You Never Miss the Water Until the Rivers, Lakes and Wells Run Dry: A Brief Illustrated History of the Utilization of Water in Grenada, Carriacou and Petite Martinique

Pond in Hillsborough, Carriacou

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Abstract: The availability of freshwater has played a primary role in the settlement of Grenada, beginning with Indigenous settlers from South America over 1600 years ago and continues today. As a contrast, the islands of the Grenadines, including Carriacou and Petite Martinique, were the last places to be settled because they had no year-long rivers or streams and thus settlers had to come up with creative ways to access water supply. As we seek to educate and create awareness on water use and its conservation among Grenadians, especially in light of the drought of 2024, it is important that we know the history of water use across the centuries, across Grenada, Carriacou and Petite Martinique. This will allow us to appreciate the way water has been used, regarded and appreciated by Grenadians across the centuries, and how understanding that can help us navigate thinking about water use today and its conservation as we embark on a future where our water supply will become challenging in this era of climate change and changing weather patterns. This research seeks to present a brief history of water utilization in Grenada and show its importance as a necessity, but also its social implications that are reflected in its culture, even today.

NAWASA public notice following the announcement of a drought in May 2024

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Introduction

It was the dry season, so the absence of rain was expected for the months between December and May, even though there are usually several consequential showers during these months. But the dry season of 2024 turned out to be particularly dry, especially towards the end. It had not rained for so long that the situation was being referred to as a drought. By the beginning of May 2024 the Government of Grenada, following a meeting of the National Emergency Advisory Council, officially declared a water crisis as a result of the water shortages experienced (Campbell 2024; IFRC 2024). And it was quite evident across the island in the brown hue of the landscape that typically characterizes a dry season, not just in the southern parts of the island and the Grenadines that usually took on this color, but in other parts of the island as well. The parishes of St. George, St. David and St. Andrew, over two-thirds of Grenada, were identified as the primary areas affected by the drought (IFRC 2024). The reservoirs and dams connected with Grenada's water supply system were decreasing quickly and the rainy season was still several weeks away. And in this era of climate change nothing can be taken for granted, like the rains returning when they are traditionally expected in early June, oftentimes even late May. Coupled with this was the heatwave that Grenada was also experiencing.

The sure sign that things were really bad was the images circulating across social media of Grand Etang Lake looking like few had ever seen it before. With the water level so low it appeared like this often water-filled lake with its surrounding lush vegetation, was actually drying up since its use had gone beyond the usual predetermined limits. It was probably the starkest evidence of the effects of the dry season and drought, and it brought the message home to many like no other notice or official directive could have done. Nonetheless, NAWASA, the National Water and Sewage Authority, issued drought warnings and began rationing water across Grenada, restricting its use and asking Grenadians to conserve this precious commodity that was now in short supply and dwindling fast (Campbell 2024). Many Grenadians became nervous about the situation and even a few messages of desperation circulated across social media. In a few communities, despite concerted attempts at equitable distribution, taps were shut off for several days as the situation worsened. Even the Grenada Development Bank began offering loans for those needing funds to procure additional storage for water.

Grand Etang Lake before drought (left)/During drought May 2024 (right)

In times of plenty it is difficult to ask people to conserve and be mindful of how they use a resource. But in times of scarcity it is a different discussion as was the case during the dry season of 2024. It had been several years (2010) since Grenadians were confronted with drought conditions like these; the water supply in the Grenadines is often challenging in the dry season as rainwater harvesting is unavailable as very little rain falls. Many seemed to have been taken by surprise by what appeared to have been all of a sudden as most people have taken the availability of clean water continuously flowing to their taps and tanks for granted. As Grenada's water supply system has seen continuous improvements and expanded to cater to the growing demand over the past few decades many take its availability for granted, leading to wastage and apathy towards conservation. Only older Grenadians remember the days when many communities experienced water shortages/outages on a regular basis and households had to find innovative ways to procure their water. Many households had some form of rainwater harvesting as well as additional storage capacity in the form of storage tanks in the most probable event that water will be gone for at least a short time. Placing the blame squarely on NAWASA for what many perceived as its inadequate what storage capacity, many may have missed the opportunity to realize that enhanced water conservation on their part has to be an instrumental part of continuing water supply improvements.

Corpus Christi is a religious holiday in Grenada. And though many people may be unaware of its religious significance, most know that it is the beginning of the traditional planting season and thus the start of the rainy season thereafter. Despite the severe drought conditions experienced in April to May 2024, there were indications that the expected rains might arrive on time to allow

Grenadian farmers to begin their planting as usual. And on the morning of Corpus Christi the island received a sustained rain shower that soaked the ground thoroughly, the first in months. Within a week of the rain shower the landscape responded with a burst of green growth and the drought of 2024 was forgotten, though the water scarcity situation remains across the islands until rains become more sustained as the rainy season progresses.

The drought and water scarcity that affected the lives of most Grenadians brought to the forefront the importance and need for the availability of potable water in Grenadian society. This has always been the case throughout Grenada's settlement dating to the period of Indigenous occupation, but it has probably become more pronounced in our heavily populated communities demanding more and better water supply. The drought of 2024 should be viewed as a wake-up call for not just NAWASA to create more storage capacity, but all Grenadians to play their part in water conservation, beginning now.

The low water level in the Annandale Dam, St. George on 19 May 2024 as a result of now rain showers and drought conditions (photo: NAWASA)

Stacked Pots, Petroglyphs and Watramama
Water in the Culture of Grenada's Indigenous Inhabitants

What we know of Indigenous habitation of Grenada we have learned from archaeological and historical sources (Hanna 2017; Martin 2013). As new information becomes available so too the evolving picture of their occupation of Grenada and Carriacou (Bullen 1964; Fitzpatrick et al. 2009, 2014; Hanna 2018, 2019; Sutty 1978, 1983, 1991). Human habitation of the Caribbean archipelago dates to at least 2000 Before Common Era (BCE) when lithic ground-stone foragers from Trinidad and Venezuela are believed to have moved into the Lesser Antilles (Hanna 2018). However, no concrete evidence of these (non-ceramic) Archaic Age peoples have been found in Grenada to date, though several paleoenvironmental studies have suggested that Grenada was probably occupied much earlier (Jones et al. 2018; Siegel et al. 2015).

Archaeological studies, beginning with Bullen (1964), have revealed a great deal about Grenada's ceramic age inhabitants based on the large quantities of ceramics that have been unearthed at over 108 identified Indigenous sites across Grenada and Carriacou (Hanna 2017, 2019; Hanna and Giovas 2022; Hofman et al. 2016, 2017) (Figure 1). Analyses of ceramics/pottery recovered from these sites suggest that at least four distinct periods or cultures existed. Though there is debate on who were the groups represented, the archaeological nomenclature defines the various periods as Saladoid-Barrancoid (c200-750 Current Era), Troumassan Troumassoid (750-900 CE), Suazan Troumassoid (900-1650 CE), and Cayoid (1250-1650).

These Indigenous cultures, in occupying Grenada and Carriacou, established settlements primarily along the coasts as illustrated in Figures 1 and 3. They lived in settlements situated near the seashore on headlands, generally near rivers and streams, that afforded several advantages like protection and security through greater lines of site/visibility, stronger currents discouraging navigating land approaches, nearshore reefs for both protection and food, extensive freshwater wetlands for food, and strong winds to deter insects/bugs, but the most important was access to clean, fresh water. The importance of water is probably why large rocks covered with petroglyphs or rock art have been found near rivers/streams, suggesting their concerns for or "to ensure the safety and security of water resources" (Hauser 2021:58-59) (Figures 2 and 3).

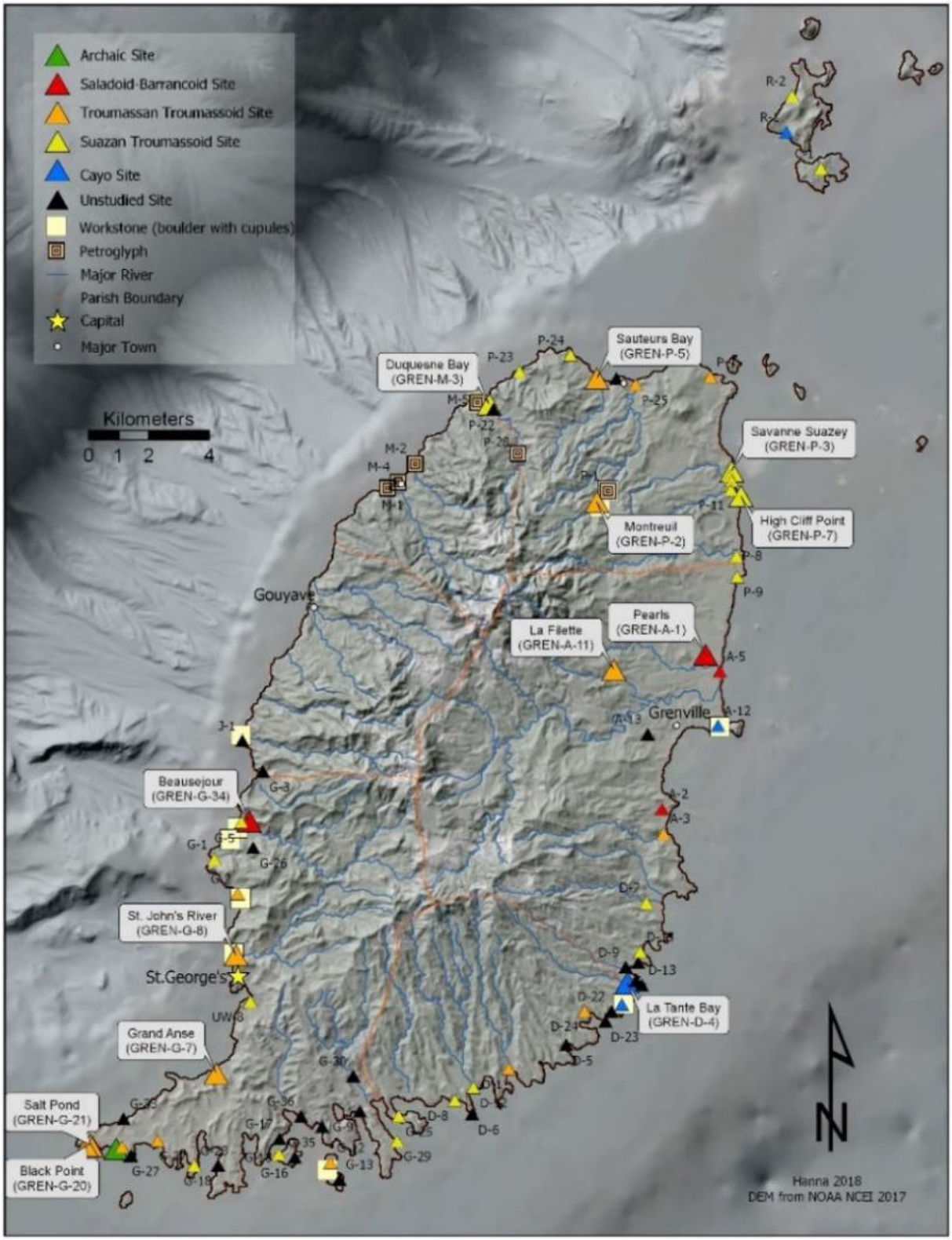


Figure 1: Map of Grenada showing Indigenous heritage sites. See also Hanna (2017) (map: Jonathan Hanna 2020)

Figure 2: Petroglyphs of faces and symbols on rocks on the banks of the Silver Ravine, Waltham, St. Mark (photo: JAM Collection). Other petroglyphs can be seen along the St. Patrick's River, just before Victoria by a small stream at the entrance to the sea, and another not far from the Duquesne River, St. Patrick.

Another aspect of the importance of rivers, streams and springs among the Indigenous peoples is the possible creation of folklore meant to protect them and involving rituals and folks spirits as alluded to above with the presence of petroglyphs. Among Amerindians is the *Watramama* and other Indigenous water spirits like *Iara* (derived from the Tupi) of the mainland that inhabit and rule over water sources like rivers, streams and lakes. These folk spirits may have been worshipped or propriated to bring good luck or remove evil spirits, or protect and safeguard these necessary and important water sources. They may have been important in some form of fertility worship as well.

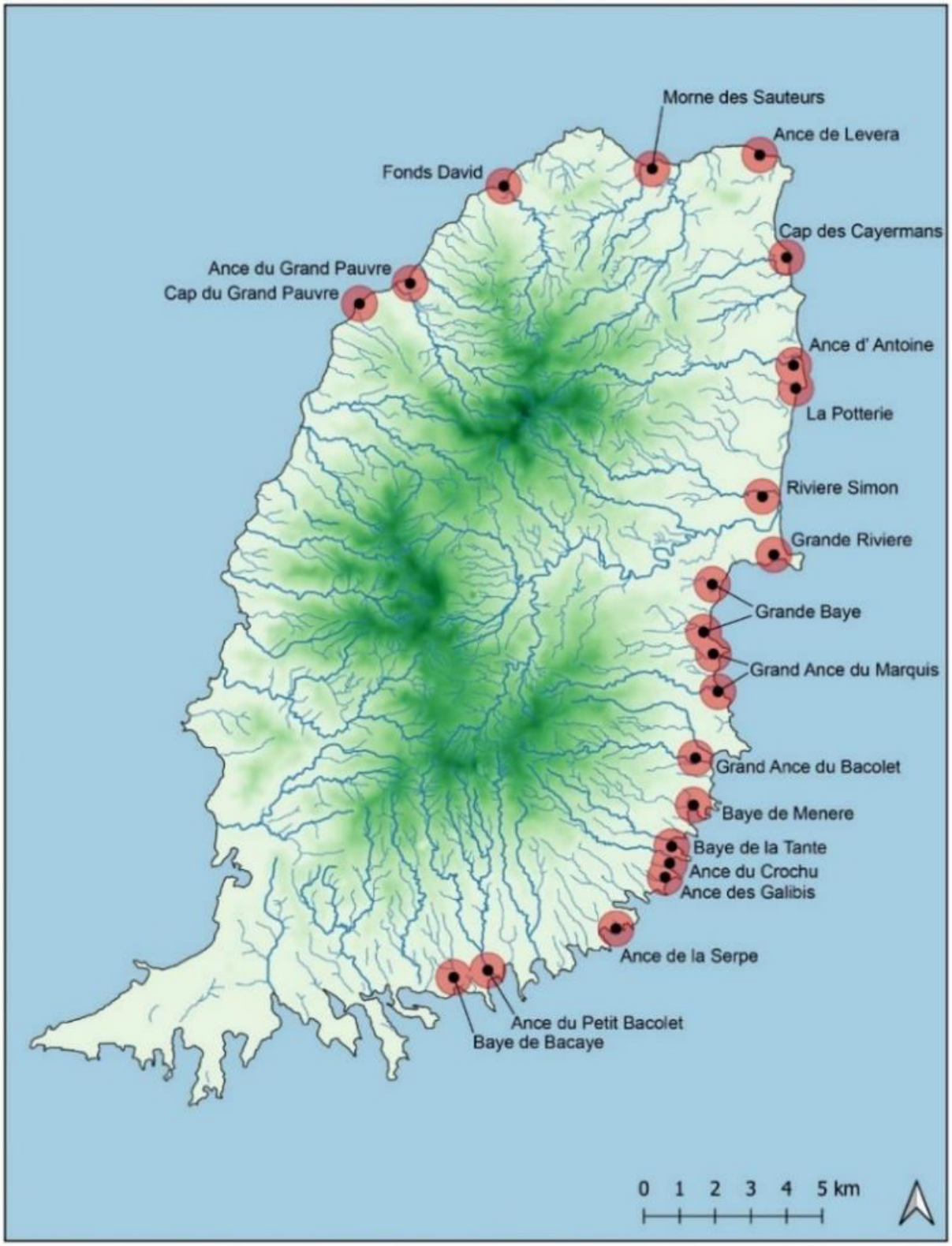


Figure 3: Map locating Indigenous settlements/sites at the mouths of rivers/streams or the "Boucherie" in Grenada, 1649-67 (see also Martin 2023) (image: Martin and Sandiford, 2020)

Figure 3 above shows the villages or *carbets* of Indigenous peoples who were resident in Grenada at the time of the successful French invasion and settlement of the island circa 1649/67. As is quite evident, these settlements were located near to the mouths of rivers and streams. As indicated above, this location was advantageous to the settlers for several reason, the most important being the availability of freshwater. Archaeological evidence from many of these historical-era settlements were show that they were earlier habitation, creating a palimpsest landscape where multiple groups of Indigenous peoples occupied the same sites because they provided the necessities for survival.

Rivers/streams, lakes and freshwater wetlands were also a source of food and teamed with several freshwater species like the mountain mullet (*Agonostomus monticola*), manicou crab (*Guinotia dentata*), the goby (*Sicydium plumieri*) or *titiri* (<Cariban "small fish"), and several crayfish or freshwater shrimp like the *caca-dos* (*Atya* spp), several *Macrobrachium* spp; the "big ling" or *gwarge*, "white crayfish" or *genne*, and the *lamay-longue*. The health of the fisheries was also a sign of the quality of the water in rivers and streams, which Indigenous communities may have maintained by proper stewardship.

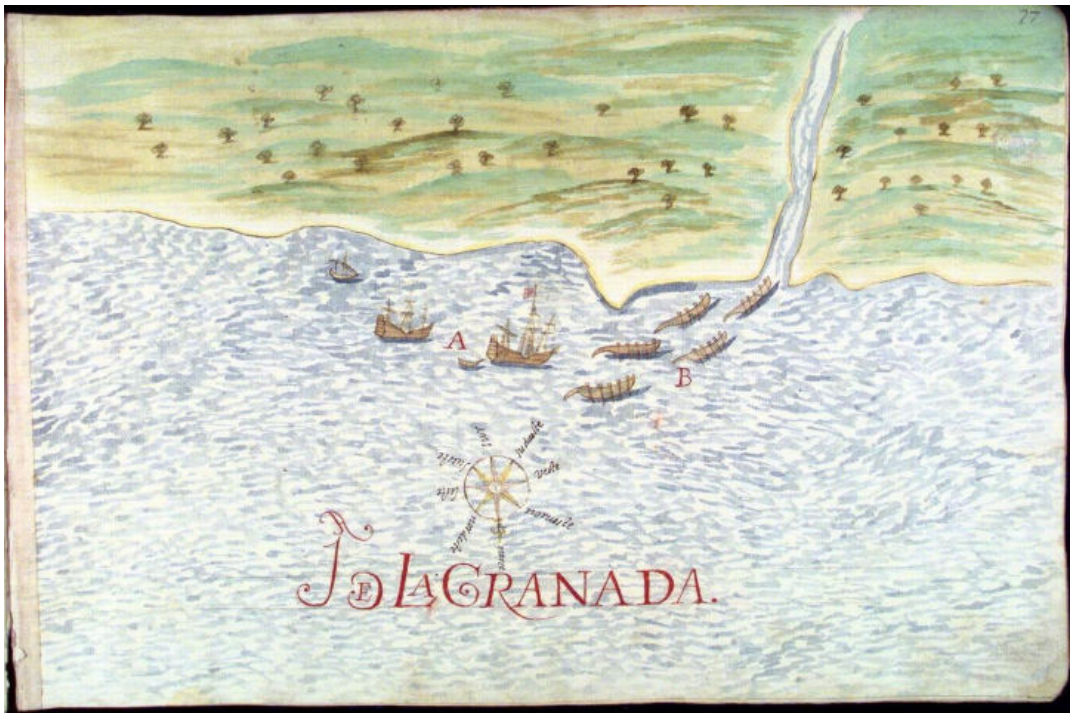


Figure 4: Spanish ships (A) and Kalinago pirogues/canoes (B) meet off the Kalinago village at the mouth of the St. Patrick's River in the north of the island in what is today Irwin's Bay, not far from present day Sauteurs by de Cardona (c1614) (drawing: Library of Congress)

In the tiny islands of the Grenadines that lacked rivers and streams the freshwater supply was not dependable, with periods of water shortages, sometimes severe shortages and droughts (Giovas 2016). The Indigenous residents developed innovative ways to procure drinkable water. One such method that is still identifiable in the cultural landscape is the "Bottomless staked pots," a series of clay pots with their bottoms broken off and stacked to create "well casing" to access underground freshwater from springs or the water table.

Figure 5: "Bottomless stacked pots" at the Carriacou Museum (photo: Carriacou Historical Society)

These stacked pots, also known as "Amerindian well casing," are shown in Figure 5, recovered by Margaret Andrews at Harvey Vale, Carriacou where workers were digging a rainwater cistern for her new hotel. She suggested the idea of "well casings" from the design that became known as the "Carriacou hypothesis." Less than 50 feet from the sea, the pots were on the site of a freshwater spring that flowed up through the pots. According to the Museum, the pots were of the Barrancoid style, dating to circa 500 Current Era (*Carriacou Museum Newsletter,* 2009, Issue 1)

Schultz (1995:v) suggests "that during dry times Amerindians dug wells in the island coastal zone to tap into the edge of the freshwater lens, using the potstacks as a well casing."

Several of these potstacks have been recovered across Carriacou and other Grenadine islands, either singly or sets, including this set from the surf at Black Bay, Carriacou on 4 July 2021. Interestingly, its situation indicates the extent of sea level rise since it was built over a millennium ago (Hanna 2021; Schultz 1995,1996).

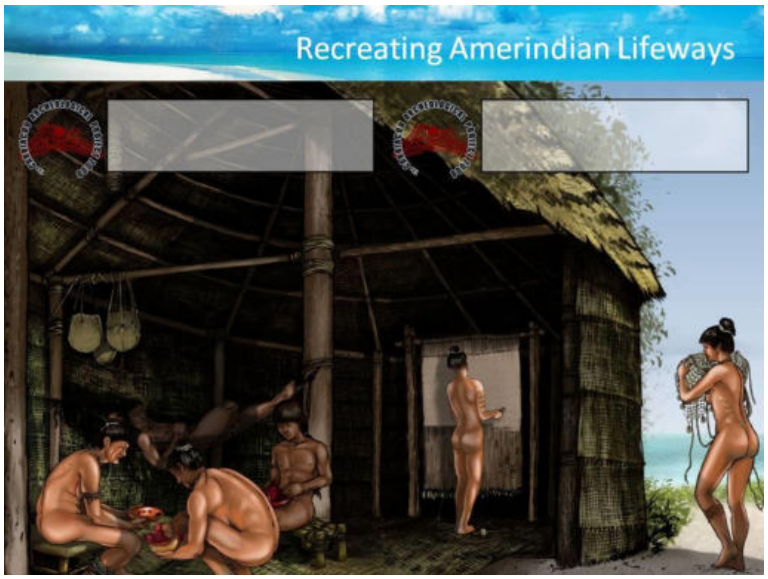
Figure 6: Neal Matheson and Christopher Stanislaus pose with bottomless ceramic pots recovered from the surf at Black Bay, Carriacou (photo: Explore Carriacou and Petite Martinique)

Figure 7: Matheson and Stanislaus struggle in the surf at Black Bay to retrieve the pots which had been initially built above the high tide mark to access underground freshwater, but were now submerged in sea water, indicating sea level rise since (photo: Explore Carriacou and PM)

Like Grenadians today, Grenada and Carriacou's Indigenous peoples (from the precolonial period) used similar means to carry and store water they collected from rivers/streams and/or (dug or spring fed) wells. Because the water supply was affected by the seasons, residents created efficient ways to store their collected water, or identify sources other than surface water, particularly during the dry season. Examples of these utensils have been excavated from Indigenous sites across Grenada and Carriacou.

Figure 8: Ceramic bowls/pots recovered from Indigenous sites in Grenada (photo: Collection Wilcox by Hofman and Hoogland, 2017)

Figure 9: Various ceramic bowls excavated from across Grenada (photos: GNM)



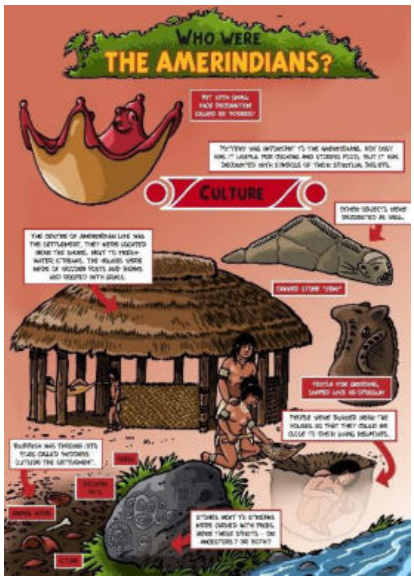


Figure 10: Drawing showing recreated Indigenous lifeways, with water or other liquid in hanging pots (left)
Figure 11: Drawing showing recreated Indigenous lifeways, with petroglyphs next to a stream, asking the question if these faces were spirits or ancestors, or both? (images: John Swogger)

The tiny island of Petite Martinique in the Grenadines has seen little or no archaeological excavations so not much can be deduced about its possible occupation by Indigenous peoples and their uses of water. It is possibly that Petite Martinique was only inhabited during the rainy season when harvesting freshwater was possible. At a later stage when these groups were better able to access, store and transport freshwater the island may have seen more continuous habitation. It is also possible that Indigenous groups utilized potstacks to access underground freshwater though no evidence have been recovered to date.

Figure 12: Boli fruits on the calabash tree, native to tropical America and the Caribbean, were used to craft drinking and other utensils (JAM Collection)

Did the Kalinago and Kalina of Grenada and Carriacou pass on any of their water harvesting techniques and utensils to the next set of invaders?

"*Les Sources*"
The Dire Need for Freshwater by the Early European Settlers to Grenada

Like the Indigenous peoples before them, European colonists would use quite similar characteristics to determine the more appropriate areas to settle, with the availability of water sources being one of the most important. In April 1609 just over 200 colonists arrived from London, England to set up a tobacco producing colony in Grenada (Martin 2013). Though the exact area of their settlement remains unknown, it appears that it was in the vicinity of the present Lagoon where the French would settle four decades later as the only reference, "Great Bay," was how the French called the area, "Grand Bay." Its deep water harbor, of course, made it a great place to settle because it was ideal for sailing ships to access and be protected (Figure 13).

One of the earliest assessments of Grenada by a French official who was interested in its colonization was made in the 1630s by one de Bonnefoy who believed that the island possessed:

"…good land for the product of all kind[s] of provisions of that country…, ***it hath the conveniency of excellent springs of fresh water, and some rivers…*****"** (Martin 2013:56).

De Bonnefoy's glowing assessment of Grenada to potentially support a colony brought several unsuccessful attempts in the late 1630s and 1640s. It was not until 1649, however, that the French, under Governor Du Parquet of Martinique, successfully settled Grenada by confronting the Kalinago and Kalina residents of Camáhogne who would nonetheless resist the European invaders with a war for their survival that lasted on and off for five decades (Martin 2013).

The site chosen for the establishment of the settlement was within the "Grand Bay," inside of a spacious harbor on the southwest of the island (Figure 13). Several streams flowed into the bay from the surrounding heights, from all the way up to the jagged rims of an eroded extinct volcanic crater, actually two rare calderas encompassing the Carenage and Lagoon today (Allen et al. 2017). The French were able to convince the Kalinago and Kalina that they were only there to fish and would also protect them from an impending attack by the British (Martin 2013). The French were seeking a foothold in the southern Caribbean, near to the South America Mainland and possible trade with or plunder the Spanish settlements there. Grenada's strategic location, and despite its small size, had the potential to support a colony because it was well watered. On 18 March 1649

Governor Du Parquet sailed into the protected harbor with 45 Frenchmen to establish a tobacco colony despite the centuries-old presence of the Kalinago and Kalina settlements scattered across the islands. With gifts to barter with the Indigenous residents the French were able to settle undisturbed for the first nine months, thus establishing themselves along the Caribbean coast.

Figure 13: Drawing of the French settlement at Port Louis, c1667 by François Blondel, showing the initial settlement on a sandbar between the Lagoon and Carenage and the plan of the new fort across the bay (BnF)

The détente that had existed between the Kalinago/Kalina and the French settlers broke down after the nine months and the former began carrying out attacks against the French invaders who had started to expand their settlements north. The first of these attacks took place not too far from the primary French settlement around the "Grand Fort" when some of the colonists went to fetch water

from the springs like they had always done. The colonists recorded the attack as the first time French blood was shed on Grenada and would unleash a war between the two for control of the island (Martin 2013). And many of the Kalinago attacks against the French would be carried out at water sources because they knew sooner or later the French had to come to collect freshwater.

Just off to the northwest (lower left in Figure 13) of the settlement was a natural spring where the settlers procured their freshwater. They would name the area "*Les Sources*," known today as "Springs," as "The Source" referenced the natural spring, probably one of the ones de Bonnefoy had identified almost two decades earlier.

According to Anonyme (1975:47*v*):

"At the same time some other Savages of Grenada, who were with those who resolutely wanted a war to ruin our command, went down towards the springs that are next to the lake that is close to the great fort of the East, or Levant, to catch some of ours who usually went there to get some water. They were not wrong in their thinking, and when they got very close in a thicket of trees and bushes, they saw the soldiers coming, taking the water, and as they were going back to their canoe on the lake, these Savages, hidden, started to discharge arrows on them."

These attacks on the French settlers by the Kalinago and Kalina whenever they went to collect water were quite frequent because they knew that the French had to get freshwater in order to survive. The French settlers appeared most vulnerable at these times and seemed unable to defend against them. Another similar incident took place in April 1655, and almost a year later the Kalinago staged another ambush of French colonists when they came to collect freshwater from the creek flowing from the St. John's River.

According to Anonyme (1975:57*r*):

"They [Kalinago] came down to the St. John's River and stayed hidden while waiting to make a bad attempt, then from the fort three men of ours came to draw some water, two of them carrying a boiler on their shoulders and (58r) the third a jug. They waited very patiently to let them fill their tanks and load them onto their shoulders, or on to their heads. Afterwards those poor men without suspecting anything took their way back, they fired upon them and wounded them; two died and the third escaped."

Father Jean Baptiste Du Tertre (1667, T.1:507) visited Grenada in 1656 to access the island for Jean de Faudoas de Sérillac and recorded its freshwater resources:

"…as regards the island of Grenada… without walking one league and a half, at the exception towards the salt ponds, where are two or three rivers or springs of natural water."

The French colonists gradually moved up and down the western coast creating settlements in the vicinity of streams and rivers, but had become better at defending and protecting themselves at these water sources. By the 1670s they had settled from Grand Anse in the south to Grand Pauvre (now Victoria) in the north, with small settlements scattered throughout (Figure 14). All along the western coast the colonists were living on lands granted by the colonial government where they built very basic straw houses (*maison de pailles*) for their families and planted various crops, with cotton (*Gossypium histura*) and indigo (*Indigofero tinctoria*) being the most common in these early years. Initially, French indentured servants comprised the majority of bonded labor, but by the time the first official census was carried out in 1669 there were only a handful of these *engagés*. Much of the labor force were enslaved Africans who numbered 222 (124 males/66 females/32 children); there were 283 (free) whites (98 males/68 females/62 children) (Martin 2013). Much of their water supply for personal use came from rivers and streams and rain water harvesting, and stored in "boilers and jugs."

Figure 14: Drawing of the French settlements at Port Louis and along the western coast towards Molinière (then called Beau Séjour) all the way south to Pointe des Salines, c1670, showing plots of agricultural lands, houses and fortifications (BnF)

By 1696, with a population of 811 persons (446 enslaved/291 whites), indigo had become the largest crop being produced, recording 47 factories across the growing colony. The production of

indigo required large quantities of water as the indigo leaves needed to be steeped in various stone vats to leech the dye particles (with paddles powered by enslaved laborers) into the water that would then be removed for drying and subsequent export (Figure 15). Much of this water would have been collected from rivers and streams, but some factories, particularly located in the dryer areas like the southern coast and the Grenadines were watered by hand-dug wells (often referred to as bore-hole wells). None of these wells remain on Grenada, but several on the island of Carriacou where indigo production continued into the late 18th century. Reportedly, the fumes from the production were harmful and the French colonial government passed a law to dissuade the release of the water from the vats from being discarded into rivers and streams, thus polluting them (Martin 2013).

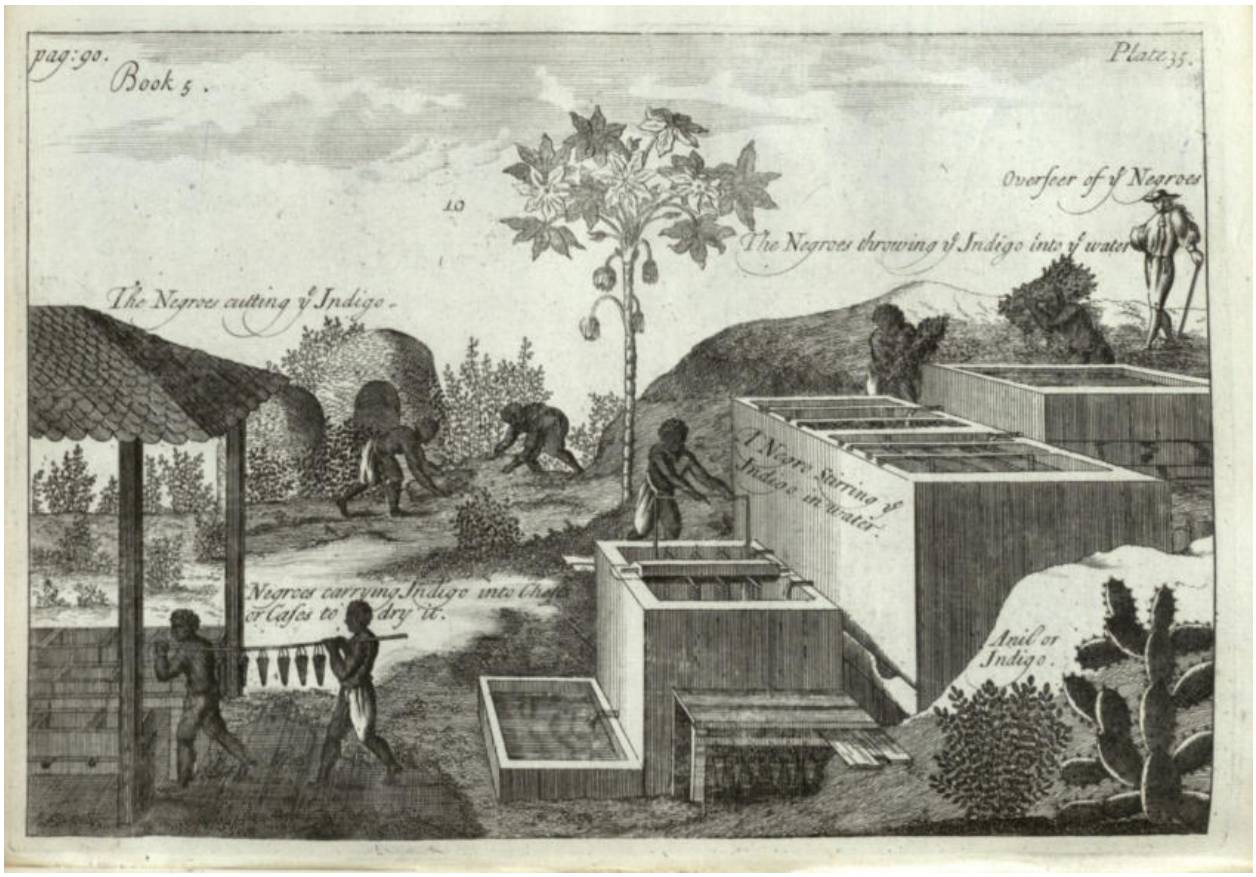


Figure 15: Representation of an Indigoterie or indigo factory where the processing of indigo leaves into dye took place (from Jean-Baptiste's Nouveau Voyage aux isles de l'Amérique, Paris, 1742, T.1:268)

Figure 16: Ningo Well in Tibeau, Carriacou on the former Limlair estate; its name derives from indigo as it was part of an Indigoterie, with the ruins of vats in the bushes in the upper right of the photograph. This large, deep 18th-century rubble wall well is quite unique to the Grenadines. It currently supplies water to animals (photo: JAM Collection)

The small islands of the Grenadines were not settled until the middle of the 18th century and only the larger islands like Carriacou and Bequia because of their arid landscapes caused by the absence of yearlong rivers and streams. Similar to small islands across the Eastern Caribbean, the settlers dug wells (Figures 16), cisterns (Figure 17) and collected rain water in various containers.

Figure 17: Abandoned underground cistern on the former Sabazan estate, Carriacou (photo: JAM Collection)

"Water Lay Down, Water Stand Up?"[1]
Water Use in the Era of Sugar and Slavery in Grenada and Carriacou

Grenada had struggled as a colony for much of its colonization in the latter half of the 17th century. French settlement slowly expanded across the entirety of Grenada once they had eliminated the threat from the Kalina and Kalinago, having killed many of them in the last fifty years of running battles (Martin 2013). The population continued to grow and spread across the island, opening up new areas for plantations. Indigo production reached its climax in 1722 when there were 159 *Indigoteries* across Grenada, with the corresponding sets of vats for its processing and requiring large quantities of water. But competition from the more lucrative sugar and coffee crops would lead its demise by the mid-1700s.

Figure 18: Representation of a sugar plantation utilizing water power to run its sugar mill and showing the various parts of the operation in the French Antilles, c18th century (image: Public Domain)

[1] "Water laydown, Water Stand Up" is a Grenadian riddle for sugar cane growing in the field.

Sugar production had grown from a slow start in the 1680s, but by the 1730s there were over fifty across Grenada. *Sucreries* or sugar factories were elaborate constructions as the processing of sugar cane into sugar required specific technologies and thus relatively large investments in materials and labor. Many sugar plantations began with simple cattle mills to grind the sugar cane, but those situated near to rivers and large streams utilized this abundantly available resource (Martin 2013). Many sugar plantations invested in the construction of water powered mills to grind the sugar cane as well as transport water to irrigate the various cane fields via massive stone canal systems (Figures 19 and 20). This utilization of water power altered the landscape as rivers and streams were dammed to manage the flow of water long distances and shared across several sugar plantations. It was massive undertaking that transformed the Grenadian landscape by the mid-1700s, recording 83 in 1749.

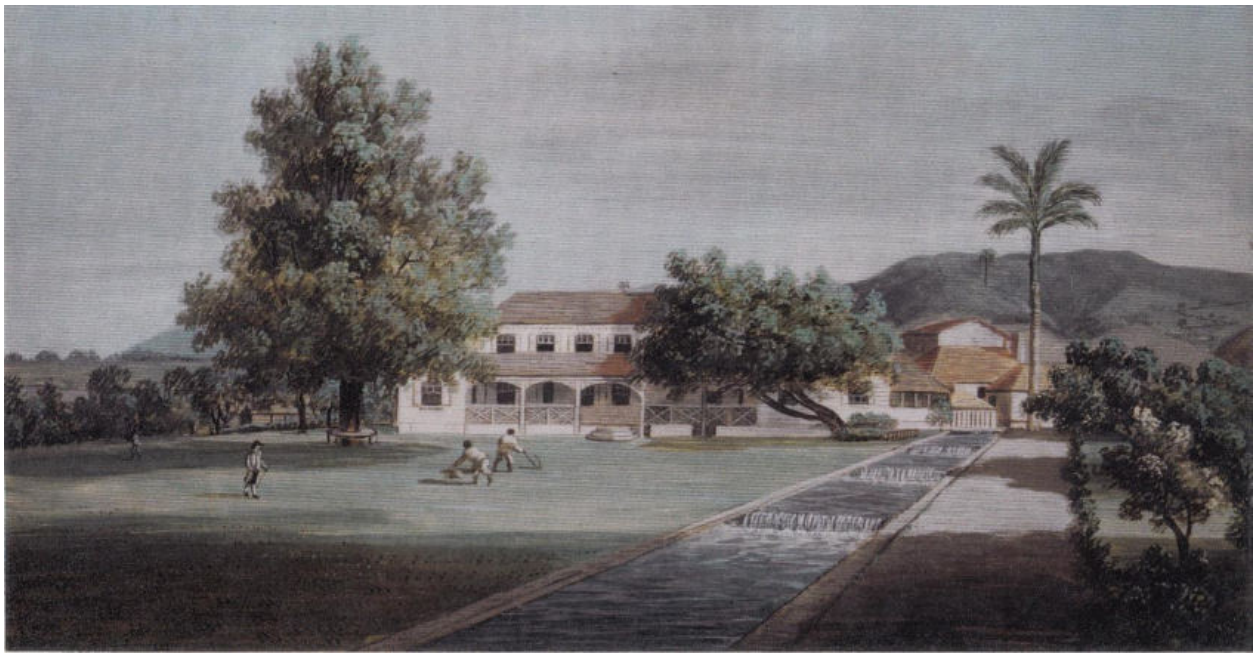


Figure 19: Idealized representation of Paraclete sugar plantation, St. Andrew, showing part of its canal or aqueduct system running across the plantation, 1789 by Adam Callender (image: Paxton House, Scotland)

Scattered across Grenada and Carriacou are the ruins of almost two centuries of sugar production, illustrating the importance of the crop to the islands' economy and how it altered and subsequently defined the Grenadian cultural landscape. The ruins of watermills and broken pieces of aqueduct systems remind of the extensive utilization of the rivers and streams to generate water power. It was a great engineering feat for its time, and provide a glimpse into the past utilization of water resources.

Figure 20: Ruins of the aqueduct system at the former Waltham sugar plantation, St. Mark (GNM)

Figure 21: Ruins of the aqueduct and one of two waterwheels at the former Westerhall estate, St. David (photo JAM Collection)

Water Aboard Slave Ships

Vital to the successful continuation of the Atlantic Slave Trade and the transportation of millions of captive Africans was the availability of drinkable water on the West African coasts and aboard slave ships plying the weeks and sometimes months of the Middle Passage. Water was collected in large barrels at slave ports all along the African coast and loaded onto ships for the voyage to the Caribbean, South and North America. One of the worse things that could happen aboard a slave ship was the loss of water or its inadequacy for whatever reason, a not uncommon occurrence. Water had to be rationed on many slaving voyages, and captives and crew died due to dehydration caused by the lack of water. The water carried on board slave ships was often described as unpleasant, undrinkable and even putrid, forcing the addition of things like kola nuts to make it taste palatable.

With water came animals, plants, microbes that carried diseases, thus water was responsible for bringing new organisms from West Africa to the Americas!

Figure 22: The Palmiste Lake or Dig at Palmiste, St. John was a large man-made pond formed by the damming of the Great St. Patrick's River. The dam or reservoir, most likely derived from a natural marsh, flowed into the canal system that supplied water power to the Palmiste sugar estate's waterwheel since the mid-1700s (photo: JAM Collection)

Figure 23: Ruins of the under-shot waterwheel at Mount Horne, St. Andrew, one of only a few that utilized the direct flow of the river to propel the mill from beneath and not overhead into its buckets from the canal (photo: JAM Collection)

Away from the plantation, the situation was very different for the enslaved living in the "slave yard" and having to procure their own water for everyday use. Rain water harvesting would have been the most important way to access clean, freshwater for the enslaved family. Of course, this would have been restricted to the rainy season, but availability would depend on storage. Access to storage materials would have been problematic as barrels and clay containers were not readily available due to the high cost of procurement. Enslaved people would make their own clay contains, often referred to as Afro-Caribbean pottery (Figure 24). Many plantations, especially those producing sugar, had access to rivers and streams so procuring surface water was relatively accessible for a majority of the enslaved. However, others would probably have had to walk long distances to access water if rain water harvesting proved unsuccessful. In parts of Grenada like the southeast and southwest where conditions were dryer wells were dug to supplement water supplies, but there were reports of well water contamination that resulted in the spread of diseases (Clyde 1985).

Figure 24: Afro-Caribbean pottery from Morne Sion, St. Lucia, showing an assortment of manufactured utensils for cooking and carrying/storing water: coalpot (A), pla (B), chodye (C), Gwa Kanawi (D), teye (E), Gwa kanari (F), kanawi (G) (photo: Corinne L. Hofman 2021)

Rivers and streams, scattered across the Grenada islandscape, were probably the most familiar places that invoked memories of home for captive Africans as these played primary roles in diverse social functions in western African societies, and would in turn inhabit the Grenadian landscape. Rivers, though used primarily by the plantations as a source of water to power sugar mills and for irrigation via extensive canals, served the enslaved as places of utility–drinking water, fishing (for crayfish and freshwater fish, including *titiri*), bathing and laundering, recreation, spiritual spaces where folk spirits lived and ruled over, and, above all, a social space where families and neighbors gathered to converse, play and celebrate (Bell 1889; Paul 2022; Pesoutova 2019). These practices associated with rivers and streams were passed down through the generations, leaving them as important spaces in the lives of Grenadians, especially in the rural areas where they remained useful far into the 20th century.

Figure 25: Women doing laundry at the river and the little boy bathing, circa 1880 (photo: JAM Collection)

These late 19th century and early 20th-century scenes of women and girls doing laundry at the river, are most likely no different to a scene during slavery. Rivers had served this purpose in West Africa and the practice transferred to Grenada upon their arrival and has continued to today.

Figure 26: Women doing laundry at the river (possibly Balthazar River), circa early 20th century (photo: historical postcard/JAM Collection)

"Piped Water"

Despite the burdens associated with accessing water, especially in the towns across Grenada, the impetus for "piped water" came from shipping. Grenada's economy had grown tremendously since its takeover by the British in 1762, with greater demands for almost everything, necessitating increased imports and exports. Hundreds of trading vessels (bringing captive Africans, goods and merchandise, or collecting slave-produced agricultural goods like sugar) arrived in Grenada and needed to refill their water supply before embarking for their next destination. Water was usually supplied in barrels, but the difficulty of collecting that water at rivers and streams and then transporting to the Carenage and loading onto ships was quite burdensome, even if it was carried out by slave labor. In 1776, the British colonial government, responding to what it deemed "the insatiable demands of ships filling barrels for long voyages," passed legislation "for procuring and conducting a stream of fresh water to the port." By 1779 there was a supply of fresh water being "piped in bamboo tubes" from the "Priests' Springs" to "The Spout," providing a supply of water to the shipping at St. George's for the first time over a distance of 2.4 km. It would be upgraded during Fédon's Rebellion and with additional funding was further improved by 1799.

Figure 27: The canal built to provide water to the shipping became known as "The Spout." In the early to mid-1900s it became the place to take a refreshing sea bathe before the popularity of Grand Anse Beach (photo: historical postcard/JAM Collection)

"Water More Than Flour"[2]
Water Use in Free Villages Across Grenada, Carriacou and Petite Martinique

The end of slavery in Grenada brought about a drastic change in the social and political landscape. Though there were no preparations for these changes, the ex-enslaved took it in stride as they relished their new freedom (Brizan 1998). Though slavery was outlawed in 1834 it was not until 1838 that the majority of the former enslaved had the freedom to leave the plantations which had enslaved them. The exodus from the plantations, however, was gradual as the ex-enslaved sought out advantageous opportunities as they became available. Many would eventually strike out on their own, either renting properties or sharecropping that allowed them to subsequently own small plots of land and to farm on their own.

Figure 28: Peasant cocoa farmer and family outside their home, circa 1880. Notice the boy carrying a pot of possibly water on his head and the water jar next to him (photo: JAM Collection)

[2] "When a situation is untenable."

By the 1840s villages began to emerge as small areas of plantations were sold off to peasant farmers to farm and live on their own. These villages, many taking their names from the adjoining plantations, developed slowly, with very few amenities (Brizan 1998). It would be almost a century before the basic amenities like better access to clean water were provided by the colonial government, and in many cases emerging communities depended on each other and their resources, continuing to do what they had been doing all along. For the remainder of the 19th century the majority of the ex-enslaved and their descendants' social conditions had not improved much.

Figure 29: Women and girls continued to do laundry in the river (here the St. John's River, St. George) as they had done during slavery, circa 1880 (photo: JAM Collection)

Figure 30: Various types of water jigs once common across Grenada, Carriacou and Petite Martinique (photos: GNM, Carriacou Museum, Michael Jessamy)

Figure 31: "Exterior of Negro squatters house, Grenada," c1850 by Percy William Justyne. Notice the large water jug and calabash dipper under the big tree next to the goat (image: National Maritime Museum, Greenwich, London)

Figure 32: Peasant family outside their thatch house, circa 1880. For most former enslaved and their descendants social amenities remained out of reach until the early to mid-1900s (photo: JAM Collection)

Figure 33: Assortment of imported jars and water carriers on display at the Carriacou Museum (photo: JAM Collection)

Figure 34: A peasant family in their tiny, shingled-roof board house, circa early 20th century. Notice the earthenware water jug at the front of the house and the other containers to the side (photo: Brizan 2001)

Figure 35: Local "drip stone" (made of limestone) and ceramic barrel for purifying and storing drinking water in the home, early 20th century on display at the Grenada National Museum (photo: Bevon McLean)

Before piped, potable water to many homes, especially in the rural areas, the need to purify drinking water was met locally by the use of porous limestone/coral fashioned to filter many impurities (Figure 35). Stored in a cool corner of the home, cold drinking freshwater was available in most homes.

European colonization of Grenada via the plantation slavery complex embodied the exploitation of the land through its division, clearing and cultivation, with enslaved Africans and their descendants forced to transform the landscape per that design; many would literally die in the

process. Thus, the enslaved became intimate with the Grenadian landscape–its Indigenous origins and French and British colonial transformations–however, taking every available opportunity to (re)fashion it, making it more familiar…, surreptitiously (re)creating it in their own image by incorporating the existing cultural and "natural" surroundings. This is nowhere more evident than in the creation of the island's mythscape from the "natural," Indigenous and European-influenced landscape, using their African motifs and memories of plants, animals, spirits, and bodies of water, reimagining them with their remembered beliefs and rituals. Elements and traces of western African folklore, mythology and spirituality were interwoven into the Grenadian landscape, becoming the place where their folk memories, mythologies and beliefs were transferred onto the plants, animals, hot springs, rivers and lakes around them as these integrated, mixed and syncretized with European and Indigenous folk expressions.

Figure 35: Sculpted representation of the Mama Glo sitting in the Underwater Sculpture Park off Molinière, St. George (photo: Grenada Tourism Authority)

Among these folk spirits is the Mama d'Leau or Mama Glo known as the Mother of the Water or from its West African progenitor Mami Wata (Figure 35). Bell (1889:28) relays the story of an event he observed at the Grand Etang Lake: *"They believe that the little mountain lake, as well as some of the mineral springs found in the island, are the haunts of a mermaid, or as they call her*

in Creole 'Patois,' 'Mother of Water,' in whose power it is to grant them welcome showers of rain in due season, or, if offended, to withhold these bounties, and, unless propitiated, ruin the prospects of a good crop of corn or other produce, on which they depend." These and other folk spirits roam the forests and bodies of water, and continue to be observed among the Spiritual Baptist and other syncretic religions (see Figure 36).

Figure 36: Spiritual Baptist adherents make sacrifices to the "Mother of the Water" at local river (photos: GNM/Michael Jessamy)

As the 19th century ended the majority of Grenadians had seen some basic improvements in their lives since gaining their freedom, but so much remained to be done, especially when it came to health and sanitation, education, and greater access to resources. Much of the improvements that took place with Grenada's water supply occurred in the towns as the colonial government began to improve the access to piped water for the first time to urban residents and construct waterworks that were necessary if these systems were to be sustainable. As such, the last two decades of the 1800s saw the beginning of construction of the infrastructure needed for a modern water supply system.

"Water That's for You Will Never Pass You": From Village Standpipe to Indoor Plumbing

The last half century had created a new dwelling landscape, laying the foundation for a new society as Grenada navigated changes to almost every aspect of its society following the end of slavery. Its population doubled between 1850 and 1900, creating greater demand for services like education and health care, accessible water supply, and forcing the expansion and modernization of the island's agricultural economy in the 20th century. The beginning of the 20th century brought many changes to the social and political landscape of Grenada. However, Grenadian society was lacking in many ways as its towns, even its capital city, remained very much underdeveloped. In regard to the water supply, not even St. George's town had access to piped water at the time. In 1836 four standpipes were made available for public access from the natural spring at Paddock that had been the source of water to the shipping decades earlier. In 1854 a cholera epidemic that killed almost 4,000 Grenadians was blamed on the islands' terrible sanitary conditions, including the rudimentary state of its potable water supply.

Figure 37: Mother and child in urban housing at the turn of the 20th century. Notice the wooden tub on the steps that's used for storing water or bathing (photo: JAM Collection)

The government had begun the improvement and expansion of the water supply system in the latter part of the 1800s by building waterworks in the towns and making piped water available to residents. Piped water first introduced to some residents of St. George's in 1836, mainly through street pipes from natural springs at the Springs estate. In 1841 a reservoir was built, and in 1879 the waterworks was expanded with a supply from a new source at the Soulier and Morne Repos Rivers five miles away. The expanded water supply and reservoir resulted in the establishment of pipe-borne water "to many of the houses and to provide fire plugs in the streets from which an abundance of water can be projected over the roofs of the highest buildings when necessary." To increase the water pressure another supply from the Les Avocats River, St. David, was added in 1889, providing water "for the districts of St. Paul's and Richmond Hill, the Government institutions at the latter place and the Government House being for the first time properly supplied with water."

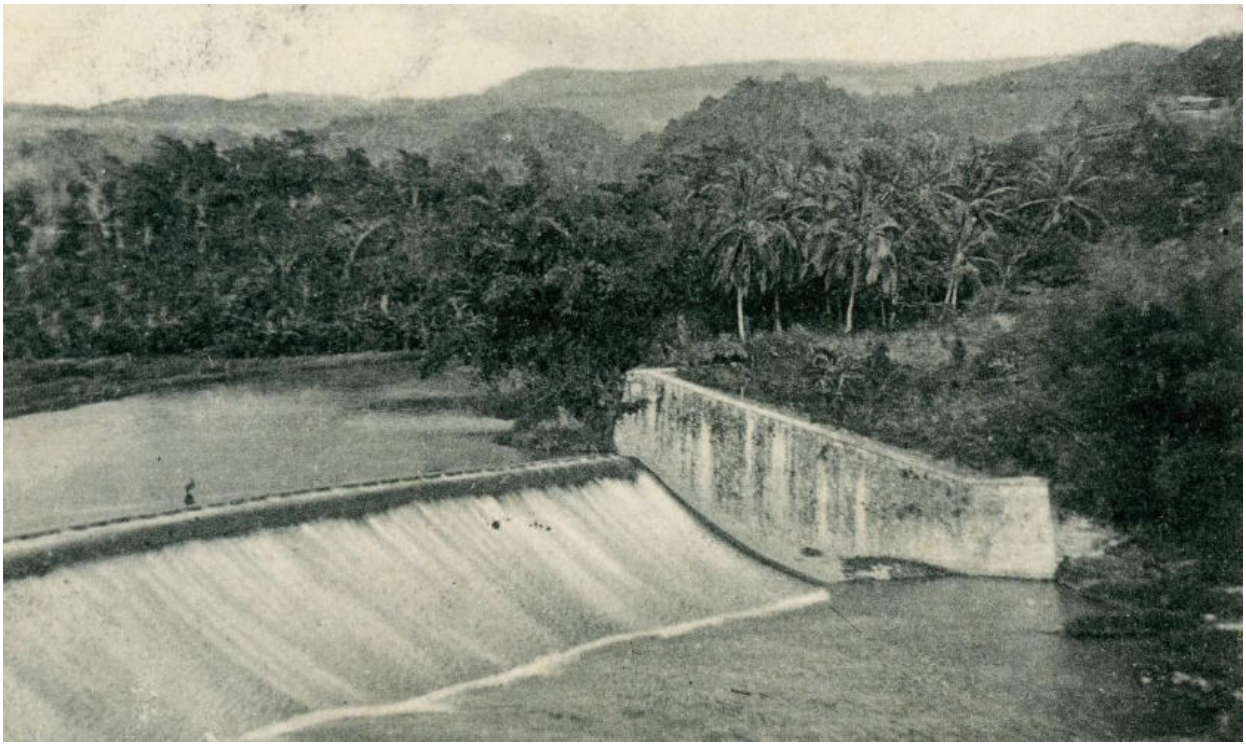


Figure 38: The St. David's Waterworks at Les Avocats (photo: historical postcard/JAM Collection)

The towns of Gouyave and Grenville received water supplies in 1890 and the other towns thereafter. Though the water system had been established by 1879, most residents, especially outside St. George's, did not receive pipe-borne water in their communities until the 1920s-30s, and in their houses until the 1960s. Stand pipes or street pipes, located centrally in most

communities, provided water for many who had to fetch or drogue water in containers, usually buckets. Street pipes became more than just places to procure water, but a venue for social gathering. Women sometimes laundered or washed clothes there, while children often took their baths as well.

Figure 39: Large reservoir for water storage at the (left) top of Halifax Street in the town of St. George's, c1880 (photo: JAM Collection)

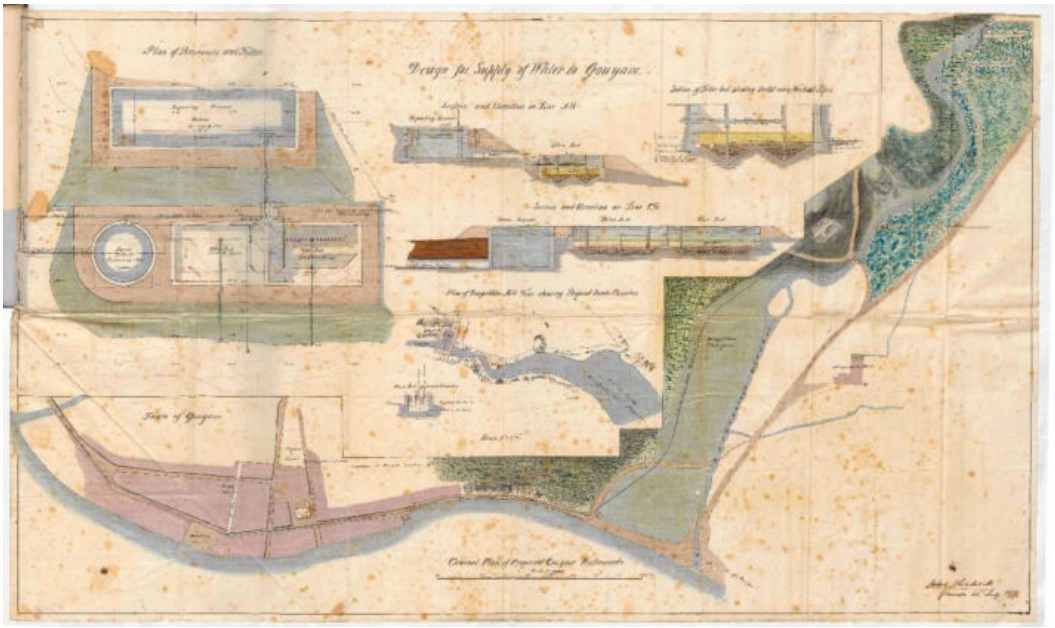


Figure 40: Extensive plan for the waterworks at Gouyave, St. John in 1879 (image: TNA)

Figure 41: One of the few remaining standpipes that provided communities with potable water for over fifty years until the availability of indoor plumbing (photo: Ian Blackie)

In 1975 all urban residents had access to at least communal water supplies, a large percentage having access to indoor facilities; 75 percent of rural residents had access to mainly communal supplies (Figure 26). Though street pipes are still present in some villages and along the streets, the availability of pipe-borne water to over 90 percent of the population has meant their decreasing use.

The islands of the Grenadines, with low elevations and the absence of permanent rivers and/or streams, their water supply proved more difficult to address. Its residents have relied on underground cisterns, bore-hole wells, rain water harvesting and ponds, but regularly experienced water shortages. Beginning in the late 1800s and early 1900s, the Grenada government made some improvements to the water supply in Carriacou and Petite Martinique by building communal tanks and wells, but they have traditionally relied on their own resources. Every community had a well, with many of them dating back over a century and connected to one of the plantations that had maintained them for centuries (Figure 42). Houses also had cisterns and/or tanks.

Figure 42: Rubble-wall well at Sabazan, Carriacou that was associated with the historical cotton plantation on the ridge above where extensive ruins can be viewed, including an underground cistern (see Figure 17) (photo: JAM Collection)

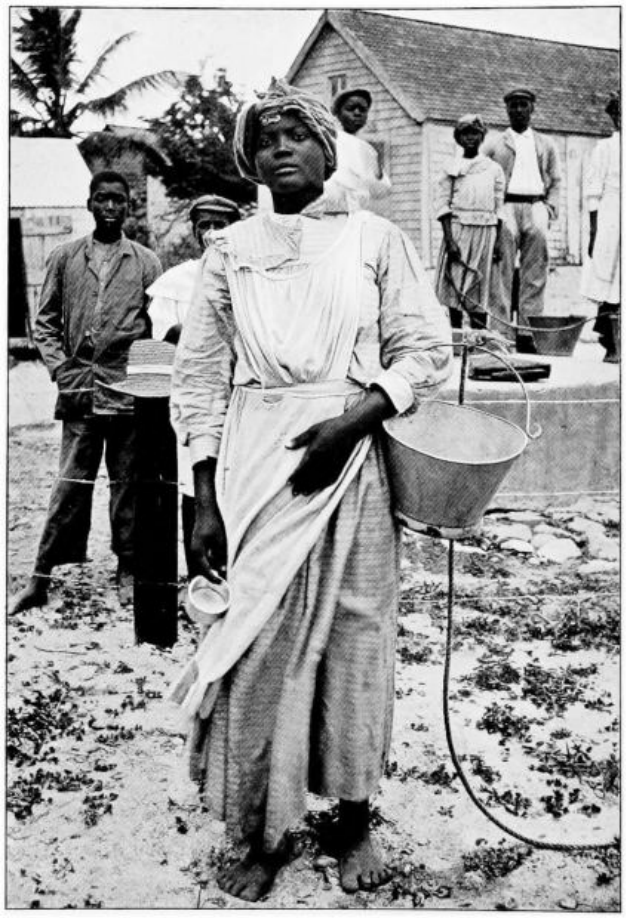


Figure 43: Residents of Hillsborough, Carriacou wait to get fill their buckets from a public water well (photo: JAM Collection

Figure 44: Abandoned water tank in Hillsborough, Carriacou (photo; JAM Collection)

Figure 45: Abandoned covered cistern in Carriacou (photo; JAM Collection)

Figure 46: Abandoned cistern in Beausejour, Carriacou (photo; JAM Collection)

Figure 47: One of several ponds across Carriacou used especially to water animals (photo: JAM Collection)

Figure 48: Community well at Windward, Carriacou (photo: JAM Collection)

As I began this brief illustrated history with the discussion of the drought of 2024, I find it appropriate to include it as part of the summary and looking forward as it is both an ending and a beginning. The drought showed that Grenada was not prepared. Had the drought gone on for another few weeks it would have proved devastating. NAWASA's capacity to meet the needs of its customers with regard to its basic need for potable water may not have been met. In this era of climate change, it is evident that Grenada is not at the place it needs to be in regard to its water supply and conservation. The drought proved that Grenada is not at a stage we it can be resilient. It is, however, an opportunity for Grenadians to learn more about how climate change will affect the availability of our basic needs like water and how we can conserve more. There is a need to explore how each household can decrease its consumption by eliminating waste with more efficient toilets and taps to begin with.

Figure 49: The Les Avocat Dam in St. David at its lowest, producing just over half of its daily capacity because of drought conditions, May 2024 (photo: NAWASA)

Grenada's water management system has undergone many changes in the just over three decades since it has been under NAWASA. Despite continuous improvements to the overall system there is also growing demand for greater availability of clean freshwater as the population increases and urbanize, and industry like tourism continue to grow and expand. This is nowhere more evident than in the Grand Anse area, which had seen drastic changes since the 1950s, going from one house to thousands of houses, businesses, etc. in just under six decades (Figure 50). These dramatic changes in demand for amenities like water presents huge challenges for the water supply system. That means that NAWASA has to stay a step ahead of demand if it is to meet the needs of its consumers, particularly those that arrive here as part of the tourism industry.

Figure 50: Satellite images of the Grand Anse area in 1951 and 2010, showing the extensive landscape changes in the intervening 59 years, particularly in the urbanization of the area due primarily to tourism development (photos: Ministry of Agriculture, GoG)

So the question remains is NAWASA up to the task to take Grenada into the future of its water management system? What courses of actions are available to NAWASA to continually keep upgrading its systems and staying relevant in providing clean, potable water to all of its customers equally? Can the history of water utilization and storage in Grenada, Carriacou and Petite Martinique over the last 500 years plus help us to chart a more efficient and effective course forward? At the River Antoine estate in St. Patrick is the only functioning waterwheel working much as it did for the past three centuries grinding sugar cane for the production of rum (Figure 51). Is there something in that technology that saw over 134 water-powered mills functioning across Grenada that can contribute to the future water supply?

Figure 51: Functioning waterwheel powered by the River Antoine at the River Antoine Estate in St. Patrick. It is the only water-powered sugar mill still extant in the region (photo: JAM Collection)

The water resources of Grand Etang Lake have become more and more in demand, and its depleted levels in May 2024 was an indication that it was absolutely vital to the supply for the island, especially in an emergency situation as in the dry season of 2024. That NAWASA was able to depend on this natural storage capacity an indication that Grenada should consider constructing additional storage capacity on the scale of Grand Etang Lake? Or, if Grand Etang Lake is better maintained with regard to its uncontrolled plant growth it can better serve in a larger capacity as the island's primary water storage facility?

Figure 52: Grand Etang Lake in St. Andrew is Grenada's only freshwater lake that utilized by NAWASA to provide water, especially during the dry season and to the high demand areas of St. George parish. (photo: JAM Collection)

Since around 2000, Grenada commissioned three reverse osmosis desalination plants, one at Woburn on the main island of Grenada (400,000 US gpd), one in Carriacou (100,000 US gpd) and one in Petite Martinique (30,000 US gpd). Of course, the plants on Carriacou and Petite Martinique are more vital to the supply for those two Grenadine islands that regularly suffer from water scarcity. The operation of these plants come at a high cost, so the question is whether desalination is a viable option for NAWASA and Grenada?

Figure 53: Signpost at the Petite Martinique Desalination Plant managed by NAWASA (photo: NAWASA)

As the dry season and drought of 2024 come to an end with the continuous showers of the rainy season, it is imperative that Grenada engages with the various stakeholders to plot a viable course forward in creating long-term solutions to its water supply issues. We are quite aware and have already been exploring solutions to Grenada's water issues with the expected climate changes that will impact small islands like Grenada, Carriacou and Petite Martinique severely if we are not prepared (Figure 54).

Figure 54: Rising sea levels have resulted in the degradation of coastal sites like at Tibeau, Carriacou where graves are been inundated by seawater (photo: JAM Collection)

Chronology of Water

(in Grenada, Carriacou and Petite Martinique)

***circa* 500 CE**: Barrancoid style bottomless ceramic pots were used to line wells on Carriacou to procure freshwater, especially just above the shoreline.

900-1100 CE: Petroglyphs created near water sources at Waltham and Victoria, St. Mark, and Duquesne and Mt. Rich, St. Patrick may indicate some connection between them and protecting water sources.

1450-1600: Kalinago and Kalina peoples inhabit Grenada and the Grenadines and create innovative ways to access surface and underground water resources.

1649: The French settled on a sandbar between the current Lagoon and the Carenage, collecting their freshwater supply from a spring at the far end of the Lagoon, coming from the area the French called "Les Sources," today Springs.

1650s: Among the crops the French settlers cultivated was indigo, necessitating the construction of wells or situated next to rivers to utilize the water that was necessary for indigo processing.

1680s: French colonists begin cultivating sugar cane and using cattle mills to grind it. It was not until the early 1700s that sugar mills utilized mills powered by rivers/streams for the grinding of the sugar cane as they required huge investments in extensive dams and aqueduct systems.

1755: The French had built 76 water-powered mills to power a majority of their sugar-mills on Grenada.

1771: The town of S. George's was "reduced to ashes" on 27 December following a fire that began in a bakery. The fire burned throughout the night as there was no fire engines or water plugs, with residents forced to use "bucket brigades" which proved inadequate.

1772: There were an increase to 95 water-powered mills running sugar processing in Grenada, showing greater utilization of rivers and streams. In Carriacou the British built windmills, in the absence of permanent rivers/streams, that processed corn and cotton, and later sugar cane.

1776: The demands of ships needing to fill barrels for long voyages forced the Grenada government to pass legislation for "procuring and conducting a stream of fresh water to the port."

1779: Fresh water supply "piped" in bamboo tubes from "The Springs" to "The Spout," providing a supply of water to the shipping at St. George's. (*The Grenada Handbook and Directory*, 1892)
: John Graham, Acting Lieutenant-Governor of Tobago assures Secretary of State that there are not above 300 French troops fit to carry arms in Grenada; new barracks built; "more negroes are wanted for wood and water." (TNA: CO101/24/6, ff.12-14)

1787: "February 10 – Assembly to Lucas: [Slave] Labour may be obtained "for the purpose of clearing, filling up, and rendering dry and healthy all the low and swampy ground within the

Artillery boundary, and for forming a basin or reservoir of water ... at the source or spring-head." (*Health in Grenada*:22)

1795: "The canal had been started as an expedient during the Julien Fédon uprising, to bring water to the Carenage from the Priest Springs on Springs Estate 2.4 km south-east of St George's." (*Health in Grenada*:56)

1799: "An Act was passed to provide funds for its [canal to the port] improvement, to set up a commission to administer it, and authorize employment of an overseer…" (*Health in Grenada*:56)
: The Grenada government procured a sturdier supply of water "piped" to St. George's for the use of ships in the harbor.

1824: Watermills increased to 123 under the British to power a majority of sugar mills, with the corresponding increase in sugar production.

1830: "There were no systems for house-hold water supply, water-borne sewage, no public lights and energy…." (*Grenada Files*, 2004:13)

1835: "In considering the outlines of a plan to bring water into St. George's, there are three very important things to be kept in view, namely – a plentiful supply of pure water – simplicity – and, economy. It has been objected that the water taken from the River Soulier would in wet weather be considerably impregnated with the lighter particles of earth...." (*The Chronicle & Gazette*, 14 March 1835)

1836: "An Act for Introducing a Supply of Water into the Town of St. George and for Facilitating the Watering of the Shipping at the Port of St George." (TAN: CO 101/81/19, No.19, ff.74-85b)
: "Legislation was enacted to provide funds for construction of a piped water supply to St. George's, four standpipes being put up although houses were not supplied directly. It would, however, be another 42 years before this facility was expanded." (*Health in Grenada*:69)
: A water supply "piped" to St. George's for public use for the first time from a spring source located at Paddock about $1^{1}/_{2}$ miles south of the Town of St. George.

1845: "Sketch of part of the Ordnance property at Grenada shewing the Water Works in red. Ordnance boundary coloured green": outline map. Reference table. Scale: 1 inch to 200 feet. Compass indicator. Signed by Captain T.H. Rimington, Royal Engineers, 19 February 1845; and by Lieutenant Colonel Thomas Moody, Commanding Royal Engineer, 4 March 1845. (TNA: MPH 1/1126/4)

1854: "The [cholera] epidemic, lasting from June 21 to September 15, 1854 cost Grenada 3,778 deaths among an estimated population of 34,077 - truly a decimation." The inadequacy of the water and sanitation system were seen as part of the cause. (*Health in Grenada*:109)

1855: "In 1855 two principal problems affecting the town were a threat to the freshwater supply through wearing out of the pipes laid 20 years previously...." (*Health in Grenada*:115)

1862: "An Act to Abolish the Tax hitherto Assessed and Imposed on Real Property for the Purpose of Introducing a Supply of Water into the Town of St. George." (TNA: CO 101/118/66, No. 63, ff. 490-493.)

1863: "An Act to Authorize and Empower the Commissioners of the Port and Harbour of Grenville to Raise a Temporary Loan for the Purpose of Introducing a Stream of Pure Water into the Town of Grenville." (TNA: CO 101/120/25, No. 144, ff. 255-257.)
: "An Act for Enabling the Governor to Direct the Application of Certain Surplus Monies collected under the Acts for Bringing Water into the Town of Saint George by way of Loan in and of the Public Service or to Deposit the Same Monies in the Colonial Bank upon Interest." (TNA: CO 101/119/7, No. 76, ff. 40-42.)

1867: "An Act to Promote the Introduction of a Supply of Fresh and Wholesome Water into the Town of Grenville in Grenada." (TNA: CO 101/126/3, No. 412, ff. 9-13.).

1873: "To cater to the growing demand for piped water surface water sources from the Soulier and Mon Repos Rivers, approximately five (5) miles northeast of St. George's, at an elevation of 1,100 feet, were tapped."

1874: "Measures adopted for the purpose of removing a defect in the arrangement of the Colonial Hospital, which was pointed out in the Secretary of State's Dispatch, No.19, 15 May [relating to the water supply], and reporting another sanitary improvement in those arrangements [fitting dry earth closets for the use of the patients, and closing the privies which were formerly used in the open yard]." (TNA: CO 321/2/32, No. 67, ff. 263-267)

1877: "Act No. 191, An Act to Provide for the Introduction of a Supply of Water into the Town of St. George." (TNA: CO 321/16/10, No.38, ff. 68-78)

1878: "Water Supply of St. George's; Civil Engineer, Mr. Osbert Chadwick's trip, Chadwick has supplied plans, estimates, and a full Report, which are to be submitted in Harley's next mail." (TNA: CO 321/21/17, No.37, ff. 143-145)
: "Proposed Water Works Scheme; plans, specifications, and Report by Civil Engineer, Mr. Osbert Chadwick; request that iron piping required may be sent out as soon as possible, along with the materials already ordered for the new prison on Richmond Hill." (TNA: CO 321/21/19, No.47, ff. 157-161)
: "St. George's Water Works; report on raising funds for the completion of Water Works; memo of Balances, 31 July 1878." (TNA: CO 321/21/40, No.90, ff. 454-460.)
: "Construction of new water works in Grenada." (TNA: CO 321/25)

1879: A new supply of water was introduced to the town of St. George's on 20 July and sourced from the Soulier and Morne Repos Rivers to accommodate the increasing demand of the expanding town. It replaced the inadequate supply from "The Springs."
: "Proposed Water works loan; necessity of obtaining permission to pledge the General Revenue of the Island as collateral security for the loan of £4000 to be raised to complete the total sum of £8000 needed." (TNA: CO321/27/33, 23, ff.435-444)
: "Water works loan; sum of £1000 at 5 percent interest has been offered by Mr. McPhail of Palmiste, and the remaining sum, Kerr has been informed, could also be obtained in Grenada on the same terms as soon as the collateral security is provided." (TNA: CO 321/27/37, No.33, ff. 491-492)

: "Disposal of Chantilly Canal to Government for supplying water to town of Grenville: States that the water is at present leased to an adjoining Estate; have instructed their agent to obtain full information on the subject." (TNA: CO 321/33/87, Hankey & Co, ff. 587-588)
: "Extension of the main of the Grenville Water Works; submission for Messrs Hankey of London the agreement for their ratification, to transfer the water rights necessary for the extension; copy of Mr. Kent's letter on behalf of Messrs Hankey, together with a plan of the proposed work [plan not in item]." (TNA: CO 321/28/10, No.62, ff. 128-138)
: "Grenada. The Grenville Water Supply Scheme: States willingness to lease Government for sum of £10 per annum for carrying out the scheme in question." (TNA: CO 321/33/88 Hankey & Co, ff. 589-590)

1880: "Transmits despatch from Lieutenant Governor Harley, reporting on the contemplated water works for the town of Gouyave: With a report on the scheme by Mr. Osbert Chadwick, including estimated costs and a large coloured plan of the proposed water works with cross sections and a map." (TNA: CO 321/37/40, No.131, ff. 365-390)

1883: "The Administrator, Edward Laborde's visit to Carriacou: for the purpose of inspecting the public departments, institutions and the water supply; encloses Mr Laborde's report." (TNA: CO 321/68/13, No 153, ff. 216-230.)

1884: "Wells and Water supply of Carriacou: replies to despatch regarding estimates and considers whether other wells should be sunk; introduces an Ordinance for levying a tax on Householders in that island for the maintenance of the supply of water, hopes to pass it through at the next Council meeting." (TNA: CO 321/78/10, No.65, ff. 69-73.)
: "Ordinance 9 of 1884: 'To raise a tax for the purpose of improving and maintaining the supply of water in the island of Carriacou'; transmits copy of ordinance." (TNA: CO 321/78/37, No.102, ff. 331-334)
: "Water for Grenville: forwards for favorable consideration a petition from the inhabitants for its laying on, includes cost of works." (TNA: CO 321/77/24, No.35, ff. 269-308)
: "Carriacou Water Rate: States that the maximum rate of 6% will not be levied, except in cases of extraordinary expenditure; in 1885 the rate will be 5% in order to establish a good water supply; subsequent years a lower maintenance rate should be sufficient." (TNA: CO 321/78/53, No.123, ff 481-482)

1885: Les Avocats Waterworks in St. David opened.

1886: Fire plugs, the precursor to fire hydrants, installed in the town of St. George's for the first time. The town had seen several devasting fires in the late 1700s that had destroyed large sections at a time.

1889: "Among the events of the year up to this date may be recorded the commencement and partial completion of an auxiliary water supply for the town of St. George's, which also provided for the districts of St. Paul's and Richmond Hill, the Government institutions at the latter place and the Government House being for the first time properly supplied with water. The source of the supply is the Les Avocats River, in St. David's parish, about six miles from the town." (*The Grenada Handbook and Directory*, 1892)

: “The preliminary survey for the introduction of an additional supply of water to the town of St. George’s by way of the districts of St. Paul’s and Richmond Hill was completed, and the work is being carried out in the present year 1889. This important work, besides securing a much-needed supply of water for these districts, will provide in this respect for the Government institutions on Richmond Hill, the Botanical Garden at its foot, and Government House, and will also reinforce the water supply of the town of St. George, which for some time past has not been sufficient for the requirements of its inhabitants.” (*Report on the Blue Book for 1888*)
: “St. Paul’s and Richmond Hill Water Supply. - These works were commenced in March and water was turned into the St. George’s Reservoir at Observatory in October. The works consisted of a dam reservoir and three filter beds at ‘Les Avocats,’ a reservoir at Fort Frederick formed by the conversion of two large casemates, a reservoir at Government House, and about six miles of mains. (*Report on the Blue Book for 1889*)

1890: “The water supply of the hospital, initially piped from the River Soulier, was augmented from the Dehar River.”
: “In July waterworks for Gouyave was completed, but the reservoir broke down in December due to a defective site.” (*The Grenada Handbook and Directory*, 1892)
: “The additional waterworks for St. George’s and the St. Paul’s and Richmond Hill district were completed, securing for the chief town and its neighborhood a supply of water which both for quantity and quality will compare favourably with any similar supply in the West Indies.” (*Report on the Blue Book for 1890*)
: Passage of the St. George’s Water Supply Amending Ordinance, 1890. (*Report on the Blue Book for 1890*)
: “The sanitary condition of the lunatic asylum was most satisfactory,--the deathrate (4.12 per cent.) being the lowest for many years. A copious water supply was laid on, and a scheme for the complete remodelling of the buildings, which will shortly be carried into effect, was elaborated. (*Report on the Blue Book for 1890*)

1891: “An alteration was made in the water rates levied in connection with the St. Paul’s and Richmond Hill water supply by fixing a rate of 5s on houses within the rateable area of the annual value of £10 and under, instead of 6 per cent, thereon.” (*Report on the Blue Book for 1891*)

1893: “The island was visited in May by Mr. Osbert Chadwick, C.E., with the object of reporting on the condition of the St. George’s Waterworks, constructed by him in 1879, and of advising the Government with respect to similar works for the town of Grenville, and as to the best means of repairing the reservoir of the Gouyave waterworks, which had collapsed in 1890 in consequence of a defective site.” (*The Grenada Handbook and Directory*)

1894: “The construction of waterworks for the town of Grenville and adjacent district was commenced.” (*The Grenada Handbook and Directory*, 1912)
: “The construction of the works necessary to secure a supply of water to the town of Grenville was commenced and vigorously pushed forward during the year. The scheme will not only be of advantage in the way of providing the residents of the district with pure water, but will be of value to shipping, and promises such additional facilities for the protection of property against fire as will. (*Annual Reports for 1894: Windward Islands*)

1895: "Two important public works were completed during the year, the Sendall Tunnel and the Grenville Water Works…. The Grenville Water Works, commenced in 1894, were completed during the year and the scheme, besides furnishing an abundant supply of pure water to the residents of Grenville and the shipping, affords a provision for the protection of property against fire which will, it is hoped, enable proprietors to insure at easier rates of premium." (*Annual Reports for 1895: Windward Islands*)
: "Mr. Osbert Chadwick, C.M.G., the consulting engineer of the works, visited them shortly before their completion and reported that they were thoroughly well constructed, adding that when finished they would be as complete as those of any town in Europe." (*Annual Reports for 1895: Windward Islands*)
: "The colony was again visited in March by Mr. Osbert Chadwick, who inspected the several waterworks, and advised the Government with respect to a scheme for lighting the town of St. George's by electricity, the motive power to be derived from the Annandale and Soulier Rivers, and who also prepared a scheme for the drainage of the swamps near the town of Grenville." (*The Grenada Handbook and Directory*, 1912)
: "The service of the St. Paul's and Richmond Hill Water Works was during the year extended by laying a new supply pipe, and It considerable district was thus brought within the area of supply." (*Annual Reports for 1895: Windward Islands*)
: A fire brigade service for the town of St. George's established at Fort George.

1897: Eight water closets with automatic flushing installed at the Colony Hospital.

1898: "St. George's waterworks, Grenada; damage by floods, Grenada." (TNA: CO 321/186)
: "The general health of the institution [of the General Hospital] was good with the exception of the last two months of the year, when there was an outbreak of diarrhea, which the house surgeon is inclined to attribute to intermittent water supply." (*Grenada-Report for 1898*)

1899: "The St. George's Town Board and the Parochial Boards of Hillsborough and Grenville have, in connection with systems of water supply, jurisdiction beyond the town boundaries." (*Grenada-Report for 1899*)
: "Complaints [from the General Hospital] as to irregularity of the water supply resulted in it being decided to give an alternative source of supply, out the work could not be done during the year. In spite of the defect in the water service, however, the general cleanliness and wellbeing of the institution seem to haye been maintained, as no cases occurred of a fresh disease breaking out amongst the patients. (*Grenada-Report for 1899*)

1900: "Diarrhea and dysentery thus take precedence of all other causes of death. While impure water must be in many villages a prominent factor in developing these diseases, it is noteworthy that in St. David's parish, where the water supply is adversely commented upon by the District Medical Officer, only 15 deaths took place in 1899 out of 182, and in 1900 only five out of 140. In Carriacou, where the water supply is both bad and scanty, there were but six deaths in 1899 and three in 1900 from diarrhea, none from dysentery being recorded." (*Grenada-Report for 1900*)
:"Free water supply to RM Steamers withdrawal: states that the Bill on the withdrawal of free water supply to Royal Mail Steamers passed its first reading. Also enclosed is a thank you letter dated 1st Jan 1901, from the Secretary of the West India Committee expressing their thanks for the

copy of the contract to convey their mail for the period 1900-1905." (TNA: CO 321/196/61, ff. 456-462)
: "Water Filtration: Submits correspondence on cleaning Grenada's Public Water Supply in which he raises technical questions and request Mr. Chadwick's expert advice." (TNA: CO 321/196/78 No.264, ff. 566-576).
: "Ordinance 15 of 1900, Mail Contract, Waters Clause Abolition: Submits for signification 'An Ordinance to prevent the permanent exemption of the Royal Mail Steam Packet Company from payment of water dues.'" (TNA: CO 321/196/89, No.277, ff. 631-635)
: "Water Supply to Royal Mail Steamers: Ordinance passed; wishes to know when contract terminates?" (TNA: CO 321/196/90, ff. 636-637)
: "Water subsidy paid by St. George's Town Board: Submits request received for relief of subsidy paid for the water which comes from St Paul's District." (TNA: CO 321/196/101, No.288, ff. 715-719)
: "Grenada Water Supply to Royal Mail Steamers: states there is nothing in existing contract stipulating as to Grenada water supply to Royal Mail Steamers. West Indian Mail Service. Contract system must be maintained, and it is desirable to arrange at once for a new contract with the Royal Mail Steam Packet Company." (TNA: CO 318/299/22, Treasury, ff. 171-197)

1903: "Water Works for St. George's, Gouyave and Sauteurs: Proposal for raising loan for St. George's £4000, Gouyave £3500, and Sauteurs £4000, approximately £11000 to £12000 be added to the debt of the colony at a fixed interest rate of $3^1/_2$%." (TNA: CO 321/215/36, No.60, ff. 393-404)

1904: "In June, new waterworks for the town of Gouyave work commenced by the Public Works Department, the water rights and land for reservoirs, &c., on Dougaldston Estate having been generously presented by the Honourable D.S. DeFreitas. These works have been rendered necessary by the collapse years ago of the former works owing to defective foundations. The Government is paying the cost of new works from Colonial revenue, the cost of the first works remaining charged as a loan to the town authority." (*Grenada-Report for 1904*)

1905: "Boards, half elected by ratepayers and half nominated by Government, were created for each district (except Carriacou), and under their administration were placed the towns and their water supplies, sanitation, and the upkeep of the byways." (*The Grenada Handbook and Directory*)
: "The erection of a fine new hospital was commenced during the year… known as Bellevue [in Carriacou]…. Here there were formerly a small fort and military buildings, and these are being utilised for the new structure, a particularly fine rain-water reservoir in an excellent state of preservation deserving special mention." (*Grenada-Report for 1905*)

1906: "An Ordinance to protect and conserve the Forests and Water Sources of the colony."
: "An Ordinance to facilitate the construction of the proposed Sauteurs Waterworks in the parish of St. Patrick, its headworks to be erected on the banks of the Montreuil River which will be the source of the works."

1908: "A water sewerage system was introduced during the year, and the water supply was increased by means of larger pipes from the main." (*Grenada-Report for 1908*)

: “The important extensions and improvement of the water supply to the principal town, commenced in the preceding year, were completed under the supervision of the Public Works Department, the cost being provided by a loan of £5,000 from Colonial funds to the District Board of St. George’s. The construction of waterworks for the town of Sauteurs from a similar loan of £4,236 to the St. Patrick’s District Board was commenced by the Department in the second half of the year, and vigorously pushed forward.” (*Grenada-Report for 1908*)

1909: “The town of Sauteurs receives water supply, with the establishment of a waterworks.”

1911: Passage of the Water Supply Ordinance.

1913: “Construction of waterworks for the town of Victoria.” (*Grenada-Report for 1913*)

1914: “St. Mark’s Water Works; submits proposal to vote £200 as grant in aid for completion of works.” (TNA: CO 321/276/54, No. 107, ff. 387-391)
: The town of Victoria receives water supply, with the establishment of a waterworks.

1915: “Water Supply for Soubise, St Andrew’s District: States that the authorities concerned have agreed to devote to this purpose £100 available from the Granville (St. Andrew’s) Water Works, in response to his offer to recommend a loan of £200, the Legislative Council have voted the latter and asks for approval.” (TNA: CO 321/282/49, No.177, ff. 361-363)
: “Ordinance 15, 1915: Transmits for approval copy of ‘an Ordinance to amend the ‘Water Supply Ordinance, 1915’ in respect of the rating of Agriculture Lands.’ With a report from the Attorney General of Grenada.” (TNA: CO 321/282/25, No.141, ff. 192-194)

1916: “Loan to St Patrick’s District Board: Submits for approval resolution passed by Legislative Council authorising loan of £150 to the District Board of St. Patrick, for repairs of Sauteurs Jetty and District Water Services, etc.; the Board said it is unable to stand the financial cost of undertaking the work which has to be carried out immediately, although the funds of the Board are in a satisfactory condition.” (TNA: CO 321/294/8, No.12, ff. 52-55)

1917: “Ankylostomiasis [Hookworm] Campaign, August 26 to December 31, 1916: Submits a medical report from Dr. Colwell Medical Officer, informing on the social conditions, illustrated with a number of photographs showing local people waiting for treatment, their surrounding living areas, a ‘dirt-eater’; the need to have clean, piped water as part of an effective sanitation system is highlighted.” (TNA: CO321/294/13, No.25, ff.81-156)

1920: “Ordinance 9, 1920: Transmits for approval copy of an Ordinance to amend the Water Supply Ordinance.” (TNA: CO 321/309/15, No.130, ff. 133-135)

1922: The water supply of the island of Carriacou is obtained from wells and from rain water stored in cisterns. (*Grenada-Report for 1922*)

1923: “All the parishes of the Island have a pipe-borne supply with the exception of St. David’s, which is well provided with numerous protected springs and streams. In the Dependency of Carriacou the water is obtained from wells and from rain water stored in cisterns. (*Grenada-Report for 1923*)

1925: "Extension and Improvement of Water Supplies: States that loan funds will be available for this very necessary work; recommends that H.F. Peet be engaged to supervise this and the road improvement work." (TNA: CO 321/330/46 Dir F.S. James, ff. 343-355)

1926: "In 1926 Grenada, the major cause of death was diarrhea and enteritis, affecting young children mostly, and being the cause of 400 deaths in that year." (*Grenada-Report for 1926*)

1927: "The public works of principal importance undertaken during the year improvement of water supplies in Carriacou." (*Grenada-Report for 1927*)
: "Application by St. Andrew's District Board to raise local loan to construct covered market in town of Grenville, and to extend the water supply. Includes printed reports of 1926 on Grenada's water supplies." (TNA: CO 321/333/13)

1928: "The Central Water Authority was established and took over the control of the water supplies of the Colony as from the end of 1928." (*Grenada-Report for 1928*)

1930: "Colonial Development Fund: water supply improvements in St. George's and various districts." (TNA: CO 321/341/5,6,7)
: "Cancellation of balance of loan raised by the Grenada Government in 1896 on behalf of St. George's Parochial Board for a water supply." (TNA: CO 321/342/16)

1931: "Good progress was made with the extension of the water service, including new waterworks at Mount Horne, and additional concrete tanks in Carriacou and Petite Martinique." (*Grenada-Report for 1931*)
: "Provision for new and improved water supplies was made under a Water Supply Ordinance, No. 6 of 1931 (26 Jun 1931-12 Jan 1932)." (TNA: CO 321/345/8)
: "The passage of the Water Supply Ordinance provides for improved and new water supplies for the towns and villages."

1932: "Improvements to waterworks were carried out at Observatory, Richmond Hill, Vendome, Boca, Snug Corner, and Les Avocats." (*Grenada-Report for 1932*)

1933: "Colonial Development Fund: improvement schemes at Carriacou and Petit Martinique. Includes photographs of water tank and jetty and landing stage at Petit Martinique." (TNA: CO 321/351/11)

1934: "Water-works improvements included completion of extension at Chantimelle, also separation of the Grand Anse district main from the St. George's works and its connection to the Richmond Hill works with the object of improving the head and service generally. New supplies at Tuileries and Union were completed." (*Grenada-Report for 1934*)

1936: "New works were constructed at Bellevue, St. Andrew's." (*Grenada-Report for 1936*)
: "Scheme of water-borne sewerage for town of St. George's." (TNA: CO 321/365/6)

1937: "Carriacou Water Supply (Amendment) Ordinance, No. 20 of 1937." (TNA: CO 321/371/7)
: "No.20. The Carriacou Water Supply (Amendment) Ordinance, 1937, removed a long-standing grievance in that Dependency by abolishing water rates and substituting therefor a system of

supplying water by the gallon at a small price which might be waived altogether so far as indigent persons were concerned. (*Grenada-Report for 1937-8*)
: "Repayment of loan for works to improve the water supply in the Belmont-Grand Anse area." (TNA: CO 321/371/16)

1938: "A new pipe-line has been laid in the Belmont area, a suburb of St. George's, and water has been piped to a village called Calliste." (*Grenada-Report for 1937-8*)
: "The post of water inspector added "to the fixed establishment." (TNA: CO 321/380/5)

1948: "There are 119 hydrants in the town of St. George's and unlimited supplies of sea water are available." (*Grenada-Report for 1948-9*)
: "There are 33 hydrants in Grenville and good supplies of sea water are available along the water front." (*Grenada-Report for 1948-9*)
: "In Carriacou, 13 tanks were laid down or improved with the aid of Development and Welfare Funds during 1948." (*Grenada-Report for 1948-9*)

1950: "Colonial Development and Welfare: allocation of a free grant for Scheme D 1369, Petit Etang Water Supply." (TNA: CO 321/427/2)
: The Grenada Manual and Mental Workers' Union under Eric Gairy, in labor negotiations, included the "installation of water pipes in convenient places for drinking and domestic purposes" as one of its key demands for Grenadian workers, especially in the "cane belt." (Brizan, *Island of Conflict*:267)

1950/1: "Two important water supply extensions in the parishes of St. Andrew and St. Patrick have now been laid. A third new supply with its source at St. David's is expected to be completed shortly; this will relieve the shortage of water in the St. David's parish and mainly in the southern part of the parish of St. George's, where owing to development in recent years, there was a great need for pipe-borne water." (*Grenada-Report for 1950-1*)

1951: "Colonial Development and Welfare: allocation of a supplementary grant for Scheme D 1369, Petit Etang Water Supply." (TNA: CO 321/427/3)

1952: "The Petit Etang water supply scheme comes into production." (TNA: CO 1031/91)

1952/3: "With the completion of the new water supply at St. David's, the shortage of water in that district and also in the southern part of the parish of St. George's has been greatly relieved." (*Grenada-Report for 1952-3*)

1955/6: "Six new dams and eight new pipe lines were completed." (*Grenada-Report for 1955-6*)

1960: "There are 43 communal water-carriage latrines across the islands."

1960-62: "Scheme to provide adequate water facilities for Grenada." (TNA: CO 1031/3660)

1961: "Six boreholes, 200 feet deep, were completed in 1961 and two of them-one in the Woodlands Valley and the other in the St. John's Valley-have been fitted with pumps. A 500,000-

gallon reservoir and 100,000-gallon high-level boosted reservoir are under construction." (*Grenada-Report for 1961-62*)
: "A dry season water shortage which had been felt in the south western section for a few years was aggravated by the real estate development started in that area. A million dollar loan has been floated, consultants called in and large-scale improvements in the water supply system of the island are being undertaken." (*Grenada-Report for 1961-62*)

1962/63: Scheme to provide adequate water facilities for Grenada., including "Partial Treatment Plant at Peggy's Whim and housing pressure filter." (*Financial Report*, 1962:20)

1963: "The 500,000 gallon reservoir at Woburn with its additional 100,000 gallon booster tank , costing $WI 390,000, was officially opened in January 1963." (*Commonwealth Survey*, v.9:565)

1963/4: "The usual dry season water shortage in the south western area of the island is now well under control. A half million gallon reservoir for low areas and a 100,000 gallon reservoir for high areas have been completed and are in operation. These are kept supplied from either of the two Woodlands Boreholes by either of the two electric pumps. The Tempe Borehole assists the Observatory reservoir." (*Grenada-Report for 1963-64*)

1965: *A Plan for Water Development in Grenada, 1965-1990* was the first significant plan on potable water supply for the entire island. As a result a number of projects were implemented including treatment plants at Annandale, Peggy's Whim, Douglaston and Petite Etang.
: There were nineteen (19) Water Supply Systems in Grenada, 14 using surface water sources. These provided potable water to 77,843 residents, with 29.2 percent via (5,191) private connections and 70.8 percent via (708) public standpipes. Per capita consumption was around 46 gallons per day. (*A Plan for Water Supply Development in Grenada*)
: "Colonial Development and Welfare Schemes have been approved during the period 1965-66 for the construction or improvement of several waterworks, including Brizan, Carriacou, St. Andrew, St. Patrick, and Petit Etang water supplies."
: "The dry season water shortage in the south western area of the island is now well under control. A half million gallon reservoir for low areas and a 100,000 gallon reservoir for high areas have been completed and are in operation. These are kept supplied from either of the two Woodlands Boreholes by either of the two electric pumps. The Tempe Borehole assists the Observatory reservoir." (*Grenada-Report for the Years 1965-66*)
: In *Grenada: Five Year Development Plan, 1964-68*, described the water situation in Grenada as the "major and most pressing problem." (*Grenada: Five Year Development Plan, 1964-68*:163-4)
: Peggy's Whim Waterworks—Extending distribution mains, and Improving Treatment facilities. (*Grenada: Five Year Development Plan, 1964-68*:163-4)

1966: "CD&W Schemes - Grenada: Improvement of Water Supplies in Rural Areas (Brisan)." (TNA: OD 28/78)

1967: Forest, Soil and Water Conservation Order 12, 1967 Amendment.

1969: Creation of the Central Water Commission with the passage of the Water Supply Act, No. 23 of 1969 to manage Grenada's water supply.

1971: Water supply, having been a part of the Public Works Department, was separated from it and created its own department as Water Works.

1974: Though the Annandale River had been seen as a possible hydroelectric source since 1895, it was not until 1975 that the Annandale Dam and Water Treatment Plant was constructed. It would become the largest treatment facility (2.5 million gallons per day) serving around 57,000 customers from Annandale to the Point Salines area.

Late 1970s: Water Works became the Central Water Commission.

1979: Passage of the Water Supply (Amendment) Law (No. 30, 1979).

1980: On 13 June the "Mardi Gras Water Treatment Plant, financed jointly by Grenada and Canada, was opened exactly 15 months after the Revolution. Now, between that plant and a similar one, some 176,000 gallons of water are pumped daily to thousands of customers." (*Westindian Digest*, 1980 (7/63):28)

1985: In July NAWASA commissioned the Mamma Cannes Water Treatment Plant in St. Andrew, and serves communities in Grand Bacolet, Hope, Petit Esperance, Felix Park, and surrounding communities.
: "The major project in the water sector was the Mama Cannes scheme, which at completion (now scheduled for March 1985) will provide one-half million gallons of water a day for the eastern part of the island." (*Economic Memorandum Grenada*, 1985:31)

1985/87: "The Central Water Commission (CWC) confronts both operational and financial problems. The problem is an important one which particularly affects future developments in the tourism sector. Current capacity is not sufficient to meet demand, in part because old pipes result in high system leakages. During 1985 the CWC will receive technical assistance to carry out an assessment of the water supply system and develop a 10 year investment plan."
: "The CWC is beset by both operational and financial problems. There is a water supply shortage; demand estimated at 8.5 million gallons a day (mgd) against a supply of 6 mgd after system losses of about 20%, primarily because of old pipes. Although the critical scarcity of water that affected Grenada during much of 1984 eased with the onset of the rainy season, the problem remains an important one, which particularly affects future development of the tourism sector. The CWC is completing several projects that will expand capacity by slightly more than 1 mgd by the end of the year, with financing provided by CDB, CIDA and USAID. Even with that additional capacity, however, the supply will still fall short of demand, even without considering future needs." (*Economic Memorandum Grenada*, 1985:28)
: Peggy's Whim Treatment Facility Enhancement: "The project entails the construction of a 300,000 gallons reservoir and the installation and replacement of 63,000 feet of distribution mains in the parishes of St. Patrick and St. Andrew." (*Economic Memorandum Grenada*, 1985:77-78)

: Mount Horne Treatment Facility Expansion: “The project entails the expansion of the treatment facility at Mount Borne by the construction of 2 additional filters and a storage tank. The project will provide an adequate supply of good quality water thereby reducing the incidence of water borne diseases.” (*Economic Memorandum Grenada*, 1985:79-80)
: Concord Water System: “Construction of a dam on Black Bay River and treatment plant. The project also entails the purchase and installation of 37,140 ft. of transmission and 101,054 ft. of distribution mains. The project will provide additional potable drinking water to southern St. John's and Northwestern St. George’s.” (*Economic Memorandum Grenada*, 1985:81-82)
: Woburn Reservoir Expansion: “Expansion of Woburn Reservoir to accommodate water from the Mama Cannes System, Annandale, Concord and Woodlands bore hole systems. To provide additional water to the government declared No. I Tourist Zone area.” (*Economic Memorandum Grenada*, 1985:83-84)

1990: Passage of legislation creating the National Water and Sewerage Authority (NAWASA), replacing the Central Water Commission that had authority for the management of Grenada’s water supply.

1991: “With respect to the domestic demand 64 % of the island population was connected to the National Water and Sewerage Authority (NAWASA) public water supply system.”
: “There are 23 surface water and 6 ground water supply facilities in the entire country, which produce 12 million gallons per day (mgd) in the rainy season and a maximum of 7 mgd in the dry season. The water demand in the rainy season is 10 mgd and for the dry season is 12 mgd. The per capita domestic water consumption is 130 liters and giving a total demand for the island in 1991 of 2,948,772 m3 yr^{-1}.”
: “In 1991 the non-domestic consumption figure was about 1.5 million cubic meters of water (85 % in St. George parish alone)…. Commercial activities predominated with 44%, industrial sector 22%, hotels 21%, schools 10% and public 3% of the total.” (OAS *Grenada Report*:10-11)

1994: “Baillie’s Bacolet Bore Hole project - This project is expected to produce 200,000 mgpd to serve mainly the Woburn and Grand Anse areas.”
: “Peggy’s Whim project -- Expected to increase production from 400,000gpd to 1.0 mgpd by December, 1994.”

1995: Construction of a dam at the Grand Etang Lake outlet by NAWASA. “Grenada’s only natural water supply storage reservoir for surface water is the Grand Etang Lake. However, its storage capacity has been considerably reduced by encroaching weeds and silt.” (*Grenada National Environmental Action Plan*, 1995)
: “The Grand Etang/Annandale project to increase the volume of water in Annandale to 400,000 gpd by pumping some of the escaping water from the Grand Etang Lake into the Annandale catchment, which will continue to service the St. George's and Grand Anse areas.” (*Grenada National Environmental Action Plan*, 1995:9)
: Baillie’s Bacolet Bore Role project -- This project is expected to produce 200,000 mgpd to serve mainly the Woburn and Grand Anse areas.

: Peggy's Whim project -- Expected to increase production from 400,000 gpd to 1.0 mgpd by December 1994." (*Grenada National Environmental Action Plan*, 1995:9)

2006: Guapo Water System in Black Forest, St. Andrew opened.

2014: "Total capacity of large dams (large dams in Grenada are those with a height of more than 4m) was estimated at 22,000m^3. This capacity corresponds to the Annandale reservoir in the Beausejour river (5000m^3), the Concord reservoir in the Black Bay River (4000m^3), the Les Avocat reservoir in the Ballie's Bacolet river (6000m^3), and the Mardi Gras reservoir in the St. Louis River (7000m^3).
: Grand Etang Lake, with a surface area of about 8 ha, is within a basin of 86 ha of tropical rainforest. It is the only exploitable natural lake. Since the 1990s, during extreme dry seasons, water from this lake has been used to supplement water supply.
: Lake Antoine has a surface area of 6.5 ha. In the late 1990s, water from this lake was used for irrigation of organic bananas. The project was however unsuccessful due to the poor quality of the water, contaminated by agrochemical use.
: Levera pond, with a surface area of 9.3 ha, is an ancient volcanic crater filled with a mixture of fresh and salt water. The pond is surrounded by red and white mangroves. Coconut palms, cactus and woody shrubs grow in the upland regions next to the pond. This lake holds no major importance for water supply, except for the occasional watering of livestock (UNDESA, 2012).

2016: Opening of the Clozier Water System that serves Clozier and Florida in St. John.

2017: On 21 February NAWASA officially commissioned the EC$2.4 million Spring Garden Water Treatment Plant that was designed to produce 150-250,000 gallons of water daily for communities including Birch Grove, Adelphi, Beaureguard, Providence, Lower & Upper Capital, Balthazar, La Digue, Belle Vue Land, Noel's Hill, St. James, The Mammy, Bocas, and Brandon Hall.

2018/19: Upgrading of the Radix Water Treatment Plant in St. George that increased output and quality: construction of two reinforced concrete sedimentation tanks, 100,000 gallons water storage tank, and the replacement of aged water main from the plant to the Mt. Parnassus Junction. It serves Radix, The Coconut and Mt. Parnassus.

2021: On 9 December NAWASA officially commissioned the Munich Water Treatment Plant in St Andrew at a cost of EC$7000,000. It "includes the construction of a brand-new sedimentation tank, two slow sand filters, and a water storage tank with a capacity of approximately 50,000 gallons" that serves the communities of Munich, Mt. Carmel, Tuilleries, Marquis, and surrounding communities in St Andrew.

2024: Due to a severe dry season, the Government of Grenada, following a meeting of the National Emergency Advisory Council, on 12 May officially declared a water crisis as a result of the water shortages experienced. The National Water and Sewage Authority (NAWASA) issued drought warnings and began rationing water across Grenada, restricting its use and asking Grenadians to conserve this precious commodity that was now in short supply and dwindling fast.

: With the usual arrival of the rainy season the drought came to an end the beginning of June as reservoirs began filling up again.

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