

# CWWA COUNTRY PROFILE

## *St. Vincent and the Grenadines*

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## CWWA Country Profile – St. Vincent and the Grenadines

### 1.1 Site Location

St. Vincent and the Grenadines is located within the Windward Islands, just North of Venezuela and the Twin Island Republic of Trinidad and Tobago. The entire nation has a land area of 389 km<sup>2</sup>, of which 345 km<sup>2</sup> on the main island of St. Vincent.

Roughly oval in shape, the main island, St. Vincent, is located north of the archipelago. It is approximately 29 km long and 18 km wide at both extremities. The capital is Kingstown, located in a large sheltered harbour on the southwest of the island.

The Grenadines comprises some 32 islands and islets, of which the largest are Bequia, Mustique, Canouan, Mayreau, Union Island, Palm Island and Petit St. Vincent.

The total population of the State is about 109,000 inhabitants (2012 Census Report). The total population of the Grenadines is estimated to be 10,000 inhabitants distributed among Bequia, Mustique, Canouan, Mayreau, Union Island, and Petit St. Vincent.

### 1.2 Topography

The general topography consists of an axial range of volcanic mountains from La Soufrière (about 1,230 m a.s.l.) in the North to Mt. St. Andrews (735 m a.s.l.) in the South. This range divides the island longitudinally and almost equally into a leeward and a windward side. The topography on the leeward side is characterized by steep spurs and narrow valleys, while on the windward side the relief is more gently rolling due to the effects of the erosion created by the strong North-East winds. The Grenadines are lower lying with highest point being Mt. Taboi (about 300 m a.s.l.) on Union Island.

### 1.3 Geology

Geologically, the structure of St. Vincent Island is simple, comprising a chain of extinct volcanoes, the craters of which coincide with the central range of mountains on an approximate North-South direction. The most common rock type is boulder agglomerate, which is principally andesitic and basaltic in composition. There are also several lava flows comprised of andesites or andesitic basalts. The most abundant volcanic products on the island are pyroclastics. These include volcanic ash outcrops all along the windward coast, scoria in the north windward, together with agglomerate and mixed pyroclastics and river alluvium.

The geology of the Grenadines is more diversified, with rock types of both volcanic and sedimentary origin.

### 1.4 Hydro-graphic network

Several streams and some rivers traverse the island of St. Vincent. Due to general orographic and geological characteristics of the island, these streams are short and steep in their upper parts, flowing into deep gorges. The lower part of main rivers broadens into small delta shaped alluvial plains.

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The largest rivers are the Colonaire, Buccament, Rabacca, Richmond, Wallilabou and Cumberland. The latter is used for the most important hydropower generation plant in St. Vincent. Rivers are perennial in the central and southern portion of the island, whilst streams in the North are mostly seasonal.

In the Grenadines there are a number of streams, which flow mainly during the rainy season. Thus, these streams are not considered suitable for potable water supply.

### 1.5 Climate

The climate of St. Vincent and the Grenadines is typically tropical, with predominantly north-eastern winds and mean monthly temperatures ranging from 26 to 32°C.

The precipitation is abundant, even during the so-called dry season, which extends from January to May. Precipitation in the dry season is about 500 mm. The total for the seven months of the wet season is about 1700 mm. Precipitation spatial distribution in St. Vincent is mainly orographic in nature, with an annual total ranging from 1500 mm on the southern coast to more than 3000 mm on the mountains.

Rainfall is significantly lower in the Grenadines. The average annual rainfall for the larger islands, which have rainfall-gauging stations, is about 1250 mm, while the dry season total averages 270 mm.

### 1.6 Economy<sup>1</sup>

Following the global financial crisis of 2008, St. Vincent and the Grenadines experienced negative to near zero growth, which compounded by the impact of several natural disasters, resulted in increased use of counter-cyclical policies.

However preliminary estimates for 2018 indicate that the economy of Saint Vincent and the Grenadines exceeded projections and grew by at least 2.3%. Growth was driven by improved performance in the tourism, fishing, construction and manufacturing sectors. For 2019, the International Monetary Fund projects the same 2.3% growth driven by increased tourism arrivals and tourism-related activities like hotel construction and expansion.

The main impetus for this upward trend will emanate from the opening of the newly constructed international airport at Argyle in 2017; sustained initiatives and developments in the agriculture sector; the construction of a state-of-the-art marina in Canouan and other large capital projects, including hotel construction as well as port developments on mainland.

St. Vincent and the Grenadines has crafted a national economic and social development plan with five (5) broad strategic goals and associated objectives and targets to guide the optimal improvement of the quality of life for all its citizens over the period 2013 to 2025.

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<sup>1</sup> The economic summary of St. Vincent and the Grenadines was adapted from the 2019 Budget Address p.7; the SVG Medium Term Debt Strategy 2018-2020 pp. 12, 13 and the National Economic and Social Development Plan 2013-2025 p.3 . All documents can be accessed from <http://finance.gov.vc/finance/>

## **2.0 Water Resources Management**

### 2.1 Institutional Arrangements

The present institutional arrangement in St. Vincent and the Grenadines assigns responsibilities for the management of water resources to different entities. The roles of the main organizations or agencies concerned with water and waste water management are described below.

#### *2.1.1 Public Health Department*

The Public Health Department of the Ministry of Health and the Environment is responsible for the quality of water distributed for human use. The Department is also responsible for monitoring and regulating the quality of seawater for recreational use and the effluents of the sewerage systems. The functions of the Department are governed by the Environmental Health Services Acts (Chapter 285) passed in 1991 and the Public Health Act of 1977

#### *2.1.2 Central Water and Sewerage Authority (CWSA)<sup>2</sup>*

The Central Water and Sewerage Authority is the agency responsible for the abstraction, treatment and distribution of potable water for domestic, commercial and institutional uses. It was established as a statutory body of the Ministry of Health in 1991, by the passing of the Central Water and Sewerage Authority Act (chapter 403). The Act also assigns to the CWSA the responsibility for the investigation and utilization of surface water and groundwater on a national scale. In addition to potable water supply, the CWSA is responsible for the disposal of sewage and solid waste and the maintenance of the nation's hydrometric network.

#### **Potable Water Supply**

The CWSA's water supply comes from rainfall catchments and small springs and streams. There are some twenty-three (23) intakes feeding sixteen (16) networks. Currently, the CWSA supplies water to over 37,500 domestic consumers and 1,320 industrial and commercial businesses. The CWSA estimates that about ninety percent (90%) of householders are connected to its water supply system. In addition, water is sold to cruise ships and other small yachts and vessels, although this amounts to less than one percent of the water supply. The total water production for 2018 was 1.94 billion imperial gallons while the total use was 1.73 billion gallons resulting in an unaccounted quantity of roughly 11 %.

All of the water systems are gravity fed with surface water; there is no well water, except for a few areas in the Grenadines. The types of treatment applied are disinfection, sedimentation and filtration in most cases. The groundwater resources of the country have not been fully investigated for quantity or quality and are not currently part of CWSA's future development programme.

The CWSA has not yet implemented supply systems in the Grenadines. There, the few inhabitants have developed private schemes, mostly relying on rainwater harvesting and boreholes. However, during the dry season, the water supply in the Grenadines is severely affected and the CWSA provides relief by

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<sup>2</sup> Some information on the CWSA is available at <http://www.cwsasvg.com/>

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trucking water to some of the islands. Private contractors also purchase water from the main island and resell to residents and businesses in Grenadines on demand. The CWSA is now pursuing the development of desalination systems in the Grenadines in order to achieve a more continuous supply.

### **Sewerage Network**

The sewerage network exists only in central area of the capital city of Kingstown and a very small section of the suburban Arnos Vale community. There are 300 sewerage connections in Kingstown and just 40 connections in Arnos Vale (2019 figures). Most of the houses and buildings in the state are still served by septic tanks. Wastewater from the sewerage network in Kingstown is collected and pumped off-shore at a distance and depth adjudged to be sufficient for adequate treatment by dilution. The effluent from the Arnos Vale network is treated by a tile-field septic system.

### **Hydrometric Network**

In 2008 the CWSA added a Water Resources Management Unit (WRMU) to its Engineering Department following the completion of a European Union funded project intended to produce a strategy for optimal and sustainable allocation of water resources in the state. The network comprises 26 rain gauges, 10 water level sensors, five climate stations, 26 groundwater sampling points and 21 flow measuring stations.

A wide range of parameters are recorded within the monitoring network including rainfall, evaporation, relative humidity, solar radiation, barometric pressure, wind speed, maximum and minimum temperature, soil temperature, water level, conductivity, pH, water density and oxygen content.

### **Financial Sustainability Strategy**

Following an island wide metering system of most domestic and commercial customers, the CWSA achieved financial sustainability in 1988 and has managed to derive a surplus from its revenues ever since. The current billing system charges all domestic consumers a fixed monthly basic charge, a portion of which is an environmental levy for the management of solid waste. In addition to this fixed charge, consumers pay for the water consumed on a tiered system, where the higher the consumption bands the higher the unit cost. Commercial customers are also required to pay a basic charge and a fixed consumption fee per unit based on the size of their business.

Domestic and commercial sewerage customers are charged fixed monthly rates in three different categories respectively. Commercial enterprises are expected to outsource the collection of their solid waste to private contractors but are charged a fixed rate for accessing the disposal services offered by the CWSA at the landfills.

Most government accounts are not metered as these institutions do not pay directly for water consumption, sewerage and solid waste services. Instead the government makes an annual payment to the authority to cover the cost of providing these services to all state-owned schools, administrative centers, medical facilities and other government institutions.

### **2.1.3 Forestry Department <sup>3</sup>**

The Forestry Department of the Ministry of Agriculture, Forestry, Fisheries and Rural Transformation is one of the responsible bodies for the assessment and the conservation of surface waters. Particularly, the department is charged with the management of watersheds, runoff and erosion control through the conservation of the rainforest. The specific functions of the Forestry Department are governed by the Forest Resource Conservation Act passed in 1992.

### **2.1.4 National Irrigation Authority**

Legislation was passed in 2004 to establish a National Irrigation Authority with the main responsibility of managing the distribution of water to farmers. The Authority was responsible for formulating and implementing annual water use plans and delivery schedules and to ensure that all equipment and infrastructure are kept in good condition. The Authority was also expected to be financially sustainable by implementing appropriate charges for water and other services supplied to customers. With funding from the European Union six (6) irrigation schemes were established on the windward side of the island that were operational between 2004 and 2010.

However owing to lack of a sustainable financing mechanism and the passage of several storms between 2010 and 2013, the National Irrigation Authority is no longer functional and the infrastructure is in a state of disrepair. The responsibility for irrigation now lies with a department within the Ministry of Agriculture called the Soil and Water Conservation Unit and there are plans in 2019 to restore one of the irrigation systems in an area called Langley Park once the funding is sourced.

## **3.0 Water Demand**

Predominant water uses are related to the domestic and commercial sector, to irrigation and to the production of hydroelectricity. Due to the lack of reliable data, it is difficult to quantify the exact percentage of water presently allocated to these different uses.

It is was estimated in 2004 that about 20,000 m<sup>3</sup> of water was used daily in the island of St. Vincent for domestic and commercial purposes, including the consumption of some bottling plants, which are incorporated in the commercial category. Unfortunately, precise data on the volume of water presently utilized for irrigation and hydroelectricity in the different periods of the year are not available. It can be foreseen that this water demand will increase considerably in the coming years because of the planned developments in the tourism and agricultural sectors.

Additionally, perennial rivers used for hydro-power generation or water supply extraction necessitate a minimum flow to be released in the riverbed, particularly in the dry season, for the preservation of flora and fauna.

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<sup>3</sup> Information on the Forestry Department is available at [http://www.agriculture.gov.vc/agriculture/index.php?option=com\\_content&view=article&id=363&Itemid=89](http://www.agriculture.gov.vc/agriculture/index.php?option=com_content&view=article&id=363&Itemid=89)

#### **4.0 Water Quality**

The Public Health Department of the Ministry of Health and the CWSA are both collecting data on quality of water at distribution points. The territory of St. Vincent is subdivided into 12 Public Health Districts (10 on the main island and 2 in the Grenadines), and sampling is done by the Ministry eight (8) times per month in each district on the main island, for the measurement of residual chlorine and PH. The CWSA carries out independent controls on water quality, particularly at strategic points of all the distribution system measuring parameters such as residual chlorine, PH and coliforms. This information is shared with the Public Health Department. The water quality standards used are those suggested by the World Health Organisation. The Public Health Department does not currently carry out water quality testing on the Grenadine Islands, which have mostly privately managed water systems.

The National Irrigation Authority is required to implement measures to ensure irrigation water quality meet the required standards.

#### **5.0 Challenges and Opportunities in the Water and Wastewater Sector**

##### 5.1 Establishing Responsibility for the Management of Water Resources

There is no single entity that manages water resources in St. Vincent and the Grenadines which results in the different organisations acting independently and with different and competing objectives. This makes managing the nation's water resources more difficult. For example, it is difficult to quantify the percentage of water presently allocated to the different stakeholders which affects forward planning in the sector. There is therefore the need for a more comprehensive national strategy which seeks to resolve issues such as right of access, monitoring and control and the financial responsibility for maintaining and upgrading the hydrometric network. Legislation is in draft to establish an independent National Water Resource Authority but is yet to be finalized and passed.

##### 5.2 Potable Water Supply

The main challenge in the potable water delivery is to implement a strategy to provide a more consistent water supply to the smaller Grenadine islands where perennial streams are non-existent. The CWSA is currently pursuing the option of desalination but issues such as cost of supply and addressing the impact of increased grey water runoff on the fragile coastal environment of these islands are yet to be fully reviewed and resolved.

##### 5.3 Wastewater

Local standards with regard to wastewater discharge are currently being considered as the country's economic strategy seeks to maximize the extensive marine resources within its territorial waters in keeping with the concept of developing a 'Blue Economy'. As such, the Ministry of Finance and Economic Planning is spearheading an initiative to establish policies and legislation to govern wastewater discharge throughout the state.

## **6.0 Solid Waste Management**

### 5.1 Background on Solid Waste Management in St. Vincent and the Grenadines

The Wider Caribbean Sea was in 1990 designated as a Special Area under the MARPOL Convention 73/78 (International Convention for the Prevention of Pollution from Ships). This effectively restricts the dumping of ship-generated solid waste in the international and territorial waters of the Caribbean Sea. It was realized that 80% of the solid waste that ends up in the sea comes from land based sources and that there was generally poor waste management services in the OECS region as a whole and very little public education with respect to good waste practices.

In 1995 Six (6) OECS countries combined to implement a project to improve waste management services in the region. Participating countries were St. Lucia, Grenada, St. Kitts and Nevis, Dominica, Antigua and St. Vincent and the Grenadines. The project was implemented from 1995 – 2003 at a total cost of USD 54 million. Funding sources included loans and credits from the World Bank (WB), Caribbean Development Bank (CDB) and the European Investment Bank (EIB); grant from the Global Environment Fund (GEF) and the European Union (EU); and by counterpart funding from the six (6) participating countries. The implementation of the project sought to achieve four (4) main outcomes which were as follows:

- 1) Established and fully functioning autonomous or semi-autonomous Solid Waste Management Entities in each participating country,
- 2) Increased coverage and improved quality of land-based solid waste management services (collection, transport and disposal) in each country,
- 3) Enhanced public awareness of solid waste management issues resulting in behavioral changes and
- 4) Improved institutional arrangements with functioning systems to help each country manage and dispose effectively of waste generated by ships (in accordance with MARPOL V 73/78) and leisure craft (yachts).

The World Bank conducted an assessment of the achievement of the outcomes in 2003 and of the six OECS countries in which the project was implemented, St. Vincent and the Grenadines was the only country to receive the highest assessment grade allowable in all four (4) outcomes.

### 5.2 Institutional and Regulatory Framework

The Solid Waste Management Unit (SWMU) was established in 1999 as a department within the Central Water and Sewerage Authority (CWSA) to perform the collection and disposal of solid waste throughout the state. The functions of the SWMU are governed by the Waste Management Act passed in 2000 that is separate from the Central Water and Sewerage Authority Act which was passed in 1991. In 2006

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regulations were also passed to support the principal Waste Management Act.

St. Vincent and the Grenadines is the only participating country in the OECS project that elected to house the solid waste management function within an existing institution instead of creating a new independent entity. The strategic thinking was to leverage the CWSA's already well-established strong institutional, technical and financial structure in ensuring the sustainability of the SWMU's operations. The CWSA at that time was a statutory institution that was providing essential public services (water and sewerage) for some 30 years prior to the implementation of the OECS project. The waste management operations therefore benefitted greatly at the onset from the support of experienced professionals in the areas of finance, customer care, human resource management, equipment maintenance and public relations.

### 5.3 Management Approach, Philosophy & Plan

The general management approach of the SWMU strives to align the daily activities of the department with the strategic goals of the CWSA while also ensuring that those goals are keeping up with changes in national policy.

The national economic and social development plan for St. Vincent and the Grenadines anticipates an increase in waste generation throughout the state as the economy continues to grow, with one of the main drivers of this growth being investments in the development of the tourism sector. As such, in order to guarantee a clean and safe environment going forward, the plan mandates that the nationwide waste management system be strengthened by the development of appropriate standards for solid waste management in accordance with international and regional practices. It also emphasizes the need to develop and comprehensive and effective solid waste recycling programme. The CWSA's current vision for the SMWU is to achieve financial viability of the department while maintaining high quality solid waste management services.

The universal metering system implemented by CWSA initially to charge customers for its water and sewerage services, has allowed for a fixed monthly charge to be levied on all households and businesses with a water connection to recover some of the cost of the current solid waste management operations. This charge is placed on the bills generated monthly for all of the CWSA's customers and in 2018 accounted for 66% of the revenue generated by the SWMU. The other sources of income include a visitor levy (11%), a central government charge (18%) and other services offered by the SWMU (4%). The capability of the CWSA to charge and collect most of its revenue directly from its customers has been the most critical factor in SWMU's ability to maintain and improve the services it is required to provide.

### 5.4 Challenges and Opportunities in Solid Waste Management

Implementing and sustaining creative and effective awareness initiatives which achieves public behavioral changes with respect to adherence to environmental laws and best practices, has been a challenge throughout the history of waste management in the country. Waste management is still not a priority issue in the minds of most of the populace, though it should be in a country where the preservation of the environment is crucial to the protection of public health and economic growth.

Enforcement of waste management laws is also inadequate. Institutions responsible for the monitoring and enforcement of environmental laws are under –resourced and unmotivated to seriously pursue

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instances where individuals or companies violate such laws. There is however a sufficiency of legislation and supporting regulations to achieve higher standards of waste management practices in the state once enforcement is strengthened.

In terms of the operations, the first decade since the completion of the project in 2003 focused on ensuring that the basic functions of the regular collection of waste and landfilling processes achieved an acceptable level of service quality, efficiency and cost effectiveness. This period also saw efforts to integrate the solid waste operations and staff into the established organizational structure and culture of the CWSA.

The next decade of operations, which coincides roughly with the implementation period of the country's National Economic and Social Development Plan, will focus on achieving mainly the following:

- Developing an appropriate information management system to guide decision making with respect to the SMWU's operations and future initiatives.
- Implementing a more sustainable waste management programme in the smaller Grenadine island chain.
- Conducting research and implementing an effective programme for the collection and disposal of biomedical waste and other hazardous waste.
- Exploring opportunities for using waste as a resource through research and forging partnerships in the areas of waste recycling.