	3.3.18 Develop incentives to encourage environmentally friendly practices, targeted to the private sector, communities and youth, including sustainable agricultural practices; sustainable forest management practices; mangrove rehabilitation; plastics disposal; recycling; and creation or enhancement of marine habitats

Outcome 3.4: Digital and connectivity gap reduced by strengthening human capital, facilitating connectivity and access to information, raising awareness and generating an innovation culture to promote human, technological, and social development

OUTPUT	INTERVENTION
3.4 A digital platform established to enhance the recovery process by providing for the delivery of essential services such as education and healthcare, the promotion of increased opportunities for women’s empowerment and environmental sustainability, enhanced government transparency and accountability, and the fostering the social development of communities, including within the broader global context.	3.4.1 Expand the coverage, access and connectivity of the entire population to networks and digital platforms
	3.4.2 Develop training materials and conduct training events for Trainers aimed at strengthening the human capital for the development and use of new technologies, applications, virtual platforms and other tools (ICT)
	3.4.3 Implement a technology literacy strategy for students, public and private workers and the community in general
	3.4.4 Provide the necessary portfolio of fiscal incentives to promote access and connectivity to networks and digital platforms





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ANNEX 1

Figure A1: Organization of Structure and Sector for the PDNA

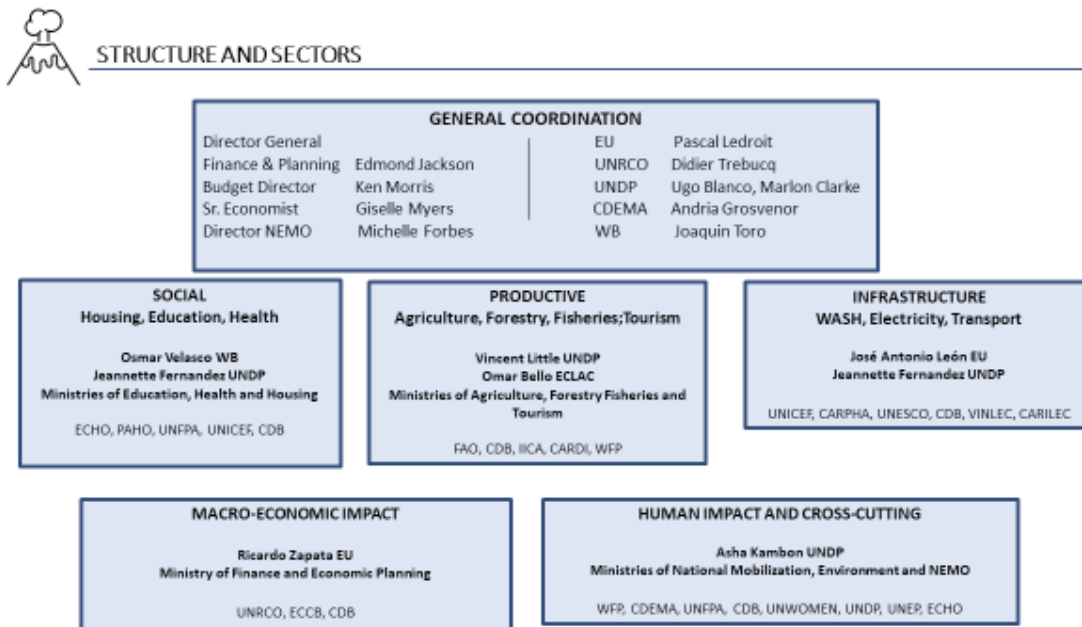


Table A1: Composition of Sector Teams for PDNA

Sector/Team Members	Sector/Team Members
SOCIAL SECTOR	
Education	Health
<ul style="list-style-type: none"> • Ann Harper, UNICEF • Keith Thomas, Ministry of Education, Saint Vincent • Alexis Caine, Ministry of Education, Saint Vincent • DeAnna Ralph, Ministry of Education, Saint Vincent • Winshell Norzeron, ECHO • Osmar Velasco, World Bank – Facilitator 	<ul style="list-style-type: none"> • Neri James, SVG Ministry of Health • Donna Joyette Bascombe, SVG Ministry of Health • Clemens Buter, PAHO • Melvin Tebbutt (WASH), PAHO • Patrice Lawrence-Williams (MHPSS), PAHO • Denise Blackstock, UNFPA
Housing	
<ul style="list-style-type: none"> • Tyrone Ballah, SVG Department of Housing • Mr. Saskia Scotland, SVG Department of Housing • Winshell Norzeron, ECHO • Osmar Velasco, World Bank - Facilitator 	<ul style="list-style-type: none"> • Karen Poslon (Environmental Health), PAHO • Benjamin Puertas (HSS), PAHO • Juan J. Castillo (Air quality). PAHO • Dorji Tshewang (Surveillance), PAHO • Derek Hardy (Logistics), PAHO • Jeannette Fernandez, UNDP - Facilitator
PRODUCTIVE SECTOR	
Agriculture	Agriculture continued
<ul style="list-style-type: none"> • Reuben Robertson, FAO • Roberto Sandoval, FAO • Malcolm Wallace, CDB • Michael Dalton, IICA • Gregory Linton, CARDI 	<ul style="list-style-type: none"> • Dr Monica Davis, MAFFRTIL • Dr Coleen Philips, MAFFRTIL • Rhonda Sutherland, MAFFRTIL • Dr Vincent Little, UNDP - Facilitator
	National Parks
<ul style="list-style-type: none"> • Darko Petrovic, WFP • Colville King, MAFFRTIL • Deborah Daniel-Williams, MAFFRTIL • Fitzgerald Providence, MAFFRTIL • Jennifer Cruickshank-Howard, MAFFRTIL 	<ul style="list-style-type: none"> • Mrs. Rodica Tannis – Rivers, Beaches and Recreation Sites • Mr. Andrew Lockhart – Marine and Terrestrial Parks • Ms. Shanell Murray – National Parks • Dr. Omar D. Bello – Facilitator • Ms. María Eugenia Rodríguez – Facilitator

• Kris Isaacs, MAFFRTIL	TourismAccomodation
• Marcus Richards, MAFFRTIL	• Ministry of Tourism, Sports and Culture Team
• Karomo Browne, MAFFRTIL	• Mr. Omar Zambrano – Facilitator
	• Dr. Omar D. Bello – Facilitator
INFRASTRUCTURE SECTOR	
Transport	WASH Continued
• Nikolai Lewis, MTW-SVG	• Diego López. UNICEF
• Natoya Thomas, BRAGSA	• Jeannette Fernandez, UNDP-team Leader
• Jude Regis, CDB	• José Antonio León, European Union - Facilitator
• Eddison Edwards, Argyle International Airport	Electricity
• Jeannette Fernandez UNDP	• Ricky Wright, VINLEC
• José Antonio León, European Union - Facilitator	• Earlan Myers, VINLEC
WASH	• Thomas Mitschke, CARILEC
• Marco Audain, CWSA	• Ken Aldonza, CDB
• Nery Jemes, CWSA	• Jeannette Fernandez, UNDP
• Saudia Rahat, UNDP	• José Antonio León, European Union – Facilitator
CROSS CUTTING ISSUES	
Disaster Risk Management	Environment
• Michelle Forbes – Director NEMO	• Yasa Belmar, Sustainable Development Unit
• Kenson Stoddard – Deputy Director NEMO	• Dr Reynold Murray, UNDP
• Andria Grosvenor – CDEMA	• B.R Ravishhankar, UNEP
• Paul Saunders – CDB	
• Marlon Clarke - UNDP	
HUMAN IMPACT ASESSEMENT	
Gender	Livelihood and Social Protection
• Farmala Jones - CDB	• Asha Kambon - UNDP
• Kimberly Skinner - UNFPA	• Claudette Pierre
• Kyana Bowen – UNWOMEN	• Darko Petrovic – WFP
• Jemima George	• Elbert Ellis - CDB
• Karen Small - CDEMA	• Sarah Bailey - WFP
	• Rochelle Baptiste

MACROECONOMIC IMPACT ASSESSMENT	
• Elke James Economist 1, EPSDU	• Sharie Roberts, Projects Officer 1 PSIP
• Giselle Myers, Senior Economist, EPSDU	• Shineco Sutherland, Economist 1, EPSDU
• Jamal Byron, Statistical officer, Statistics	• Stuart Davies, Senior Economist, UN RCO
• Janelle Horne, Economist II EPSDU	• Kevin Wood, Country Economist, ECCB
• Iorielle Robertson, Economist 1	• Kimberly Waithe, CDB
• Shimeque Smith, Economist 1, EPSDU	• Ricardo Zapata-Marti, Consultant, EU



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