

DEVELOPMENT
KNOWLEDGE AND
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A Benchmark for the Performance of State-Owned Water Utilities in the Caribbean

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Nils Janson
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Foreword

The World Bank is partnering with the Caribbean to implement a comprehensive 360-degree approach for building resilience that includes a focus on ex ante efforts. This covers several areas of work, such as investing in better preparedness and more resilient infrastructure, creating fiscal buffers for difficult times, strengthening human capital, diversifying economies and strengthening the private sector, and better managing the region's abundant natural resources.

In this context, *A Benchmark for the Performance of State-Owned Water Utilities in the Caribbean* is a useful tool for policy makers and practitioners alike for advancing the agenda of better and more resilient service delivery. The study collects a comprehensive set of data from 14 Caribbean water utilities and conducts in depth analysis of 5 of them—Belize, Dominica, Grenada, Jamaica, and St. Lucia. It was developed at the request of ministries of finance in the region. We hope that it can serve as a tool to guide country efforts for providing better services and building fiscal discipline and that it can help countries move toward accomplishing their sector goals. The challenges it identifies are complex and multidimensional, requiring differentiated techniques to accomplish sector results.

Evidence shows that well-run water utilities with access to commercial finance help countries to more likely achieve the Sustainable Development Goal on ensuring access to water and sanitation for all (SDG6). The study shows that addressing the state-owned enterprises' complex and multidimensional challenges is key, given their impact on the countries' fiscal accounts and on improving service delivery to all citizens. This is increasingly important in the Caribbean region, given the implications of climate change. The number and intensity of disasters is expected to increase—such as floods and droughts, rise in sea levels, and storm surges further inland. The availability of fresh water is a major issue as a result of changes to seasonal rain patterns and sea water intrusion into aquifers.

In 2017, two consecutive category 5 hurricanes, Irma and Maria, passed through the region, a first of its kind event. In September 2019, another category 5 hurricane, Dorian, affected the region and hit the northern Bahamas as one of the most intense Atlantic storms to reach land since records began. Indeed, the

Caribbean is one of the most affected regions in the world by climate change and natural disasters. Building a smart and resilient water utility for the future is therefore a critical priority.

Tahseen Sayed

Country Director for the Caribbean Region

The World Bank

Preface

This work is the result of a request from Permanent Secretaries and Finance Secretaries in the Caribbean region to collect and analyze basic data on state-owned enterprises (SOEs), which pose major fiscal risks. This report is not meant to provide in-depth policy or reform recommendations for the water utilities or for the water sector. At the clients' request, this work aims to respond to the following: What standard key performance indicator (KPI) should be collected from the water utilities that would allow ministries of finance (a) to understand their basic performance and (b) to determine the scope of the challenge of collecting such data and benchmark against the economies in the region? The benchmarking can serve as the foundation on which additional analytical work can be done. This report applies the World Bank's Water Global Practice Water Utility Turnaround Framework (Soppe, Janson, and Piantini 2018). In addition, it informed the policy dialogue in some of the countries in the region.

In the Caribbean region, as well as (or perhaps even more than) in other areas around the world, building a smart and resilient water utility for the future is critical. Public utilities provide water supply and sanitation (WSS) services. Although some of these utilities perform well, others suffer from performance issues observed in many other public sector entities, such as low operating and investment efficiency. Through its Water Utility Turnaround Framework, the World Bank is promoting a three-pronged approach to enhance water utilities' performance: (a) strengthening the operational efficiency of the utility, (b) improving the governing environment, and (c) improving access to funding for WSS. A framework for turning around poorly performing water utilities will benefit the management of these utilities, governments, donors providing technical and financial support for improving the WSS sector, and ultimately citizens at large. Despite dedicating substantial time and resources to water utilities, global efforts to improve water utilities' performance seem to have run out of steam. Yet sustaining a successful turnaround is key to ensuring that people maintain or gain access to safely managed WSS services. Improving the performance of water utilities is challenging. The problems they face are complex and multidimensional; political problems, weak institutions, low capacity, and inefficient practices cannot be solved by applying a cookie-cutter approach, nor by applying standard technical and managerial techniques. Improving corporate governance (including, but not limited to, competent management, dedicated leadership, and so forth) and operational and managerial efficiency are critical. Using a comprehensive

turnaround framework is the best approach to improve performance and efficiency, and to increase access to finance. Evidence shows that water utilities with access to commercial finance are much more likely to achieve the Sustainable Development Goals (SDGs).

Many of the Caribbean countries assessed for this report do not have or have limited essential elements for enabling good governance, while others do have the essential elements but still have underperforming utilities. Although creating a good governing environment is essential for maintaining performance of state-owned water utilities, many actions can be taken by a state-owned water utility to improve performance without changes to its governing environment. This report proposes areas that could be improved without changing the governing environment.

Governance can be improved by strengthening and improving the credibility, accountability, and autonomy of the utilities. Utilities can improve their credibility in the eyes of stakeholders by improving their performance in areas such as quality of service, operating efficiency, and financial sustainability. Performance improvements can be achieved by creating the right incentives and by identifying the priority areas that a utility should improve. Utilities can improve their accountability by agreeing on and meeting well-defined and measurable objectives and targets. When a utility has more authority over its management and resources, its autonomy increases. To improve performance, the governing environment should therefore incentivize by

- Assessing the condition of the sector and establishing a baseline of the utility;
- Setting multiyear targets for increasing quality of service and operating efficiency and agreeing on sources of funding to cover the associated costs; and
- Strengthening oversight and accountability.

Most of the countries surveyed for this report lack up-to-date, detailed, and comprehensive data on water supply and sanitation services, including utility service provision. This lack of information complicates efforts to establish a common understanding of issues in the sector, which in turn makes it difficult to develop an informed and actionable plan for addressing problems in the sector and the utility. To address this challenge, state-owned water utilities should carry out an assessment of their initial situation—a baseline—to help identify their priority needs and assess the priorities and gaps in the water and sanitation sector as a whole.

Moreover, governments should support state-owned water utilities in carrying out baseline assessments by providing financial assistance or technical support. The first step to creating a baseline is to identify the information and data that are required. Utilities that do not collect data regularly will need to develop a system to collect information. Because the main governance challenge relates to the inadequacy of incentives for achieving the SDGs, the initial work on the baseline should focus on obtaining the relevant information to set objectives and targets for the increase in service provision and coverage (for example, gaps between rural and urban areas, piped water coverage, and wastewater collection).

Setting comprehensive, multiyear targets is an important element of improving utility performance. Multiyear targets should be based on the utility's current situation (determined through baseline measurements) and desired future performance. The utility and the government body or regulatory authority responsible for its oversight should use the baseline data to create specific objectives and clear indicators to track actual performance. Given the current performance of many state-owned water utilities in the Caribbean, these targets should focus on increasing operating

efficiency (for example, reducing nonrevenue water and improving the collection rate) and quality of service provided (for example, improving continuity of service).

Both the utility and the authority responsible for oversight should agree on the multiyear targets and the sources of funding to cover the costs of reaching them. This is important because in most countries in the Caribbean, a government body or regulatory authority is typically responsible for setting the utility's tariffs. Although adjusting tariffs to cover the cost of service is more sustainable and efficient in the long run, governments that are not willing or able to increase tariffs to cover the full cost of service should provide subsidies through a reliable mechanism to cover the excess costs not expected to be covered through tariff revenues. Any subsidies provided through such a mechanism should be targeted and calibrated according to specific public policy objectives. Because the main governance challenge relates to the inadequacy of incentives for achieving the SDGs, utilities should set clear targets for expanding coverage that are linked to the funding needed to achieve the targets.

Government policy should establish a clear, detailed, and effective process for regulating and monitoring utility performance. For example, a government body or regulatory authority should be clearly responsible for evaluating and reporting on progress against multiyear targets. This will help the utility establish credible systems for measuring performance against targets on a regular basis.

Holding the managers and other staff of the utility accountable for progress against the objectives and targets also is key for improving governance. This is key to promoting sound regulation and accountability, and it means that the government should put in place adequate incentives for managers of SOEs and other staff to meet determined targets. Some mechanisms, such as performance contracts in which the government and the utility agree to meet certain targets provided they receive support, have been found to be useful.

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Executive Summary

This report provides recommendations for how to improve the management and governance of state-owned enterprises (SOEs) in the water and sanitation sector in the English-speaking Caribbean. SOEs play a significant role in most Caribbean countries' economies through their impact on fiscal accounts and service delivery to citizens. For this report, the strengths and weaknesses of SOEs' performance and governance were identified through a benchmarking analysis of 14 water utilities, with a focus on five countries (Belize, Dominica, Grenada, Jamaica, and St. Lucia) that participate in the Supporting Economic Management in the Caribbean (SEMCAR) Program. This benchmarking study should be a useful tool for policy makers and practitioners seeking to improve service delivery in the sector, restore or maintain fiscal discipline, and pursue sector goals in a sustainable manner.

This work is based on a request from the Caribbean countries to address the challenge of a lack of data and to address associated fiscal concerns. This activity is not meant to provide in-depth policy or reform recommendations for the water utilities or for the water sector. The benchmarking can serve as the foundation on which additional analysis can be done. This report applies the World Bank's Water Global Practice water utilities turnaround framework.¹ In addition, it informed the policy dialogue in some of the countries in the region in the context of budget support operations and other technical assistance programs.

In the Caribbean region, building smart and resilient water utilities for the future is critical. Public utilities provide water supply and sanitation (WSS) services. Although some WSS utilities perform well, others suffer from performance issues also observed in many other public sector entities, such as low operating and investment efficiency. Through its Water Utility Turnaround Framework, the World Bank is promoting a three-pronged approach to enhance water utilities' performance: (a) strengthening the operational efficiency of the utility, (b) improving the governing environment, and (c) improving access to funding for WSS. A framework for turning around poorly performing water utilities will benefit the management of these utilities, governments, donors providing technical and financial support for improving the WSS sector, and ultimately citizens at large. Despite dedicating substantial time and resources to WSS utilities, improving their performance remains a challenge. Yet sustaining a successful turnaround is key to ensuring that people maintain or gain access to safely managed WSS services. The problems WSS utilities face are complex and multidimensional; political problems, weak institutions, low

capacity, and inefficient practices all exacerbate less than satisfactory performance. These issues cannot be solved by applying a cookie-cutter approach, nor focusing only on standard technical and managerial techniques. Improving corporate governance (including, but not limited to, competent management, dedicated leadership, etc.) is critical to improving operational and managerial efficiency. Using a comprehensive turnaround framework is the best approach to improve performance and efficiency and to increase access to finance. Evidence shows that WSS utilities with access to commercial finance are much more likely to achieve the Sustainable Development Goals (SDGs).

The benchmarking analysis finds that many state-owned water utilities in the English-speaking Caribbean countries are underperforming in terms of coverage, quality of service, operating efficiency, and finances. Overcoming these challenges will require long-term measures, some with ambitious and challenging implementations. For instance, investments are needed to expand water coverage and improve wastewater collection and treatment; however, funding for investments might not be so easily mobilized.

Shorter-term measures targeted at strengthening financial sustainability would involve the establishment of reliable cash flows that would allow utilities to cover their costs. Most state-owned WSS utilities struggle to provide their customers with the desired level of continuity, pressure, and water quality. To improve the quality of the service, state-owned water utilities must have reliable cash flows. Establishing reliable cash flows will come mainly from three sources: by improving commercial processes, adjusting tariff levels and structures, and identifying public service obligations and compensating the utilities for these.

Proposing a tariff adjustment to the regulator, or other relevant government body, would allow utilities to (gradually) recover costs. Today, the tariffs charged by most state-owned utilities do not cover the full cost of service, and this cost can be expected to increase when state-owned WSS utilities are responsible for increasing wastewater collection and especially wastewater treatment. When raising tariffs is not politically feasible, SOEs could concentrate efforts on improving their billing and collection processes to improve compliance.

Additionally, SOEs' financial sustainability and quality of service can be improved by reducing commercial and physical losses of water. Many of the state-owned WSS utilities in the Caribbean have high nonrevenue water (NRW) levels. A first step to reducing NRW is to gather adequate information, such as comprehensive water balances, to develop effective strategies for reducing NRW. In general, measuring and recording relevant information would help address basic data gaps. Few WSS utilities measure, collect, or can readily access data on the quality of the services they provide. This lack of information makes it more difficult to develop solutions to improve the quality of service and operating efficiency, while also adversely affecting the transparency and accountability of the utility.

In terms of benchmarking governance, this analysis finds that governance frameworks vary in quality across the region. Some countries, such as Belize, have a strong governance framework with well-developed policies and legal and regulatory frameworks, while others, such as Suriname, have unclear sector policies and underdeveloped legal and regulatory frameworks. The five countries of focus—Belize, Dominica, Grenada, Jamaica, and St. Lucia—have moderate to well-developed frameworks compared with other Caribbean countries. In this analysis, we find that WSS utilities operating under better-developed governance frameworks usually perform better than WSS utilities with underdeveloped frameworks. Belize's water utility, for example, operates under a well-developed governance framework,

and it is also one of the top-performing utilities. However, the report does not claim a causal link between governance frameworks and operational performance.

Improving the performance of state-owned water utilities in the Caribbean may also require that each country use a comprehensive and targeted governance approach. This approach must ensure that essential elements of good governance—such as an appropriate legal and regulatory framework, accountability and oversight mechanisms, and a professional board of directors—are in place.

These are the main conclusions of this report:

- In many countries in the Caribbean region, the sector governance structure needs to be further enhanced, especially to ensure that access to and the quality of water and sanitation services can be further improved by increasing the government's capacity to plan, prioritize, design, fund, and implement policies and investments. The current lack of reliable and up-to-date information makes it more difficult to assess the performance of service providers and to develop solutions that improve the quality of service. The lack of information also adversely affects transparency and accountability, which may have a negative impact on a household's willingness to pay for water and sanitation services.
- The capital costs of providing water and sanitation services in the Caribbean region are very high as measured by the gross book value of assets. The average book value of assets in the region was US\$4,075 for what is essentially only water supply infrastructure—access to wastewater collection and treatment is very low or nonexistent. This value varies widely between countries because of differences in water source availability and economies of scale (because of variations in population size and density). These high costs are a significant barrier to expanding services while keeping them affordable, and hence it is important to understand the efficiency with which capital expenditures are employed in the region, and to understand the drivers that are affecting capital efficiency. It also calls for looking beyond conventional water, and especially wastewater, technologies and approaches, to ensure that more wastewater is properly collected and treated to ensure that its exacerbation of marine pollution is minimized or eliminated.
- Most service providers are struggling to provide universal and high-quality services. In the best-performing utilities, this financial viability is accompanied by what are globally relatively high levels of affordability (households spending more than 2 percent of their household income on water supply services). The study found that—depending on the utility investigated—operating efficiency could be improved by reducing nonrevenue water losses, increasing staff productivity, improving billing and collection management, and improving energy savings. Realizing efficiency gains in water supply could then help to free up much-needed resources to invest in wastewater infrastructure and services.

Abbreviations

APUA	Antigua Public Utilities Authority
AQUA	Aqualectra Curaçao
BWA	Barbados Water Authority
BWS	Belize Water Services Limited
CAPEX	capital expenditures
CWC	Central Water Commission (Grenada)
CWSA	Central Water and Sewerage Authority (St. Vincent and the Grenadines)
DOMLEC	Dominica Electricity Services
DOWASCO	Dominica Water and Sewerage Company Limited
DSCR	debt service coverage ratio
EBITDA	earnings before interest, taxes, depreciation, and amortization
EIA	environmental impact assessment
GBV	gross book value
GLC	government-linked company
GWI	Guyana Water Incorporated
KPI	key performance indicator
MCWTPU	Ministry of Communications, Works, Transport, and Public Utilities (St. Lucia)
MH	Ministry of Health (Dominica)
MOW	Ministry of Works (Grenada)
MOWH	Ministry of Water and Housing (Jamaica)
NAWASA	National Water and Sewerage Authority (Grenada)
NEPA	National Environment and Planning Agency (Jamaica)
NIWRA	National Integrated Water Resource Authority (Belize)
NRCA	Natural Resource Conservation Authority (Jamaica)
NRW	nonrevenue water
NTP	National Transformation Program (Malaysia)
NURC	National Utilities Regulatory Commission (St. Lucia)
NWC	National Water Commission (Jamaica)
NWSC	National Water and Sewerage Commission (St. Lucia)
OPEX	operating expenditures
OUR	Office of Utilities Regulation (Jamaica)
PRASA	Puerto Rico Aqueduct and Sewer Authority

PUC	Public Utilities Commission (Belize)
ROA	return on assets
ROE	return on equity
SDGs	Sustainable Development Goals
SEMCAR	Supporting Economic Management in the Caribbean
SOE	state-owned enterprise
SWM	Surinaamsche Waterleiding Maatschappij (Suriname)
UDC	Urban Development Corporation (Jamaica)
WAC	Water Authority Cayman
WASA	Water and Sewerage Authority (St. Lucia)
WASCO	Water and Sewerage Company (St. Lucia)
WHO	World Health Organization
WRA	Water Resources Authority (Jamaica)
WSA	Water and Sewerage Act of 1989 (Dominica)
WSC	Water and Sewerage Corporation (The Bahamas)
WRMA	Water Resource Management Agency (St. Lucia)
WSS	water supply and sanitation

1 Introduction

In the Caribbean region, as well as (or perhaps even more than) in other areas around the world, building a smart and resilient water utility for the future is critical. Public utilities provide water supply and sanitation (WSS) services. Through its Water Utility Turnaround Framework, the World Bank is promoting a three-pronged approach to enhance water utilities' performance: (a) strengthening the operational efficiency of the utility; (b) improving the governing environment; and (c) improving access to funding for WSS.

State-owned enterprises (SOEs) have a significant role in most Caribbean countries, representing significant public expenditures and important public assets requiring management. They also deliver fundamental services to citizens and are under pressure from the public to operate in the most effective and efficient way.

This report analyzes the performance of SOEs in the water sector and provides recommendations for how to ensure that SOEs operate more efficiently and effectively. More specifically, it focuses on how to improve the management and governance of SOEs in the water and sanitation sector in the English-speaking Caribbean. For this report, a benchmarking study was conducted to identify the main strengths and weaknesses related to the performance and governance of 14 water utilities.

Benchmarking can help utilities improve their performance by identifying relative performance and relevant "best practices." This benchmarking study is expected to be a useful tool for policy makers and practitioners who are seeking to improve service delivery in the sector, to restore or maintain fiscal discipline, and to pursue sector goals. It is also expected to be of use for water utility managers who aim to improve the performance of the utilities that they manage.

The report has the following two main components:

- **Assessment of the Performance of Water Utilities (chapter 2).** This chapter identifies key strengths and weaknesses of state-owned water utilities in the Caribbean. To assess the performance of water utilities, the team focused on access to service, quality of service, operating performance, financial performance (that is, a utility's capacity to cover its expenses), and affordability of tariffs.
- **Governance of Water Utilities (chapter 3).** This chapter describes the effectiveness of the existing legal, institutional, and regulatory frameworks used to oversee water utilities.

BENCHMARKING PERFORMANCE OF WATER UTILITIES

When using quantitative indicators to assess the performance of a water utility, the following six aspects are generally considered the most important:

- *Access to service* refers to the water and wastewater service coverage that a utility provides to its customers.
- *Quality of service* refers to the reliability, continuity, and responsiveness of the services provided by the utility. It also includes the quality of water provided and the quality of wastewater that is collected and disposed.
- *Affordability of tariffs* refers to the customers' ability to pay for the utility's water and wastewater services.
- *Operating performance* refers to the utility's ability to provide a cost-efficient water and wastewater service.
- *Financial performance* refers to a utility's resources to operate and maintain, replace, and expand the infrastructure to maintain or improve accessibility, safety, adequacy, reliability, convenience, and cost-effectiveness by generating sufficient revenues to cover expenses.
- *Status of fixed assets* refers to the utility's ability to invest in fixed assets to expand coverage, improve quality of service, and increase operating efficiency. Because of the lack of information, this study used the status of fixed assets instead of the quality of physical assets (the latter would have been a better indicator of whether the utility is properly equipped to achieve the levels of desired operational and financial performance).¹

This study compares state-owned utilities' performance across these six dimensions. It also uses other system variables for measuring the scope and type of each utility's water and sanitation systems, where relevant.

UTILITIES INCLUDED IN THE BENCHMARKING

This benchmarking study assesses the performance of state-owned water utilities in the English-speaking Caribbean, in addition to the state-owned utilities in Curaçao, Puerto Rico, and Suriname. It uses information received directly from or obtained from publicly available sources on the following utilities:²

- **Antigua Public Utilities Authority (APUA)** is the wholly government-owned utility in Antigua. The APUA Water Division is responsible for providing potable water to 33,896 customers. APUA also provides electricity, telephone, Internet, and mobile services.
- **Aqualectra (AQUA)** is the sole water utility in Curaçao. AQUA is fully owned by the Island Territory of Curaçao. It provides water services to 79,303 customers. AQUA also provides electricity services.
- **Barbados Water Authority (BWA)** is the state-owned water utility in Barbados. It is responsible for providing water and wastewater services to 106,580 customers.
- **Belize Water Services Limited (BWS)** is the state-owned water utility in Belize. It operates in Belize's urban areas and contiguous rural villages. The government

of Belize owns most of its shares. BWS provides water to 55,483 customers and sewerage services to 10,691 customers.

- **Dominica Water and Sewerage Company Limited (DOWASCO)** is the state-owned water utility in Dominica. It provides water to 22,171 customers and sewerage services to 3,335 customers.
- **Guyana Water Incorporated (GWI)** is the state-owned water utility in Guyana. It provides water services to approximately 176,748 customers.
- **National Water and Sewerage Authority (NAWASA)** is the state-owned water utility in Grenada. It provides water to 42,564 customers.
- **National Water Commission (NWC)** is the state-owned water utility in Jamaica. It provides water to 362,386 customers and sewerage services to 132,315 customers.
- **Puerto Rico Aqueduct and Sewer Authority (PRASA)** is an island-wide public water and wastewater utility. It provides water services to 1,237,935 customers.
- **Surinaamsche Waterleiding Maatschappij (SWM)** is the state-owned water utility in Suriname. SWM provides water services to 105,054 customers in Paramaribo, Nieuw Nickerie, and Moengo. It only provides sewage service in Paramaribo.
- **Water Authority Cayman (WAC)** is the state-owned water utility in the Cayman Islands. It provides water to approximately 14,000 service connections.
- **Water and Sewerage Authority (WASA)** is the state-owned water utility in Trinidad and Tobago. WASA provides water to approximately 380,339 customers.
- **Water and Sewerage Company (WASCO)** is the state-owned water utility in St. Lucia. It provides water to 47,362 customers and sewerage services to 3,242 customers.
- **Water and Sewerage Corporation (WSC)** is the state-owned water utility in The Bahamas. It operates in New Providence and the Family Islands. WSC provides water services to 59,001 customers and wastewater services to 12,503 customers.

Within the benchmarking, particular emphasis is placed on the water utilities in five countries (Belize, Dominica, Grenada, Jamaica, and St. Lucia), selected because of their participation in the Supporting Economic Management in the Caribbean (SEMCAR) Program and data limitations. Detailed case studies of the water utilities in these countries are provided in the appendixes: Belize (appendix A), Dominica (appendix B), Grenada (appendix C), Jamaica (appendix D), and St. Lucia (appendix E).

The utilities included in this benchmarking study are fully or majority-owned by their respective governments (see table 1.1). However, they do not all provide the same services. Some utilities provide water, wastewater collection, and wastewater treatment, such as WASA (Trinidad and Tobago), WASCO (St. Lucia), and WSC (The Bahamas). Others, such as DOWASCO (Dominica) and SWM (Suriname), only provide water and wastewater collection services. Moreover, the benchmarked utilities operate in markets of different sizes and they depend on different sources of water (for instance, in The Bahamas and in Curaçao desalinated water is an important water source), which affects the cost of doing business. Table 1.2 shows the

TABLE 1.1 Utilities included in the benchmarking

UTILITY	JURISDICTION	PERCENT OF GOVERNMENT OWNERSHIP OF UTILITY	SOLE PROVIDER OF PIPED WATER	WASTEWATER COLLECTION	WASTEWATER TREATMENT
APUA	Antigua	100	Yes	No	No
AQUA	Curaçao	100	Yes	No	No
BWA	Barbados	100	Yes	Yes	Yes
BWS	Belize	83	No	Yes	Yes
DOWASCO	Dominica	100	Yes	Yes	No
GWI	Guyana	100	Yes	Yes	Yes
NAWASA	Grenada	100	Yes	Yes	Yes
NWC	Jamaica	100	Yes	Yes	Yes
PRASA	Puerto Rico	100	No	Yes	Yes
SWM	Suriname	100	No	Yes	No
WASA	Trinidad and Tobago	100	Yes	Yes	Yes
WASCO	St. Lucia	100	Yes	Yes	Yes
WSC	Bahamas, The	100	No	Yes	Yes

Sources: Information provided by utilities.

Note: APUA = Antigua Public Utilities Authority; AQUA = Aquallectra Curaçao; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; GWI = Guyana Water Incorporated; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; SWM = Surinaamsche Waterleiding Maatschappij; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

TABLE 1.2 Size and composition of the markets served by the benchmarked utilities in 2015 (unless specified otherwise)

UTILITY	JURISDICTION	GDP PER CAPITA (US\$)	ANNUAL REVENUES (US\$ THOUSANDS)	NUMBER OF WATER CUSTOMERS	NUMBER OF WASTEWATER CUSTOMERS	PERCENT OF RESIDENTIAL WATER CUSTOMERS
APUA (2014)	Antigua	13,432	13,400	33,896	0	91
AQUA	Curaçao	22,619	—	79,303	0	92
BWA (2013)	Barbados	14,917	—	106,580	2,377	95
BWS	Belize	4,879	21,551	55,483	10,691	89
DOWASCO	Dominica	7,116	7,275	22,171	3,335	81
GWI	Guyana	4,127	15,900	176,748	—	—
NAWASA (2014)	Grenada	9,212	10,945	42,563	—	—
NWC	Jamaica	5,232	225,659	362,386	132,315	93
PRASA (2014)	Puerto Rico	28,529	1,054,488	1,237,935	—	95
SWM	Suriname	9,485	13,702	105,054	—	—
WASA (2010)	Trinidad and Tobago	19,325	10,161	317,095	—	—
WASCO (2014)	St. Lucia	7,736	21,586	47,362	3,242	93
WSC	Bahamas, The	22,817	45,928	59,001	12,503	87

Sources: Data provided by utilities. GDP per capita data provided by the World Bank.

Note: — = not available. APUA = Antigua Public Utilities Authority; AQUA = Aquallectra Curaçao; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; GDP = gross domestic product; GWI = Guyana Water Incorporated; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; SWM = Surinaamsche Waterleiding Maatschappij; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

difference in revenues and in the number of customers per utility. These differences are considered when assessing the performance of these utilities.

SOURCES OF INFORMATION

This benchmarking study uses financial, operational, legal, and regulatory information from the utilities and the water sector of each country. Information used in this study are from the following sources:

- Data available on the websites of the utilities
- Annual reports published by the utilities
- The utilities' audited financial statements
- Operating, technical, and commercial information provided directly by the utilities that is not publicly available or part of the utilities' audited financial statements
- Information obtained during conference calls, e-mail exchanges, and site visits
- Water sector legislation and regulations
- The “Assessment of the Water Sector in the Caribbean” report published by the Caribbean Development Bank (Caribbean Development Bank 2015)
- World Bank project appraisal documents
- World Bank data

Well-performing water utilities typically have updated information and a deep understanding of their business. This includes having up-to-date and accurate information regarding their customer base, the volumes of water they produce and bill, and the condition of their fixed assets. In addition, within an effective governance framework, state-owned utilities make much of this information readily available to their stakeholders, including their customers. For example, effective water utilities publish annual reports with their audited financial statements within three to four months after the closing of their financial year on their websites. The availability and accuracy of this information is a strong indicator of a well-performing utility within a transparent and accountable governance framework. Therefore, the information available from or provided by each of the five assessed utilities is viewed to be a good proxy of the performance of each utility and the effectiveness of the governance framework.

Table 1.3 describes the information available from or provided by each of the five assessed utilities regarding some of the most important aspects of their business: quality of service, financials, water balance, other operating information, and coverage. For example, DOWASCO has published its annual report for 2015. That report has the audited financial statements, so it is labeled “Publicly available (2015)” in table 1.3. Subsequently, the availability and timeliness of each utility's information was assessed. Those with more current and complete data receive higher ratings.³ For example, BWS (Belize) was rated a 4 because it provided the information for 2016 and made its financial information publicly available, while NAWASA

TABLE 1.3 Information availability and disclosure

UTILITY	COUNTRY	QUALITY OF SERVICE	FINANCIALS	WATER BALANCE	OTHER OPERATING INFORMATION	COVERAGE	RATING ^a
BWS	Belize	Provided (2016)	Publicly available (2015); provided (2016)	Provided (2016)	Provided (2016)	Provided (2016)	4
DOWASCO	Dominica	Provided (2013)	Publicly available (2015)	Not provided	Provided (2015)	Provided (2015)	3
NAWASA	Grenada	Provided (2015)	Publicly available (2014)	Provided (2015)	Provided (2015)	Publicly available (2014)	3
NWC	Jamaica	Publicly available (2016)	Publicly available (2016)	Provided (2016)	Provided (2016)	Provided (2016)	4
WASCO	St. Lucia	Provided (2015)	Provided (2014)	Not provided	Provided (2015)	Provided (2015)	2

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

a. The year for which the data are available determines the rating; those with more current and complete data receive higher ratings.

(Grenada) was rated a 3 because most of the information it provided dated from 2015 and publicly available information dated from 2014. WASCO (St. Lucia) was rated a 2 because it did not provide the company's water balance and the data it provided dated from 2014 and 2015.

2 Assessment of Performance of Water Utilities in the Caribbean

This chapter analyzes the operational and financial performance of state-owned water utilities in Belize, Dominica, Grenada, Jamaica, and St. Lucia. The assessment, which indicates that the performance of the water utilities in the participating Caribbean countries needs to be improved, includes the following key points:

- Water coverage is very high, while access to wastewater services, especially through centralized piped systems, is low.
- The quality of service provided by many water utilities in the Caribbean is generally poor. Few utilities are able to measure, collect, or obtain data on the access and quality of the services they provide.
- Most of the water utilities in the Caribbean need to improve their operating efficiency. Many utilities exhibit high levels of nonrevenue water, lengthy delays in collecting bills from customers, and overstaffing.
- The utilities in the five countries of focus—Belize Water Services Limited (BWS), Dominica Water and Sewage Company (DOWASCO), National Water and Sewerage Authority (NAWASA) (Grenada), National Water Commission (NWC) (Jamaica), and Water and Sewerage Company (WASCO) (St. Lucia)—have stronger financial performance than most state-owned water utilities in the Caribbean.
- Water tariffs charged by the benchmarked utilities are affordable for customers.

Table 2.1 summarizes the performance of the five utilities of focus. The utilities are rated on the basis of their performance in water and sanitation coverage, quality of service, operating efficiency, and financial performance. The criteria used to assess the performance of the water utilities (see table 2.2) are based on the Water Utility Turnaround Framework, which was developed by the World Bank's Water Global Practice to improve the performance of utilities in countries where it is working (Soppe, Janson, and Piantini 2018; see box 2.1).

The framework recognizes that capital investments may be an important part of turning around a utility. Capital investments can be essential for increasing access to water supply and sanitation services, improving service quality, and increasing operational efficiency. The framework does emphasize the need to ensure that the utility has thorough knowledge of its systems and sufficient internal capacity when

TABLE 2.1 Summary performance of state-owned water utilities in the Caribbean

STATE-OWNED ENTERPRISE	COUNTRY	WATER COVERAGE	SANITATION COVERAGE	QUALITY OF SERVICE	OPERATING PERFORMANCE	FINANCIAL PERFORMANCE
BWS	Belize	4	1	3	4	3
DOWASCO	Dominica	2	1	—	2	2
NAWASA	Grenada	—	—	—	2	3
NWC	Jamaica	2	1	—	2	1
WASCO	St. Lucia	2	1	—	1	1

Note: Performance score ranges from 0 to 4, where a 4 indicates high level of success and a 0 indicates low level of success. The scores shown in this table are based on the scores obtained by the utility on the basis of the criteria listed in table 2.2. — = not available. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewage Company; NAWASA = National Water and Sewage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

TABLE 2.2 Performance ranking criteria

ELEMENT	0 RUDIMENTARY	1 BASIC	2 GOOD	3 WELL-PERFORMING	4 WORLD-CLASS
Organization and strategy	<ul style="list-style-type: none"> No performance targets 	<ul style="list-style-type: none"> Has measurable annual targets^a 	<ul style="list-style-type: none"> Index of aggregate performance targets is between 80% and 90%^b 	<ul style="list-style-type: none"> Index of aggregate performance targets is between 90% and 95% 	<ul style="list-style-type: none"> Index of aggregate performance targets is above 95%
Human resource management	<ul style="list-style-type: none"> Staff per thousand connections is greater than 10.0 	<ul style="list-style-type: none"> Staff per thousand connections is between 6.6 and 10.0 	<ul style="list-style-type: none"> Staff per thousand connections is between 5.1 and 6.5 	<ul style="list-style-type: none"> Staff per thousand connections is between 2.5 and 5.0 	<ul style="list-style-type: none"> Staff per thousand connections is less than 2.5
Financial management	<ul style="list-style-type: none"> Negative EBITDA margin^c 	<ul style="list-style-type: none"> EBITDA margin is positive but less than 5% 	<ul style="list-style-type: none"> EBITDA margin is between 5% and 17% Debt service coverage ratio (DSCR)^d exceeds 1.2 	<ul style="list-style-type: none"> EBITDA margin is between 18% and 30% DSCR exceeds 1.2 Net income is positive 	<ul style="list-style-type: none"> EBITDA margin is greater than 30% DSCR exceeds 1.2 Net income is positive The utility's planned CAPEX for the next 3 years is fully funded; >50% of the planned CAPEX is financed with debt
Technical operations	<ul style="list-style-type: none"> Piped water coverage is less than 50%^e Continuity cannot be measured or is less than 8 hours per day on average NRW is greater than 60% or unknown^f Average consumption is below 50 lpcd or above 500 lpcd 	<ul style="list-style-type: none"> Piped water coverage is between 50% and 75% Continuity of between 8 and 14 hours per day on average NRW is between 40% and 60% Average consumption is between 50 and 100 lpcd, or between 400 and 499 lpcd 	<ul style="list-style-type: none"> Piped water coverage is between 75% and 85% Continuity of between 15 and 19 hours per day on average NRW is between 30% and 39% and utility has a good understanding of the NRW value 	<ul style="list-style-type: none"> Piped water coverage is between 85% and 95% Continuity of between 20 and 23 hours per day on average NRW is below 30% and has fallen significantly during past several years 	<ul style="list-style-type: none"> Piped water coverage is above 95% Continuity of 24 hours per day on average NRW is approaching the utility's economic level Average consumption completely meets the needs of customers
	<ul style="list-style-type: none"> 0% of households in service area are connected to centralized wastewater system 0% of wastewater collected is treated 	<ul style="list-style-type: none"> < 20% of households in service area are connected to centralized wastewater system < 50% of wastewater collected is treated 	<ul style="list-style-type: none"> Between 20% and 49% of households are connected to centralized wastewater system Between 50% and 75% of wastewater collected is treated 	<ul style="list-style-type: none"> Between 50% and 80% of households are connected to centralized wastewater system Between 76% and 90% of wastewater collected is treated 	<ul style="list-style-type: none"> > 80% of households are connected to centralized wastewater system > 90% of wastewater collected is treated

continued

TABLE 2.2, continued

ELEMENT	0 RUDIMENTARY	1 BASIC	2 GOOD	3 WELL-PERFORMING	4 WORLD-CLASS
Commercial operations	<ul style="list-style-type: none"> Collection rate^a is below 60% 	<ul style="list-style-type: none"> Collection rate is between 60% and 70% 	<ul style="list-style-type: none"> Collection rate is between 71% and 90% Accounts receivable (days)^b are between 90 days and 61 days 	<ul style="list-style-type: none"> Collection rate is between 91% and 95% Accounts receivable (days) are between 60 days and 30 days 	<ul style="list-style-type: none"> Collection rate is greater than 95% Accounts receivable (days) are less than 30 days

Source: Adapted from the Water Utility Turnaround Framework (Soppe, Janson, and Piantini 2018) that was approved by the World Bank in June 2017.

Note: CAPEX = capital expenditures; DSCR = debt service coverage ratio; EBITDA = earnings before interest, taxes, depreciation, and amortization; lpcd = liters per person (capita) per day; NRW = nonrevenue water.

- a. The utility has a document, which has been approved by its Board of Directors or the manager of the utility, that clearly establishes specific measurable annual targets.
- b. In addition to having a document approved by its Board of Directors or the manager of the utility that clearly establishes specific measurable targets, the utility meets 80 to 85 percent of those targets. For example, if the utility has 10 targets and it meets 8 of these targets, its index of aggregate performance targets would be 80 percent.
- c. The EBITDA margin is equal to (revenues minus operating expenses) divided by revenues.
- d. The DSCR is equal to EBITDA divided by (interest plus repayment of principal).
- e. Piped water coverage is defined as the percentage of the population living within the utility's service area that is connected to the utility's network.
- f. Liters per connection per day lost is a more accurate measure of NRW. However, many utilities in developing countries do not have the capacity to measure this indicator. Therefore, this table uses NRW as a percentage of water supply so that it can be applied to all utilities. If, in the course of applying the Water Utility Turnaround Framework, it becomes apparent that this approach can be improved, the table will be changed.
- g. The collection rate is equal to cash collected from customers divided by billed amount.
- h. Accounts receivable (days) are equal to accounts receivable (net of provisions for doubtful accounts) divided by revenues, and then multiplied by 365.

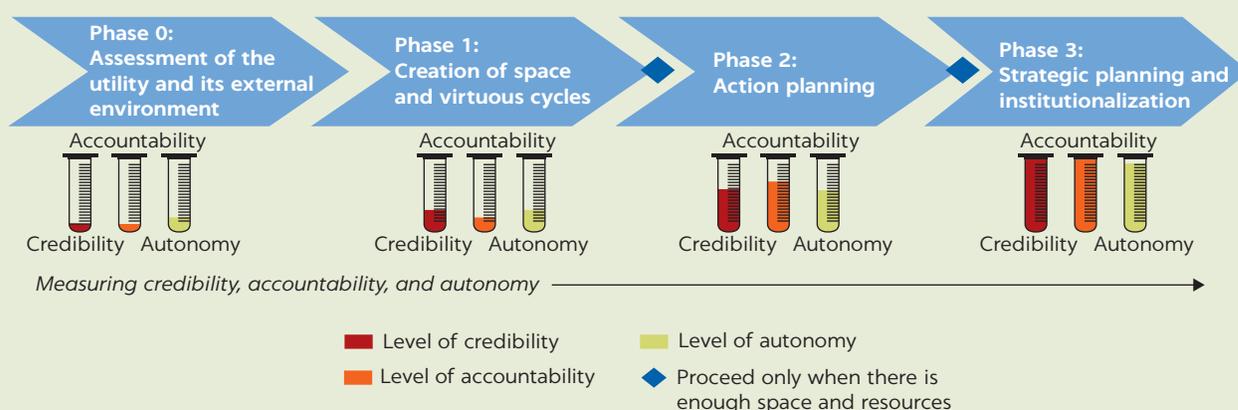
BOX 2.1

Water Utility Turnaround Framework

The Water Utility Turnaround Framework guides water utilities in improving their operational and financial performance. It recognizes that poor performance can originate from internal factors as well as a dysfunctional political economy environment—where water utilities often operate with little or no credibility, accountability, and autonomy. The framework consists of four phases, each comprising several steps (see figure B2.1.1). Several tools can be used to implement each phase. Phase 0 is a preliminary phase in which the current state of the utility and its external environment are assessed. From phase 1 onward, it is proposed that all steps be taken sequentially

and, to the extent possible, in the order set by the framework. Phase 1 is intended to help the utility's manager undertake relatively small, low-cost interventions to build the credibility, accountability, and autonomy necessary to move on to the next phase. Phase 2 allows management to design and implement action plans. Finally, in phase 3, management develops and implements measures that further raise the utility's maturity level, institutionalize best practices, and enable it to make long-term strategic plans. It should be noted that utilities can face a multitude of challenges at different times, and the improvement process may not be as linear as laid out here.

FIGURE B2.1.1 Framework phases



Source: Soppe, Janson, and Piantini 2018.

making these investments. This focus on strengthening the internal capacity of the utility should lead to more efficient and effective capital investments.

ACCESS TO WATER AND SANITATION SERVICES

The information regarding the benchmarked utilities indicates that while water coverage is very high, access to wastewater services is low in the Caribbean (see table 2.3). A well-performing utility should provide sufficient service to a large and potentially increasing number of people in the service area.

Water coverage

Water coverage at the country level

The provision of improved water services is high in the countries of the five utilities assessed. Improved water service includes any type of facility that adequately protects water from outside contamination, particularly from fecal matter (WHO no date). Improved water services include piped water as well as public standpipes and protected wells.

Of the five countries of focus, Belize has the highest access to improved water, with 100 percent of the population having access to improved water sources (see figure 2.1); approximately 81 percent of the population is served with piped water, and the remaining 19 percent of the population is served with other improved water. Jamaica and Dominica have the lowest rates of access to improved water, at 94 percent. In Jamaica, 72 percent of the population receives piped water and 22 percent of the population receives water from other improved services. In Dominica, 68 percent of the population receives water services from piped sources and 26 percent of the population receives other improved services.

Access to improved water differs between urban and rural areas. In general, rural populations have lower water coverage than urban areas, except in Belize (see figure 2.2). Jamaica and St. Lucia present the most significant differences in coverage between urban and rural areas. Urban access to improved water sources in Belize, Grenada, Jamaica, and St. Lucia is above the average for Latin America and the Caribbean (that is, 97 percent), and rural access to improved water sources is above the regional average (84 percent) in all five of the countries examined.

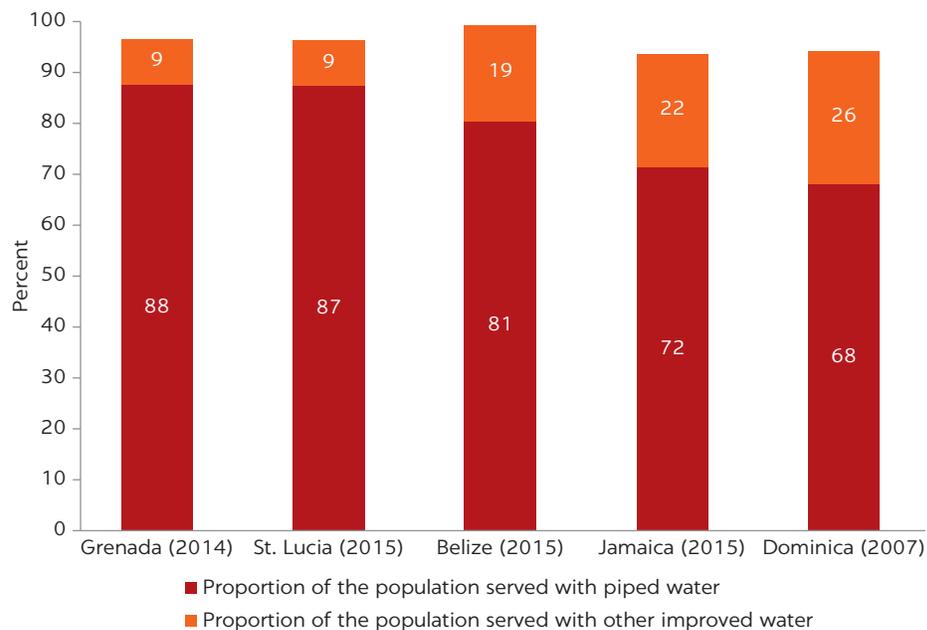
TABLE 2.3 Comparison of access to water and sanitation, 2015

STATE-OWNED ENTERPRISE	COUNTRY	COUNTRY'S IMPROVED WATER COVERAGE (%)	UTILITY'S WATER COVERAGE (%)	COUNTRY'S IMPROVED SANITATION COVERAGE (%)	UTILITY'S WASTEWATER COVERAGE (%)
BWS	Belize	100	96	91	17
DOWASCO	Dominica	94	67	—	8
NAWASA	Grenada	97	—	98	—
NWC	Jamaica	94	73	82	20
WASCO	St. Lucia	95	70	91	4

Sources: UNICEF and WHO 2015; Caribbean Development Bank 2015. Data provided by utilities.

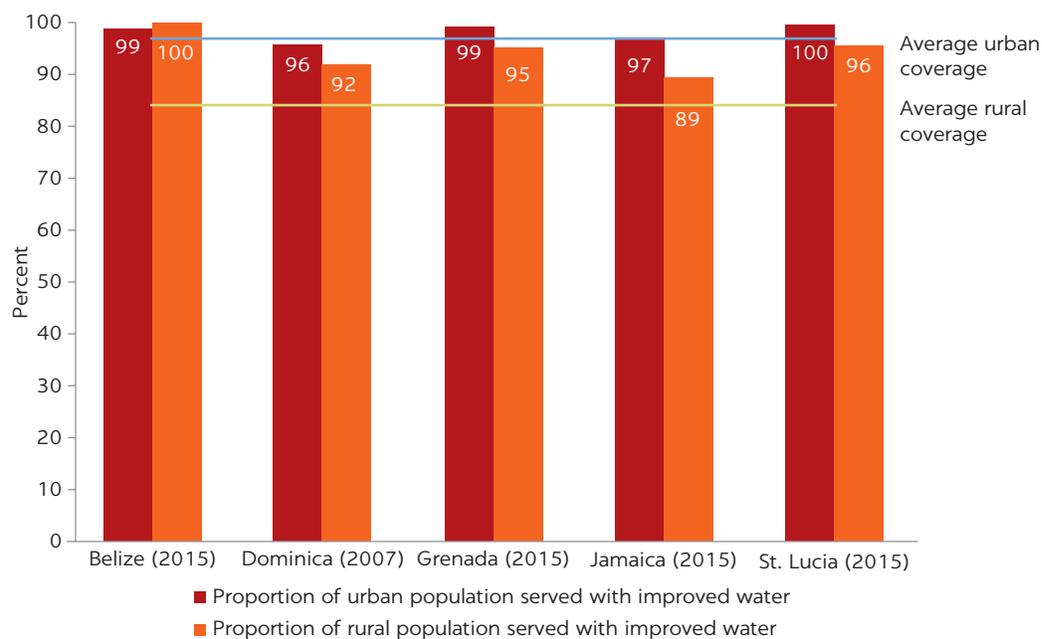
Note: — = not available. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewage Company; NAWASA = National Water and Sewage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

FIGURE 2.1
Access to improved water in Belize, Dominica, Grenada, Jamaica, and St. Lucia



Source: UNICEF and WHO 2015.

FIGURE 2.2
Access to improved water for urban and rural areas



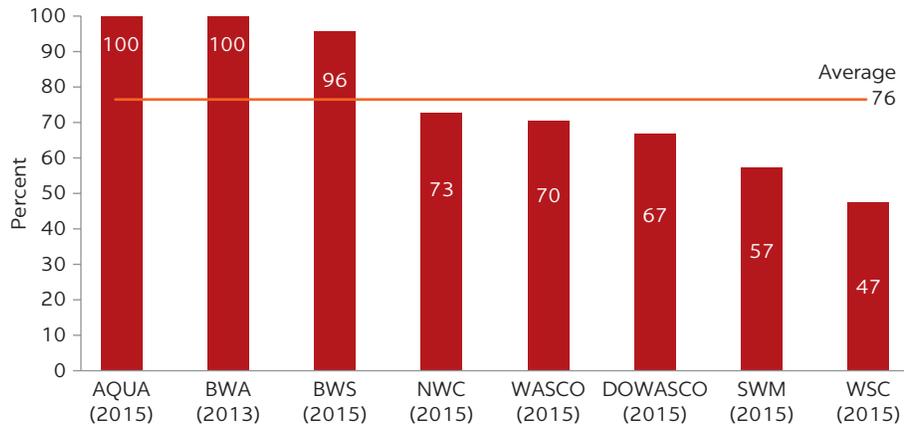
Source: UNICEF and WHO 2015.

Water coverage at the utility level

Water service coverage varies greatly among utilities in the Caribbean. Service coverage at the utility level is measured as the percentage of people within the utility's

service area who receive service from the utility.¹ Several utilities provide sufficient service to a large and potentially increasing number of people in the service area, such as Aquallectra Curaçao (AQUA), Barbados Water Authority (BWA), and BWS. These utilities provide the most extensive coverage among the benchmarked utilities (see figure 2.3). Surinaamsche Waterleiding Maatschappij (SWM) (Suriname) and Water and Sewerage Corporation (WSC) (The Bahamas) rank the lowest, providing service to 57 percent and 47 percent, respectively, of the population in their service areas.

FIGURE 2.3
Piped water coverage by utility



Sources: Original calculations with information provided by the utilities.

Note: AQUA = Aquallectra Curaçao; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewage Company; NWC = National Water Commission; SWM = Surinaamsche Waterleiding Maatschappij; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

Sanitation coverage

Sanitation coverage at the country level

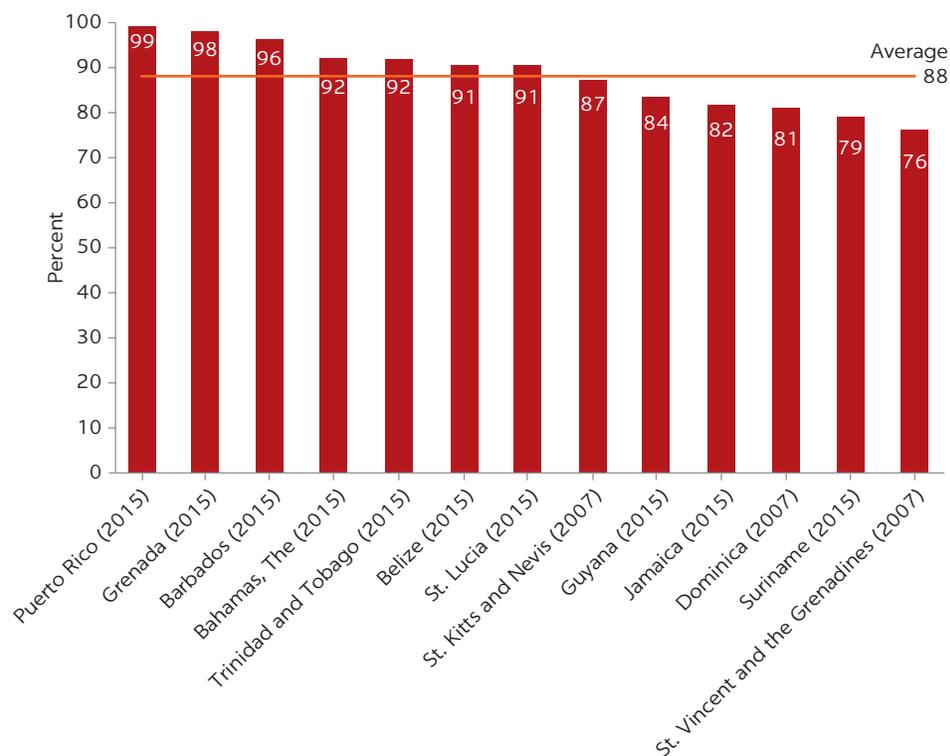
At the country level, sanitation coverage is assessed using the proportion of the population within a country with access to improved sanitation services. According to the World Health Organization (WHO), improved sanitation services include any type of facility that hygienically separates human excreta from human contact (WHO no date). Facilities using sewer connections, septic tanks, pour-flush latrines, and pit latrines with slabs are considered improved sanitation facilities.

Belize, Dominica, Grenada, and St. Lucia have a high level of access to improved sanitation. Their sanitation coverage is equal to or greater than the Latin America and the Caribbean average of 88 percent (see figure 2.4). Of the five countries of focus, Grenada has the highest access to improved sanitation, with 98 percent of the population served, while Dominica has the lowest level of access (81 percent).

Although some countries have high access to improved sanitation services, access to improved sanitation services varies between urban and rural areas. In Belize, access to improved sanitation is higher in urban areas than in rural areas, while the opposite holds true in Dominica, Jamaica, and St. Lucia (see figure 2.5).

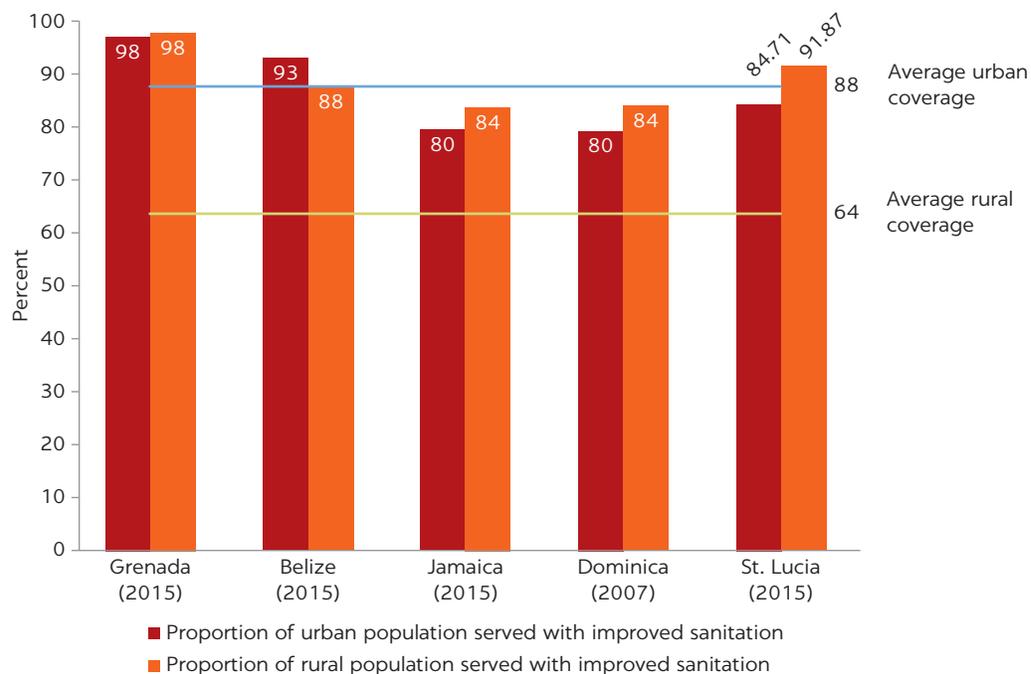
The most commonly used improved sanitation facilities are septic tanks and pit latrines. Table 2.4 shows the level of access to improved sanitation facilities in a subset of Caribbean countries. The Bahamas has the highest use of septic tanks, with approximately 81 percent of the population using septic tanks, while 13 percent are connected to a centralized sewerage system, and 4.5 percent use pit latrines (table 2.4). Access to centralized wastewater systems is low in the region. At 22 percent, Jamaica has the highest proportion of the population connected to a centralized sewerage system, while Grenada ranks the lowest (5 percent).

FIGURE 2.4
Proportion of population with access to improved sanitation



Source: UNICEF and WHO 2015.

FIGURE 2.5
Access to improved sanitation in rural and urban areas



Source: UNICEF and WHO 2015.

TABLE 2.4 Types of sanitation facilities in use

COUNTRY	CENTRALIZED SEWERAGE SYSTEM (%)	SEPTIC TANKS (%)	PIT LATRINES (%)	OTHER (%)
Bahamas, The (2009)	13	81	5	n.a.
Belize (2010)	63	n.a.	34	n.a.
Grenada (2012)	5	55	36	14
Guyana (2013)	13	n.a.	56	n.a.
Jamaica (2007)	22	42	34	n.a.
St. Lucia (2006)	7	63	23	n.a.
St. Vincent and the Grenadines (2012)	12	57	30	n.a.
Trinidad and Tobago (2012)	30	64	6	n.a.

Sources: PAHO 2012; Caribbean Development Bank 2015; Prudent-Phillip 2013; Silva 2015a, 2015b.

Note: n.a. = not applicable.

TABLE 2.5 Water pollution levels, 2010

COUNTRY	BIOCHEMICAL OXYGEN DEMAND ^a (MG/L ³)	TOTAL SUSPENDED SOLIDS ^b (MG/L)	F-COLI ^c (#/100 ML)	T-COLI ^d (#/100 ML)
Belize	813	1,875	100	37
Dominica	264	600	29	9
Grenada	346	788	38	13
Jamaica	12,413	28,212	1,354	451
St. Lucia	671	1,526	73	24

Source: Caribbean Development Bank 2015.

Note: # = parts/units; L = liter; MG = milligram; F-COLI = fecal coliform; T-COLI = total coliform.

- Biochemical oxygen demand (BOD) measures the amount of dissolved oxygen (DO) that is used by aerobic microorganisms when decomposing organic matter in water. The higher levels of BOD indicate the amount of organic matter available for oxygen consuming bacteria is greater.
- Total suspended solids (TSS) are considered conventional water pollutants. They are dry-weight particles that can be found in water.
- Fecal coliform (F-Coli) are a group of coliforms found in human and animal human material.
- Total coliform (T-Coli) include coliforms that are found in the soil and the environment.

Despite the relatively high level of access to improved sanitation, the lack of treatment and the undue disposal of wastewater are still prevalent in the Caribbean. On a regional level, it is estimated that 20 percent of the wastewater produced in the Caribbean is collected and that 5 percent of the total wastewater is treated and disposed of appropriately (Pemberton 2003). A 2010 Caribbean Environment Programme technical report on water pollution in the Caribbean found fecal coliform bacteria (F-Coli) in water sources, which indicates water is contaminated with fecal material; higher contamination leads to a greater health risk for individuals who come in contact with the contaminated water. In 2010, Jamaica's water source had the highest pollution levels and the highest levels of *Escherichia coli* (*E. coli*) (table 2.5).

In summary, in all of the analyzed countries, wastewater collection needs to be improved and wastewater treatment needs to be increased.

Sewerage coverage at the utility level

Wastewater coverage at the utility level is very low in the Caribbean. Of the benchmarked utilities that provided information regarding this indicator, coverage averaged 9 percent (figure 2.6). Of those utilities, NWC (Jamaica) has the most extensive coverage, providing wastewater services to 20 percent of the population.

FIGURE 2.6
Sewerage coverage by utility



Sources: Information provided by the utilities.

Note: AQUA = Aqualetra Curaçao; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NWC = National Water Commission; WASCO = Water and Sewerage Company.

QUALITY OF SERVICE

The information obtained regarding the benchmarked utilities indicates that the quality of service provided by many water utilities in the Caribbean is generally poor; this is evidenced by the lack of data. To perform well, utilities need to have the necessary systems and equipment in place to measure quality of service. Not having these systems can affect the performance of the utilities and may exacerbate poor service provision because it is difficult to improve performance if one does not know what needs to be improved and by how much. In reality, few water utilities measure, collect, or can readily access data on the quality of the services they provide (for example, regarding average continuity in their networks). Indeed, most of the utilities surveyed did not provide any information on the quality of the services they provide. In addition, for those utilities that provided information on their quality of service, data on water quality are more readily available than data on the quality of the service.

Quality of service describes the reliability, continuity, and responsiveness of the service provided by the utility. It also includes the quality of water provided and the wastewater that is collected and disposed. The quality of service provided by water utilities in the Caribbean is assessed using the following indicators:

- Quality of water supplied
- Continuity of service
- Average number of complaints per 1,000 customers
- Wastewater treatment

Of the five utilities of focus, BWS (Belize) provided information on all five aspects of quality of service. The other four utilities provided little or no information. In instances where the other utilities provided information, the quality of service reported by BWS was, in most cases, higher than for the other four utilities. For example, BWS reported that 96 percent of its water-quality tests met WHO standards (the same level as NAWASA in Grenada), while WASCO (St. Lucia) reported that 83 percent of its water-quality tests met WHO standards. BWS reported that

100 percent of its wastewater is treated, while DOWASCO (Dominica) reported that 23 percent of its wastewater receives treatment and NWC (Jamaica) reported that 50 percent of its wastewater receives treatment. BWS's rate of complaints per year per 1,000 customers (24.9) was in between the other two utilities reporting information (39 for DOWASCO in Dominica and 11.3 for WASCO in St. Lucia) (see table 2.6).

Quality of water supplied

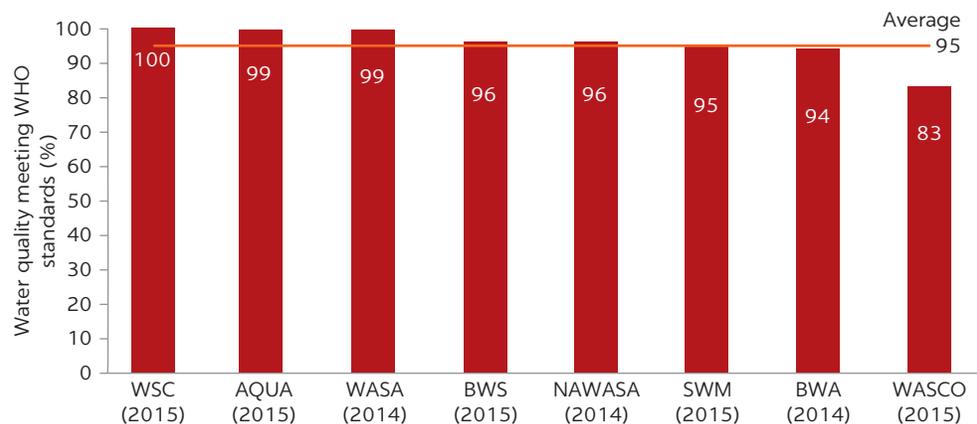
All of the utilities that provided information reported high levels of water quality; the quality was measured by determining what percentage of the water tested met WHO standards for adequate water quality. Specifically, seven utilities—AQUA (Curaçao), BWS (Belize), SWM (Suriname), WSC (The Bahamas), WASA (Trinidad and Tobago), NAWASA (Grenada), and BWA (Barbados)—reported that the percentage of water tested met standards. And six out of eight utilities reported at least 95 percent of the water they supplied met WHO standards for water quality (see figure 2.7).

TABLE 2.6 Summary indicators of quality of service

UTILITY	COUNTRY	QUALITY OF WATER SUPPLIED (% OF WATER-QUALITY TESTS MEET WHO STANDARDS)	WASTEWATER TREATMENT (% OF WASTEWATER RECEIVING TREATMENT)	CONTINUITY OF SERVICE (AVERAGE HOURS OF SERVICE PER DAY)	CUSTOMER SERVICE (COMPLAINTS PER YEAR/1,000 CUSTOMERS)
BWS	Belize	96	100	24	24.9
DOWASCO	Dominica	—	23	—	39
NAWASA	Grenada	96	—	—	—
NWC	Jamaica	96	50	16	112
WASCO	St. Lucia	83	—	—	11.3

Sources: Information provided by the utilities.
 Note: — = not available. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company; WHO = World Health Organization.

FIGURE 2.7
 Quality of water supplied



Sources: Information provided by the utilities.
 Note: AQUA = Aquallectra Curaçao; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; NAWASA = National Water and Sewerage Authority; SWM = Surinaamsche Waterleiding Maatschappij; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WHO = World Health Organization; WSC = Water and Sewerage Corporation.

Continuity of service

Most of the utilities that provided information reported high levels of continuity of service. Continuity of service is measured as the average hours of water supplied per day. Continuous water service is when a customer receives an average of 24 hours of water service per day, seven days per week (24/7).

Six utilities—AQUA (Curaçao), WASA (Trinidad and Tobago), WSC (The Bahamas), SWM (Suriname), BWS (Belize), and Guyana Water Incorporated (GWI)—provided information on the continuity of water service. GWI reported intermittent service, providing water an average of 12 hours of service per day, while all of the other utilities provided continuous service 20 hours per day (see figure 2.8).

Customer satisfaction

Customer satisfaction varied greatly among the utilities that provided information. For this report, customer satisfaction was assessed as the average number of customer complaints per 1,000 customers, as reported by the utilities. It is important to note that utilities that are focused on improving customer service may receive more complaints than other utilities because they may have better systems in place for collecting and tracking customer complaints. For example, BWS (Belize) recently installed an upgraded work-order tracking system that monitors customers' complaints and BWS's responsiveness to those complaints.

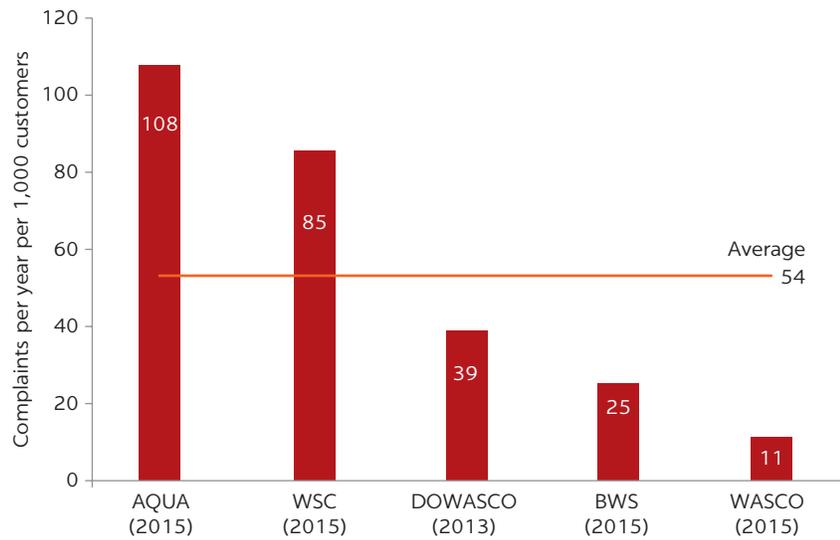
Six utilities—AQUA (Curaçao), NWC (Jamaica), WSC (The Bahamas), DOWASCO (Dominica), BWS (Belize), and WASCO (St. Lucia)—reported on the number of complaints received. The average number of customer complaints per 1,000 customers ranged from 108 (AQUA in 2015) to 11 (WASCO in 2015) (see figure 2.9).

BWS also reported on the degree to which customers are satisfied with various aspects of quality of service, including continuity of water supply, water pressure, and quality of BWS's responsiveness to customer complaints. Overall, BWS customers are satisfied with most aspects of service quality. More than 80 percent of BWS customers are satisfied with the continuity of service and water pressure. In addition, 80 percent of BWS customers indicated that the utility's responsiveness to customer complaints is either good or excellent (BWS 2014).

FIGURE 2.8
Continuity of service



Sources: Information for AQUA, WSC, and BWS provided by the utilities. Source for GWI, WASA, and SWM data: Caribbean Development Bank 2015.
Note: AQUA = Aqualiectra Curaçao; BWS = Belize Water Services Limited; GWI = Guyana Water Incorporated; SWM = Surinaamsche Waterleiding Maatschappij; WASA = Water and Sewerage Authority; WSC = Water and Sewerage Corporation.

FIGURE 2.9**Average number of customer complaints per 1,000 customers**

Sources: Information provided by the utilities.

Note: AQUA = Aqualetra Curaçao; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

Wastewater treatment

Wastewater treatment is inadequate in the Caribbean in terms of wastewater treatment rates and effluent quality. Wastewater treatment is measured as the percentage of wastewater that receives any type of treatment—primary, secondary, or tertiary. Only two utilities—BWS (Belize) and DOWASCO (Dominica)—reported on wastewater treatment. Wastewater treatment rates varied greatly between these utilities. For example, BWS reported that it treated 100 percent of its collected wastewater, while DOWASCO reported a wastewater treatment rate of 23 percent. Wastewater treatment is not the only recourse; for instance, areas that are not densely populated can explore the use of septic tanks, provided the right regulatory framework is implemented to protect the environment and the water resources.

Poor effluent quality is also prevalent in the region, as indicated by the following anecdotal evidence:

- **Belize:** Water wells in areas where sewage treatment facilities are located have shown contamination with fecal material (Amandala 2015). Tests of the well water have shown a high presence of *E. coli* and other coliforms. This contamination has caused swimming to be discouraged in some coastal waters.
- **Dominica:** At two small sewerage systems, Canefield and Jimmit, the sewage is collected and disposed of at sea with no prior treatment (Caribbean Development Bank 2015).
- **Grenada:** Inappropriate disposition of sewage is responsible for the presence of fecal coliform in the coastal waters of Grenada (Caribbean Development Bank 2015).
- **St. Lucia:** Wastewater is either partially treated and discharged into a natural watercourse, or untreated and discharged into open drains. The discharge of untreated wastewater has led to pollution within the Vieux Fort Coast. Most treatment facilities do not operate satisfactorily because of inadequate

maintenance and outdated treatment regimens—15 percent of treatment facilities were in poor condition and 39 percent were nonoperational (Caribbean Development Bank 2015).

OPERATING PERFORMANCE

Most of the water utilities in the Caribbean need to increase their operating efficiency. Many of them have nonrevenue water (NRW) levels above 40 percent, have lengthy delays in collecting bills from customers, and are overstaffed. Among the five utilities assessed for this study, BWS (Belize) has the best operating performance. It has the lowest NRW level (24 percent), the shortest average time to collect bills from customers, and the highest staff productivity (table 2.7).

The assessment of the operating performance of the five utilities is based on the indicators given and the comparison with the full set of benchmarked utilities provided in subsequent subsections of this chapter:

- Nonrevenue water
- Collection efficiency
- Staff efficiency
- Energy efficiency.

Nonrevenue water

NRW is the difference between the volume of water produced and the volume of water that is billed to customers. Higher NRW losses can increase operating expenditures (by increasing electricity and chemical costs or purchased water) and decrease revenues (as water that is consumed is not billed). The optimal NRW value for a water utility depends on the cost of water production.² Most water utilities with high NRW losses may benefit from reducing NRW. The information collected for this report indicates that all of the benchmarked utilities—except for NAWASA (Grenada), AQUA (Curaçao), and BWS (Belize)—would benefit greatly from the reduction of their NRW (figure 2.10).

Of the five utilities that are the focus of this study, DOWASCO (Dominica) and WASCO (St. Lucia) did not report their levels of NRW—the values provided in figure 2.10 are estimates from the Caribbean Development Bank’s 2015 report. It is possible that these two utilities did not report their levels of NRW because they

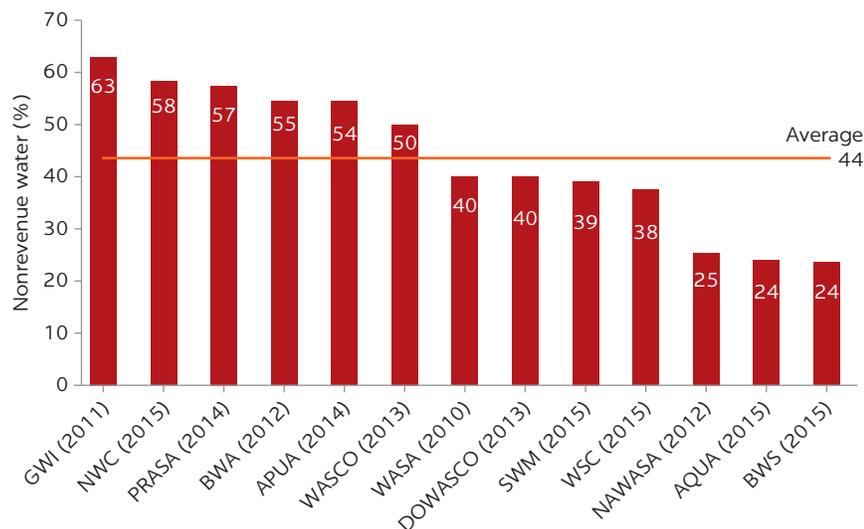
TABLE 2.7 Operating performance of utilities

UTILITY	COUNTRY	NONREVENUE WATER	COLLECTION EFFICIENCY	STAFFING	ENERGY EFFICIENCY	OVERALL PERFORMANCE
BWS	Belize	4	4	3	3	4
DOWASCO	Dominica	2	2	2	2	2
NAWASA	Grenada	4	3	2	—	3
NWC	Jamaica	1	2	2	1	2
WASCO	St. Lucia	1	1	2	2	1

Source: For DOWASCO and NAWASA nonrevenue water data: Caribbean Development Bank 2015.

Note: Performance score ranges from 0 to 4, where a 4 indicates high level of success and a 0 indicates low level of success. The scores shown in this table are based on the scores obtained by the utilities on the basis of the criteria listed in table 2.2. — = not available. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

FIGURE 2.10
Nonrevenue water across Caribbean water utilities



Sources: Information provided by the utilities. Source for DOWASCO, NAWASA, GWI, WASCO, and CWASA data: Caribbean Development Bank 2015.

Note: APUA = Antigua Public Utilities Authority; AQUA = Aqualetra Curaçao; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; GWI = Guyana Water Incorporated; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; SWM = Surinaamsche Waterleiding Maatschappij; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

did not have sufficiently accurate data to know their approximate levels of NRW.³ The available data indicate that two of the five assessed utilities improved their NRW levels from 2010 to 2015 (figure 2.11). NWC (Jamaica) reduced its NRW from 68 percent to 58 percent, and BWS (Belize) reduced its NRW from 29 percent to 24 percent. However, NWC's NRW is still high.

NRW is of particular concern for NWC, which reported one of the highest levels of NRW (58 percent). Even though this is a substantial improvement from 2011, when NWC's NRW was 68 percent, it still poses a major problem for the utility's financial sustainability. NWC acknowledged in note 2 (b) of its 2016 audited financial statements that

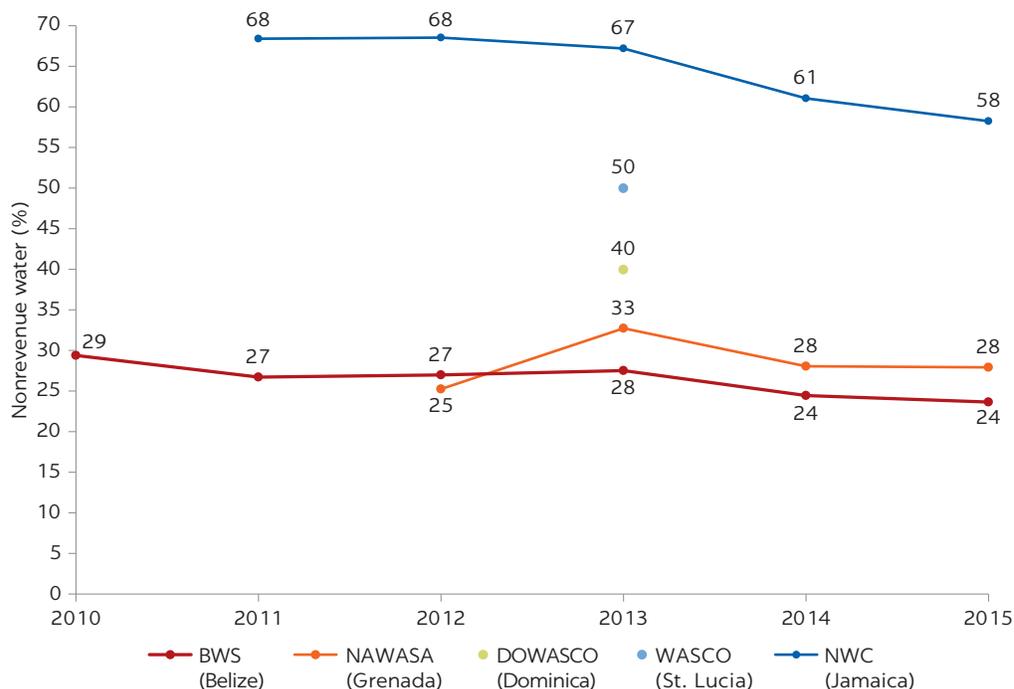
the ability of the group and the Commission to regain and sustain profitability and to generate the incremental cash flows to meet its significant debt service obligations and other operational costs is, therefore, dependent on its ability to successfully minimize operational costs and reduce nonrevenue generating water supplied.

BWS (Belize) demonstrates that a well-implemented strategy can lead to significant reductions in NRW. Between 2003 and 2015, BWS managed to reduce its NRW from 54 percent to 24 percent (see figure 2.12). This reduction in NRW allowed BWS to bill 60 percent more water in 2015 than it did in 2003, using the same volume of water produced.

Collection efficiency

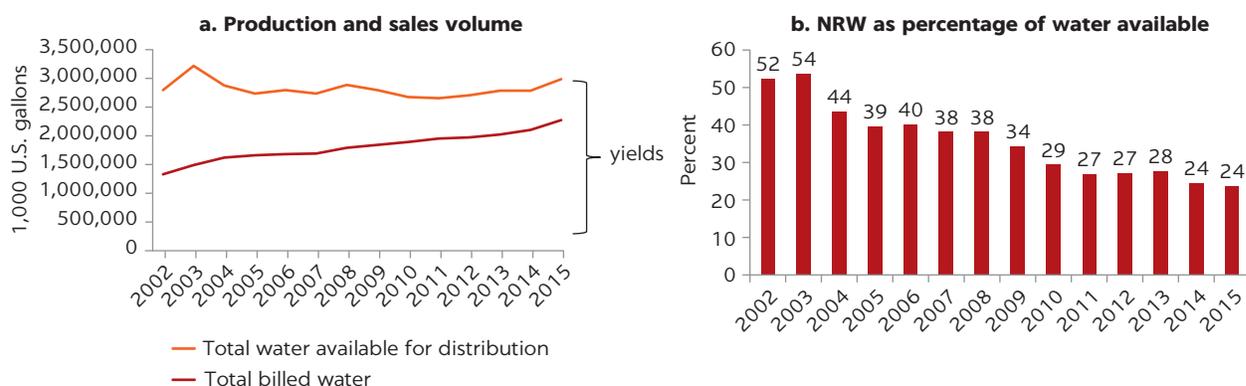
A water utility's ability to collect bills issued to its customers has a direct and significant impact on its financial sustainability. Only three of the utilities reported the data necessary to directly calculate the utilities' collection rate; therefore, collection efficiency was assessed using the ratio of accounts receivable (net of

FIGURE 2.11
Nonrevenue water levels of the assessed utilities, 2010–15



Sources: Information provided by the utilities.
 Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

FIGURE 2.12
BWS’s nonrevenue water, 2002–15

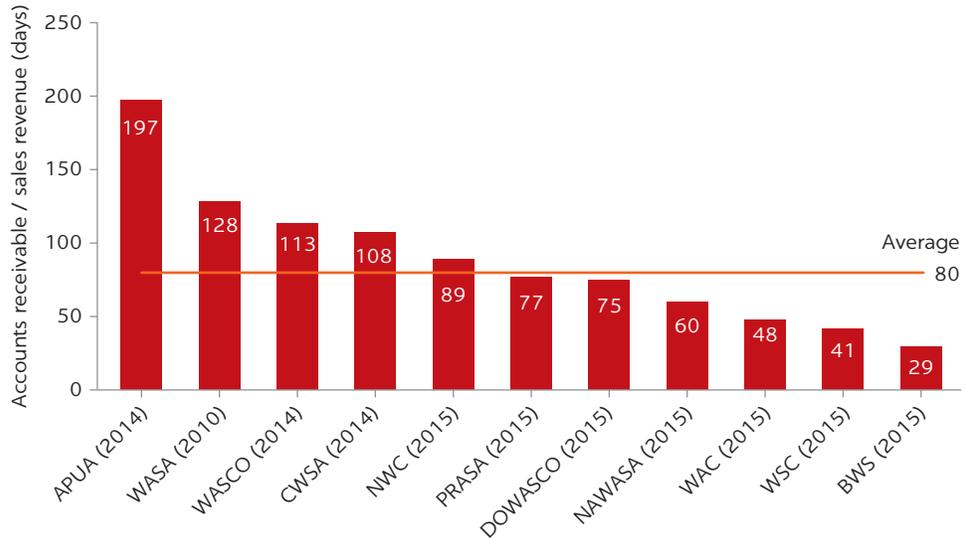


Sources: Information provided by BWS.
 Note: BWS = Belize Water Services Limited; NRW = nonrevenue water.

provisions for doubtful accounts) to revenue, and then multiplying by 365 days. For the benchmarked utilities, it takes on average about 80 days to collect amounts billed to customers (figure 2.13), with several of the utilities taking more than 100 days.⁴ At 29 days, BWS (Belize) appears to have the best collection efficiency of the benchmarked utilities.

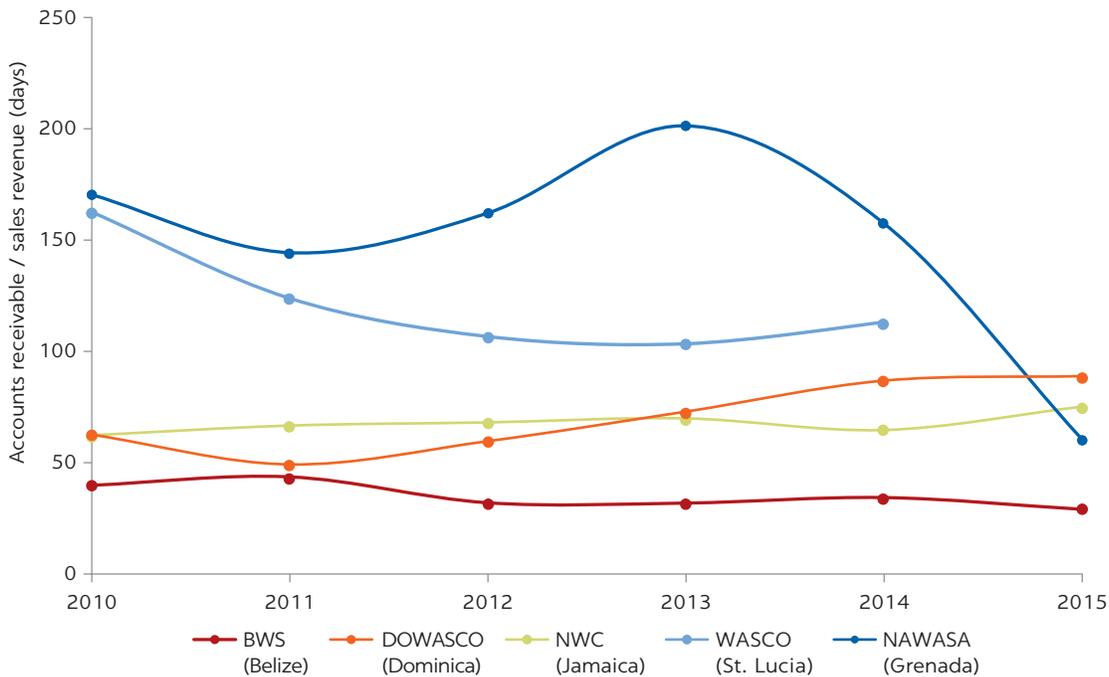
Three out of the five assessed utilities—NAWASA (Grenada), BWS (Belize), and WASCO (St. Lucia)—improved their collection efficiency between 2010 and 2015 (figure 2.14). While BWS (Belize) and WASCO (St. Lucia) decreased their collection period at an incremental rate over five years, NAWASA sharply

FIGURE 2.13
Accounts receivable / sales revenue



Sources: The utilities' audited financial statements.
 Note: APUA = Antigua Public Utilities Authority; BWS = Belize Water Services Limited; CWSA = Central Water and Sewerage Authority; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WAC = Water Authority Cayman; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.14
Accounts receivable / sales revenue for the assessed utilities, 2010–15



Sources: The utilities' audited financial statements.
 Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

decreased its collection period, from about 200 days to about 50 days, between 2013 and 2015.

Another indicator of a water utility’s collection efficiency is the provision for doubtful accounts as a percentage of gross accounts receivable.⁵ Water utilities increase their provisions for doubtful accounts as their confidence in collecting certain bills decreases. Therefore, a utility with high uncertainty about whether bills can be collected will have provisions for doubtful accounts that represent a high percentage of its gross accounts receivable. For the benchmarked utilities, provisions for doubtful accounts averaged 48 percent of their accounts receivable (figure 2.15).

Staff efficiency

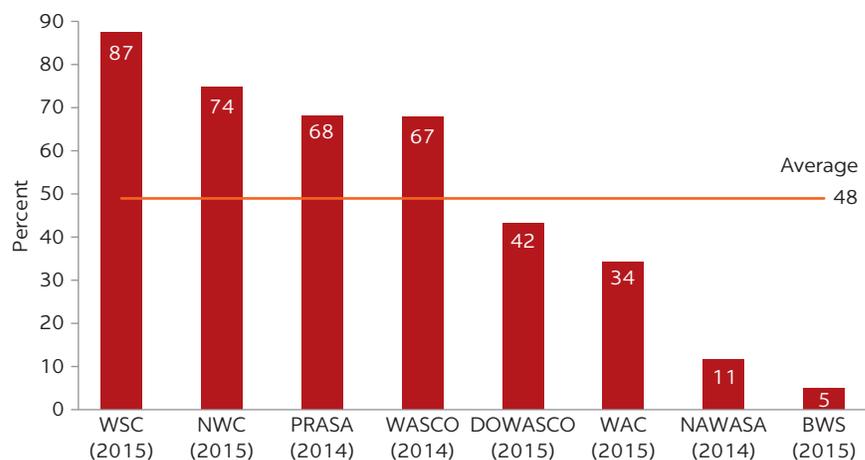
The indicators for the benchmarked water utilities suggest that most water utilities in the Caribbean could increase their financial sustainability by improving staff efficiency. For most water utilities, staff costs represent a large share of operating expenditures (OPEX). Therefore, staff efficiency is an important measure of operating efficiency from a cost perspective.⁶ For this study, staff efficiency of the benchmarked utilities was assessed with the following indicators:

- Staff costs as a percentage of operating expenditures
- Number of employees per 1,000 connections
- Average annual compensation per employee (US\$)

Staff costs as a percentage of operating expenditures

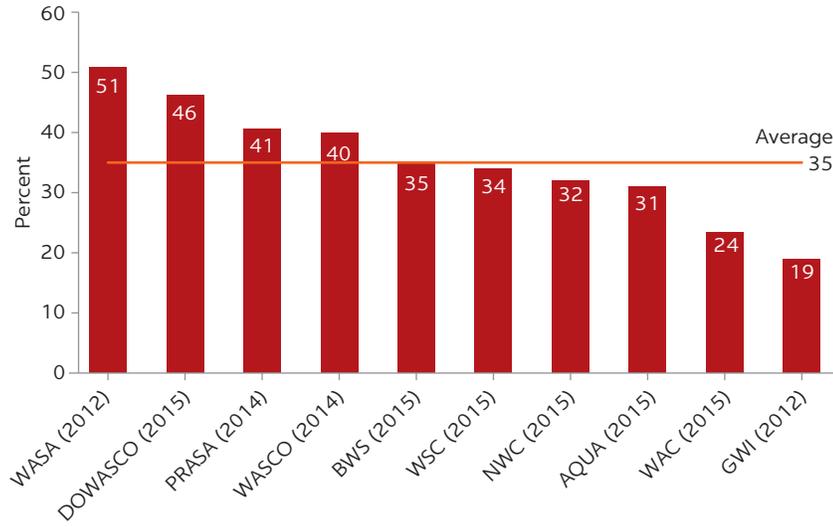
For the benchmarked utilities that have the information available to calculate this indicator, staff costs range from 19 percent (GWI in Guyana) to 51 percent (WASA in Trinidad and Tobago) of OPEX (see figure 2.16). For reference, a typical value for water utilities falls in the range of 25 percent to 40 percent.⁷ Of the five

FIGURE 2.15
Provision for doubtful accounts / gross trade receivables



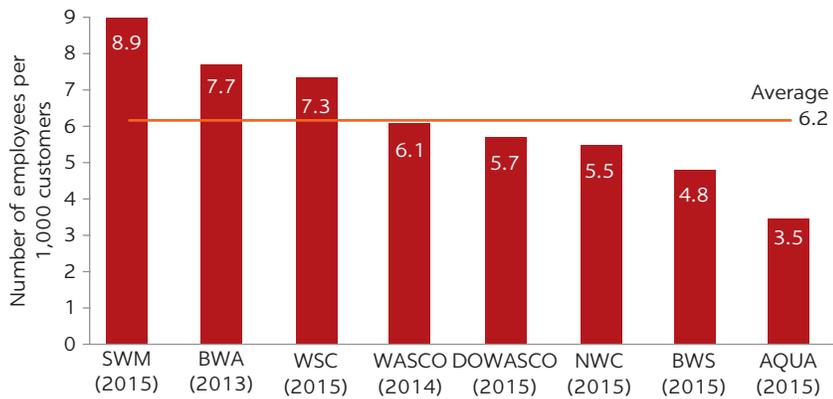
Sources: The utilities’ audited financial statements.
 Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WAC = Water Authority Cayman; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.16
Staff costs as a percentage of operating expenditures



Sources: The utilities’ audited financial statements.
 Note: AQUA = Aquallectra Curaçao; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; GW I = Guyana Water Incorporated; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WAC = Water Authority Cayman; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.17
Employees per 1,000 water customers



Sources: Information provided by the utilities.
 Note: AQUA = Aquallectra Curaçao; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NWC = National Water Commission; SWM = Surinaamsche Waterleiding Maatschappij; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

utilities of focus for this study, NWC (Jamaica) has the lowest value (32 percent) and DOWASCO (Dominica) has the highest value (46 percent).

Number of employees per 1,000 connections

The results from the benchmarked utilities indicate that many water utilities in the Caribbean may be over-staffed. That is, the average water utility in the Caribbean could provide the same quality of service with fewer staff. Labor productivity in water utilities is most commonly measured as the number of employees per 1,000 connections.⁸ From the benchmarked utilities with information available, AQUA (Curaçao) is the most efficient (3.5) and SWM (Suriname) is the least efficient (8.9) (see figure 2.17). The best-performing utilities in the world have less than 2.5 staff per 1,000 connections. However, since the majority of the Caribbean utilities under review tend to be very small, achieving such staff productivity numbers may be more difficult because of the lack of economies of scale in the region.

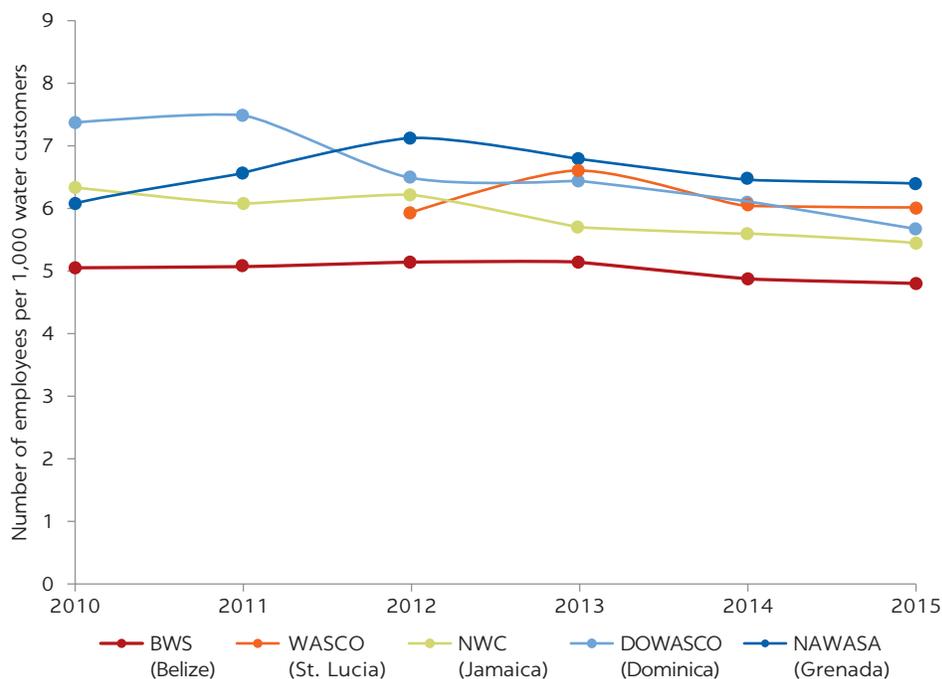
Figure 2.18 shows the labor productivity of the assessed state-owned enterprises (SOEs) from 2010 to 2015. Three out of the five assessed utilities maintained the number of employees per 1,000 water customers from 2010 to 2015. DOWASCO (Dominica) is the only assessed SOE that improved its labor productivity, reducing its number of employees per 1,000 water customers from more than 7 to around 6.

Average compensation per employee

Of the benchmarked utilities for which there is information available, the average annual compensation per employee is about US\$33,419 (figure 2.19), with DOWASCO (Dominica) at the bottom of the range (US\$16,187) and PRASA (Puerto Rico) at the top (US\$57,296).

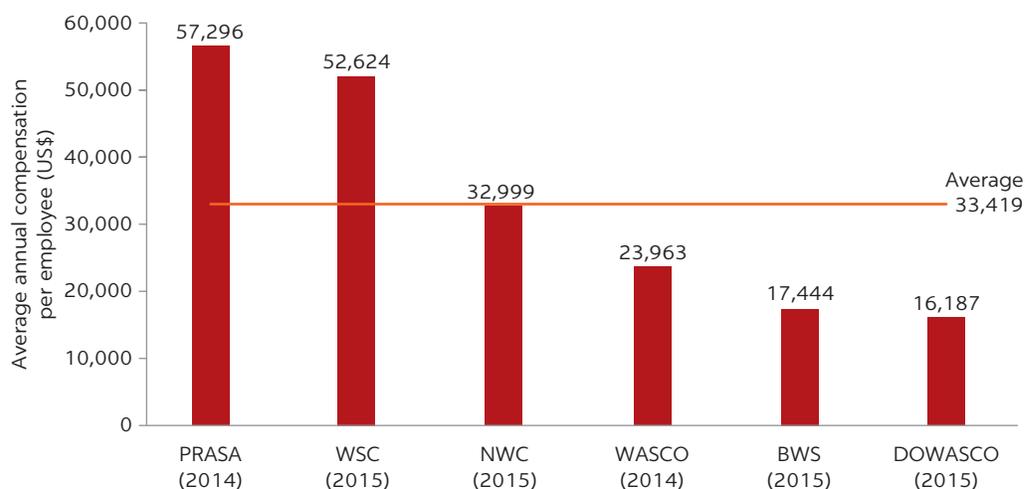
Despite having staff costs that represent about 35 percent of operating expenditures, of the benchmarked utilities, BWS (Belize) has the most efficient labor force. It has one of the highest levels of staff productivity, and its average annual compensation is among the lowest (see figure 2.20).

FIGURE 2.18
Number of employees per 1,000 water customers of the assessed state-owned enterprises, 2010-15



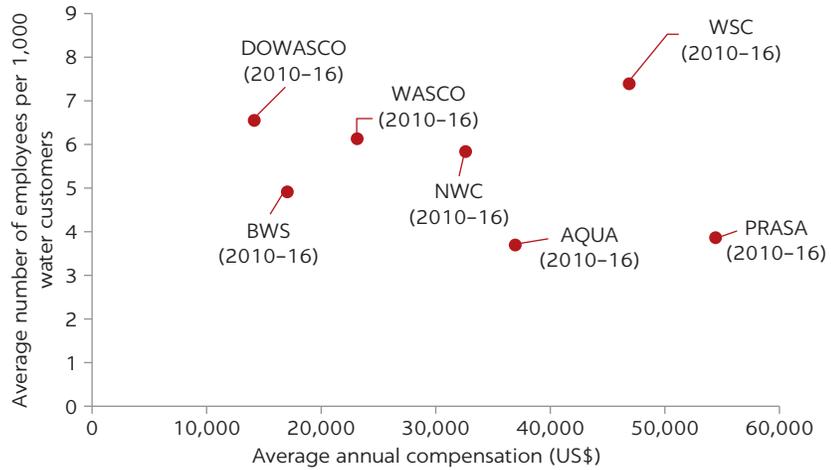
Sources: Information provided by the utilities.
 Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

FIGURE 2.19
Average annual compensation per employee



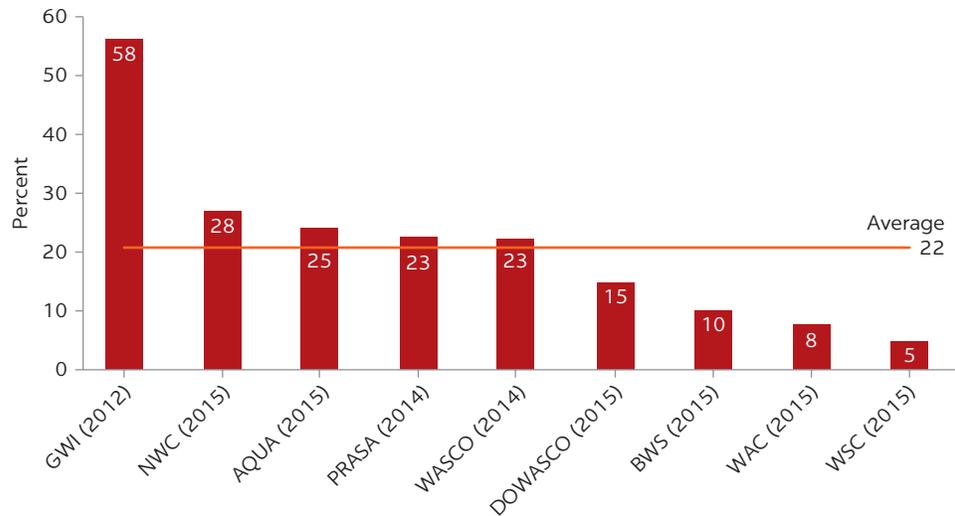
Sources: Information provided by the utilities.
 Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.20
Employees per 1,000 customers vs. average annual compensation



Sources: Information provided by the utilities.
 Note: AQUA = Aqualetra Curaçao; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.21
Electricity costs as a percentage of operating expenditures

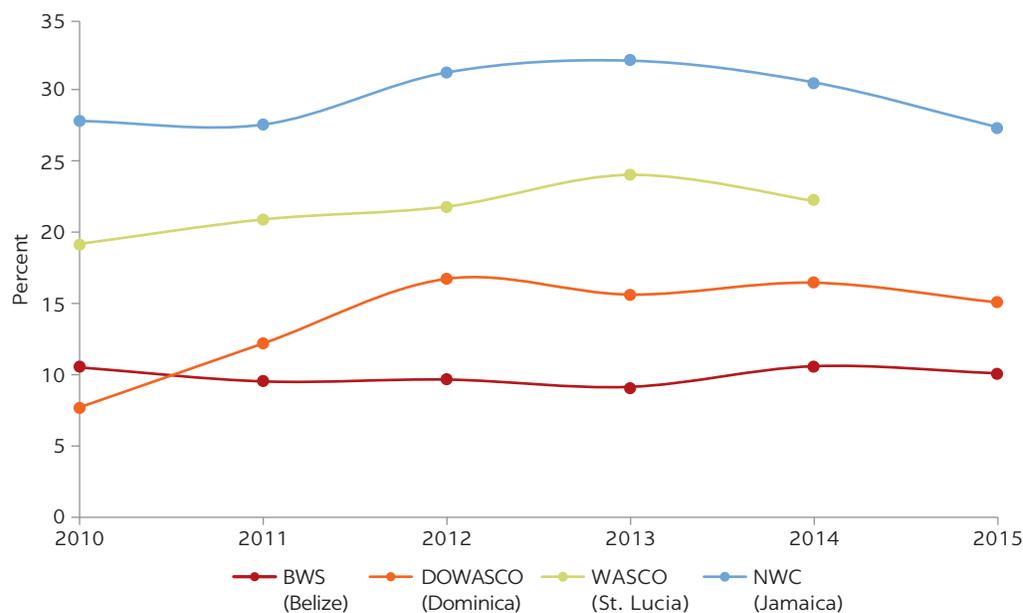


Sources: The utilities' audited financial statements.
 Note: AQUA = Aqualetra Curaçao; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; GW I = Guyana Water Incorporated; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WAC = Water Authority Cayman; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

Energy efficiency

Water utilities can be large consumers of electricity; electricity costs usually represent a large share of utilities' operating expenditures. They use electricity primarily for abstracting, treating, and distributing water, as well as for collecting and treating wastewater.² Electricity costs as a percentage of operating expenditures ranged from 5 percent (WSC in The Bahamas) to 58 percent (GWI in Guyana) (see figure 2.21).¹⁰ According to a recent Caribbean Development Bank report (2015),

FIGURE 2.22
Electricity costs as a percentage of operating expenditures, 2010–15



Sources: The utilities' audited financial statements.

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NWC = National Water Commission; WASCO = Water and Sewerage Company.

NWC's (Jamaica) electricity costs are a large share of its operating expenditures (28 percent) because of its need to service areas at different altitudes and its long transmission network.

Figure 2.22 shows the electricity costs of the assessed SOEs from 2010 to 2015. Three out of the four assessed water SOEs—NWC (Jamaica), WASCO (St. Lucia), and BWS (Belize)—that provided information on their operating expenses maintained their electricity costs at about the same level. In contrast, DOWASCO's (Dominica) electricity costs doubled, from 7 percent to 15 percent, during this period.

FINANCIAL PERFORMANCE

The five utilities of focus all have earnings before interest, taxes, depreciation, and amortization (EBITDA) margins of at least 14 percent (see table 2.8).¹¹ In addition, except for NWC, each of the utilities has a debt service coverage ratio (DSCR)¹² above 1.2, which shows that those utilities have the ability to access commercial financing. However, NWC (Jamaica) and WASCO (St. Lucia) have demonstrated some weaknesses in their financial performance that have led their auditors to indicate that their respective governments' continued support may be essential for each of these utilities to continue as a "going concern" (a business that is making a profit). One indication of this is NWC's negative return on assets (ROA).

Of the five utilities, BWS (Belize) has the strongest financial position. In 2015, it had an EBITDA margin of 35 percent, a DSCR of 2.2, an ROA of 4.1 percent,¹³ and it did not depend on the government's support to remain a going concern.

Water utilities are capital intensive—they depend on a continuous flow of capital expenditures to expand access and improve quality of service. For this reason,

TABLE 2.8 Financial performance

UTILITY	COUNTRY	EBITDA MARGIN (%)	NET INCOME / REVENUES (%)	RETURN ON EQUITY (%)	DEBT SERVICE COVERAGE RATIO	RELIANCE ON GOVERNMENT ^a
BWS (2015)	Belize	35	17	4.1	2.2	No
DOWASCO (2015)	Dominica	40	10.7	1.3	1.62	No
NAWASA (2015)	Grenada	27	18	6.3	—	No
NWC (2015)	Jamaica	14	-5	-1.6	1.1	Yes ^b
WASCO (2014)	St. Lucia	22	14.3	4.8	6.4	Yes ^c

Sources: The utilities' audited financial statements.

Note: — = not available. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; EBITDA = earnings before interest, taxes, depreciation, and amortization; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

a. "Yes" indicates that the utility's audited financial statements state that the utility may not be able to continue as a "going concern" without the government's continued support.

b. Note 2(b) of NWC's 2016 audited financial statements states: "The Group and the Commission made a loss for the year of US\$4,110,716,000 (2015: US\$450,775,000) and US\$4,190,997,000 (2015: US\$1,218,321,000) respectively, and, at the reporting date, the Group and Commission had an accumulated deficit of US\$31,730,540,000 (2015: US\$28,645,283,000) and US\$31,825,764,000 (2015: US\$28,672,148,000) respectively. The ability of the Group and the Commission to regain and sustain profitability and to generate the incremental cash flows to meet its significant debt service obligations and other operational costs is, therefore, dependent on its ability to successfully minimize operational costs and reduce non-revenue-generating water supplied. These conditions indicate the existence of a material uncertainty that may cast doubt about the Group's and the Commission's ability to continue as a going concern."

c. Note 2 of WASCO's 2014 audited financial statements [these were the most current version provided by WASCO] states: "The Company had a deficit of US\$117,402,790 at December 31, 2014 (2013: US\$123,870,092). The ability of the Company to continue as a viable entity is dependent on improvement of the collection of water and sewerage charges, the successful implementation of mechanisms designed to restructure its operations, and the continued financial support of the Government of Saint Lucia and other financial institutions."

TABLE 2.9 Financial performance and adequacy of physical assets

UTILITY	COUNTRY	OPERATING MARGIN	PROFITABILITY	ADEQUACY OF CAPITAL EXPENDITURES	ADEQUACY OF FIXED ASSETS	OVERALL FINANCIAL SITUATION
BWS	Belize	4	3	3	3	3
DOWASCO	Dominica	4	2	3	3	2
NAWASA	Grenada	3	3	0	2	3
NWC	Jamaica	2	0	3	2	1
WASCO	St. Lucia	3	3	0	1	1

Note: Performance score ranges from 0 to 4, where a 4 indicates high level of success and a 0 indicates low level of success. The scores shown in this table are based on the scores obtained by the utilities on the basis of the criteria listed in table 2.2. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

it is important to complement the analysis presented in table 2.8 with one that looks at capital expenditures and fixed assets. A water utility that is not regularly investing in its assets or that does not have a sufficient asset base will struggle to provide the desired levels of access and quality of service. Table 2.9 shows that BWS has the strongest financial situation across measures of financial performance (operating margin and profitability), and adequacy of physical capital (capital expenditures and the status of fixed assets).

A detailed assessment is provided here of the following elements of the financial performance of the five utilities:

- Operating margin
- Profitability
- Liquidity and capital structure
- Adequacy of capital investments
- Adequacy of fixed assets

Operating margin

Operating margin, as measured by the EBITDA margin,¹⁴ is primarily a result of the utility’s operating efficiency and the adequacy of its tariffs. For example, a utility with a high EBITDA margin, such as BWS (Belize) or DOWASCO (Dominica), will generally have high operating efficiency and tariffs that cover most of its reasonable costs of providing service. The EBITDA margin for the benchmarked utilities ranges from –55 percent (GWI in 2012) to 44 percent (WAC in 2015) (see figure 2.23).

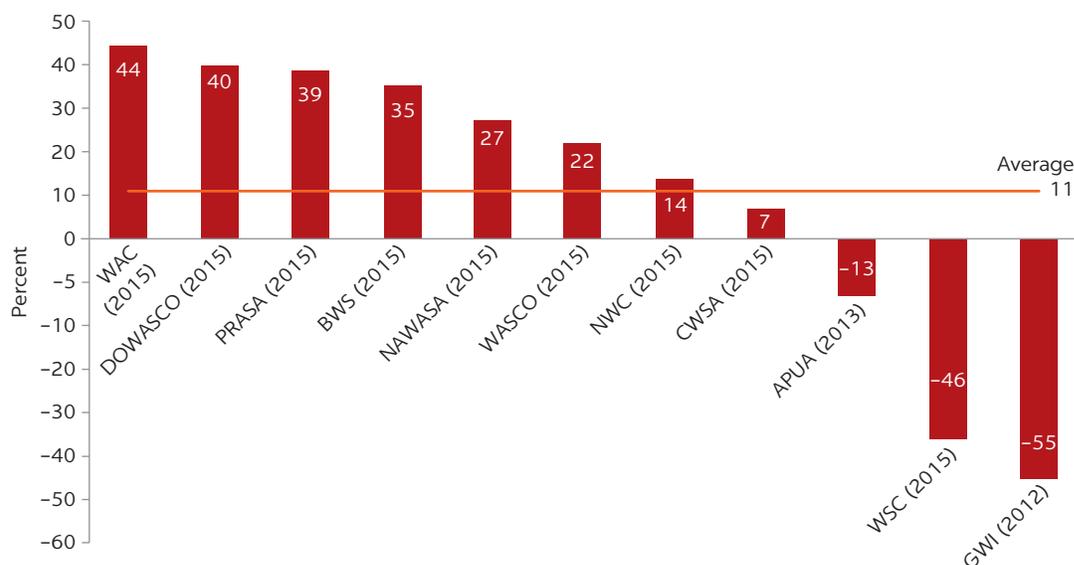
Most of the assessed utilities increased their operating margins between 2010 and 2015 (figure 2.24). WASCO (St. Lucia) had the most significant improvement—its EBITDA margin increased from about –20 percent to 20 percent between 2011 and 2015. All the assessed utilities, except BWS, had higher operating margins in 2015 compared to their operating margins in 2011.

Table 2.10 shows how the operating efficiency (see this chapter’s third section for the detailed assessment) and adequacy of tariffs for each of the five utilities combine to produce their respective EBITDA margins. NAWASA (Grenada), NWC (Jamaica), and WASCO (St. Lucia) need to increase their operating efficiency and the level of their tariffs to generate an EBITDA margin that would enable them to be more financially sustainable.

Profitability

A water utility’s profitability is a result of its operating margin in combination with its depreciation charge (which depends on its asset base), its interest expense (which depends on its borrowings), and taxes. Profitability can be measured by

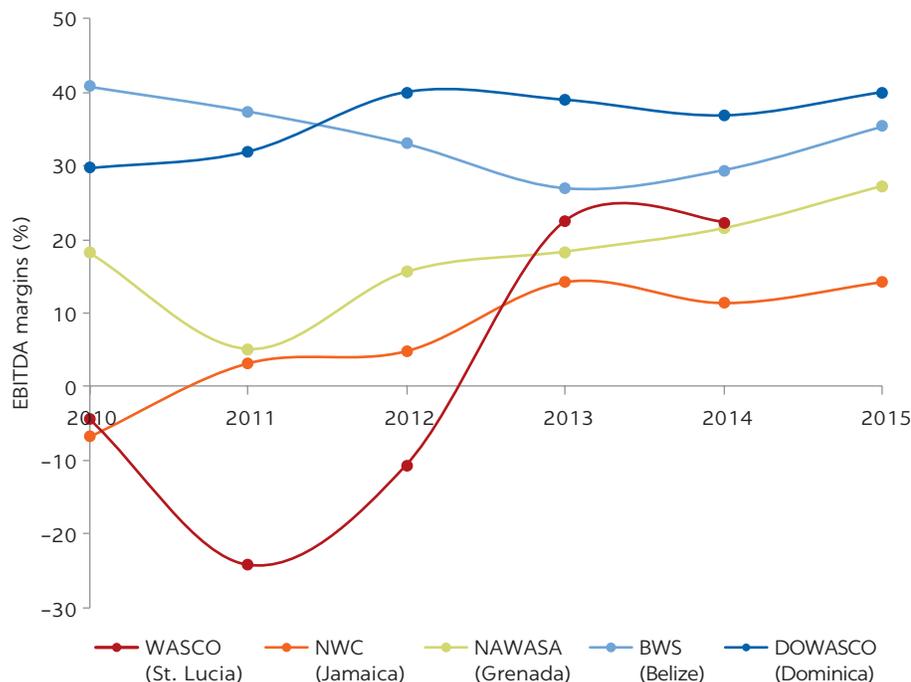
FIGURE 2.23
EBITDA margins



Sources: The utilities’ financial statements.

Note: AQUA = Aqualetra Curaçao; BWS = Belize Water Services Limited; CWSA = Central Water and Sewerage Authority; DOWASCO = Dominica Water and Sewerage Company Limited; EBITDA = earnings before interest, taxes, depreciation, and amortization; GWl = Guyana Water Incorporated; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WAC = Water Authority Cayman; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.24
EBITDA margins of assessed utilities, 2010–15



Sources: The utilities' audited financial statements.

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; EBITDA = earnings before interest, taxes, depreciation, and amortization; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

TABLE 2.10 Breaking down the EBITDA margin

UTILITY	COUNTRY	OPERATING EFFICIENCY	ADEQUACY OF TARIFFS	EBITDA MARGIN (%)	OPERATING COST COVERAGE
BWS (2015)	Belize	4	4	35	1.55
DOWASCO (2015)	Dominica	2	4	40	1.64
NAWASA (2015)	Grenada	3	3	27	1.37
NWC (2015)	Jamaica	2	2	14	1.17
WASCO (2014)	St. Lucia	1	3	22	1.29

Sources: The utilities' financial statements and other information provided by them.

Note: Operating cost coverage is calculated as revenues divided by operating expenditures. Performance score ranges from 0 to 4, where a 4 indicates high level of success and a 0 indicates low level of success (see table 2.2). BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; EBITDA = earnings before interest, taxes, depreciation, and amortization; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

comparing the utility's net income with its revenues, assets, and equity. Table 2.11 shows these indicators for the five assessed utilities. NWC's (Jamaica) negative profitability is a cause of concern. Its return on equity is very low—the lowest among the benchmarked utilities—because its shareholders' equity has deteriorated as its retained losses have accumulated.¹⁵

In table 2.12, the composition of the net income / (loss) for each of the five utilities of focus is compared, and the elements of the income statement as a percentage of the utility's revenues are shown. For example, for BWS (Belize), the depreciation and amortization expenses are equal to 12 percent of revenues. NWC (Jamaica) stands out as the only utility to finish with a loss, as a result of its comparatively low EBITDA, high depreciation and amortization expenses, and relatively high interest expense.

TABLE 2.11 Profitability of the assessed utilities

UTILITY	COUNTRY	NET INCOME / REVENUES (%)	RETURN ON ASSETS (%)	RETURN ON EQUITY (%)
BWS (2015)	Belize	17	4	6
DOWASCO (2015)	Dominica	11	1	3
NAWASA (2015)	Grenada	19	6	8
NWC (2014)	Jamaica	-5	-2	-41
WASCO (2014)	St. Lucia	11	5	9

Sources: The utilities' audited financial statements.

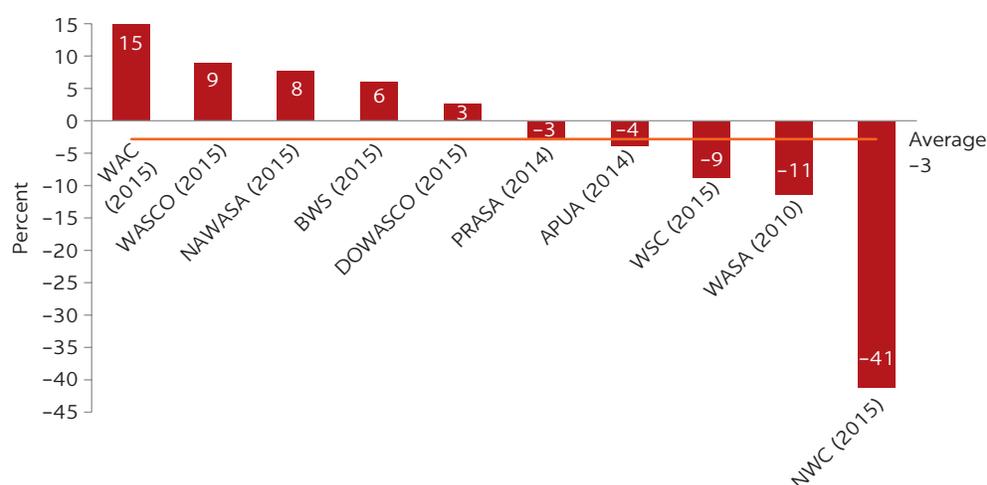
Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

TABLE 2.12 Decomposition of net income (values as a percentage of revenues)

ASPECT OF INCOME	BWS, 2015 (%)	DOWASCO, 2015 (%)	NAWASA, 2015 (%)	NWC, 2015 (%)	WASCO, 2014 (%)
EBITDA	35	40	27	14	22
Depreciation and amortization	12	21	12	24	18
EBIT	23	19	15	10	4
Interest	5	9	1	4	0
Other income / (expenses)	1	0	4	1	7
Earnings before taxes	19	11	19	16	11
Income tax (expense) / credit	2	0	0	11	0
Net income / (loss)	17	11	19	5	11

Sources: The utilities' audited financial statements.

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; EBIT = earnings before interest and taxes; EBITDA = earnings before interest, taxes, depreciation, and amortization; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

FIGURE 2.25 Return on equity for benchmarked utilities


Sources: The utilities' audited financial statements.

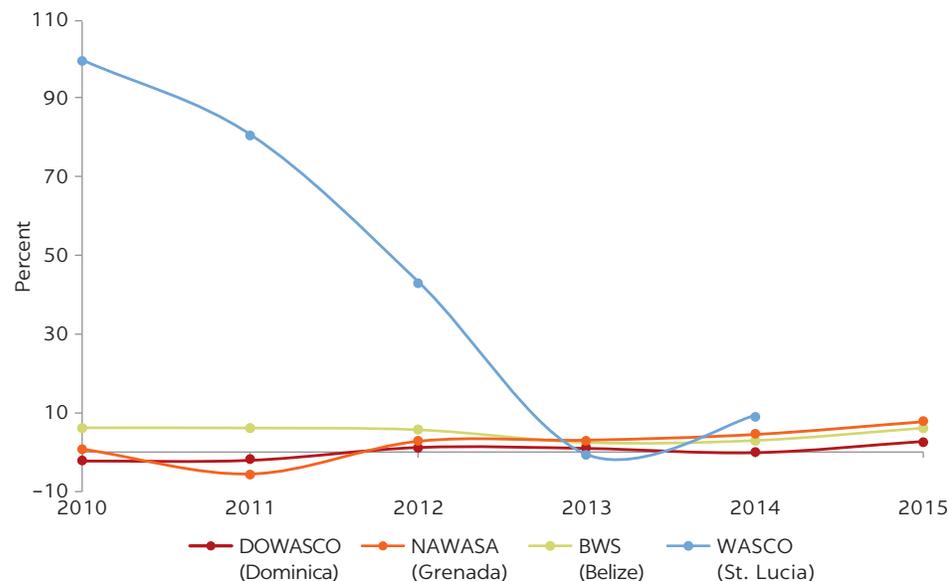
Note: APUA = Antigua Public Utilities Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WAC = Water Authority Cayman; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

The return on equity for the benchmarked utilities ranged from -41 percent (NWC in 2015) to 15 percent (WAC in 2014) (see figure 2.25).

The return on equity (ROE) of the assessed SOEs from 2010 to 2015 was compared (see figure 2.26). WASCO's (St. Lucia) ROE declined sharply, from 100 percent to

FIGURE 2.26

Return on equity for assessed state-owned enterprises, 2010–15



Sources: The utilities' audited financial statements.

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; WASCO = Water and Sewerage Company.

TABLE 2.13 Return on assets for water and electricity utilities

COUNTRY	WATER (%)	ELECTRICITY (%)
Belize	4	5
Dominica	1	13
Grenada	6	10
Jamaica	-2	3
St. Lucia	5	5

Sources: The utilities' audited financial statements.

Note: Values shown are for Belize (BWS in 2015 and BEL in 2015), Dominica (DOWASCO in 2015 and DOMLEC in 2015), Grenada (NAWASA in 2015 and GRENLEC in 2014), Jamaica (NWC in 2015 and JPS in 2015), and St. Lucia (WASCO in 2014 and LUCELEC in 2014). BEL = Belize Electricity Limited; BWS = Belize Water Services Limited; DOMLEC = Dominica Electricity Services; DOWASCO = Dominica Water and Sewerage Company Limited; GRENLEC = Grenada Electricity Services; JPS = Jamaica Public Service Company; LUCELEC = St. Lucia Electricity Services Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

0 percent, between 2010 and 2013.¹⁶ In contrast, DOWASCO (Dominica), BWS (Belize), and NAWASA (Grenada) experienced slight variations in their ROE (figure 2.26).

As a point of comparison, the ROAs for electricity companies in each of the five countries of the assessed water utilities were compared with the ROAs for the water utilities (see table 2.13). The ROAs for the electricity utilities were higher than those for the water utilities in all of the countries analyzed except in St. Lucia. Part of this difference is because electricity utilities are typically able to charge tariffs that are closer to cost recovery than water utilities. Governments, either by setting tariffs directly or by influencing the regulatory authorities, tend to limit increases in tariffs charged by water utilities. As a result, water utilities have lower profitability and greater difficulty attracting the capital they require. A second reason for the lower return on assets is that water (and wastewater) utilities tend to be more capital intensive than electricity utilities.

Liquidity and capital structure

Water utilities need to have the resources to meet short-term obligations (for example, paying their electricity bills) and to contract and to service long-term debt. Their ability to cover these obligations can be measured with the following indicators:

- **Current ratio.** The current ratio is the ratio of the utility's current assets (the assets that can be reasonably expected to be converted into cash within one year) to its current liabilities (the obligations that it must pay within 12 months). A water utility with good liquidity should have a current ratio greater than 1.0 (meaning that its current assets exceed its current liabilities).
- **Debt service coverage ratio (DSCR).** The debt service coverage ratio provides a measure of a company's ability to cover obligations (interest plus principal) related to its borrowings with its EBITDA. It is calculated by dividing EBITDA by the company's interest expenses and principal repayments due on borrowings.
- **Total debt to equity.** The water utility's total debt-to-equity ratio provides a good measure of its financial leverage. A utility with a high value for this indicator will find it difficult to contract more debt. In contrast, a utility with a very low value has greater scope for increasing its borrowing. It also has a higher-cost capital structure because the cost of equity is higher than the cost of debt.

Table 2.14 shows these three indicators of liquidity and capital structure for the five utilities assessed in this report. On the basis of these indicators, it can be concluded that BWS (Belize), NAWASA (Grenada), and WASCO (St. Lucia) have high levels of liquidity. In addition, each of these three utilities has a low debt-to-equity ratio. DOWASCO's (Dominica) current ratio is below 1.0, but it does have a solid DSCR of 1.6 and its debt-to-equity ratio is also low. NWC's (Jamaica) indicators suggest that its liquidity is just below the desired level and that it may have too much debt. However, these numbers should be looked at carefully. In many countries around the world, the majority, if not all, of a water utility's capital investments are financed with government funds, and a significant part of that government funding does not necessarily end up as debt for the utility. Therefore, it is important to understand how sector funding takes place within a country when assessing these indicators.

TABLE 2.14 Indicators of liquidity and capital structure

UTILITY	COUNTRY	CASH FROM OPERATIONS PER CUSTOMER (US\$/YEAR)	CURRENT RATIO ^a	DEBT SERVICE COVERAGE RATIO ^b	SHAREHOLDERS' EQUITY PER CUSTOMER (US\$)	TOTAL DEBT / EQUITY
BWS (2015)	Belize	88	1.3	2.2	1,040	0.3
DOWASCO (2015)	Dominica	89	0.9	1.6	1,302	0.5
NAWASA (2015)	Grenada	180	2.1	—	790	0.03
NWC (2015)	Jamaica	90	0.8	1.1	75	10.7
WASCO (2014)	St. Lucia	59	1.4	6.4	563	0.5

Sources: The utilities' audited financial statements.

Note: — = not available. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; EBITDA = earnings before interest, taxes, depreciation, and amortization; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

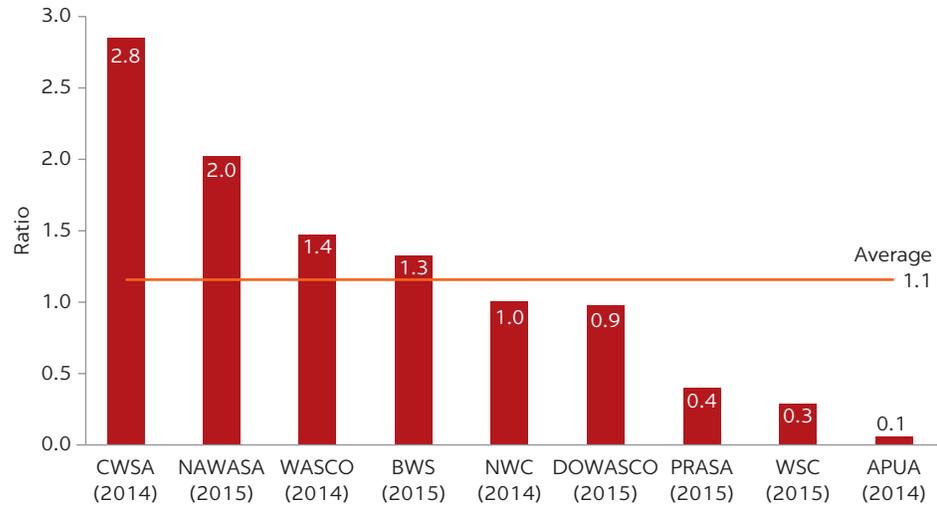
a. Current assets divided by current liabilities.

b. EBITDA divided by interest plus principal.

The current ratio for the benchmarked utilities was compared (see figure 2.27). The current ratio ranges from a low of 0.1 (APUA in 2014) to a high of 2.8 (WAC in 2015). Five of the nine utilities have a current ratio below 1.0, suggesting that these five utilities may have liquidity problems.

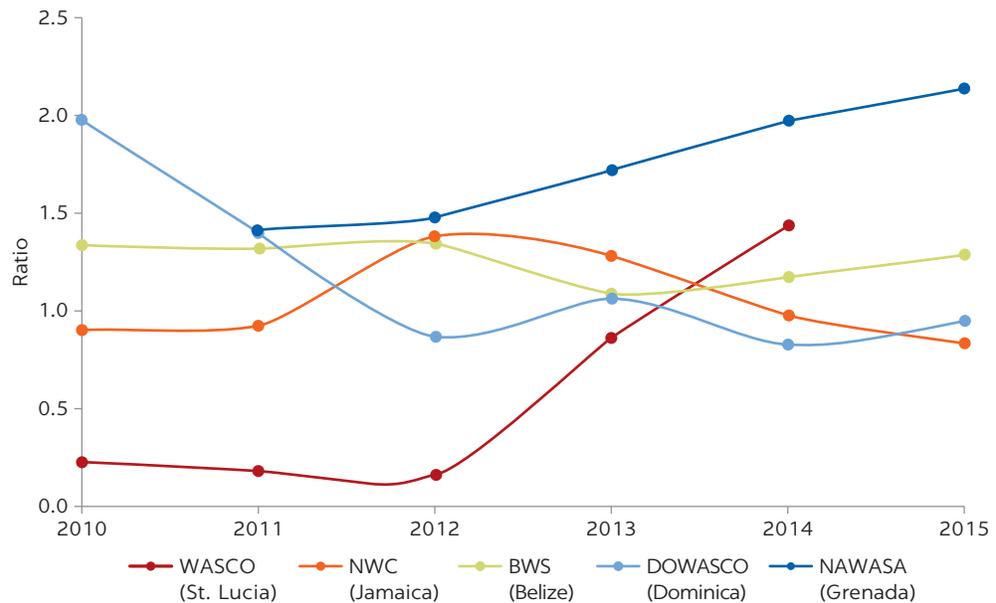
Figure 2.28 illustrates the trend of the current ratio for the five assessed utilities. NAWASA (Grenada) and WASCO (St. Lucia) have increased their current ratio

FIGURE 2.27
Current ratio for benchmarked utilities



Sources: The utilities' audited financial statements.
 Note: APUA = Antigua Public Utilities Authority; BWS = Belize Water Services Limited; CWSA = Central Water and Sewerage Authority; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.28
Current ratio for assessed state-owned enterprises, 2010-15



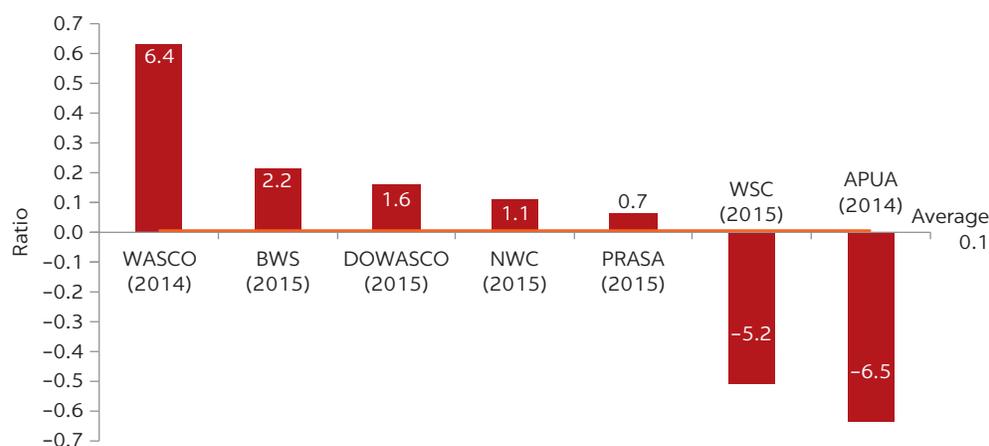
Sources: The utilities' audited financial statements.
 Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

to above 1, which means they have a cushion against unforeseeable contingencies that may arise in the short term. Although BWS (Belize) has experienced a decline of its current ratio since 2010, it still maintains a healthy current ratio greater than 1.

The DSCR for the benchmarked utilities ranges from a low of -6.5 (APUA in 2014) to a high of 6.4 (WASCO in 2014) (see figure 2.29).

The total debt-to-equity ratio for the benchmarked utilities ranges from a low of 0.03 (NAWASA in 2014) to a high of 10.7 (NWC in 2015) (see figure 2.30).

FIGURE 2.29
Debt service coverage ratio for benchmarked utilities



Sources: The utilities' audited financial statements.

Note: APUA = Antigua Public Utilities Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.30
Total debt / equity ratio



Sources: The utilities' audited financial statements.

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WAC = Water Authority Cayman; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

Adequacy of capital investments

Water utilities are among the most capital-intensive infrastructure companies (Hull 2013, 131–32). They need a large amount of infrastructure to generate revenues; in addition, investments tend to be extremely bulky and costly. For water utilities with less than universal coverage, the capital investment requirements (also known as capital expenditures, or CAPEX) are particularly relevant.

The adequacy of capital investments was assessed using the following two indicators:

- Average CAPEX per customer (US\$/year). This is calculated as the average capital expenditures over several years divided by the number of customers at the end of the last year of the period.
- CAPEX/revenue. This is calculated as CAPEX divided by revenues for one year.

There is large variability in the average CAPEX per customer that is consistent with the bulkiness of water (and wastewater) investment (see table 2.15). Yet the CAPEX per customer, when investments are made, is high. On a per-customer basis, NWC (Jamaica) invested the most in 2015. In contrast, WASCO (St. Lucia) and NAWASA (Grenada) made limited investments between 2011 and 2014, which may affect their ability to improve their operating efficiency, quality of service, and coverage.

Figure 2.31 shows the average CAPEX per customer for all of the benchmarked utilities.

Adequacy of fixed assets

Capital investments (flow of funds) made by water utilities are recorded in their balance sheets as fixed assets (stock). Well-performing utilities have fixed assets that enable them to provide a certain level of access and customer service while maintaining operating efficiency. The following two indicators can be used to measure the adequacy of a water utility's fixed asset base:

- **Gross book value per customer (in US\$).** This indicator provides a measure of the value of fixed assets relative to the number of customers. Gross book value (GBV) is the value of fixed assets at the cost of developing those assets.

TABLE 2.15 Levels of capital investments

UTILITY	COUNTRY	AVERAGE CAPEX PER CUSTOMER (US\$/YEAR) ^a	CAPEX/REVENUE (%) ^b
BWS (2011–16)	Belize	110.2	30.6
DOWASCO (2011–15)	Dominica	203.4	58.1
NAWASA (2011–15)	Grenada	40.6	18.0
NWC (2011–15)	Jamaica	208.3	28.0
WASCO (2011–14)	St. Lucia	24.9	3.0

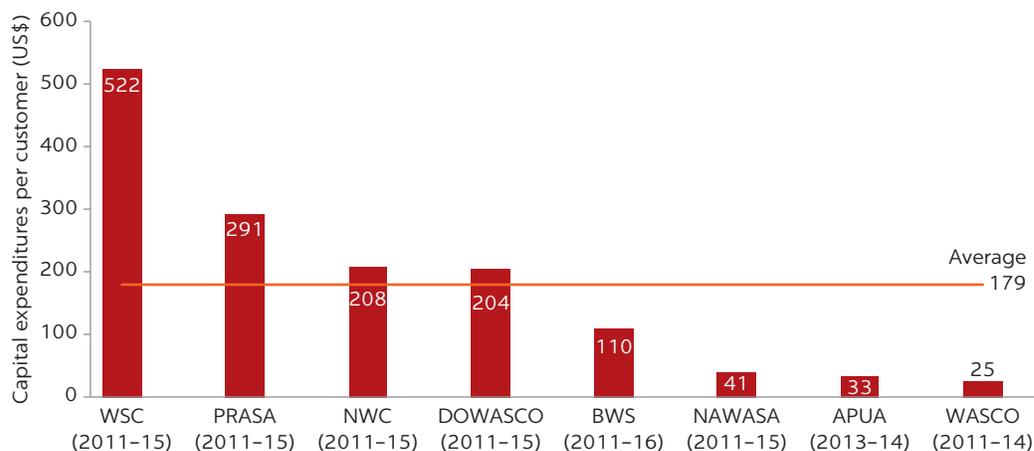
Sources: The utilities' audited financial statements and information provided by the utilities regarding the number of customers.

Note: BWS = Belize Water Services Limited; CAPEX = capital expenditures; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

a. This is the average annual CAPEX for the period indicated divided by the number of customers for the last year in the period. For example, for BWS it is average annual CAPEX from 2011 to 2016 divided by number of customers in 2016.

b. This is CAPEX divided by revenues for the following years for each utility: BWS (2015), DOWASCO (2015), NAWASA (2014), NWC (2015), WASCO (2014).

FIGURE 2.31
Average CAPEX per customer



Sources: The utilities' audited financial statements and information provided by the utilities regarding the number of customers.
Note: This is the average annual CAPEX for the period indicated divided by the number of customers for the last year in the period. For example, for BWS, it is average annual CAPEX from 2011 to 2016 divided by number of customers in 2016.
 APUA = Antigua Public Utilities Authority; BWS = Belize Water Services Limited; CAPEX = capital expenditures; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

In general, assuming the number of customers remains fixed, as the utility improves quality of service and/or increases operating efficiency, it is expected that the GBV per customer will increase. Therefore, water utilities with much lower values of this indicator may struggle to provide the same level of quality of service and to operate at the same level of efficiency as water utilities with higher values.

- **Accumulated depreciation / gross book value.** This indicator provides a measure of the extent to which a water utility's fixed assets have deteriorated. For example, a water utility that has just developed its plant and equipment will have a very low value for this indicator. In contrast, a utility that has made minimal investments during the recent past—thereby holding gross book value nearly constant as depreciation has accumulated—will have a much higher value.

On the basis of the information obtained for these two indicators (see table 2.16), the following conclusions can be reached for each of the five water utilities assessed for this report:

- **BWS's** fixed asset base has a relatively low GBV per customer (US\$1,762) and its accumulated depreciation indicates that its fixed asset base is quite new. One reason for its lower GBV is that BWS purchases water and therefore does not have the fixed assets needed to produce that water on its balance sheet.
- **DOWASCO's** accumulated depreciation indicates that its fixed asset base is still relatively new.
- **NAWASA's** fixed asset base may need to be increased to increase coverage, quality of service, and operating efficiency. At US\$1,258, its GBV per customer is relatively low compared with the other utilities, while accumulated depreciation represents 47 percent of its GBV.

- **NWC's** GBV per customer is the highest among the assessed utilities, at US\$3,493, but accumulated depreciation represents 52 percent of its GBV.
- **WASCO's** GBV stands at US\$2,316; it has the highest ratio of accumulated depreciation to gross book value (65 percent, in comparison with an average of 47 percent for the benchmarked utilities).

Figure 2.32 shows the GBV per customer for all of the benchmarked utilities. This value ranges from US\$1,258 (NAWASA) to US\$8,427 (PRASA). On average, the value may appear to be very high (US\$4,075) for what essentially amounts to only a water supply connection (as the number of customers benefiting from wastewater collection, let alone wastewater treatment, is very low). However, it is difficult to determine whether these gross book values are adequate or not, as that depends on many factors. Except for Belize, population growth in the other four countries is very low (at or below 0.5 percent per year), while population densities tend to be high. Both of these factors suggest that CAPEX requirements for water

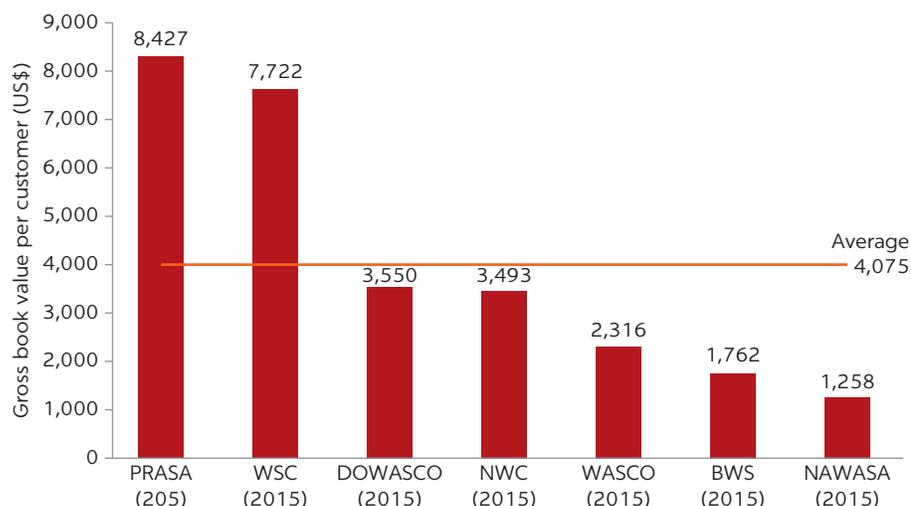
TABLE 2.16 Levels of fixed assets

UTILITY	COUNTRY	GROSS BOOK VALUE PER CUSTOMER (US\$)	ACCUMULATED DEPRECIATION / GROSS BOOK VALUE (%)
BWS	Belize	1,762	21
DOWASCO	Dominica	3,550	31
NAWASA	Grenada	1,258	47
NWC	Jamaica	3,493	52
WASCO	St. Lucia	2,316	65
Average of benchmarked utilities		4,075	47

Sources: The utilities' audited financial statements.

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

FIGURE 2.32
Gross book value per customer



Sources: The utilities' audited financial statements; information provided by the utilities regarding the number of customers.

Note: BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

FIGURE 2.33
Accumulated depreciation / gross book value



Sources: The utilities' audited financial statements.

Note: APUA = Antigua Public Utilities Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation; WAC = Water Authority Cayman.

supply should be lower. In addition, wastewater collection and treatment are low or nonexistent, which further suggests that CAPEX should be low. On the other hand, all of these systems, with the exception of Jamaica's NWC, tend to be very small, suggesting a lack of economies of scale that would drive up capital costs. The type of water supply infrastructure that is included also matters. For example, in The Bahamas, the dependence on desalination of water supplies (which is an expensive water supply solution) plays a role in explaining the differences in CAPEX. However, the wide variety in overall gross book values suggests that there may be large variations in the efficiency with which CAPEX is applied in the region.

Figure 2.33 shows the accumulated depreciation / gross book value for all benchmarked utilities. The values range from a low of 21 percent (BWS) to a high of 77 percent (APUA). These values are indicative because there is no international benchmark for what constitutes good or poor performance, and therefore, the interpretation of this indicator is highly variable depending on context.

AFFORDABILITY OF TARIFFS

On average, water tariffs in the Caribbean are affordable. Household expenditures on water services are below 3 percent of household income across the region, with the exception of Belize. However, the results from the study suggest that in many countries, tariffs do not cover the cost of service and that there is scope to increase tariffs charged by the water utilities.

A sustainable utility should provide services in a manner that is affordable for everyone, including its poorest customers. The affordability of tariffs of the five water utilities were assessed using the following indicators:

- Average water tariffs
- Average residential water tariffs
- Household expenditures on water as a percentage of household income.

Table 2.17 shows a summary of the indicators used to measure the affordability of tariffs of the five utilities.

Average water tariffs

There is a large variance in average water tariffs across the benchmarked utilities. To calculate the average water tariffs, the utilities' total revenues from sales of water were divided by the volume of water billed. The average water tariffs for BWS, NAWASA, and NWC are below the average of the benchmarked water utilities of US\$2.32 per cubic meter (see figure 2.34). APUA and AQUA have the highest average water tariffs, at US\$4.47 and US\$3.07 per cubic meter, respectively. One reason these two utilities have such a high tariff is that they produce high levels of water with desalination—APUA produces around 70 percent and AQUA produces 100 percent.¹⁷ Thus, they incur high costs, some of which are passed on through their tariffs.

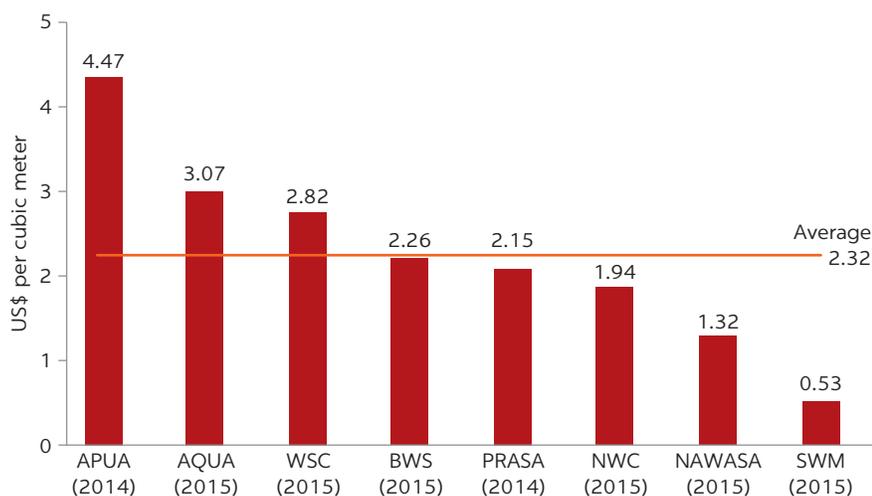
TABLE 2.17 Affordability of tariffs of water utilities in the Caribbean

UTILITY	COUNTRY	AVERAGE WATER TARIFF (US\$/M ³)	AVERAGE RESIDENTIAL WATER TARIFF (US\$/M ³)	RESIDENTIAL WATER BILL (US\$ AT 15 M ³)	HOUSEHOLD EXPENDITURES ON WATER / TOTAL HOUSEHOLD EXPENDITURES (%)
BWS (2015)	Belize	2.26	1.89	29.30	3.20
DOWASCO (2015)	Dominica	—	—	19.11	1.56
NAWASA (2015)	Grenada	1.32	—	20.40	0.77
NWC (2015)	Jamaica	1.94	0.73	10.00	1.79
WASCO (2015)	St. Lucia	—	—	62.50	2.81

Sources: Information provided by the utilities in their annual reports and on their websites; World Bank total household expenditure data.

Note: — = not available; M³ = cubic meter. These utilities did not provide the information required to calculate these values. BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; WASCO = Water and Sewerage Company.

FIGURE 2.34
Average water tariffs



Sources: The utilities' audited financial statements and information provided by the utilities regarding the volume of water billed.

Note: APUA = Antigua Public Utilities Authority; AQUA = Aquallectra Curaçao; BWS = Belize Water Services Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; SWM = Surinaamsche Waterleiding Maatschappij; WSC = Water and Sewerage Corporation.

Most of the benchmarked SOEs had approximately the same average water tariffs from 2010 to 2015 (see figure 2.35). The only two utilities whose average water tariffs increased were PRASA (Puerto Rico) and NWC (Jamaica). PRASA's average water tariffs increased from around US\$1.50 per cubic meter to US\$2.10 per cubic meter from 2013 to 2014. NWC's average water tariffs increased from around US\$1.20 per cubic meter to around US\$1.70 per cubic meter.

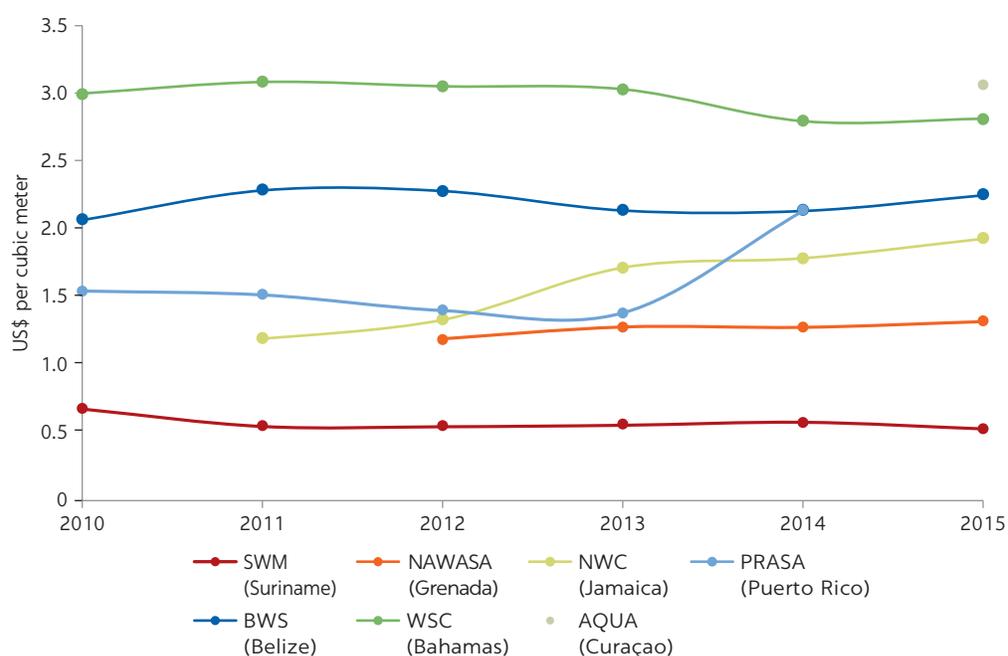
Average residential water tariffs

The average residential water tariff was calculated by dividing the utilities' total revenue from sales of water to residential customers by the total volume of water billed to residential customers. The average residential water tariff (for the utilities that provided sufficient data to calculate this indicator) is US\$1.68 per cubic meter (see figure 2.36). Due primarily to the high cost of desalination, WSC (The Bahamas) and APUA (Antigua) have the highest residential water tariffs, at US\$2.78 and US\$2.53 per cubic meter, respectively. BWS is slightly above the average with a tariff of US\$1.89 per cubic meter, while NWC is below the average with a residential tariff of US\$0.73 per cubic meter.

Household expenditures on water as a percentage of household income

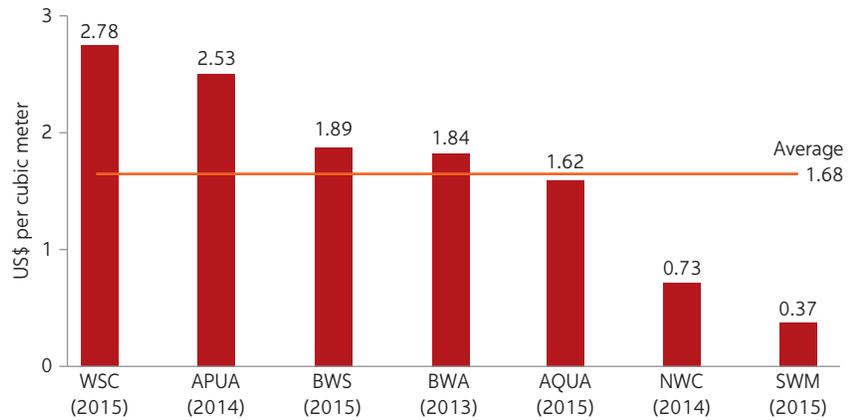
Household expenditures on water as a percentage of household income is a measure used to analyze the affordability of tariffs through the impact of water costs on household income. This measure also provides a better indicator to compare the

FIGURE 2.35
Average water tariffs, 2010–15



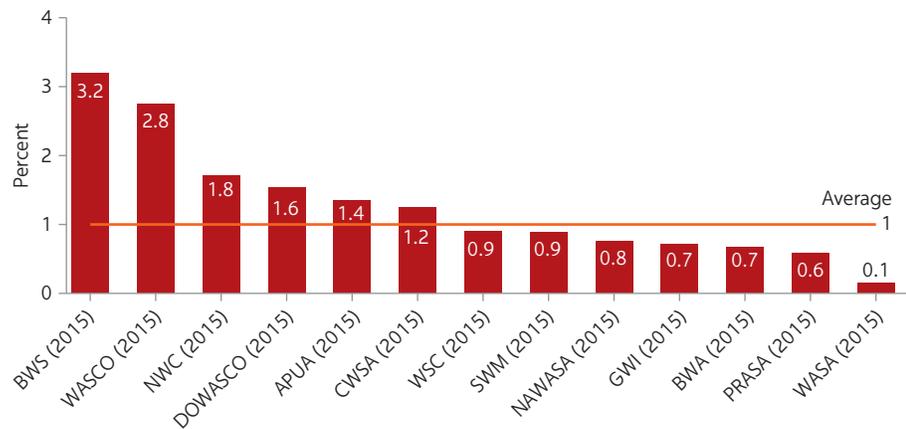
Source: The utilities' audited financial statements and information provided by the utilities regarding the volume of water billed.
 Note: AQUA = Aquallectra Curaçao; BWS = Belize Water Services Limited; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; SWM = Surinaamsche Waterleiding Maatschappij; WSC = Water and Sewerage Corporation.

FIGURE 2.36
Average residential water tariffs



Sources: The utilities' audited financial statements and information provided by the utilities regarding the volume of water billed to residential customers.
 Note: APUA = Antigua Public Utilities Authority; AQUA = Aquallectra Curaçao; BWA= Barbados Water Authority; BWS = Belize Water Services Limited; NWC = National Water Commission; SWM = Surinaamsche Waterleiding Maatschappij; WSC = Water and Sewerage Corporation.

FIGURE 2.37
Household expenditures on water as a percentage of total household expenditures



Sources: World Bank total household expenditure data.
 Note: APUA = Antigua Public Utilities Authority; BWA = Barbados Water Authority; BWS = Belize Water Services Limited; CWSA = Central Water and Sewerage Authority; DOWASCO = Dominica Water and Sewerage Company Limited; GWI = Guyana Water Incorporated; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; PRASA = Puerto Rico Aqueduct and Sewer Authority; SWM = Surinaamsche Waterleiding Maatschappij; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

affordability of tariffs across the Caribbean. To calculate it, the average residential monthly bill was divided over the average total household expenditures of each country. The United Nations Development Programme (UNDP) suggests that water costs should not exceed 3 percent of household income (UNDP 2006). For this study, household expenditures were used as a proxy for household income because statistics on household expenditures are more readily available and household expenditures are a more reliable indicator of welfare.

Figure 2.37 shows household expenditures on water as a percentage of total household expenditures across the benchmarked utilities. The data suggest that,

on average, water tariffs in the Caribbean are affordable and the tariffs that utilities charge to residential households could be increased without crossing the 3 percent threshold.

For the benchmarked utilities, average household expenditures on water as a percentage of household income are 1 percent. Only Belize is above the 3 percent threshold; WASCO, which has the second-highest residential bill, is still below the threshold at 2.8 percent. Of the five utilities focused on in this study, NAWASA has the lowest household expenditures on water, at 0.8 percent of total household expenditures.

3 Governance of State-Owned Water Utilities

In most countries in the Caribbean, the governing environment in the water and sanitation sector often does not provide adequate incentives to achieve the governments' objectives for the sector.¹ This environment includes the tradition of maintaining tariffs in water utilities that do not cover the full cost of the service,² even if the tariffs undermine the delivery of the service, the political nature of the hiring and removal of managers of state-owned water utilities, and the constraints placed on the compensation of management and staff.

The governing environment consists of the legal, institutional, and regulatory frameworks in place to oversee the state-owned water utilities (described in this chapter's first section). These frameworks have been developed to varying degrees. Of the five countries of focus assessed for this study, the governing environment in Belize is found to be the most effective (see this chapter's second section), even though sewage continues to be a challenge in Belize. Governing environments that are not as effective may impact quality of service and transparency and availability of information—several state-owned water utilities have significant scope for improving their operating efficiency.

The challenge of improving services is even more critical if countries want to reach the Sustainable Development Goals (SDGs). The SDGs, unlike the Millennium Development Goals, do not only aim to improve access; they also aim to improve the quality of that access. The SDGs are difficult to achieve, for several reasons. First, the required cost, effort, and coordination are high. Second, most water utilities do not have clear medium-term targets that are consistent with achieving SDGs. Most of the water utilities do not have a plan that is linked to available resources to achieve medium-term targets. This limits a water utility's autonomy to achieve targets and diminishes the accountability of the utilities with respect to the SDGs.

To improve performance, a three-step process is recommended to improve the credibility, accountability, and autonomy of the utility. The utility should assess the condition of the sector and establish a baseline for the utility; set multiyear targets and agree on sources of funding to cover the costs of reaching them; and strengthen regulation and accountability. Ultimately, this process will help build better and more competent state-owned water utilities in the Caribbean (see this chapter's third section).

See box 3.1 for some lessons from Malaysia.

BOX 3.1

Lessons from Malaysia for Caribbean state-owned enterprises

The Supporting Economic Management in the Caribbean (SEMCAR) Program, financed by Global Affairs Canada and implemented jointly by the World Bank and the International Monetary Fund, assists 12 Caribbean countries with governance reforms. In the summer of 2017, the World Bank Group's Global Knowledge and Research Hub in Malaysia and the government of Malaysia collaborated with SEMCAR to organize a knowledge exchange that aimed to strengthen the capacity of Caribbean countries to more effectively manage their state-owned enterprises (SOEs). Several key institutional challenges had been identified in the governance of SOEs in the Caribbean where the Malaysian experience was deemed useful to provide practical solutions. The focus of this exchange was on “the how” of reforms rather than on “the what,” recognizing that often it is the implementation challenges that derail even the best-designed policies.

SOEs are present throughout the Caribbean economy, including air, sea, and land transportation; telecommunications; energy and water; agriculture; housing; and the service sector. Analyses completed to date indicate that the SOE sector suffers from a lack of quality information and from poor monitoring of performance. There are also challenges associated with fiscal risks and contingent liabilities, weak compliance with policies and reporting procedures, large debt accumulation, and a lack of consensus regarding a development approach. Some operational challenges include the efficient and effective use of government resources, quality service delivery, and ongoing privatization and divestment efforts.

The Caribbean delegation included 16 officials from 10 participating SEMCAR countries: Antigua and Barbuda, Barbados, Grenada, Jamaica, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, St. Lucia, St. Kitts and Nevis, and Dominica. In the words of Faris Hadad-Zervos, Country Manager, “the case of Malaysia stands out because of its focus on implementation, coupled with broad consultative processes, and leadership to transform Malaysia into a high-income society.” Discussions with the Ministry of Finance and Khazanah, Malaysia's wealth management fund, gave the Caribbean delegation insights into the nuts and bolts of how Malaysia's government-linked companies

(GLCs) were transformed to become profitable and more efficient.

Furthermore, the Caribbean delegation learned valuable lessons from the implementation of Malaysia's National Transformation Program (NTP) that included the government and the economic transformation, as well as strategic reform initiatives that cut across these relationships. The NTP was driven by the Prime Minister's Performance Management and Delivery Unit, which helped to coordinate various implementing agencies and assisted in monitoring and problem solving (World Bank 2017). Learning from Malaysia's regulatory practices that simplified a number of regulations and reengineered business processes, especially the way in which the firms interact with the state, was deemed particularly useful (Kunicova and Tran 2017).

Experience has shown that, when done right, peer-to-peer learning is a powerful way to share, replicate, and scale up what works in development. The SEMCAR knowledge exchange with Malaysia was an example in which participants had direct access to best practices in terms of policies as well as practitioners' tools. In the words of several participants, the experience produced a critical “mind-shift.” For example, Grenada thought that Malaysia's management of GLCs provides the country with a new vision for excellence, for which it made steps to customize and implement. Most lessons discussed in Kuala Lumpur resonated with the Caribbean counterparts. In the case of Suriname, for example, the most important lessons included promoting meritocracy in the civil service; setting up clear goals and targets through an inclusive process; assuring buy-in of all stakeholders, including the opposition; and encouraging the professional business attitude of GLCs pursuing ambitious goals. After their visit to Malaysia, all of the participants, and especially authorities in St. Vincent and the Grenadines and St. Lucia, had a new appreciation for the importance of change management beyond legislative mandate and leadership, with the prime minister at the helm.

Also, the devastating past hurricane seasons were a tragic reminder that preparation is vital. Advancing SOE reforms is one of several ways to anchor a sustainable path for the fiscal accounts, which is key to building resilient governance.

LEGAL, INSTITUTIONAL, AND REGULATORY FRAMEWORKS IN BELIZE, DOMINICA, GRENADA, JAMAICA, AND ST. LUCIA

To analyze the governing environment for state-owned water utilities in the Caribbean, one must first determine if there are strong legal, institutional, and regulatory frameworks in place for the water and sanitation sectors. These frameworks are typically developed through laws or government decrees. In the following subsections, the legal, institutional, and regulatory frameworks in Belize, Dominica, Grenada, Jamaica, and St. Lucia are examined and compared.

Legal framework

At first glance, it appears that the legal frameworks for the water and sanitation sectors in Belize, Dominica, Grenada, Jamaica, and St. Lucia provide for an effective governing environment. These laws and regulations typically establish state-owned water utilities and assign key functions of the sector to various government bodies. Table 3.1 shows that Belize and Jamaica have the most well-developed legal frameworks for the water and sanitation sector. The following conclusions can be drawn from the information presented in table 3.1:

- All of the five countries have legislation that establishes the state-owned water utility as a separate legal entity.
- All of the five countries have legislation that establishes a tariff program for the state-owned utility.
- Belize, Jamaica, and St. Lucia have legislation that establishes a regulatory authority with responsibilities for overseeing the water and sanitation sector.

TABLE 3.1 Existing laws in the legal framework

	MAIN LEGISLATION	ESTABLISHES A PUBLIC WATER UTILITY AS A SEPARATE LEGAL ENTITY	ESTABLISHES A REGULATORY AUTHORITY	ASSIGNS RESPONSIBILITIES TO GOVERNMENT BODIES
Belize	<ul style="list-style-type: none"> • Water Industry Act, Chapter 222 (2001) • Water Industry Order, Water Industry Act, Section 85–86 (2001) • Public Utilities Commission Act, Chapter 223 (1999) • Village Councils Act, Chapter 88 (1999) • National Integrated Water Resources Act (2010) 	✓	✓	✓
Dominica	<ul style="list-style-type: none"> • Water and Sewerage Act (1989) • Water Regulations, Statutory Rules and Orders No. 60 (1997) • Sewerage Regulations, Statutory Rules and Orders No. 61 (1997) 	✓		✓
Grenada	<ul style="list-style-type: none"> • National Water and Sewerage Authority Act, Chapter 208 (1990) • National Water and Sewerage Authority Regulations, Statutory Rules and Orders No. 10 (1995) • National Water and Sewerage Authority Regulations, Statutory Rules and Orders No. 40 (2010) 	✓		✓
Jamaica	<ul style="list-style-type: none"> • National Water Commission Act (1963) • Office of Utilities Regulation Act (1995) • Water Resources Conservation Authority Act (1991) • Water Resources Act and Regulations (1996) 	✓	✓	✓
St. Lucia	<ul style="list-style-type: none"> • Water and Sewerage Act (1999) • National Utilities Regulatory Commission Act (2016) 	✓	✓	✓

Legal framework in Belize

In Belize, there are five laws that make up the legal framework for the water and sanitation sector. The Water Industry Act (2001) is one of the most important pieces of legislation in the framework. The Water Industry Act is all encompassing—it states Belize’s water resource and environmental policies, it establishes a state-owned water utility, and it designates responsibility to government bodies for monitoring and regulating the sector, among others. The Water Industry Act also builds on the Public Utilities Commission Act (1999) by outlining the powers and responsibilities of the Public Utilities Commission for regulating and licensing the water and sanitation sector.

Others relevant laws in Belize include the Village Council Act (1999) and the National Integrated Water Resources Act (2010). The Village Council Act governs the provision of water and sanitation services in rural areas. The National Integrated Water Resources Act established the National Integrated Water Resource Authority to coordinate overall water policy in Belize, but it has not yet been fully set up organizationally because of funding constraints (see appendix A for more information on Belize’s legislation in the water and sanitation sector).

Legal framework in Jamaica

Like Belize, Jamaica has multiple laws that rule the water and sanitation sector. Two of these laws include the National Water Commission Act (1963) and the Office of Utilities Regulation Act (1995). The National Water Commission Act establishes the National Water Commission (NWC), the country’s state-owned water utility responsible for establishing and managing the national water supply. Conversely, the Office of Utilities Regulation Act creates the Office of Utilities Regulation (OUR), the regulatory authority for utility services in Jamaica. The act gives OUR the authority to determine and monitor service charges and issue licenses for the water and sanitation sector.

Jamaica’s other laws focus on the conservation and regulation of water resources. The National Resources Conservation Authority (1991) gives broad responsibilities to various government bodies for managing natural resources and protecting the environment. Specifically, the Water Resources Act and Regulations (1996) creates a government authority that regulates water resources, including the extraction and use of water sources (see appendix D for more information on Jamaica’s legislation).

Legal frameworks in Dominica and Grenada

The legal frameworks in Dominica and Grenada are not as comprehensive as those in Jamaica or Belize, and it would benefit Dominica and Grenada to reference Jamaica or Belize’s frameworks for good practices. In the case of Dominica, the Water and Sewerage Act (1989) establishes the state-owned water utility and assigns key regulatory and monitoring responsibilities to different government ministries. In Grenada, the National Water and Sewerage Authority Act (1990) establishes the state-owned water utility and lays out the country’s national policy for the water and sewerage sector.

In addition, Dominica and Grenada developed their regulatory frameworks through secondary legislation; that is, both countries use statutory rules and orders to establish regulatory procedures. These include guidelines for water and wastewater tariffs, metering, collections, coverage areas, and water rationing, among others

(see appendixes B and C for more information on the legal frameworks in Dominica and Grenada, respectively).

Legal framework in St. Lucia

St. Lucia uses two acts to govern its water and sanitation sector—the Water and Sewerage Act (1999) and the National Utilities Regulatory Commission Act (2016). The Water and Sewerage Act restructured the water sector and created the Water and Sewerage Company (WASCO), the state-owned utility in charge of the provision of water and wastewater services. The National Utilities Regulatory Commission Act is a recent law that created a new regulatory authority to oversee utility supply services in St. Lucia. The National Utilities Regulatory Commission Act gives the regulatory authority the right to oversee the economic regulation and technical regulation of WASCO (see appendix E for more information on St. Lucia’s legislation).

Institutional framework

To analyze the institutional frameworks of the five Caribbean countries’ utilities focused on in this report, the government bodies involved in policy making, regulation, and funding of the water and wastewater sector were examined. Belize and Jamaica have more government bodies involved in the water and sanitation sector than any of the other countries analyzed (see table 3.2). However, all five countries clearly identify and allocate responsibilities over the sector to different government bodies. The following conclusions can be drawn from the data presented in table 3.2:

- Multiple ministries are involved in making policies for the water and sanitation sector. Dominica and Jamaica, however, also involve their state-owned utility in policy making.
- All five countries have separate entities for economic, health, and environmental regulations over the water and sanitation sector. Health and environmental regulations are carried out by specialized ministries, typically a ministry of the environment or ministry of health. In Jamaica, there are multiple ministries involved in environmental regulations.
- All five countries have a ministry that allocates funding to the state-owned utility. Nevertheless, Belize and Jamaica are the only countries in which another ministry funds service provision in rural areas.

All five countries involve multiple ministries in policy making for the water and sanitation sector. In Belize, policy-making responsibilities span four to five ministries (see appendix A for more information on Belize). Jamaica and Dominica designate part of this responsibility to their state-owned water utilities. In Dominica, the Dominica Water and Sewerage Company (DOWASCO) oversees the country’s water resources management under the supervision of the Ministry of Lands, Housing, Settlements, and Water Resource Management (see appendix B for more information on Dominica). In Jamaica, the National Water Commission (NWC) “may, with the approval of the relevant Minister, make regulations for the better carrying of [the National Water Commission] Act into effect” (see appendix D for more information on Jamaica).³

The five Caribbean countries that were analyzed distribute regulatory responsibilities differently. To oversee the economics aspect of the water and sanitation sector, Belize, Jamaica, and St. Lucia established regulatory authorities

TABLE 3.2 Government bodies responsible by country

	GOVERNMENT BODY	POLICY MAKING	SECTOR REGULATION	HEALTH REGULATION	ENVIRONMENTAL REGULATION	FUNDING
Belize	• Ministry of Natural Resources and Immigration	✓				
	• Ministry of Finance and Public Utilities	✓				✓
	• Ministry of Labour	✓	✓			✓
	• Ministry of Forestry, Fisheries, and Sustainable Development Environment	✓			✓	
	• Public Utilities Commission		✓	✓		
	• Ministry of Health					
Dominica	• Ministry of Lands, Housing, Settlements, and Water Resource Management	✓	✓		✓	
	• Ministry of Agriculture and the Environment	✓				
	• DOWASCO	✓				
	• Ministry of Health			✓		✓
	• Ministry of Finance, Social Security, and Foreign Affairs					
Grenada	• Ministry of Agriculture, Lands, Forestry, Fisheries, and Environment	✓			Not clear	
	• Ministry of Communications, Works, Physical Development, Public Utilities, ICT, and Community Development		✓	✓		
	• Ministry of Health					✓
	• Ministry of Finance and Energy					
Jamaica	• Ministry of Water and Housing	✓				
	• NWC	✓				
	• Ministry of Local Government and Community Development	✓	✓			✓
	• Office of Utilities Regulation		✓			
	• Water Resource Authority				✓	
	• Natural Resources Conservation Authority				✓	
	• National Environmental and Planning Agency				✓	
	• Ministry of Health and Environment			✓		
• Ministry of Finance and Public Service					✓	
St. Lucia	• Ministry of Communications, Works, Transport, and Public Utilities	✓				
	• National Utilities Regulatory Commission		✓			
	• Ministry of Health			✓		
	• Water Resource Management Agency				✓	
	• Ministry of Finance and Economic Affairs					✓

Note: "Government bodies responsible by country" are discussed in the table. To simplify the classification and for the purpose of this analysis, regulatory and ownership bodies and roles are jointly reflected. Future analysis could distinguish between the two and further develop the ownership discussion beyond such concepts as "policy making" and "funding" (to include execution of ownership rights, for example, strategic decisions, board appointments, and voting shares). DOWASCO = Dominica Water and Sewerage Company; ICT = Information and Communication Technology; NWC = National Water Commission.

to monitor their state-owned utility (see appendix E for more information on St. Lucia). Dominica and Grenada use ministries instead of regulatory authorities (see appendix C for more information about Grenada).

The health-related responsibilities in the water sector reside with the ministry of health (or its equivalent) in each country. Environmental standards are also enforced by a ministry, a specialized government body, or a combination. For example, Jamaica has three specialized public authorities in charge of regulating environmental standards. In Grenada, it is not clear whether the Ministry of Agriculture, Lands, Forestry, Fisheries, and Environment has the mandate to hold the utility accountable to environmental standards (see appendix C for more information on the government bodies in Grenada).

Finally, all five countries have a ministry that allocates funding to the state-owned utility. The responsibility generally lies with the ministry of finance (or its equivalent) in each country. In Belize and Jamaica, however, other ministries are also in charge of funding the rural water and sanitation sector. In Belize, the Ministry of Labor oversees, regulates, and funds the Village Water Boards that supply water to rural areas. In Jamaica, the Ministry of Local Government and Community

Development provides policy, regulation, and funding mechanisms to small water systems in Parish Councils.

Regulatory framework

In general, any utility has an interest in regulatory stability. To reach world-class performance, state-owned enterprises (SOEs) providing water need to be able to carry out longer-term, higher-cost capital investments, and be ensured that the external environment fosters successful performance. To meet this objective, regulatory frameworks need to have a robust mechanism for setting and adjusting tariffs, clearly defined performance standards that are not subject to frequent or arbitrary changes, and transparent accountability mechanisms for enforcing standards. Change in or application of the regulatory framework can be an important catalyst for change.

Only two of the countries (Belize and Jamaica) that were analyzed have well-developed regulatory frameworks that establish effective cost-reflective tariffs and near-term performance targets. Although most countries have regulatory authorities with some responsibility to set cost-reflective tariffs, this does not happen in practice. Multiyear targets are not established by any of the utilities, which makes effective regulation of utility performance difficult.

Regulating tariffs

Table 3.3 shows that Belize, Jamaica, and St. Lucia have regulatory authorities that are responsible for approving water tariffs. In Dominica and Grenada, water tariffs are approved by the minister in charge of water and sewerage. In general, tariffs should be determined by the utility to recover certain costs of service, subject to the approval of the regulatory authority. In Dominica, the legislation does not specify how tariffs should be determined—instead, the water utility has the power to set tariffs how it sees fit.

Although every utility has the authority to propose tariffs, tariffs are not adjusted in a timely manner in all countries. The tariffs for the state-owned water utilities in Belize and Jamaica have been increased since 2015 (BWS 2015; Jamaica Observer 2016). Adjustments have been more difficult for WASCO in St. Lucia, where tariffs were last increased in 2013 (St. Lucia News Online 2013). However, the tariffs for the state-owned water utilities in Dominica and Grenada have not been adjusted in at least six years (New Today 2015). In Dominica, the last tariff adjustment occurred in 2011, its first adjustment since 1998 (Dominica News Online 2011).

Tariffs in most countries cover the existing cost of service for the utilities, with the only exception being NWC in Jamaica (see the fourth section of chapter 2 for more information). However, these utilities need to improve their quality of service and expand their wastewater treatment and collection services, changes that require significant capital investments. At the moment, the tariffs for these utilities would not cover the cost of improving their quality of service and increasing wastewater collection and treatment.

Regulating Performance

Table 3.3 shows that only the water utilities in Belize, Grenada, and Jamaica have multiyear targets. Multiyear targets are a key element of regulation because they allow the regulator to monitor the utility's performance in a clear and effective manner. Multiyear targets can include targets for service coverage, quality of service, operating efficiency (including energy efficiency, nonrevenue water, and

TABLE 3.3 Key regulatory framework elements

	BELIZE	DOMINICA	GRENADA	JAMAICA	ST. LUCIA
Who is responsible for approving water tariffs?	Public Utilities Commission	Minister responsible for water and sewerage	Minister responsible for water and sewerage	Office of Utilities Regulation	National Utilities Regulatory Commission
How are tariffs determined?	Determined to recover the reasonable costs of providing service and securing a reasonable rate of return on investment	Determined by the utility by means of a program under Section 37 of the Water and Sewerage Act (1989)	Determined to cover some cost of providing the service (including debt service and depreciation)	Determined so that revenue is sufficient to pay for operating expenditures, debt, and some capital expenditures	Determined to cover the efficiently incurred costs of the service and a reasonable return on capital
How frequently are tariffs adjusted?	Last adjustment 2015	Last adjustment 2011	Last adjustment 2010	Last adjustment 2017	Last adjustment 2013
Do tariffs reflect cost of service?	✓		✓	✓	✓
Are there multiyear targets for the state-owned utility?	✓		✓	✓	

Sources: Water Industry Act, Chapter 222 (2001); Water and Sewerage Act (1989); National Water and Sewerage Authority Act, Chapter 208 (1990); Office of Utilities Regulation Act (1995); Water and Sewerage Act (1999).

collection rate), and financial performance. Information on the multiyear targets in Belize, Jamaica, and Grenada is as follows:

- **Belize Water Services Limited (BWS).** BWS establishes its targets every five years through its business plan. The Public Utilities Commission (PUC) monitors the performance of BWS against these targets, and it adjusts the water tariffs on the basis of BWS's actual performance. The current multiyear targets are listed in the BWS Business Plan for 2015 to 2020 (BWS 2014). These targets include the following:
 - Indicators for financial performance (including revenues, costs, profits, dividends, cash, capital expenditures, and new long-term loans)
 - Indicators for service coverage (including sales volume, production volume, and customer count)
 - Indicators for operating efficiency (nonrevenue water)
- **National Water Commission (NWC).** NWC sets its targets every five years. Although its multiyear targets are not published in NWC's annual reports, OUR discloses them as part of its determination notices. Like PUC in Belize, OUR monitors NWC's performance against these targets and adjusts the water tariffs accordingly. NWC's current multiyear targets are very comprehensive. They are listed in the National Water Commission Review of Rates—Determination Notice for 2013 to 2018.⁴ These targets include the following:⁵
 - Indicators for operational efficiency (including collections, K-factor programs, and nonrevenue water)
 - Indicators for service coverage (including water coverage and sewage coverage)
 - Indicators for quality of service (including effluent quality, water pressure, continuity of service, notification of supply interruption, percentage of leaks, and billing complaints)

- **National Water and Sewerage Authority (NAWASA).** Although NAWASA sets multiyear targets, information about the targets is not publicly available and could not be analyzed for this report.

EVALUATING THE GOVERNING ENVIRONMENT

The effectiveness of the governing environment in Belize, Dominica, Grenada, Jamaica, and St. Lucia varies considerably. Although the legal, institutional, and regulatory frameworks are in place in each of these countries, they do not always provide for an effective governing environment. In Belize, the governing environment has allowed the state-owned water utility to build managerial autonomy, hold management and staff accountable, and provide incentives for performance. In contrast, in Grenada, the governing environment has resulted in limited managerial autonomy, inadequate monitoring and supervision, and a lack of transparency. Table 3.4 provides further detail about the governing environment by country.

Table 3.4 shows that Belize has the most effective governance framework. Jamaica—which has legal, institutional, and regulatory frameworks that are similar to those in Belize—does not have such an effective governing environment. Dominica, Grenada, and St. Lucia also lag in effectiveness. From the analysis undertaken, the following conclusions can be drawn:

- **Managerial autonomy in some utilities is limited.** Managers of the water utilities in Dominica, Grenada, and St. Lucia do not have full managerial autonomy to carry out operations. Managerial autonomy is important because it ensures that management can make substantial and permanent changes without interference

TABLE 3.4 Evaluation of the governing environment^a

INDICATOR	BELIZE	DOMINICA	GRENADA	JAMAICA	ST. LUCIA
Clear identification and allocation of responsibilities in the sector	4	4	4	4	4
State-owned utility is established as a separate legal entity	4	4	4	4	4
State-owned utility has autonomy from government	3	2	2	3	2
Availability to citizens of information on actual performance	4	3	2	4	0
Public participation in planning and regulatory hearings	2	—	—	2	0
Responsibilities for providing services are well defined	4	4	4	4	4
Clear and public agreement on coverage and service levels to be provided	3	1	1	4	0
Adequate financial plan (tariffs plus subsidies provided through reliable mechanisms) for covering costs of providing desired services	3	2	2	1	1
Monitoring unit has adequate skills, resources, and focus	4	1	1	3	1
Effective monitoring and enforcement of “agreements” with the state-owned utility	3	1	1	1	0
Managers of the state-owned utility have freedom to manage	4	2	2	3	1
Managers and staff of the water utility have incentives to perform well	3	2	2	2	2
Overall	3	1	1	2	1.6

Note: Performance score ranges from 0 to 4, where a 4 indicates high level of success and a 0 indicates low level of success (see table 2.2). — = not available.

a. The conceptual underpinning for this evaluation framework is explained further in this chapter’s second section, including methodology, potential caveats, and limits to it. For instance, “autonomy” could refer to the power to self-govern and independently make decisions. “Good information” is deemed information that is accurate, is collected regularly, and that feeds into the decision-making process. “Adequacy of skills” may be difficult to gauge; however, for the purpose of this exercise, it means the minimum level of knowledge and ability to perform the relevant functions.

or predation from other parts of government. Otherwise, management may have been incentivized by the political system to increase certain types of costs or to support commercially unviable, but politically tenable, policy and regulatory decisions.

- **Financial planning does not consider the costs of expanding and improving services.** None of the state-owned utilities have tariffs that fully cover the cost of expanding and improving services, particularly wastewater collection and treatment. As a result, financial planning for most utilities is inadequate because it does not consider the higher cost of service associated with making these investments.
- **There are weak and insufficient incentives for operating efficiently.** With the exception of BWS in Belize, most utilities are not reviewed to ensure costs are low, nor do the utilities have strong incentives to reduce costs. For example, performance-based remuneration for utility management and staff is not used for any utility other than BWS.
- **Limited competencies, resources, and credibility for effective utility supervision.** In countries such as Dominica and Grenada, ministries are not able to check if the utilities are meeting performance standards or to judge their performance. The ministries in charge of oversight seem to lack the capacity to carry out this function or they may not have the resources to do so. Countries with a regulatory authority may also face similar issues with credibility. In countries such as Jamaica and St. Lucia, the regulatory authority does not have the credibility to effectively monitor and improve utility performance.

PROPOSED APPROACH FOR IMPROVING GOVERNANCE OF STATE-OWNED WATER UTILITIES IN THE CARIBBEAN

Improving the performance of state-owned water utilities in the Caribbean requires that each country uses a comprehensive and targeted governance approach. This approach must ensure that essential elements of a good governance framework are in place and that concrete actions are taken to improve the performance of water SOEs.

Essential elements of a good governing environment

The following elements are essential for creating a good governing environment and are important for maintaining the adequate performance of water utilities (World Bank 2014):⁶

- **An appropriate legal and regulatory framework.** The legal and regulatory framework must clearly assign all key functions in the sector. For example, the framework must clearly define which body is responsible for setting effluent standards and which body is responsible for enforcing those standards. It must also establish a reasonable mechanism for setting and adjusting tariffs. However, it should be noted that having an appropriate legal and regulatory framework is not always necessary to reform the performance of a water utility, but it is necessary to sustain a successful utility reform.
- **Timely and credible communication to the public regarding performance of the sector.** Providing civil society with timely and credible information—for example, information regarding the commitments that each of the stakeholders has

made to improve the sector—enhances accountability within the sector. It also contributes to obtaining greater support from the public for the government's initiatives within the sector. It is important that this information is provided by a body that the public considers to be credible.

- **Appropriate accountability and oversight mechanisms.** Adopting the appropriate transparent accountability and oversight mechanisms is necessary for making utilities responsible for public funds. The board of directors of the public utilities should ensure there are adequate internal controls. Accountability can be improved by publishing audited financial statements, annual reports, and business plans.
- **A competent board of directors.** The board of directors should have the adequate competencies to carry out their functions and act in the interest of the utility. This is essential because board members ultimately are responsible for guiding the performance of the utility. Board members should be highly qualified and capable of exercising objective and independent judgment to guide and monitor performance and to advise management and exercise oversight over the discharge of their responsibilities. Board members should carry out their principal fiduciary duties: the duty of care and the duty of loyalty.⁷
- **Financial sustainability.** This includes not only the existence of hard budget constraints but also the need to ensure that SOEs are compensated for noncommercial activities.

Recommended actions to improve water utility performance in the Caribbean

Many of the countries assessed do not have or have limited essential elements for enabling good governance, while others do have the essential elements but still have underperforming utilities (for example, NWC). Although creating a good governing environment is essential for maintaining the performance of state-owned water utilities, many actions can be taken by a state-owned water utility to improve performance without changing its governing environment. This report proposes areas that could be improved without changing the governing environment.

Governance can be improved by strengthening and improving the credibility, accountability, and autonomy of the utilities. Utilities can improve their credibility in the eyes of stakeholders by improving their performance in areas such as quality of service, operating efficiency, and financial sustainability. Performance improvements can be achieved by creating the right incentives to improve performance and by identifying the priority areas that a utility should improve. Utilities can improve their accountability by agreeing upon and meeting well-defined and measurable objectives and targets. When a utility has more authority over its management and resources, its autonomy increases. Therefore, the governing environment should incentivize utilities to improve performance by implementing the following actions:

- Assessing the condition of the sector and establishing a baseline of the utility
- Setting multiyear targets for increasing quality of service and operating efficiency and agreeing on sources of funding to cover the associated costs
- Strengthening oversight and accountability

Assessing the condition of the sector and establishing a baseline for the utility

With the exceptions of Belize and Jamaica, the countries surveyed for this report lack up-to-date, detailed, and comprehensive data on water supply and sanitation services, including utility service provision. This lack of information complicates efforts to establish a common understanding of issues in the sector, which in turn makes it difficult to develop an informed and actionable plan for addressing problems in the sector and the utility.

To address this challenge, state-owned water utilities should carry out an assessment of their initial situation—a baseline—to help identify their priority needs and assess the priorities and gaps in the water and sanitation sector as a whole. The baseline should provide the data necessary to develop realistic objectives related to coverage, quality of service, operating efficiency, and financial performance for state-owned water utilities and the sector as a whole that are agreed upon by the government, the utility, and other stakeholders. It should also include a review of the legal and regulatory framework, the existing technical and financial situation of the utility, and the availability of financing mechanisms for developing required assets.

Accurate data are crucial for effectively forecasting operating expenditures and capital investments. Since water utilities are among the most capital-intensive utilities,⁸ and many of their assets are underground, the importance of accurate data cannot be overstated. With accurate baseline data, management can prepare effective strategies for improving operations and developing the necessary fixed assets. Establishing a baseline that accurately diagnoses the utility's financial, operational, and commercial situation is therefore essential.

However, state-owned water utilities in the Caribbean—such as Dominica, Grenada, and St. Lucia—do not have accurate and comprehensive data on essential elements for operating and improving their water utilities (such as the volume of water produced and billed for, the condition of their fixed assets, and their customer base), and these utilities do not make that data available to the public. This information gap makes it impossible for customers and the public—who pay for services through tariffs and taxes, as well as the government itself—to fully evaluate the services received. It also makes it difficult for utilities to make informed and strategic decisions about current challenges and objectives for improvement.

Therefore, it is important for governments to support state-owned water utilities in carrying out baseline assessments by providing financial assistance or technical support. The first step in creating a baseline is to identify the information and data that are required. Utilities that do not collect data regularly will need to develop a system to collect information. Because the main governance challenge relates to the inadequacy of incentives for achieving SDGs, the initial work on the baseline should focus on obtaining the relevant information to set objectives and targets for the increase in service provision and coverage (for example, gaps between rural and urban areas, piped water coverage, and wastewater collection).

Setting multiyear targets for increasing quality of service and operating efficiency and agreeing on sources of funding to cover costs of reaching these targets

Setting comprehensive, multiyear targets is an important element of improving utility performance. Multiyear targets should be based on the utility's current situation (determined through baseline measurements) and desired future performance.

The utility and the government body or regulatory authority responsible for its oversight should use the baseline data to create specific objectives and clear indicators with which to track actual performance. Given the current performance of many state-owned water utilities in the Caribbean, these targets should focus on increasing operating efficiency (for example, reducing nonrevenue water and improving the collection rate) and quality of service provided (for example, improving continuity of service).

Both the utility and the authority responsible for oversight should agree on the multiyear targets and the sources of funding to cover the costs of reaching them. This step is important because in most countries in the Caribbean, a government body or regulatory authority is typically responsible for setting the utility's tariffs. Although adjusting tariffs to cover the cost of service is more sustainable and efficient in the long run, in cases where governments are not willing or able to increase tariffs to cover the full cost of service, they should provide subsidies through a reliable mechanism to cover the excess costs not expected to be covered through tariff revenues. Any subsidies provided through such a mechanism should be targeted and calibrated according to specific public policy objectives. Because the main governance challenge relates to the inadequacy of incentives for achieving the SDGs, utilities should set clear targets for expanding coverage that are linked to the funding needed to achieve the targets.

Belize, Grenada, and Jamaica have multiyear performance targets for their state-owned water utilities. However, only Belize and Jamaica have clear goals that are linked with the funding to achieve them. The state-owned water utilities in these countries have tariffs that cover their operating expenses and some portion of capital costs. However, tariffs are not sufficient to fund capital investments required to improve the quality of service, operating efficiency, and wastewater collection and treatment. In Grenada, the multiyear targets for NAWASA are not publicly available and cannot be analyzed or compared with those of other countries.

Dominica and St. Lucia do not have targets to guide utility performance. These countries appear to lack the information that is required to set objectives or to clearly establish targets. In cases such as these, governments should work with the utilities to collect accurate information to set targets and to provide the funding to meet those targets. Regulatory authorities or the government bodies responsible for oversight should also verify and report on progress against targets, helping to ensure accountability.

Strengthening oversight and accountability

Government policy should establish a clear, detailed, and effective process for regulating and monitoring utility performance. For example, a government body or regulatory authority should be clearly responsible for evaluating and reporting on progress against multiyear targets. This will help the utility establish credible systems for measuring performance against targets on a regular basis.

Holding the managers and other staff of the utility accountable for progress against the objectives and targets also is key for improving governance. It is extremely important for a governing environment to provide the correct incentives to promote regulation and accountability. This means that the government should put in place the adequate incentives for managers of SOEs and other staff to meet determined targets. Some mechanisms, such as performance contracts in which the government and the utility agree to meet certain targets provided they receive support, can help align these incentives.

In Dominica and Grenada, it appears that the ministries responsible for oversight of the state-owned water utilities do not have the information needed to check if the utilities are performing well. On the basis of the information available, it appears that these countries do not provide customers of the utilities with mechanisms for registering complaints or managing public consultations on tariff issues. In addition, there appear to be few requirements in the legal framework for the collection and public dissemination of information on performance, costs, and investments. Utility performance can easily deteriorate as a result.

Some countries—such as Belize, Jamaica, and St. Lucia—have assigned responsibility for monitoring the performance of the utility to a regulatory body. Although this arrangement works well in Belize, it has not led to the same level of performance improvement in Jamaica or St. Lucia.² This is especially puzzling in the case of Jamaica, which has a governing environment that would be expected to be more conducive to improved utility performance. Nevertheless, if regulators are lax when enforcing service standards or if the system lacks credibility, the incentives for state-owned water utilities to achieve targets may be reduced.

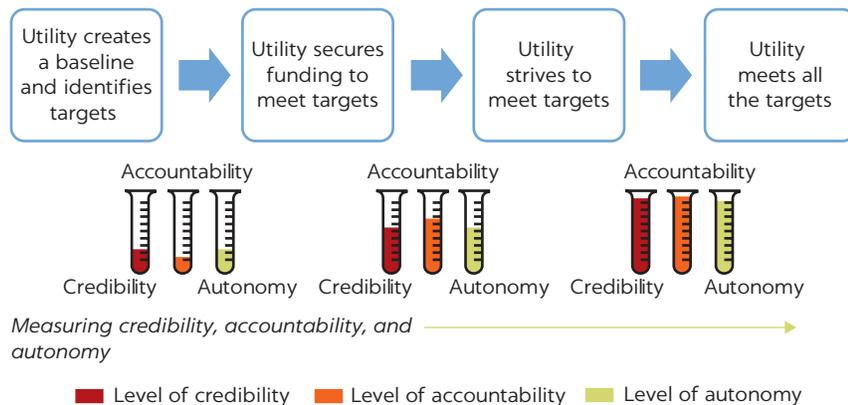
Conclusion

A good governing environment provides the incentives and support for improving the performance of state-owned water utilities. Establishing a baseline provides the utility with the information to set realistic objectives and multiyear targets. These objectives and targets can then be incorporated into agreements between the government and the utility regarding the expected performance of the utility. As the utility works to meet its targets and obtain concrete results, it builds credibility in the eyes of relevant stakeholders (figure 3.1).

In addition, a good governing environment should help the utility establish greater autonomy from the government (figure 3.1). To do so, the utility should demonstrate it has the capacity to make important decisions about its operations, staffing, and capital investments. It should also demonstrate it has the capacity to carry out the corrections needed to improve performance without consistent support from the government.

Finally, a good governing environment would improve accountability (figure 3.1). By setting targets and ensuring the utility’s compliance with the targets, managers

FIGURE 3.1
Building an efficient utility



Source: World Bank, based on Soppe, Janson, and Piantini 2018.
Note: This figure is an earlier version of figure B2.1.1.

of state-owned water utilities are held responsible for their management. Adopting adequate incentives that tie the performance of the utility to the utility's management would push managers to constantly strive to improve the utility's operating efficiency and financial performance.

It should be noted that to achieve their objectives and targets, utilities need the resources, incentives, and capacity to do so. For example, achieving universal water and wastewater coverage targets will require resources. The government needs to carefully assess the level of funding it is willing and able to provide through dedicated and reliable subsidy mechanisms when tariffs are set below the cost of service.¹⁰ When utilities do not have the resources required to achieve their targets, it damages their credibility and undermines their accountability.

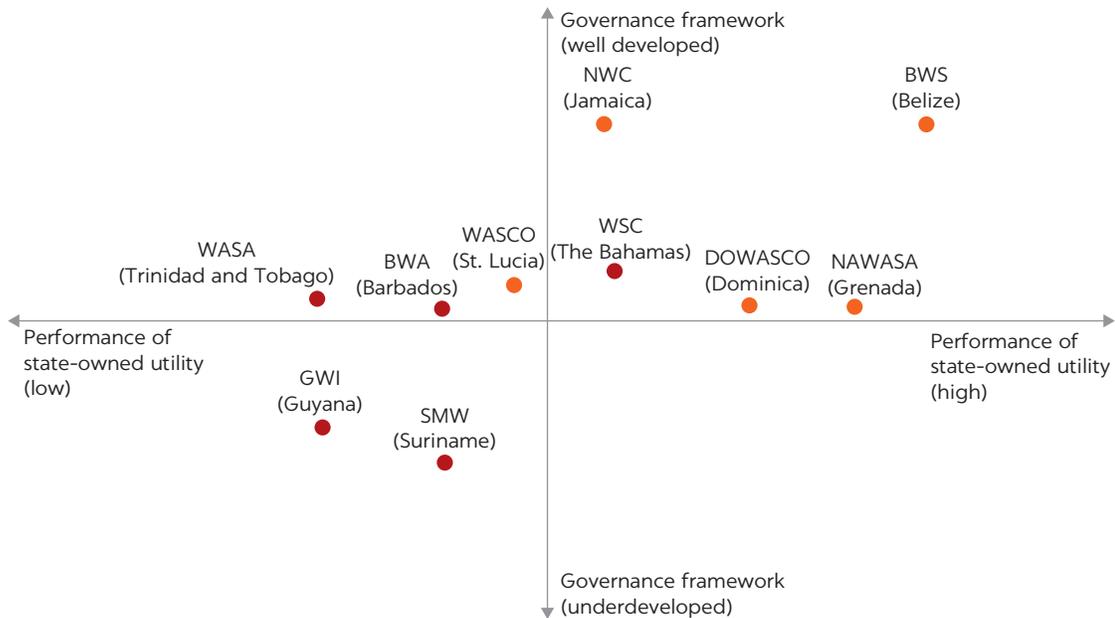
Of the five countries analyzed, Belize has the best governing environment for improving utility performance. The country has legislation that clearly identifies and allocates responsibilities in the water and sanitation sector. BWS, the state-owned water utility, carried out a baseline assessment to establish its multiyear targets. It continues to work with PUC to set multiyear targets and to agree on the sources of funding to cover the costs of meeting them. The utility's tariffs also cover the cost of its current multiyear targets—they are adjusted periodically to ensure cost recovery. In addition, BWS is effectively monitored and held accountable to its targets by PUC. This incentivizes the utility to meet its targets.

The governing environment in Jamaica does not greatly differ from the one in Belize. Nevertheless, NWC's performance is below that of the state-owned water utility in Belize (BWS). Like Belize, Jamaica has legislation that clearly identifies and allocates responsibilities in the water and sanitation sector. NWC has multiyear targets that are based on an accurate baseline. It is monitored by a regulatory authority that oversees its performance and approves its tariffs. Despite this, NWC continues to underperform. Given the similar governing environments for BWS and NWC, the difference in utility performance merits further investigation to identify the causes of this divergence.

CONCLUSIONS

In the Caribbean region, as well as (or perhaps even more than) in other areas around the world, building a smart and resilient water utility for the future is critical. Public utilities provide water supply and sanitation (WSS) services. Although some of these utilities perform well, others suffer from performance issues observed in many other public sector entities, such as low operating and investment efficiency. Through the Water Utility Turnaround Framework, the World Bank is promoting a three-pronged approach to enhance water utilities' performance: (a) strengthening the operational efficiency of the utility, (b) improving the governing environment, and (c) improving access to funding for WSS.

Governance in the water and sanitation sector needs to be improved in many of the jurisdictions in the Caribbean. There is a disparity among governance frameworks across the region. Some countries, such as Belize, have a strong governance framework with well-developed policies and legal and regulatory frameworks, while others, such as Suriname, have a weak framework because of unclear sector policies and underdeveloped legal and regulatory frameworks. The five assessed countries—Belize, Dominica, Grenada, Jamaica, and St. Lucia—have moderate to well-developed frameworks compared with other Caribbean countries.

FIGURE 3.2**Level of development of governance framework versus performance of state-owned utilities in the Caribbean**

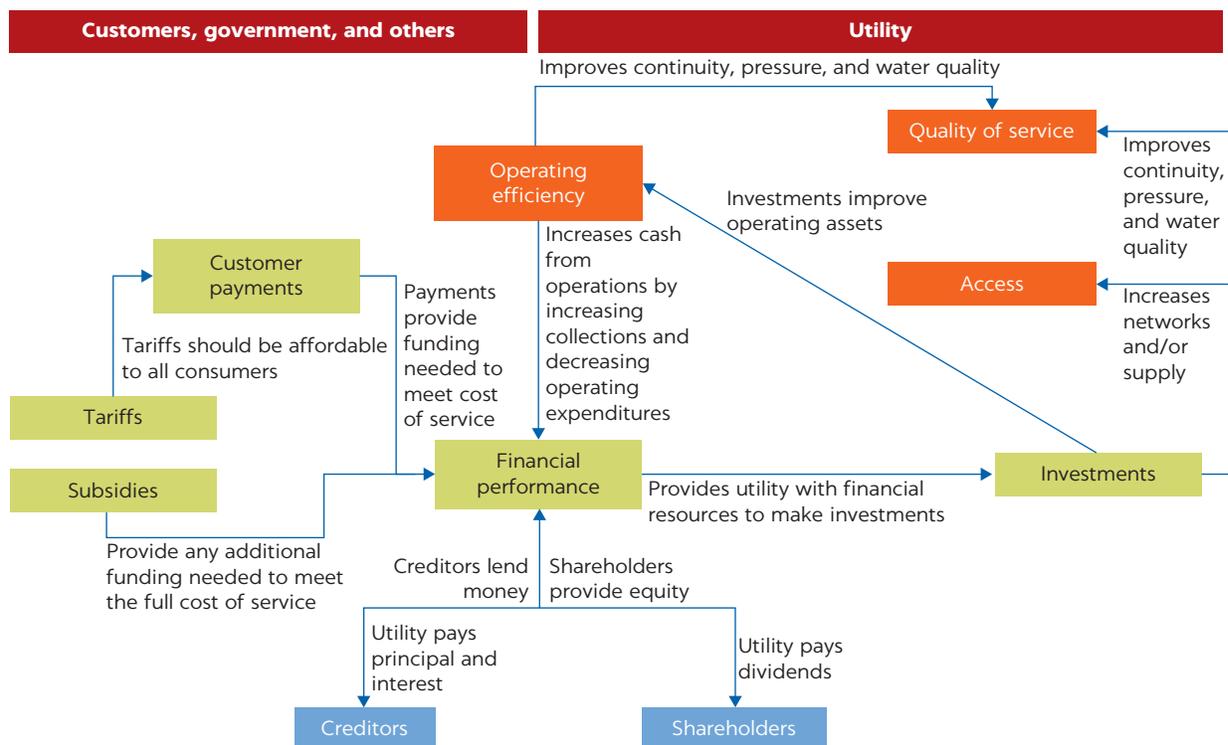
Note: The governance framework considers the country's sector policies and the level of development of its legal, regulatory, and institutional system. The points were plotted based on the governance assessment in chapter 3 of this report. The performance of a state-owned utility is based on its coverage, quality of service, operating efficiency, and financial performance. Each criterion used to assess the performance of state-owned enterprises carries the same weight. The points were plotted based on the performance assessments in chapter 2 of this report. The state-owned utilities in orange are the utilities that are assessed in this report. The utilities in red are other benchmarked utilities. BWA = Barbados Water Authority; BWS = Belize Water Services Limited; DOWASCO = Dominica Water and Sewerage Company Limited; GWI = Guyana Water Incorporated; NAWASA = National Water and Sewerage Authority; NWC = National Water Commission; SMW = Surinaamsche Waterleiding Maatschappij; WASA = Water and Sewerage Authority; WASCO = Water and Sewerage Company; WSC = Water and Sewerage Corporation.

The governance and performance of the water and sanitation sector are related. In this study, it has been found that water utilities operating under well-developed governance frameworks usually perform better than water utilities with underdeveloped governance frameworks (figure 3.2). For example, the water utility in Belize, BWS, operates under a well-developed governance framework. It is also one of the top-performing utilities.

In conclusion, and as reflected in figure 3.3, the 14 benchmarked state-owned water utilities are not providing the access, especially for wastewater, and the quality of service expected by households, businesses, and governments in the region. The analysis of cases presented identifies the following challenges related to the utilities' performance:

- **Piped water coverage in the benchmarked countries is below the Latin America and the Caribbean average.** Utilities in the region need to increase access to piped water systems. This is important because, in urban areas and some rural areas, piped water systems are the most efficient and effective way to provide potable water. However, many water utilities in the Caribbean are not investing enough in their assets. A water utility that is not regularly investing in its assets or that does not have a sufficient asset base will struggle to provide desired levels of access and quality of service, and its operating efficiency may be negatively affected. The lack of investment may also have a negative impact on a utility's operating efficiency. To increase access through piped water systems,

FIGURE 3.3
Assessing the performance of state-owned water utilities



utilities must make the necessary investments in assets to extend their coverage and, in some cases, the water supply.

- **Collection and treatment of wastewater in most jurisdictions in the Caribbean is noticeably lacking.** Most state-owned water utilities collect less than 20 percent of wastewater. Furthermore, in many cases, adequate treatment of the wastewater collected is limited. Other than the treatment performed by the state-owned water utilities, most wastewater collection and treatment is minor. Achieving substantial increases in wastewater collection and treatment will require significant capital investments.
- **The quality of service provided by most state-owned water utilities is not adequate.** Most state-owned water utilities struggle to provide their customers with the desired level of continuity, pressure, and water quality. This can be the result of insufficient revenues to cover their costs or low operating efficiency.¹¹ To improve low quality of service related to low revenues, state-owned water utilities must ensure income streams that allow them to cover their costs. This income can come from tariffs or subsidies.
- **Currently, tariffs do not cover the cost of service.** Tariffs charged by most of the state-owned utilities (which are easily affordable for most customers) cover operating expenditures, even in cases where operating expenditures are high. However, these tariffs do not cover other costs, such as wastewater collection and treatment.
- **Information regarding quality of service, NRW levels (which are high in most water utilities), and operating efficiency are poor in many of the water utilities.**

Utilities in the region need to reduce commercial and physical losses of water to improve their financial sustainability and the quality of service they provide. It was found that few water utilities measure, collect, or can readily access data regarding the quality of their services. This lack of information makes it more difficult to assess utilities' performance and to develop solutions to improve the quality of service, NRW, and operating efficiency. The lack of information also reflects poorly on the utility because it decreases transparency and accountability. To improve their performance, utilities should start to record information regarding quality of service, NRW, and operating efficiency.

One of the main pillars of SOEs corporate governance is to ensure that an effective legal and regulatory framework is in place (World Bank 2014). Having an effective legal and regulatory framework is said to create an enabling environment for good governance. However, changing a deficient legal and regulatory framework can be cumbersome, and it can take time. It also does not guarantee the utility will automatically improve its performance, as illustrated by the case of NWC in Jamaica. Therefore, this report focuses on improving governance at the utility level, without changing the external environment in which the utility operates, and identifies the following areas for improvement by the governments and the utilities:

- **Lack of comprehensive data to assess the performance of the utility.** Building on the points previously raised, most countries lack comprehensive data on water and sanitation services provided by the water utilities. This lack of data does not allow the government to adequately understand the issues in the sector and develop adequate solutions to address these issues. Therefore, the first step to improve governance within the sector is to assess the condition of the sector. State-owned utilities should carry out an assessment of their initial situation—a baseline—to help identify their priority needs; there are many tools to help them undertake these assessments (for example, IBNET, at <http://www.ib-net.org>). The baseline should also be used to assess the priorities and gaps in the water and sanitation sector. Countries such as Brazil, Malaysia, and Peru have been very effective in establishing key performance indicators (KPIs) and collecting and monitoring data to feed this information into the decision-making process. This benchmarking report may help, in the sense of developing KPIs for the water sector in the Caribbean region.
- **Targets for expanding water and sanitation coverage are not linked to the funding that would be required to achieve those targets.** The second step needed to improve governance is to set multiyear targets to meet a government's and a utility's objectives. The targets should be based on the utility's current state, and they should be measurable and quantifiable to ensure they can be tracked regularly. Both the government and the utility should agree on the targets and the sources of funding to cover the costs of achieving them.
- **Lack of regulatory and accountability mechanisms.** To strengthen regulatory and accountability mechanisms, it is necessary to establish clear and effective processes for regulating and monitoring utility performance. In some countries, ministries, or the regulatory authorities responsible for oversight, do not have the information to check the performance of water utilities and do not have the proper mechanisms in place to feed this information into the decision-making process. Establishing adequate regulating and monitoring mechanisms is essential to improve governance in the sector. This would also help to keep managers of water utilities and public officials accountable for the performance of the utility.

APPENDIX A

Belize

Belize Water Services Limited (BWS) is the water utility in charge of providing water and sewerage services to cities and other urban areas of Belize. The government holds a majority of its shares, and the Public Utilities Commissions (PUC) regulates its operational and financial performance.

LEGAL AND REGULATORY FRAMEWORK

Belize has different legal and regulatory frameworks for its urban and rural water sectors. Five laws govern the urban water sector, and the Village Councils Act governs the rural water sector. These laws establish the responsibilities of the different bodies in charge of making policy, regulating, or funding the water and sanitation sector.

Legislation

The water sector is regulated by the PUC, an autonomous institution established by the Public Utilities Commission Act (PUC Act), first approved in 1999 and revised in 2000. At that time, the Water and Sewerage Authority (WASA) was responsible for water services in urban areas. In 2001, the Water Industry Act ceased the functions of WASA. BWS was created to replace WASA, and PUC issued a 25-year exclusive license to BWS to provide water and sanitation services in the areas previously served by WASA. Village Water Boards are governed by the Village Councils Act. The following are key milestones, policies, and regulations that govern the water sector:

- **The Public Utilities Commission Act, Chapter 223, Revised Edition 2000.** This act established PUC, giving it authority over the electricity, water, and telecommunications sectors. The act sets out PUC's composition, governing rules, and general functions. It enables PUC to issue regulations on rates and procedures for reviews, appeals, accounts, and reports. In the water sector, BWS is the only utility with a license from PUC, and the only utility regulated by PUC.
- **The Water Industry Act, Chapter 222, Revised Edition 2003.**¹ This act, which was approved in 2001, replaced the Water and Sewerage Act, Chapter 185 of the Laws of Belize. The Water Industry Act 2003 ceased the functions of WASA (established under Section 3 of the repealed act). The act gives the minister of natural resources and immigration responsibility for promoting a national policy for water and gives PUC the right to grant licenses for providing water and sewerage services. It also sets out the function and duties of PUC, the responsibilities

of the licensees, and the regulations for water pollution control (including specification of controlled areas and award of permits for discharge).

- **Water Industry (Vesting Day) (Dissolution of WASA and Nomination of Successor Company) Order 2001.** This order specifies the date on which WASA was officially dissolved (March 23, 2001), and was replaced by BWS (a company formed and registered under the Companies Act of Belize).
- **The BWS License (2001).** PUC issued this 25-year license to BWS on March 20, 2001. The license authorizes BWS to serve all areas previously serviced by WASA, and sets out performance and safety standards, reporting requirements, and license fees to be paid to PUC. Under the terms of the license, BWS is to follow by-laws issued by PUC for setting tariffs, and to request approval for its proposed tariffs from PUC. From the license's expiry in 2026, BWS has the first right of refusal to continue to operate in the same service area under 15-year contract extensions.
- **The Village Councils Act, Chapter 88, Revised Edition 2003.** This act governs the Village Councils and sets out the legal procedures for establishing a village, the procedures for electing members to the Village Council, the powers and duties of the Village Council, and regulations for the Village Water Boards. Furthermore, Part VII:01 of this act establishes how the Village Water Boards should be composed, the responsibilities and powers of the Village Water Boards, the rates to be charged for water supplied, and the accounting procedures for the Village Water Boards.
- **The National Integrated Water Resources Act 2010.** This act established the National Integrated Water Resource Authority (NIWRA) to coordinate overall water policy in Belize. According to the act, NIWRA should report to the Ministry of Natural Resources and is responsible for developing a National Water Master Plan and for allocating water resources by acting as licensing agency for drilling and water abstraction. Although legally established in 2010, it has not yet been fully set up organizationally due to funding constraints.

Bodies with responsibilities in the water and sanitation sector

Four kinds of bodies have responsibilities in Belize's water and sanitation sector: government ministries and departments, regulators, financial intermediaries, and service providers. Government ministries and departments oversee the sector, design policies, protect the environment, and regulate health standards. Regulators monitor the service provider's economic and financial performance and issue water abstraction licenses. Financial intermediaries provide concessional financing for water and sanitation projects. Service providers, which include BWS and Village Water Boards, provide services to customers.

Belize has different legal and regulatory frameworks for its urban and rural water sectors. Some bodies participate in both the urban and rural water sectors. However, most bodies' responsibilities are limited to either the urban or rural areas.

Government ministries and departments

Six government ministries and departments are responsible for supervising and developing the water and sanitation sector in Belize:

- **Ministry of Labor, Local Government, and Rural Development (Ministry of Labor).** The Ministry of Labor develops policy for and oversees water provision

in rural areas. It also monitors and regulates Village Water Boards. Specifically, its Rural Development Department (RDD) is responsible for the following:

- Approving and undertaking capital investments in rural water supply
 - Appointing the members of the Village Water Boards to manage rural water supplies
 - Training Village Water Board staff
 - Approving the tariffs charged by Village Water Boards
 - Monitoring Village Water Boards’ compliance with reporting requirements
 - Providing Village Water Boards with technical and some financial support where required
- **Ministry of Finance, Public Service, Energy, and Public Utilities (Ministry of Finance and Public Utilities).** The Ministry of Finance and Public Utilities approves annual budgetary allocations for investments in the water and sanitation sector by BWS and Village Water Boards. In addition, this ministry is “the ministry responsible for water and sewerage,” pursuant to the Water Industry Act. As such, it is responsible for setting the sector’s policy, establishing regulations for the sector, and overseeing the actions of the sector’s regulator, the Public Utilities Commission. In addition, the minister of finance and public utilities is a member of BWS’s Board of Directors.
 - **Ministry of Economic Development, Petroleum, Investment, Trade, and Commerce (Ministry of Economic Development).** The Ministry of Economic Development monitors investments in the public sector. Thus, it collects and evaluates information on government projects in the water sector.
 - **Ministry of Natural Resources and Immigration (Ministry of Natural Resources).** The Ministry of Natural Resources is responsible for water-resource management.² In 2003, the ministry reestablished a Pro Tempore Water Commission to act as an organizing body for developing water resource policy.
 - **The Ministry of Health.** The Ministry of Health has several health-related responsibilities in the water sector. Most importantly, it has a National Drinking Water Quality Program that monitors water quality. According to the Public Health Ordinance (1985), this ministry can also investigate public health complaints; monitor sewage, solid waste, and liquid waste management; and engage in “pollution prevention.”
 - **The Department of the Environment.** The Department of the Environment, housed in the Ministry of Forestry, Fisheries, and Sustainable Development, is responsible for fostering the prudent use and management of Belize’s natural resources by protecting the environment and controlling pollution. It is responsible for formulating both the National Environmental Policy and Strategy and the National Environmental Action Plan.

Autonomous regulator (independent from the government): The Public Utilities Commission

The PUC Act of 1999 established PUC to regulate the electricity, water and sanitation, and telecommunications sectors. It is an autonomous entity, funded by licensing fees paid by providers. In the water sector, PUC is responsible for

Ensuring that ... utility customers have safe, reliable, and high-quality services at affordable rates, while allowing a reasonable return on investment for investors, so as to facilitate the development of an environment that will stimulate national growth (PUC no date).

PUC carries out three functions: (a) it issues licenses to water providers (currently, BWS is the only licensed water provider); (b) it sets quality of service standards and tariffs; and (c) it monitors and enforces compliance with these regulations.

As part of the regulatory framework, PUC should approve BWS's tariffs every five years, BWS's tariffs should be set at a level that ensures a 12 percent rate of return, and BWS can apply to PUC to increase its tariffs in line with inflation and other indexation factors.

Service providers

Two types of water suppliers serve Belize's urban and rural areas. BWS provides water and sewerage services for urban areas, and Village Water Boards manage and operate water supply systems in rural villages. Although they are autonomous entities, the government has substantial and direct influence over both service providers:

- **Belize Water Services Limited.** BWS is the water utility responsible for providing water and sewerage services in all major urban areas and contiguous villages. In recent years, BWS has provided some technical assistance to Village Water Boards on a fee-per-service basis.

In 2001, the government of Belize created BWS, vested it with the assets and liabilities of the previous government-owned utility, granted it a 25-year license, and sold 83 percent of the shares in BWS to the private water operator Cascal B.V. (Cascal). Four years later, the government repurchased Cascal's shares in BWS. Thus, the government owns 83 percent of BWS's shares (with the Social Security Board owning 10 percent and the general public having purchased the remaining 7 percent) and has the right to appoint seven of the eight members of BWS's Board of Directors.

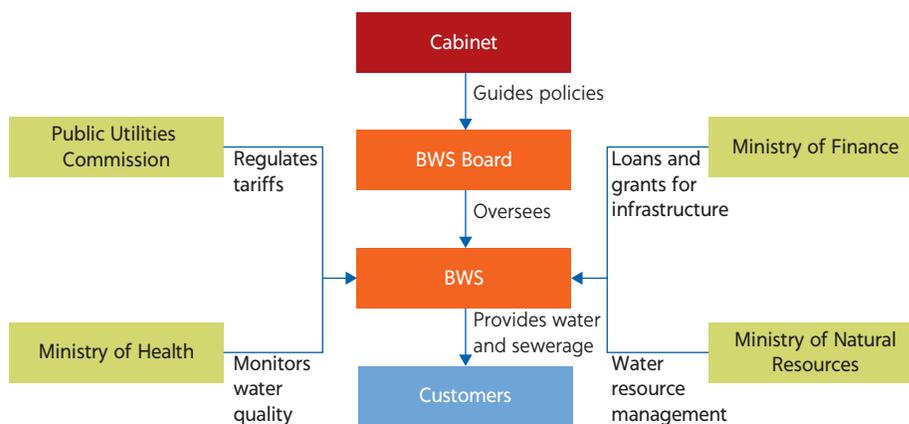
- **Village Water Boards** are responsible for overseeing the day-to-day management and operation of rudimentary water supply systems in their village or multiple villages. As such, they are responsible for operating and maintaining the water supply system, collecting tariffs from consumers, and submitting monthly financial and cash flow reports to RDD.

There are seven members in each Village Water Board. Five members are appointed by the minister of labor after consultation with the Village Council and the area representative. The other two members are the Village Council chairman and another council member. PUC does not play a role in regulating Village Water Boards because none of these boards has applied for an operating license from PUC.

Village Water Boards may form a District Association of Water Boards, which would provide technical and financial assistance and advice to its members. However, there are not any District Associations of Water Boards functioning in Belize.

Figure A.1 illustrates the relationships and roles of the government, BWS, and PUC in water and sanitation services in urban areas.

FIGURE A.1
Overview of urban water sector structure in Belize



Source: Belize Water Services Limited.
 Note: BWS = Belize Water Services Limited.

BELIZE WATER SERVICES LIMITED

In 2001, the government of Belize created BWS and granted it a 25-year operating license. BWS is the sole provider of water and wastewater services in all major urban areas and contiguous villages. As such, the company serves approximately 59 percent of Belize's population.³ It is also the only provider in the country with experience in developing, operating, and maintaining a sewer system. BWS has managed to provide nearly universal coverage of water supply within its service area; however, the largest gap in the urban areas is in the collection and treatment of wastewater. BWS's lack of financial capacity to invest further in infrastructure may jeopardize BWS's substantial gains in operating efficiency and its ability to meet coverage and quality of service goals.

Composition of market

BWS is the water utility responsible for providing water and sewerage services in all major urban areas and contiguous villages. As a result, 100 percent (169,659 people)⁴ of the country's urban population is in BWS service areas, and 25.3 percent (52,771 people)⁵ of the country's rural population is in BWS service areas.

BWS has residential, commercial, and government customers. Most of its customers are residential customers, and residential customers account for most of the billings of BWS's served water. In 2016, BWS had 55,483 total customers, and almost 90 percent were residential customers. Residential customers consumed 73 percent of billed water.

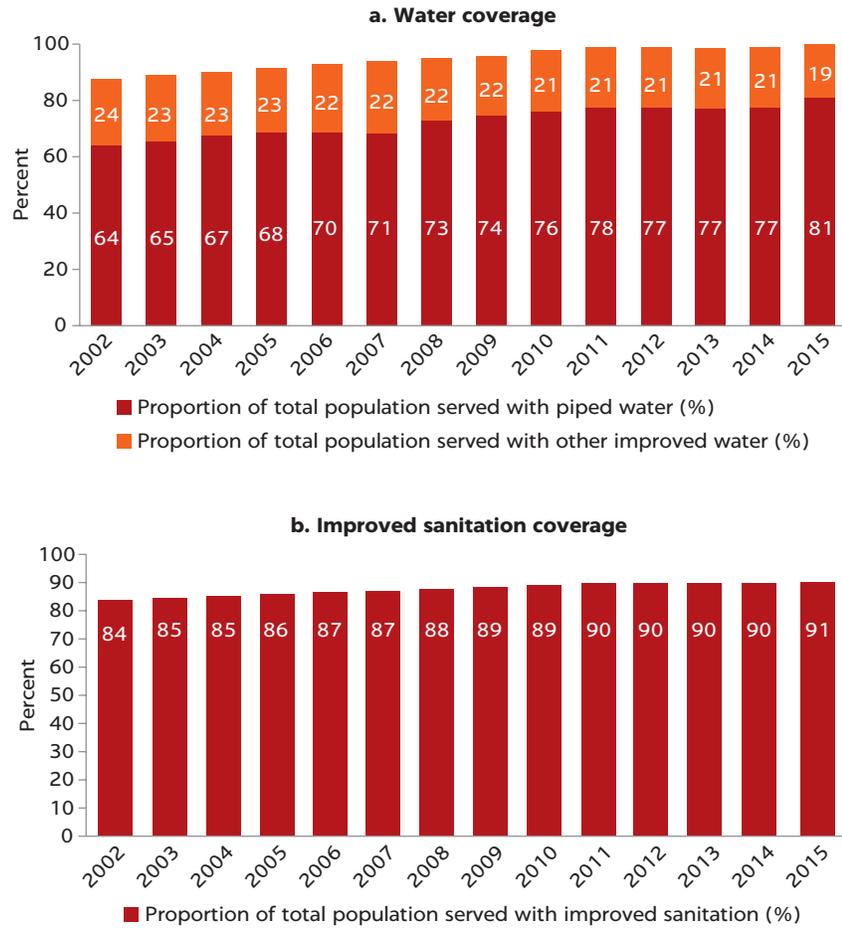
Operating performance

BWS is one of the few water utilities in the Caribbean that can access operating information quickly, a reflection of strong management of its information and accounting systems.

Service coverage

BWS has nearly universal water service coverage but has very low wastewater service coverage. In 2015, it provided water service to 96 percent of people in its service

FIGURE A.2
Water and sewerage coverage in Belize



Source: UNICEF and WHO 2015.

area; however, it provided wastewater service to only 17 percent of people in its service area.

Figure A.2 provides a complete picture of water and sewerage coverage in Belize. Access to clean water (that is, improved water) is nearly universal, even among rural communities. Access to piped water and access to improved wastewater services grew quickly from 2002 to 2015, both in urban areas and in rural areas. Wastewater services also increased, but much less rapidly.

APPENDIX B

Dominica

The Dominica Water and Sewerage Company Limited (DOWASCO) is the body in charge of providing water and sewerage services in all of Dominica. It is government owned and under the supervision of the Ministry of Lands, Housing, Settlements, and Water Resource Management.

INTRODUCTION

The Commonwealth of Dominica is a small island in the Eastern Caribbean. It has a population of approximately 71,700 people. Dominica's one utility, DOWASCO, is responsible for providing water and sewerage services to the island. DOWASCO was created under the Water and Sewerage Act of 1989. It is responsible for managing water resources in the country and conducts research, data collection, and water resource projections (Caribbean Development Bank 2015).

Water in Dominica is predominantly used for domestic supply, hydropower, and export. Therefore, the entities consuming the most water are DOWASCO and the Dominica Electricity Services (DOMLEC) company for hydropower generation (Chase 2008). In 1989, DOWASCO received an exclusive license to abstract water for 25 years. Any other entity that wants to abstract water must receive a sublicense from DOWASCO. So far, the licenses have been given to two bottling companies and to a company that exports bulk water through tankers.

LEGAL AND REGULATORY FRAMEWORK OF THE WATER AND SANITATION SECTOR OF DOMINICA

The Water and Sewerage Act of 1989 and the Water and Sewerage Regulations of 1997 govern the water and sanitation sector of Dominica. They establish the responsibilities of the different bodies in charge of making policy, regulating, or funding the water and sanitation sector.

Laws and regulations governing the water and sanitation sector in Dominica

The Water and Sewerage Act and the Water and Sewerage Regulations establish the framework for the water and sanitation sector in Dominica. Although this framework has made DOWASCO more independent from the government, the sector lacks an independent regulator that oversees DOWASCO's performance:

- **Water and Sewerage Act of 1989 (WSA).** WSA sets the institutional and regulatory framework for the sector. It grants DOWASCO an exclusive 25-year license for the provision of water and sanitation,¹ establishes the Water and Sewerage Advisory Council to advise the Ministry of Public Utilities, and makes the Ministry of Health responsible for water quality. WSA also makes the Ministry of Public Utilities responsible for approving any tariff adjustments proposed by DOWASCO and makes DOWASCO responsible for implementing water policy. The Ministry of Lands replaces the Ministry of Public Utilities in all responsibilities related to the water and sanitation sector.

WSA grants DOWASCO greater independence from the government, allowing for economic, rather than political, consideration to guide its decision-making. It creates new commercial requirements for DOWASCO, obliging it to ensure its revenues are sufficient to cover operating expenses and capital expenditures. The 1994 amendment to WSA removed tax and duties exemptions that had been granted to DOWASCO.

There are other laws that put DOWASCO simultaneously in charge for providing water and sanitation services and for leading water resource management. However, these laws usually lack the necessary mechanisms to coordinate with other institutions. The government drafted the National Integrated Water Resources Management Policy, but it has not been ratified.

There is no regulatory body for the water and sanitation sector in Dominica. Rather, regulation is performed either through the decisions of DOWASCO's board or the minister of lands. The regulatory framework of the water and sanitation sector in Dominica consists of the following:

- **Water Regulations, 1997.** Provide the regulations for the implementation of water-related matters set in the WSA of 1989 and amended in 1994.
- **Sewerage Regulations, 1997.** Provide the regulations for the implementation of sewerage-related matters set in the WSA of 1989 and amended in 1994. These regulations were amended in 2008. The amendment introduced new rates for sewerage services.

Bodies responsible for policy making, regulating, and providing water and sanitation in Dominica

There are five key bodies with responsibilities in Dominica's water and sanitation sector. Four of these are ministries that oversee the sector and resource management. The fifth is DOWASCO, which is the service provider. There are no private service providers in Dominica's water and sanitation sector:

- **Dominica Water and Sewerage Company Limited.** DOWASCO is a registered company owned entirely by the government of the Commonwealth of Dominica. It was created in 1989 under the Water and Sewerage Act, replacing the National Water Services. DOWASCO is responsible for providing water and sewerage services in the entire country. It also oversees Dominica's water resource management under supervision of the Ministry of Lands, Housing, Settlements, and Water Resource Management.
- **Ministry of Lands, Housing, Settlements, and Water Resource Management.** The ministry regulates the delivery of water and sewerage services in Dominica.

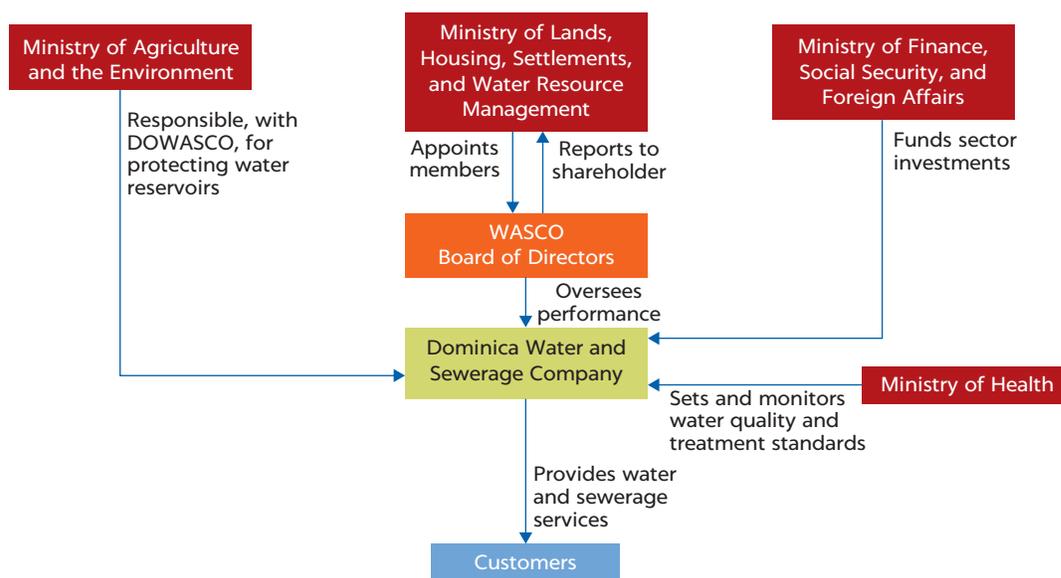
It is responsible for appointing DOWASCO's Board of Directors, approves tariff changes, and oversees DOWASCO's performance. It also has the authority to create policies related to water infrastructure. The ministry is responsible for monitoring and coordinating activities with respect to water resource management.

- **Ministry of Health (MH).** MH is responsible for establishing water quality and treatment standards for Dominica's water and sanitation sector. The Environmental Health Division monitors DOWASCO's water treatment practices and water source protection, water quality, and water treatment for the entire island. It analyzes and controls the water quality test results that DOWASCO provides. It also oversees septic tanks, latrines, and public sewerage services.
- **Ministry of Finance, Social Security, and Foreign Affairs.** The ministry is responsible for approving budgets and investments in the water and sanitation sector.
- **Ministry of Agriculture and the Environment (Forestry Division and Environment Coordination Unit).** The Ministry of Agriculture and the Environment and DOWASCO are jointly responsible for protecting water reservoirs. The Ministry of Agriculture and Environment monitors and approves processes related to environmental compliance.

Figure B.1 shows the relationships between the main bodies with responsibilities in the water and sanitation sector in Dominica.

There is no independent economic regulator in the water and sanitation sector in Dominica. Instead, different responsibilities for regulating the sector fall under the jurisdiction of DOWASCO's Board of Directors and of the ministries involved in the sector.

FIGURE B.1
Main bodies in Dominica's water and sanitation sector



Source: Dominica Water and Sewerage Company Limited.
 Note: DOWASCO = Dominica Water and Sewerage Company; WASCO = Water and Sewerage Company.

DOMINICA WATER AND SEWERAGE COMPANY

DOWASCO is the government-owned corporation responsible for providing water and sanitation services to the whole island of Dominica.

Governance

DOWASCO is governed by a seven-member Board of Directors; its members are from both the private and public sectors. The Board of Directors is appointed by the Ministry of Lands, Housing, Settlements, and Water Resource Management. The Board of Directors reports to the shareholder—the government of Dominica. It is responsible for the activities, financial integrity, and performance of DOWASCO. It sets policies to ensure that DOWASCO fulfills its legal, financial, operational, and professional responsibilities.²

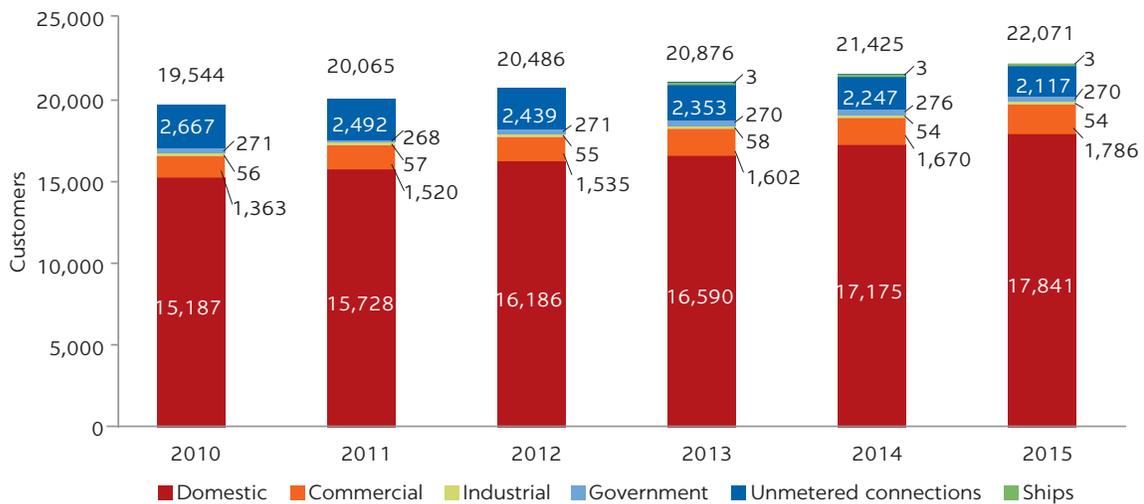
DOWASCO is fiscally independent from the government. Regulation does not specify or constrain how DOWASCO must spend its funds. Although the Ministry of Lands must approve changes to tariffs, regulation establishes that DOWASCO must charge rates that will ensure the coverage of expenses. Therefore, there is no dependency on government subsidies to cover operating expenses. However, DOWASCO must obtain approval from the Ministry of Finance before it obtains a loan or grant.³ In practice, DOWASCO has not received operating subsidies from the government in the past 10 years.

Composition of DOWASCO’s market

In 2015, there were 22,071 water service connections. Residential connections represented 80.8 percent of water connections.

Figure B.2 shows that DOWASCO’s customers are primarily residential. However, nonresidential customers account for 40 percent of water sales. Government

FIGURE B.2
DOWASCO’s customers by type



Source: Dominica Water and Sewerage Company Limited.
Note: DOWASCO = Dominica Water and Sewerage Company.

customers represent only 1 percent of the customer base but represent 19 percent of total water sales.

Service coverage

DOWASCO's service coverage needs to improve. DOWASCO's water service coverage increased from 60 percent to 67 percent of the population from 2011 to 2015. Sewerage service coverage has remained at around 8 percent since 2011.

APPENDIX C

Grenada

Grenada is an archipelago of three islands: mainland Grenada, Carriacou, and Petit Martinique. It has a land area of 345 km² and a population of 106,667.

The National Water and Sewerage Authority (NAWASA) manages water and sewerage services in Grenada. NAWASA provides water to 97 percent of the population and wastewater services to 98 percent of the population. However, NAWASA's water supply is vulnerable to droughts, hurricanes, and tropical storms.

Positive cash flows from operations and increasing marginal earnings before interest, taxes, depreciation, and amortization (EBITDA) prove the company's good financial standing. However, NAWASA could improve its operating efficiency by working on reducing its nonrevenue water (NRW) level and improving its collection rate.

LEGAL AND REGULATORY FRAMEWORK OF GRENADA'S WATER AND SANITATION SECTOR

The NAWASA Act of 1990, its amendments, and other regulations govern the water and sanitation sector in Grenada. The laws and regulations specify the bodies responsible for overseeing, regulating, and providing water and wastewater-related services in the country.

Laws and regulations governing the water and sanitation sector in Grenada

The NAWASA Act, its amendments, and other regulations make up the main legal framework governing the water and sanitation sector in Grenada:

- **National Water and Sewerage Authority Act CAP. 208 (NAWASA Act) (1990).** In 1990, the government passed the NAWASA Act. This act transferred the responsibility for water and sewage management from the Central Water Commission (CWC)¹ to NAWASA. NAWASA became responsible for providing, conserving, distributing, and using water resources. It also became responsible for treating and disposing of wastewater. NAWASA is responsible for investigating water resources and advising the Ministry of Communications, Works, Physical Development, Public Utilities, Information and Communication Technology, and Community Development (Ministry of Works, or MOW) on improvements, preservation, conservation, and utilization of water supplies.

- **National Water and Sewerage Authority (Water Supply and Sewerage Areas) Order SRO 10 (1995).** This order establishes water supply and sewerage areas in the main cities in Mainland Grenada, Carriacou, and Petit Martinique.
- **National Water and Sewerage Authority Regulations SRO 40 (2010).** This set of regulations describes the rates, charges, and fees for the supply of water to consumers and for the disposal of sewage. The regulation has three schedules. Schedule I outlines rates and fees to be paid by metered consumers, Schedule II outlines the charges and fees for services provided by NAWASA, and Schedule III provides the calculation for a rate formula for sewerage.
- **Other policies and legislation.** The NAWASA Act has been amended several times without any major changes to the legal framework. The government drafted a National Water Policy in 2007 (Government of Grenada 2007a), which placed integrated water resource management on the agenda. The “Road Map Toward Integrated Water Resources Management Planning” was launched in 2007 (Government of Grenada 2007b).

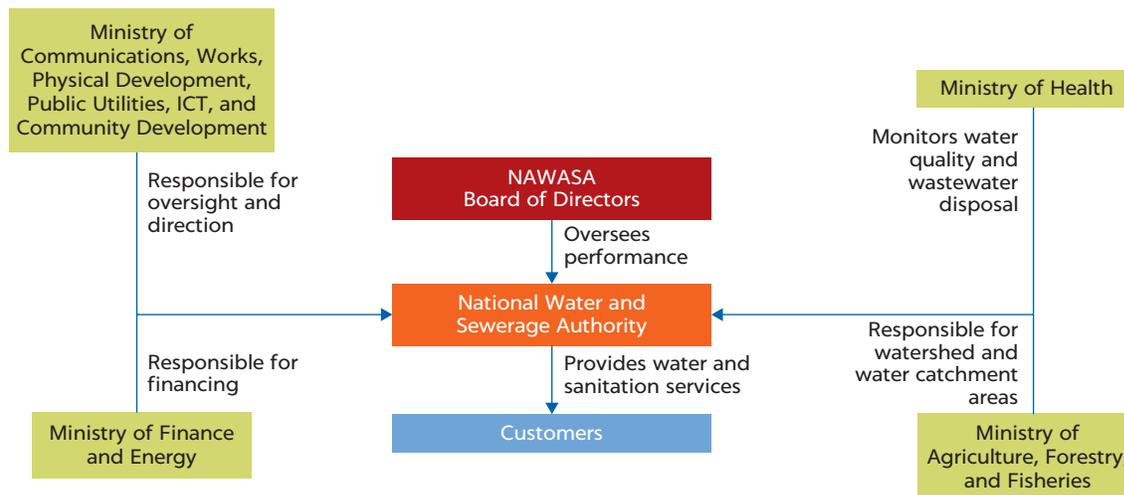
Bodies with responsibilities in the water and sanitation sector in Grenada

Two types of bodies have responsibilities in Grenada’s water and sanitation sector: government ministries and statutory bodies. Government ministries oversee the sector and regulate health and environmental standards. Statutory bodies provide water and sanitation services and set standards for the provision of services. NAWASA is a statutory body that provides water and sewerage services to customers and monitors the quality of the service it provides:

- **National Water and Sewerage Authority.** NAWASA is the government-owned company responsible for providing the water supply and for the safe disposal of wastewater. The NAWASA Act of 1990 created NAWASA and transferred the water and wastewater management functions of the CWC to NAWASA.
- **Ministry of Communications, Works, Physical Development, Public Utilities, Information and Communication Technology, and Community Development.** MOW is responsible for overseeing NAWASA.
- **Ministry of Health.** The Ministry of Health is responsible for monitoring water quality and wastewater disposal in Grenada.²
- **Ministry of Agriculture, Forestry, Fisheries, and the Environment.** The Ministry of Agriculture, Forestry, Fisheries, and the Environment is responsible for watershed and water resource management. It protects water catchment areas and develops irrigation projects on the islands (FAO 2001). The ministry’s Water Resource Unit cooperates with NAWASA by sharing data on water-related issues (Caribbean Development Bank 2015).
- **Ministry of Finance and Energy.** The Ministry of Finance determines NAWASA’s budget, investments, and its ability to borrow or obtain credit.

Figure C.1 shows the relationships between the key stakeholders in the water and sanitation sector in Grenada.

FIGURE C.1
Main bodies in Grenada’s water and sanitation sector



Source: National Water and Sewerage Authority.

Note: ICT = Information and Communication Technology; NAWASA = National Water and Sewerage Authority.

NATIONAL WATER AND SEWERAGE AUTHORITY

NAWASA is responsible for water supply and wastewater collection and treatment services in Grenada.

Governance

NAWASA's Board of Directors is responsible for the utility's performance. The board consists of nine representatives from relevant ministries, the Private Sector Organization of Grenada, and the public. Specifically, the minister of MOW appoints the board's chairman and deputy chairman. He or she also appoints one board member nominated by the Private Sector Organization of Grenada and two board members representing the public. The ministers of agriculture, health, works, and finance each appoint one board member.³

NAWASA's Board of Directors is managed by a manager, a deputy manager, and the relevant staff needed by the board to perform its duties.

Composition of market

The NAWASA Act defines two categories of water users: domestic and nondomestic. Domestic users include households and farmers. Nondomestic users include commercial customers, industrial customers, and public institutions (Government of Grenada 2007b). Domestic users account for 48 percent of water usage, and nondomestic users account for the remaining 52 percent of water usage.

Service coverage

NAWASA supplies most water in Grenada. It has 97 percent service coverage, supplying water to 43,031 consumers.⁴ Approximately 88 percent of the population is served through piped water.

Water supply in Carriacou and Petit Martinique is deficient. In Carriacou, NAWASA's desalination plant operates at less than 10 percent of capacity because of operational problems (Peters 2006). Residents rely on NAWASA water trucks for their water provision or on self-supply. The 2011 Census reported that in Carriacou, 44 percent of the water supply came from nonpiped water catchments and 49 percent came from piped private sources.⁵

Water storage is also uneven throughout the country. There is insufficient water storage capacity in the north of the country, and excess capacity in the south of Mainland Grenada.

Grenada has only two sewerage collection disposal systems in place.⁶ The public sewer system is concentrated in Mainland Grenada in the town of Saint George and in the south of the island. Sewerage services are provided to approximately 1,700 customers.⁷ However, most residents rely on septic tanks or pit latrines. The 2011 Census reported that only 4 percent of households were connected to a sewer. Another 58 percent of households had septic tanks and 30 percent used pit latrines.

APPENDIX D

Jamaica

The National Water Commission (NWC) is the water utility in charge of providing water and sewerage services to Jamaica. It is a government-owned utility, and the Office of Utilities Regulation (OUR) regulates its operational and financial performance.

LEGAL AND REGULATORY FRAMEWORK

Laws and regulations governing the water and sanitation sector of Jamaica

Four acts establish the responsibilities of the different bodies in charge of making policy, regulating, and providing services in the water and sanitation sector.

Legislation

The structure of Jamaica's water and sewage sector is shaped by a set of laws and regulations that define the roles and responsibilities of sector participants. Legislation clearly sets out the government's authority to issue licenses and to set and enforce standards for safety, metering accuracy, and health. Additionally, sector laws have created bodies to provide for the protection of the environment and the allocation of water resources and the regulation of the sector. The following key laws and regulations govern the water and sanitation sector:

- **National Water Commission (NWC) Act (1963).** The NWC Act provides for the establishment of a Water Commission whose functions include establishing and managing the national water supply. The NWC Act is all encompassing. It creates the NWC, and one of the functions of NWC is to keep under constant review the quality, reliability, and availability of water supply services and the rates charged for such services [NWC Section 4(1)(c)]. The NWC Act also provides that NWC may purchase water in bulk and sell water either in bulk or to individual consumers. The act further provides, in section 19, that NWC “may, with the approval of the relevant Minister, make regulations for the better carrying of this Act into effect. ...”

If NWC is supplying to an area serviced by the Parish Council, the minister may remit any water rates applicable under the Parish Council arrangement to NWC. NWC could also acquire any water works owned by the Parish Council.

Initially, NWC had been empowered to manage and regulate independent operators from whom it purchased and to whom it sold water in bulk, but this role has changed since the advent of the OUR Act. The regulatory powers that are

contained in the NWC Act are subject to the operations of the OUR Act by virtue of section 2A of the OUR Act.

- **Natural Resources Conservation Authority Act of 1991.** Under the National Resources Conservation Authority Act, the Ministry of Health and the Environment (MOHE) has the mandate to protect Jamaica's physical environment. The implementing authority, the National Environment and Planning Agency (NEPA), has broad responsibility for managing Jamaica's natural land and aquatic environments. NEPA is an executive agency that became operational on April 1, 2001. Its mission is to promote sustainable development by ensuring protection of the environment and orderly development in Jamaica.

The National Resources Conservation Authority Act requires that environmental impact assessments (EIAs) be carried out for all proposed projects with significant environmental impact. The EIA report must include socioeconomic analysis, evaluation of alternatives, and impact-mitigation policies and measures.

- **The Office of Utilities Regulation Act (1995).** This act provides a regulatory framework for prescribed utility services. The act empowers OUR to issue licenses and to determine and monitor service charges, rates, or other fees payable by consumers for utility services. OUR has jurisdiction over the providers of the "prescribed utility services" listed in the act. The supply or distribution of water and the provision of sewerage services are two of the prescribed utility services.

The OUR Act gives wide regulatory powers to OUR. Section 4(3) of the OUR Act requires OUR to institute measures to, inter alia, encourage competition in the provision of prescribed utility services and to inquire into the nature and extent of the utility services provided by a licensee. Section 4A of the act states that no organization can provide a prescribed utility service without first being issued a license granted by the minister.

- **Water Resources Act and Regulations (1996).** This act provides for the establishment of an authority to regulate, allocate, conserve, and manage the water resources of Jamaica. It governs the extraction and use of water resources. It governs the exploitation of water from its source. It is under this act that the Water Resources Authority operates.

Bodies with responsibilities in the water and sanitation sector

The water and sanitation sector in Jamaica is dominated by NWC, a vertically integrated, publicly owned utility, with several smaller public and private service providers servicing the smaller and less-densely populated regions. Although the responsibilities and actions of these service providers are dictated by the laws that govern the sector, deficiencies in the legal framework for the sector lead to several regulatory and oversight difficulties. These shortcomings include confusion regarding the proper way to incorporate government objectives and the proper way to respond to the numerous government entities that oversee or could potentially oversee the sector.

There are three types of bodies with responsibilities for Jamaican water and sanitation: government agencies responsible for making policy, overseeing, or funding the water and sanitation sector; an autonomous regulator responsible for regulating providers; and utilities and other suppliers that provide water and sanitation services.

Government agencies responsible for making policy, overseeing, or funding the water and sanitation sector

The following 10 government agencies have a significant role in regulating the water sector, specifically in monitoring and enforcing health and environmental regulations:

- **Ministry of Water and Housing.** The Ministry of Water and Housing (MOWH) is responsible for the approval of water service licenses, at the recommendation of OUR, and for setting water sector policy. MOWH also oversees NWC and the Water Resources Authority.

The minister of water appoints the board of NWC, generally in consultation with the prime minister. The NWC Act also grants the minister specific powers relating to the oversight of NWC's operations and tariffs.

- **Water Resources Authority.** The Water Resources Authority (WRA) is a board with responsibility for regulating, controlling, and managing all water resources. It works in collaboration with other planning agencies, including the NEPA and the Natural Resources Conservation Authority. These agencies are responsible for reviewing and approving all environmental, construction, and discharge permits, with the objective of ensuring proper planning of integrated water resources. WRA's mandate also includes minimizing the impact of water-related natural disasters and promoting public education on water resources.

The Water Resources Act authorizes WRA to manage all of the nation's water resources by evaluating and controlling the allocation of ground and surface water. As such, WRA prepares island-wide master plans for water resources utilization. NWC, the National Irrigation Commission (NIC), and any other entity must obtain extraction permits from WRA to extract water.

- **Rural Water Supply Limited.** Rural Water Supply Limited (RWS) is a public company owned by MOWH. It is responsible for developing rural water projects where there are no other service providers and for turning such new assets over to NWC, Parish Councils, or private providers for operation.
- **Ministry of Finance and the Public Service.** The Ministry of Finance and the Public Service (MOFP) provides financial support by way of direct payments and loan support to government-owned entities. Previously, these functions were a part of NWC.
- **Ministry of Local Government and Community Development.** The Ministry of Local Government and Community Development is responsible for minor water supplies and provides governance, a policy and regulatory framework, and funding mechanisms. As such, it operates and maintains small water systems and standpipes through the Parish Councils.
- **Natural Resources Conservation Authority.** The Natural Resources Conservation Authority (NRCA) is a board with functions similar to those of the WRA. Established in 1991,¹ its role is to ensure the conservation and protection of Jamaica's natural resources, to manage environmental protection areas, and to build public awareness and provide policy advice on such matters. In 2001, NRCA's operational responsibilities were transferred to NEPA, and NRCA was reconfigured as an approval board for permit applications reviewed by NEPA.

- **National Environment and Planning Agency.** NEPA implements the Ministry of Health and Environment’s responsibilities under the National Resources Conservation Authority Act. Becoming operational in April 2001, NEPA took over NRCA’s operational responsibilities and manages Jamaica’s natural land and aquatic environments and promotes sustainable development. In the water sector, NEPA is responsible for determining and monitoring environmental standards for water supply and sewage. This includes reviewing and coordinating permitting for the processes that licenses in the water and wastewater services must go through. NEPA reviews all plans to develop and provide water services to determine the scope and extent of a project’s possible impact on the environment, advises on the requirement of an environmental impact assessment, performs reviews of such assessments, and presents its findings to WRA, NRCA, and the Ministry of Health and Environment for their consideration. NEPA is also responsible for monitoring the performance of permits and discharge licenses issued by WRA and NRCA.
- **Ministry of Health and Environment, Environmental Health Division.** The Environmental Health Division of the Ministry of Health and Environment monitors potable water quality, effluent quality, and other health-related issues. The division performs over 2,000 tests per week to monitor potable water and effluent quality against World Health Organization (WHO) standards and serves legal notices for violations of these standards.

Information collected is used to monitor providers and for public outreach purposes. When water quality standards are not met, the division carries out public safety notifications, including the use of town hall meetings, and print and radio media as necessary. Additionally, the division informs WRA, NRCA, and NEPA of necessary levels of tertiary treatment for discharge from buildings and wastewater treatment plants.
- **Urban Development Corporation.** The Urban Development Corporation (UDC), which operates under the Office of the Prime Minister, develops water and sanitation facilities to support developments when there are no other service providers.
- **Jamaica Social Investment Fund.** The Jamaica Social Investment Fund (JSIF) is a private company set up and sponsored by the government in 1996 as part of its poverty alleviation strategy to channel resources to small-scale community-based projects, including water and sewage projects. It was intended as a temporary measure, but its existence has been extended several times; currently, it has obligations running until 2020.

Autonomous regulator responsible for regulating providers: Office of Utilities Regulation

OUR is responsible for regulating all public utility services, including water and sewerage, electricity, telecommunications, and public transportation. The Office of Utilities Regulation Act (Act 13) established OUR in 1995, and OUR became operational in 1997. It finances its operations through regulatory fees charged to license holders.

OUR’s director general is appointed by the governor general, on the recommendation of the prime minister. The two deputy directors general are appointed by the prime minister on the recommendation of the minister.

OUR is responsible for setting tariffs for all regulated utilities. In the water and sewerage sector, OUR uses a price cap mechanism with incentives. Tariff rates for each license holder are set every three to five years and adjusted annually on the basis of a price adjustment mechanism. OUR also reviews all license applications for the sector, ensuring proper approvals have been received from relevant government planning and environmental agencies, and it presents such license applications to the Ministry of Water and Housing for approval. Additionally, OUR monitors and enforces the terms of such licenses once they have been approved.

OUR may issue decisions and regulations for the sector to ensure consumer needs are met, utilities operate efficiently, consumer health and the environment are protected, and that utilities can supply economical and reliable service to their customers.

In exercising its duties, OUR requires all sector license holders to report regularly (monthly, quarterly, or annually) on service standards and operations as well as prepare audited financial statements.

Providers of water and sanitation services in Jamaica

NWC furnishes most water and sewage services in Jamaica. NWC's services are supplemented by several small private providers, a small government-owned provider, and 13 Parish Councils.

NWC is a vertically integrated and government-owned utility that produces more than 90 percent of the treated water in the country and supplies piped water to approximately 73 percent of the population. NWC owns more than 95 percent of the sewage treatment capacity on the island, serving 25 percent of the population. Most urban centers do not have a central sewage system, and NWC only supplies sewage service in the areas of Montego Bay, Portmore, Negril, and Ocho Rios. It also provides sewage service to Kingston, through a special purpose contract with the Central Wastewater Treatment Company.

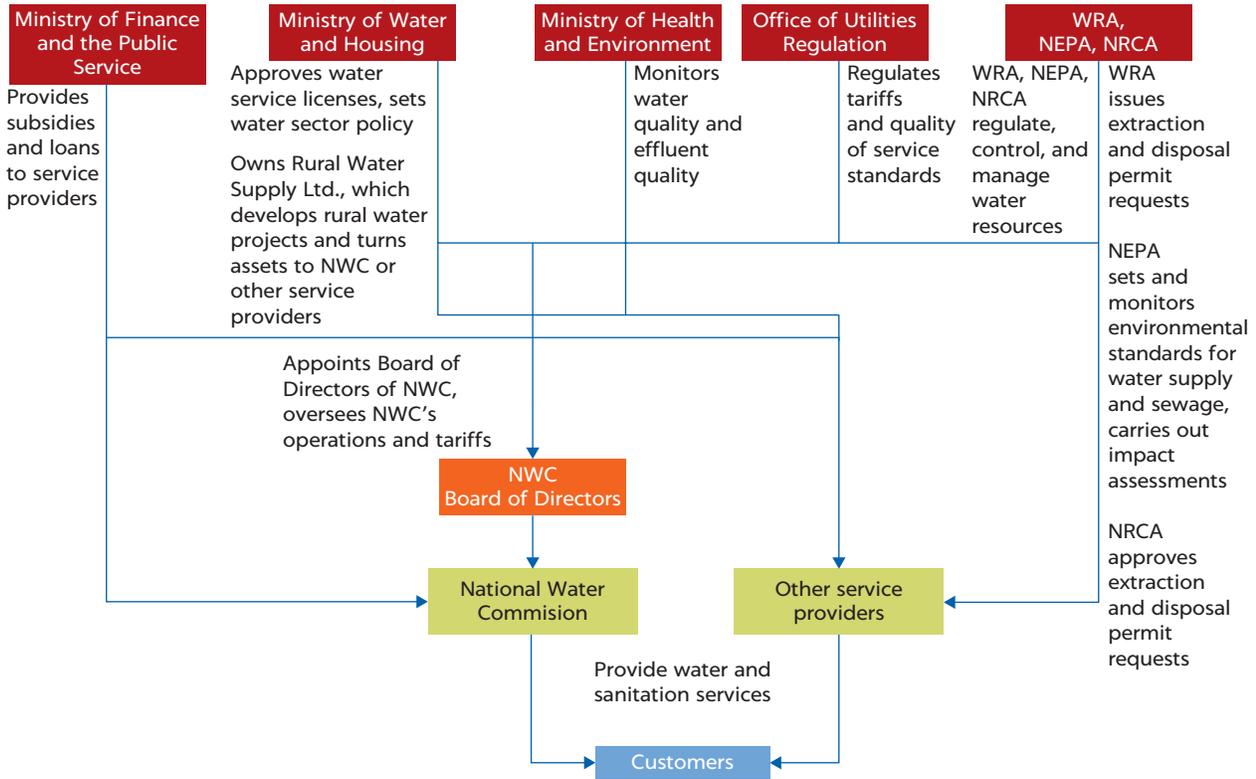
Besides NWC, there are three other types of purveyors of water and sanitation services in Jamaica. First, some Parish Councils also own and operate simple water supply systems. These systems function as part of the parish's overall services to the community and are not separate companies. Second, the Runaway Bay Water Company—which is owned by UDC, a government agency—sells bulk water to NWC and distributes water directly to consumers in the Runaway Bay area. Third, there are five small private companies that provide water and sewerage services, mostly to new housing developments through small water and sewerage plants. Private companies have been engaged to provide service in areas NWC does not currently serve or is not capable of serving effectively because of insufficient capacity.

Figure D.1 illustrates how the entities involved in the Jamaican water sector interact.

NATIONAL WATER COMMISSION

NWC supplies piped water to approximately 70 percent of the population. NWC has affordable tariffs and average levels of water quality and service, but low levels of operational efficiency and inadequate sewerage coverage. Overall regulation of the sector has increased customer service and service quality, via the enforcement of the Guaranteed and Overall Standards.

FIGURE D.1
Key relationships between entities in the Jamaican water sector



Source: National Water Commission.
 Note: NEPA = National Environment and Planning Agency; NRCA = National Resources Conversation Authority; NWC = National Water Commission; WRA = Water Resources Authority.

Composition of market

NWC has several categories of customers: residential, commercial, schools, condominiums, employees, and government. Most of its customers are residential customers; however, commercial customers account for most of the billings of NWC’s served water. In 2016, NWC had 345,846 total active customers, and almost 93 percent were residential customers. However, residential customers consumed only 45 percent of billed water, and commercial customers consumed 51 percent of billed water.

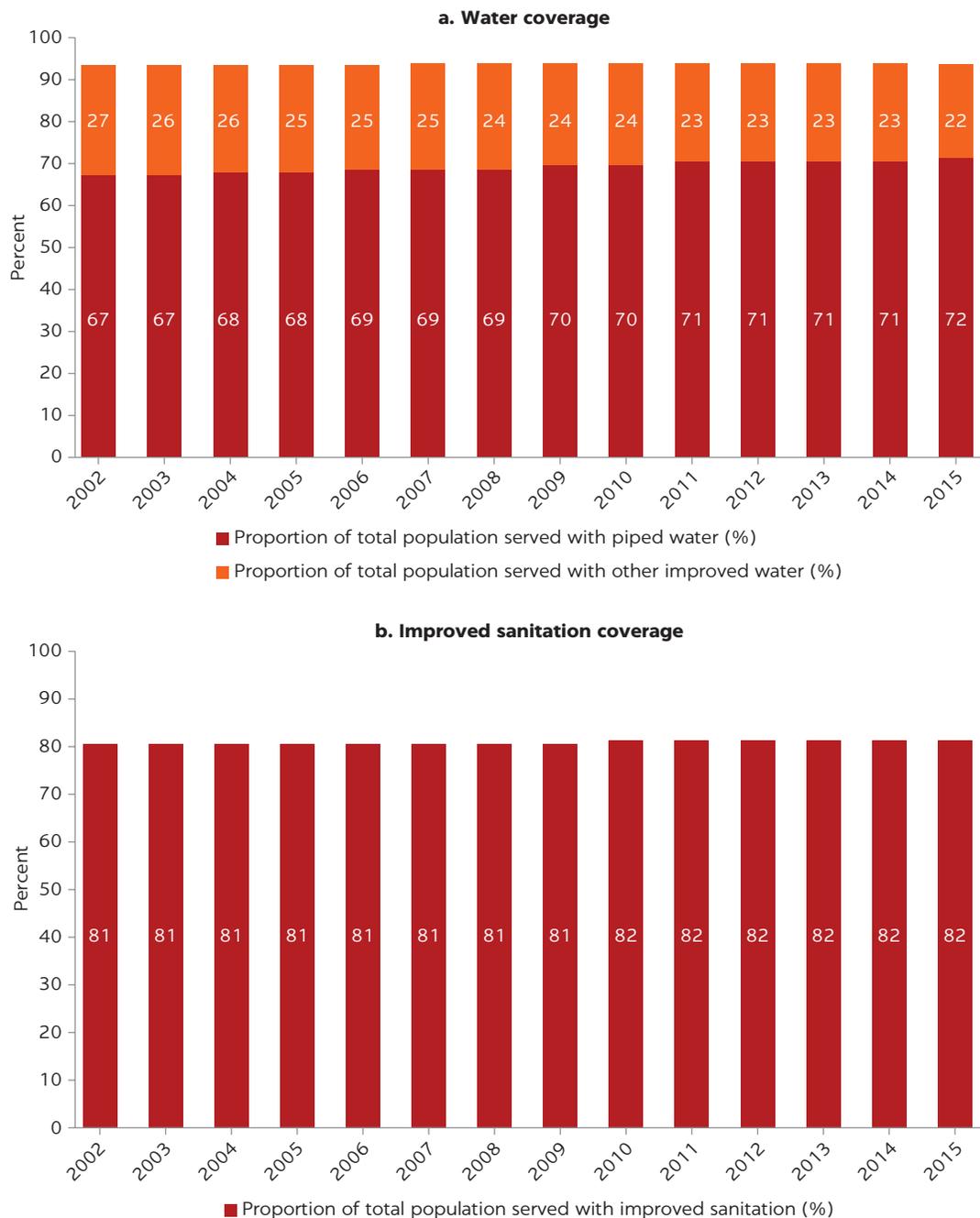
Service coverage

NWC has high water services coverage and low wastewater services coverage. NWC has water service coverage of 73 percent and an estimated wastewater coverage of 20 percent (figure D.2).

Although the proportion of the population serviced with improved water is high, at 94 percent, there is a discrepancy between coverage in urban and rural areas. The proportion of the urban population serviced with improved water is nearly universal, while the proportion of the rural population serviced with improved water is 89 percent.

The proportion of the population serviced with piped water across the country has never exceeded 75 percent—20 percentage points below the proportion of the population with access to improved water.

FIGURE D.2
Water and sewerage coverage in Jamaica



Source: UNICEF and WHO 2015.

APPENDIX E

St. Lucia

St. Lucia is a small island located in the Eastern Caribbean. It has a population of approximately 185,000 people. St. Lucia has one water and sanitation utility, the Water and Sewerage Company (WASCO). WASCO was established in 1999 under the Water and Sewerage Act. WASCO is responsible for providing water and wastewater management services for the entire island. WASCO has successfully provided water to a large percentage of the population. The demand for water in the north of the island has increased significantly because of the region's growing population. However, centralized wastewater services are limited in St. Lucia. WASCO has not been able to increase coverage of sewerage services on the island.

LEGAL AND REGULATORY FRAMEWORK OF ST. LUCIA'S WATER AND SANITATION SECTOR

The Water and Sewerage Acts of 1999 and 2005 govern the water and sanitation sector in St. Lucia. They structure the framework for the bodies responsible for overseeing, regulating, and providing services in the water and sanitation sector.

Laws and regulations governing the water and sanitation sector in St. Lucia

The Water and Sewerage Act of 1999 restructured the water and sanitation sector in St. Lucia, resulting in the current institutional arrangement:

- **Water and Sewerage Act (No. 13 of 1999).** In October 1999, the government restructured the sector through the enactment of the Water and Sewerage Act (No. 13 of 1999). The act established WASCO, replacing the Water and Sewerage Authority (WASA) as the provider of water and wastewater services.
- **Water and Sewerage Act (amendment) (No. 14 of 2005).** The Water and Sewerage Act (amendment) of 2005 established the regulatory bodies that oversee the water and sewerage sector in St. Lucia. The Water Resource Management Agency was created to manage the country's water resources. The act also established the National Water and Sewerage Commission (NWSC) to regulate the sector and sector-wide policies.
- **National Utilities Regulatory Commission Act (No. 3 of 2016).** The act established the National Utilities Regulatory Commission (NURC) for the regulation of utility supply services and related matters. It transfers all responsibilities and regulatory functions from the NWSC to NURC.

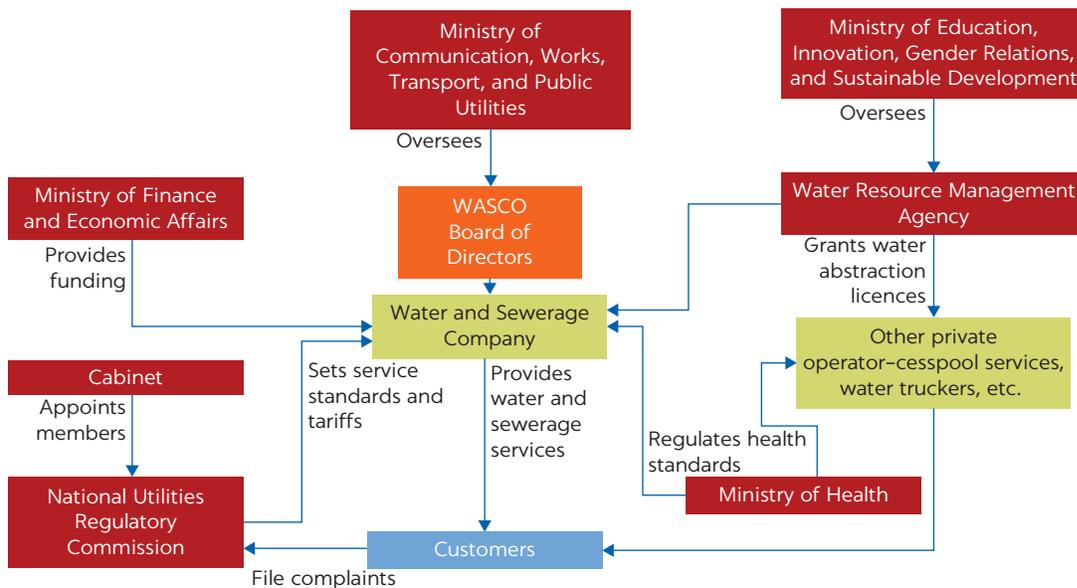
- **Other policies and legislation.** The government of St. Lucia passed the National Water Policy and other pieces of legislation that address water resource management in the country. In 2008, the government also began to develop an Integrated Water Resources Management Plan with external funding and technical assistance. However, the plan has not been finalized or implemented.

Bodies with responsibilities in the water and sanitation sector

Three kinds of bodies have responsibilities in St. Lucia's water and sanitation sector: government ministries, regulators, and service providers. Government ministries oversee the sector, appoint members to regulators, and regulate health standards. Regulators monitor the service providers' economic and financial performance, issue water abstraction licenses, and safeguard the environment. Service providers, which include WASCO and private operators, provide water and sewerage services to customers. The following are the most important stakeholders in the water and sanitation sector in St. Lucia:

- **Water and Sewerage Company.** WASCO is the government-owned company responsible for providing water and sewerage services. It was established under the Company Act in 1999, and it started operating under a 25-year license for water and a 15-year license for sewerage. WASCO replaced WASA as the body in charge of the provision of water and sanitation services in St. Lucia.
- **Private operators.** There are three kinds of private operators in St. Lucia. Two of these private operators are clients of WASCO. First, some hotels self-supply with desalination plants. Second, several private operators purchase water from WASCO and sell it to hotels in the north of the island. Third, a few private operators offer sewage disposal services. They use cesspool-emptying trucks and discharge at processing facilities owned and operated by WASCO.
- **Ministry of Communications, Works, Transport, and Public Utilities (MCWTPU).** MCWTPU is responsible for the water and sanitation sector in St. Lucia. It is responsible for making sector policy and supervising the operations of WASCO.
- **Ministry of Finance and Economic Affairs.** The Ministry of Finance is responsible for funding infrastructure and other projects within the water and wastewater sector in St. Lucia.
- **Ministry of Health.** The Ministry of Health is responsible for monitoring water supply and wastewater services and ensuring that they comply with health regulations and quality standards.
- **Water Resource Management Agency (WRMA).** WRMA was established under the amendment of the Water and Sewerage Act in 2008. WRMA is responsible for managing the island's water resources. WRMA is under the portfolio of the Ministry of Education, Innovation, Gender Relations, and Sustainable Development; therefore, it can only be regarded as semiautonomous. It has about 20 employees and lacks the resources to perform its mandate successfully.
- **National Utilities Regulatory Commission.** NURC is the regulatory body overseeing utility supply services in St. Lucia, including WASCO's. It was established by the National Utilities Regulatory Commission Act of 2016. It replaced the National Water and Sewerage Commission, which was the previous sector

FIGURE E.1
Key stakeholders in the water and sanitation sector in St. Lucia



Source: Water and Sewerage Company.
 Note: WASCO = Water and Sewerage Company.

regulator. NURC is responsible for managing service licenses and establishing, approving, and monitoring tariffs. NURC has between five and seven commissioners appointed by the minister after consultation with the cabinet. The minister also names one of the commissioners as the chairperson of NURC. And NURC is financially dependent on the budget allocated by the government.

Figure E.1 shows the relationships between the most important stakeholders in the water and sanitation sector in St. Lucia.

WASCO is regulated by a group of semi-independent regulators. NURC and WRMA are under the jurisdiction of ministries. The cabinet has the power to appoint the board of NURC.

WATER AND SEWERAGE COMPANY

WASCO was created under the Water and Sewerage Act of 1999. WASCO is the sole provider of water supply and wastewater management services in St. Lucia. Although other small operators deliver water to remote areas or to hotels, they acquire the water from WASCO.

Governance

The Board of Directors is responsible for WASCO's performance. The board reports directly to MCWTPU. MCWTPU appoints the seven members of the Board of Directors.

Composition of market

In 2015, WASCO had 47,362 active customers and US\$21.2 million in water sales. Residential customers represented 93 percent of WASCO's customers and

49 percent of water sales. Commercial customers represented 5 percent of customers and 17 percent of water sales. Industrial customers represented fewer than 0.1 percent of customers but represented 21 percent of water sales.

Service coverage

WASCO supplies almost all water in St. Lucia. In 2015, more than 92 percent of the population had access to improved water (Caribbean Development Bank 2015). In 2015, WASCO's water coverage was 70 percent. The North and Castries Basin make up 58 percent of water distribution.

Only 4 percent of the population of St. Lucia is connected to the public centralized sewer system. The rest of the population depends mostly on septic tanks or pit latrines.

Notes

EXECUTIVE SUMMARY

1. The Water Utility Turnaround Framework is a product of the World Bank Water Global Practice and forms part of the WSS Global Solutions Group's agenda on building sustainable urban utilities. The study was developed by a World Bank team led by Gerard Soppe and composed of Alex Bakalian, William Kingdom, and Christiaan Heymans, with support from Maria Angelica Sotomayor. The team of Castalia helped develop the framework—Nils Janson, Scarlett Piantini, Laura Saiki, Jaime Hurtado, and David Erhardt.

1 INTRODUCTION

1. The historical book value does not necessarily correlate well with the quality of the fixed assets these values refer to, as the latter depends on the maintenance effort, which is only partially reflected in the book value since maintenance is not normally capitalized.
2. The utilities in St. Vincent and the Grenadines and St. Kitts and Nevis did not provide the information necessary to be included in this study.
3. Rating scale goes from 0 to 4, with 4 being the highest rating. The rating is based on a set of criteria but is not a standard methodology.

2 ASSESSMENT OF PERFORMANCE OF WATER UTILITIES IN THE CARIBBEAN

1. In many cases, the benchmarked utilities do not have a direct way of calculating that value. For those utilities, we calculated the coverage level by multiplying the number of residential customers reported by the utility by the estimated average household density for the utility's service area.
2. For example, a water utility with a high percentage of its water supply produced from desalination (such as WSC) will have a much higher cost of water supply than one with a gravity-fed system.
3. For WASCO, the Caribbean Development Bank's 2015 report notes that "estimated levels of nonrevenue water range between 40 percent and 60 percent based on a high-level audit undertaken." For NAWASA, it states that "NAWASA has reported a level of unaccounted for water at 15–20 percent. However, this sum represents leakage within the distribution system and not the entire network. A report titled *Climate Change Adaptation for Grenada* (UNDESA 2012) suggests that losses within the water system could be as high as 33–40 percent."

4. Accounts receivable / revenues (days) are calculated by dividing accounts receivable (net of provisions for doubtful accounts) by revenues, and then multiplying by 365 to normalize the ratio in days.
5. For further reference, a utility's balance sheet will show its net accounts receivable. This amount is calculated by subtracting provision for doubtful accounts from its gross accounts receivable. A utility can thus have a low value for net accounts receivable by reducing its gross accounts receivable (by increasing its collection of accounts receivable due) or by recognizing that a larger percentage of the bills due from its customers may not be collected (thereby increasing its provision for doubtful accounts). A utility with a high collection efficiency therefore will have a low level of provisions for doubtful accounts and accounts receivable.
6. However, it is important to note that the performance of the water utility is closely linked to the performance of its labor force. For many utilities, it is more important to ensure that it has the qualified staff that it needs than to concern itself with reducing the size of its labor force.
7. The range is because other operating expenditures incurred by water utilities depend on the specific characteristics of their service areas. For example, a water utility that must pump all of the water it supplies will spend a significant amount of money on electricity. This will make the cost of electricity a relatively high share of OPEX and thereby decrease the share of staff costs.
 Tynan and Kingdom (2002), using data from 246 water utilities in 51 developed and developing countries, found that staff costs represented 39 percent of operating expenditures in the utilities in developing countries and 29 percent in the utilities in developed countries.
8. This indicator is calculated as the number of full-time staff divided by (the number of connections/1,000). The higher the value of the indicator, the lower staff productivity. In well-run utilities, this indicator has a value of 1 or less.
9. The amount of electricity required by a utility will depend on the specific characteristics of its service areas. For example, water utilities that produce water with desalination require a large amount of electricity for that process. Also, water utilities that must pump water across long distances or into areas of high elevation use more electricity than those utilities that have gravity-fed supply and flat service areas.
10. The value is particularly low for WSC because most of its water supply comes from desalinated water, which it purchases, and hence the cost of the electricity used for desalination is embedded in the cost of the purchased water.
11. EBITDA is "earnings before interest, taxes, depreciation, and amortization." It is calculated as revenues minus operating expenses. The EBITDA margin is calculated as EBITDA divided by revenues. This is related to the operating cost recovery ratio (which is operating revenues divided by operating expenses). For example, a 14 percent EBITDA margin is equivalent to an operating cost recovery ratio of 117 percent.
12. The DSCR is calculated as EBITDA divided by (interest expenses plus principal due on loans).
13. Return on assets is calculated as net income / (loss) for the year (as obtained from the income statement) divided by the value of the utility's total assets (as obtained from the balance sheet).
14. EBITDA is earnings before interest, taxes, depreciation, and amortization. It is calculated as revenues minus operating expenses. The EBITDA margin is calculated as EBITDA divided by revenues.
15. In 2015, NWC registered a net loss of J\$1.2 billion (equivalent to about US\$10.5 million) and had shareholders' equity of J\$2.9 billion. By 2016, the situation had worsened as it registered a net loss of J\$4.2 billion and had shareholder's equity of negative J\$12.5 billion.
16. It is not clear what explains the return on equity variable trend in St. Lucia between 2010 and 2013.
17. Information provided by WSC and the Caribbean Development Bank (2015).

3 GOVERNANCE OF STATE-OWNED WATER UTILITIES

1. The governance world of state-owned enterprises tends to focus on ownership: making important decisions, appointing board members, and voting shares. "Sector governance" discussions tend to focus on the role of the regulator, which (in the case of infrastructure) sets prices, and delivery targets. Future analytical work can build on this analysis to answer questions such as: Who is responsible for what? Who sets targets and benchmarks? How do "owners" work with "regulators"? In many countries, the combination of a weak owner and a strong regulator

leads to a situation in which the regulator starts to have more of an “ownership” role. This can result in a situation in which roles and responsibilities are no longer clear. Best practice literature argues that there is a need for both strong regulators and owners. In the sample of countries used in this analysis, there are several cases of this exact situation, where there is a relatively stronger regulator and a weaker owner. Future analysis could try to identify which specific roles are important, and who should be doing what, as technical assistance or policy discussions will be dependent on those answers.

2. Tariffs are generally not low—for water supply, tariffs are more than US\$2 per customer, which is significant and much higher than in most countries.
3. National Water Commission Act, 1963, Section 19.
4. Some multiyear targets were slightly adjusted as part of OUR’s midtariff review for NWC in 2016. However, most original multiyear targets appear in the determination notice for tariffs from 2013 to 2018 (OUR 2013).
5. The complete list of the quality-of-service performance targets appear separately in another OUR report (OUR no date).
6. Financial discipline (for example, hard budget constraints, and ensuring SOEs are compensated for noncommercial activities/PSOs/QFAs) is also a key element. Transparency and disclosure are somewhat implicit in “accountability and oversight” but to the full extent—especially in relation to issues such as management compensation, related-party transactions, and so forth.
7. Duty of care refers to the board member’s obligation to exercise reasonable diligence and care in performing his or her obligations. Duty of loyalty refers to the duty of allegiance to the SOE or its shareholders.
8. The “Report of the World Panel on Financing Water Infrastructure,” written by James Winpenny and dated March 2003, notes that “water, wastewater, and hydro projects are among the most capital-intensive of infrastructure investments. In the United States, for instance, the ratio of capital investment to revenues is twice as high in water as in natural gas, and 70 percent higher than in electricity and telecommunications” (Winpenny 2003). This report cites an unpublished IFC paper, “The Unique Risks of Financing Water and Sanitation Projects,” for this statement.
9. The regulator in St. Lucia was established in 2016. Little progress has been accomplished since then.
10. Water utility infrastructure is large, costly, and it takes a long time to generate sufficient revenues, hence the need for subsidies and the importance of technology.
11. Implicit behind this is another layer—insufficient revenues may lead to less-than-necessary investment or the inability to operate at full capacity or perform required maintenance.

APPENDIX A: BELIZE

1. The Water Industry Act comprises the Substantive Laws as of May 31, 2003, and the Subsidiary Laws as of October 31, 2003.
2. The National Integrated Water Resources Act of 2010 assigned the responsibility for the management of water resources and wastewater disposal to the National Integrated Water Resources Authority (NIWRA). However, the NIWRA has not been set up organizationally; therefore, it is not operational.
3. In 2010, BWS provided services to approximately 46,936 households, out of Belize’s total of approximately 79,272 households (shown in the 2010 Census).
4. BWS estimates based on 2010 census data.
5. BWS estimates based on 2010 census data.

APPENDIX B: DOMINICA

1. Water and Sewerage Act of 1989, Section 5.
2. DOWASCO website, http://www.dowasco.dm/index.php?option=com_content&view=article&id=36&Itemid=59.
3. Water and Sewerage Act 1989, Sections 27, 32.

APPENDIX C: GRENADA

1. The CWC was created by the Water Supply Act 1969 (Act No 23 of 1969).
2. The government of Grenada's website, <http://www.gov.gd/ministries/health.html>.
3. NAWASA Act, 1990.
4. NAWASA's website, <http://nawasa.gd/about-us/history>.
5. Ministry of Finance, 2011 Census, <http://finance.gd/images/Censussubmissionfinal.pdf>.
6. NAWASA's website, <http://nawasa.gd/about-us/history>.
7. NAWASA's website, <http://nawasa.gd/about-us/history>.

APPENDIX D: JAMAICA

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ECO-AUDIT

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Improving the management and governance of state-owned enterprises in the water supply and sanitation sector in the Caribbean is critical. State-owned enterprises play a significant role in the economy through their impact on fiscal accounts and service delivery to citizens. This benchmark analyzes the strengths and weaknesses of 14 water utilities, with focus on Belize, Dominica, Grenada, Jamaica, and St. Lucia. It is a tool for policy makers and practitioners seeking to improve service delivery in the sector, restore or maintain fiscal discipline, and pursue sector goals in a sustainable manner.

In the Caribbean region and beyond, building smart and resilient water utilities for the future is a priority. The challenges are complex and multidimensional. Political problems, weak institutions, low capacity, and inefficient practices exacerbate less-than-satisfactory performance. These challenges cannot be met by applying a cookie-cutter approach or by focusing only on standard technical and managerial techniques. Improving corporate governance will increase operational and managerial efficiency. Evidence shows that water supply and sanitation utilities with access to commercial finance are more likely to achieve the Sustainable Development Goals.

This benchmark finds that many of the analyzed state-owned water utilities are underperforming in terms of coverage, quality of service, operating efficiency, and financial performance. Overcoming these challenges will require long-term measures, with implementation that is likely to be ambitious and challenging. Shorter-term measures targeted at strengthening financial sustainability would involve establishing reliable cash flows that allow utilities to cover their costs.

Benchmarking governance in state-owned enterprises varies across the region. Some countries have a strong governance framework with well-developed policies and legal and regulatory frameworks, while others have unclear sector policies and underdeveloped legal and regulatory frameworks. Water supply and sanitation utilities with better-developed governance frameworks usually perform better than those with underdeveloped frameworks.