



Diagnostics of Pacific Water and Wastewater Association Water Utilities

PART A: SDG 6 PROFILE FOR SOLOMON ISLANDS
AND SOLOMON WATER



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- SI\$1 = \$0.12
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The currency used in this report is US dollars unless specified otherwise.



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ABBREVIATIONS

ADB	Asian Development Bank
AGPAR	Aggregate Performance Ratio
CSO	Customer Service Obligation
EU	European Union
GDP	Gross domestic product
GESI	Gender Equality and Social Inclusion
GNI	Gross national income
JMP	Joint Monitoring Program of UNICEF/WHO
l/c/d	Liters per customer per day
MHMS	Ministry of Health and Medical Services
MMERE	Ministry of Mines, Energy and Rural Electrification
NRW	Non-revenue water
O&M	Operation and maintenance
PRIF	Pacific Region Infrastructure Facility
PWWA	Pacific Water and Wastewater Association
SDG	Sustainable Development Goal
SOE	State-owned enterprise
SWOT	Strength, Weakness, Opportunity, and Threat
ToR	Terms of reference
UWSSSP	Urban Water Supply and Sanitation Sector Project
WaSH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization
WS	Water Supply
WSS	Water Supply and Sanitation
WW	Wastewater

1 INTRODUCTION

1.1 Introduction

This report is part of a study called “Diagnostics of Pacific Water and Wastewater Association Water Utilities” and has the objective to assess progress, formulate recommendations, propose measures, and develop tools to assist Pacific Island Countries, water utilities, and Pacific Water and Wastewater Association (PWWA) in achieving United Nations Sustainable Development Goal 6 (SDG-6), i.e., universal access to safe water and sanitation.

To assess progress and evaluate the contribution of water utilities in achieving SDG-6, a diagnostic framework has been developed, which is described in section 1.2 below. The framework has been applied and tested in five countries and five PWWA member utilities with the following purpose:

- i) assess the status of SDG-6 achievement in the countries concerned;
- ii) assess the current contribution and potential of water utilities in realizing universal access to safe Water Supply and Sanitation (WSS) in their country; and
- iii) formulate strategies and plans for enhancing the contribution of water utilities toward achieving SDG 6.

In the current report, the diagnostic framework is applied for Solomon Islands and its water utility Solomon Water (Solomon Water). Based on the outcome of the diagnostic analysis, a Strategic Action Plan was formulated in collaboration with Solomon Water to enhance its contribution to achieving SDG-6.

As the Strategic Action Plan contains several large GIS images and is of considerable size, this report has been divided in two parts:

Part A: SDG – 6 Assessment of Solomon Islands and Solomon Water

Part B: Solomon Water – SDG-6 Strategic Action Plan

Both documents refer to and can be read apart from each other.

1.2 SDG-6 Diagnostic Analysis of PWWA Utilities

The diagnostic framework assumes that the contribution of a utility to universal access to safe WSS in a country is determined by various internal factors, including its performance, available resources, and level of service delivery, and by external factors such as the geography, demography, natural environment, socioeconomic conditions, sector policies and the institutional and regulatory environment. Also, the performance of other WSS organizations in a country will play a role. A schematic presentation of the internal and external factors is presented in Figure 1.1.

Step 1 – Carry out the diagnostic analysis

For each factor in the framework, indicators have been developed that help understand the key issues and constraints. Where possible, the indicators have been quantified and data have been collected from available reports and databases, including the IBNET/PWWA Benchmarking database, the Joint Monitoring Program (JMP) of UNICEF/WHO, and data available from the utilities and governments. A list of indicators is attached as Annex 1 to this report. The diagnostic analysis is presented in chapters 2 and 3 of this report.

Figure 1.1: Diagnostic Framework for SDG-6 Achievement



SDG = United Nations Sustainable Development Goal, WSS = water supply and sanitation.

Note: Light blue circles refer to so-called “internal” factors, and dark blue circles refer to “external” factors.

Source: Authors.

Step 2 – SWOT Analysis

To obtain a better understanding of the potential contribution of a utility to increasing universal access to safe WSS, a Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis has been carried out. The SWOT analysis is often used by organizations entering new markets or starting new activities. Likewise, the SWOT analysis in this case is used to assess how Pacific Water Utilities can enhance their contribution to universal access to safe WSS in their country.

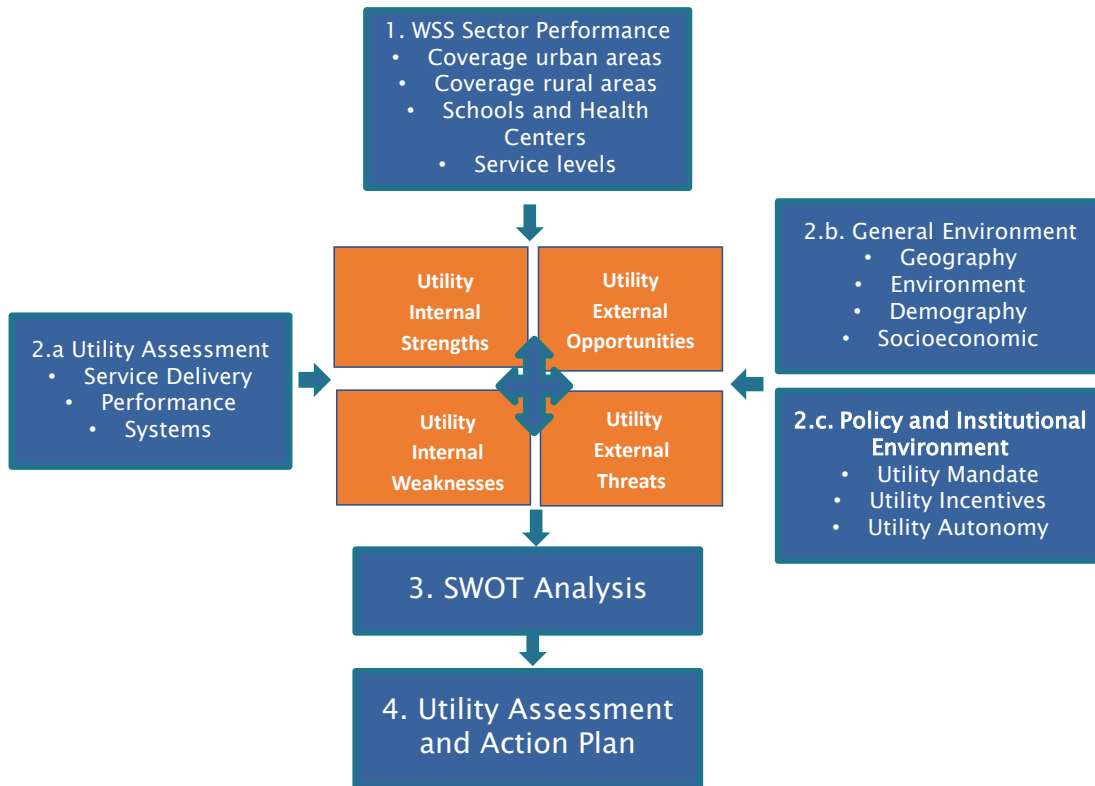
The SWOT analysis for Solomon Water is described in Chapter 4 of this report. In the SWOT analysis the internal strengths and weaknesses of the utility are identified to assess its potential to (contribute to) achieving universal access to safe WSS as well as the external opportunities and threats.

Step 3 – Prepare an SDG-6 Action Plan

Following the SWOT Analysis, a Working Group within Solomon Water and the consultants have conducted various remote meetings to validate the data, carry out the SWOT analysis and subsequently formulate a strategic action plan for Solomon Water to enhance its contribution to SDG-6 achievement in Solomon Islands. A summary of the Action Plan is presented in Chapter 5 of the report and in a separate document (Report B – Solomon Water SDG-6 Action Plan), which is part of this report.

The various steps in the Diagnostic Framework are schematically presented in Figure 1.2.

Figure 1.2 Flow Diagram of SDG-6 Diagnostic Analysis for PWWA Utilities



PWWA = Pacific Water and Wastewater Association, WSS = water supply and sanitation.
Source: Authors.

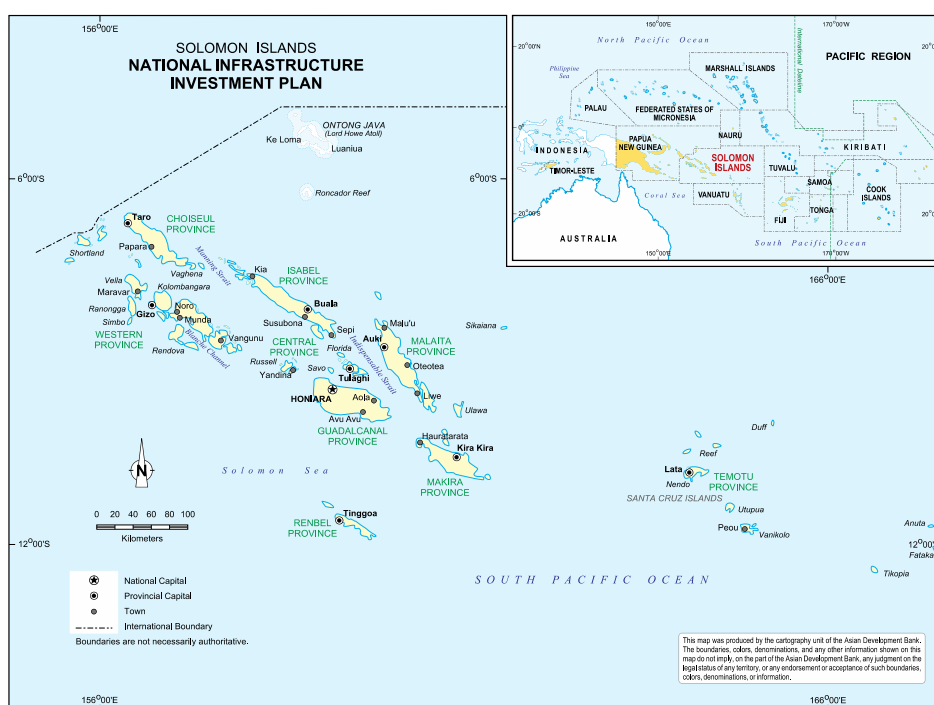
The methodology of the diagnostic analysis, as presented above, has been applied to Solomon Islands and its water utility Solomon Water (Solomon Water). Data and information were collected from available reports and databases, including the PWWA/IBNET database, the JMP, and data available from Solomon Water and the government. The data in the report were collected and validated by consultants in close collaboration with a Working Group of Solomon Water, consisting of the CEO and the Chief Operations Officer.

2 COUNTRY AND UTILITY CHARACTERISTICS

2.1 Solomon Islands

Solomon Islands is an archipelagic state situated in the southwest Pacific Ocean, approximately 2,000 km to the northeast of Australia. Its land mass of 28,400 km² extends over nearly 1,000 islands comprising nine main island groups. The capital, Honiara, is located on Guadalcanal, the largest island (Figure 2.1).

Figure 2.1: Map of Solomon Islands



The Solomon Islands faces many challenges in the provision of infrastructure. In particular, the country's geography presents enormous problems for meeting the population's demands for municipal services and related infrastructure. A summary of provincial characteristics is shown in Table 2.1.

Table 2.1 Provincial Characteristics

Province*	Land Area km ²	Population	Characteristics
Choiseul	3,837 (13.5%)	35,037 (5.1%)	Capital: Taro (492 km from Honiara) No other urban areas One major island, many small islands Nickel mining, Logging
Western	5,475 (19.3%)	102,363 (14.9%)	Capital: Gizo (366 km from Honiara) Other urban areas: Munda, Noro, and Seghe Several islands of differing size Primary tourist destination in Solomon Islands Major logging area Tuna processing – SolTuna
Isabel	4,136 (14.6%)	35,037 (5.1%)	Capital: Buala (152 km from Honiara) No other urban areas One large island, many small islands

Province*	Land Area km ²	Population	Characteristics
			Logging, mining, fisheries, agriculture Tourism growing in north
Central	615 (2.2%)	34,350 (5.0%)	Capital: Tulagi (37 km from Honiara) No other urban areas Two groups of small islands – Florida and Russell Big copra operation in Russell Islands, logging Tourist resorts in Florida Islands
Rennell- Bellona	671 (2.4%)	4,122 (0.6%)	Capital: Tinggoa (232 km from Honiara) No other urban areas Two small islands Tourist resorts and Logging
Guadalcanal	5,358 (18.5%)	210,909 (30.7%)	Honiara main urban area, government, and commercial centre Many small urban settlements along north coast One large island, a few small ones Important agricultural area in eastern part of island Major gold mining and palm oil operations
Malaita	4,225 (14.9%)	183,429 (26.7%)	Capital: Auki (102 km from Honiara) Other urban areas: Maluu, Apio One large island, a few small ones Major copra and cocoa areas and palm oil Major tuna processing plant proposed at Bina harbour
Makira-Ulawa	3,188 (11.2%)	53,586 (7.8%)	Capital: Kirakira (235 km from Honiara) No other urban areas One large island, a few small ones Cocoa, logging
Temotu	895 (3.2)	28,167 (4.1)	Capital: Lata (664 km from Honiara) No other urban areas A few small islands and very remote
Total	28,400	687,000^a	

*Note: The order of the provinces in the table follows that used in the National Census (which is west to east).

^a Estimate UN Population Office 2020: provincial figures updated based on percentages in Solomon Islands National Infrastructure Investment Plan.

Source: Ministry of Development Planning and Aid Coordination 2013, Solomon Islands National Infrastructure Investment Plan.

2.2 The Solomon Islands WSS Sector Performance in achieving SDG-6

“Improved access to water and sanitation” has quantitative and qualitative aspects and is currently monitored by the JMP. The status of achieving universal access to water, sanitation and hygiene is presented in Table 2.2.

Table 2.2: Solomon Islands Access to Water and Sanitation (% of total population)

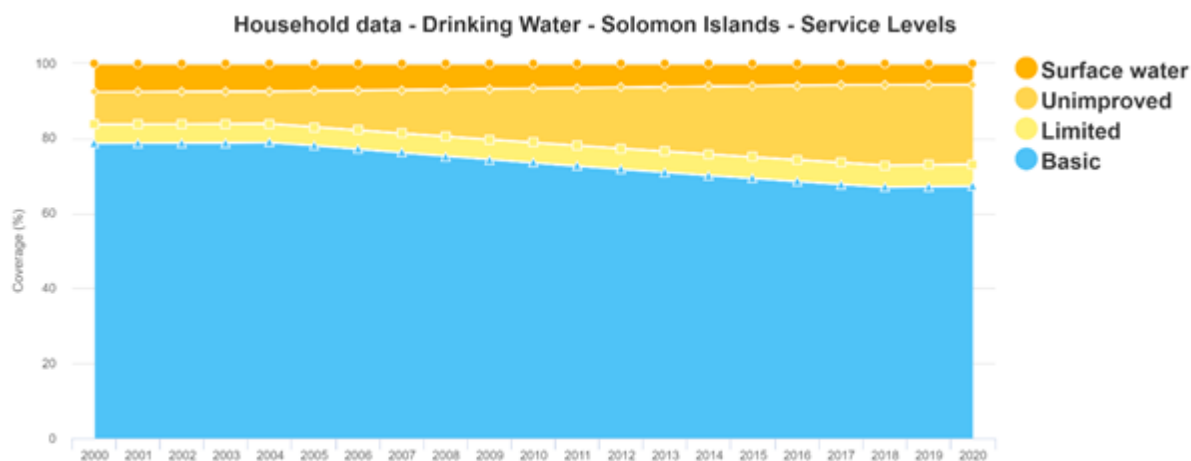
Solomon Islands	Drinking water			Sanitation			Hygiene		
	National 2017	Rural* 2017	Urban* 2017	National* 2017	Rural* 2017	Urban* 2017	National 2017	Rural 2017	Urban 2017
Safely managed	-	-	-	-	-	-	-	-	-
Basic service	68	61	91	34	20	78	36	29	59
Limited service	6	6	4	6	2	18	36	40	24
Unimproved	15	18	4	7	9	0	-	-	-
No service	12	15	1	54	69	4	28	31	17

Source: WHO/UNICEF JMP 2019.

2.2.1 Access to safe water supply

Solomon Islands does not score well on universal access to safe water supply services. Based on the latest JMP report of 2017, about 68% of the Solomon Islands population has access to basic water supply services. In urban areas, this is 91%; in rural areas, this is 61% access. A significant number of households, mostly living in remote areas or on outer islands, do not have access to safe WSS.

Figure 2.2: Access to Safe Water Supply (% of total population)



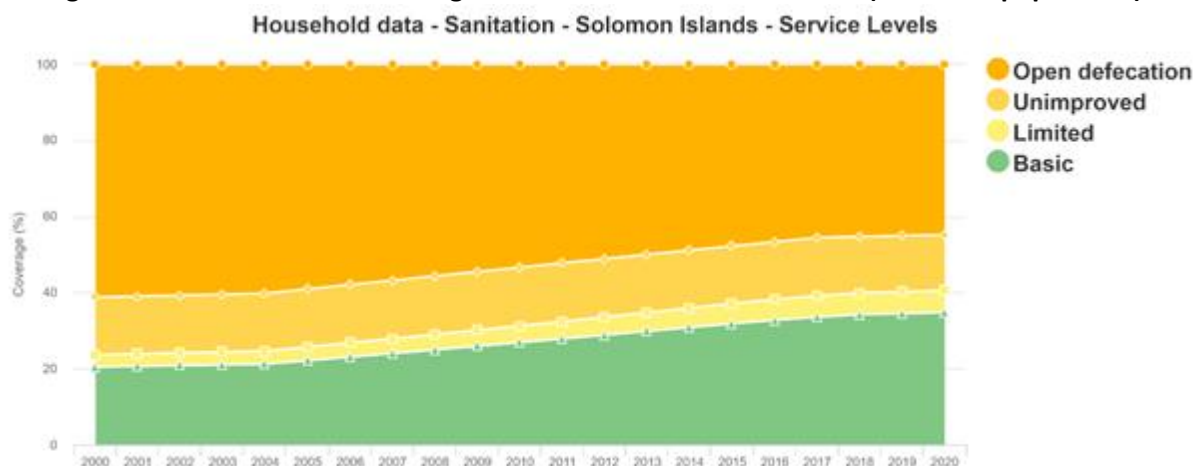
Source: WHO/UNICEF JMP 2019.

The trend in water supply access over the past 20 years is presented in Figure 2.2 and shows that, over the past 20 years, access to safe water has decreased from approximately 80% in the year 2000 to approximately 70% in 2020. This is a matter of serious concern, because apparently the efforts made by water supply service providers in Solomon Islands are insufficient to keep up with population growth! Possible reasons include the period of civil unrest between 1998 and 2003 and the breakdown of urban water supplies, particularly at Kirakira, Munda, and Gizo, caused by rapid population growth in squatter settlements.

2.2.2 Access to safe sanitation and sewerage services

According to JMP data, access to safe sanitation has steadily increased from approximately 20% in the year 2000 to its current level of approximately 35%. This trend is presented in Figure 2.3.

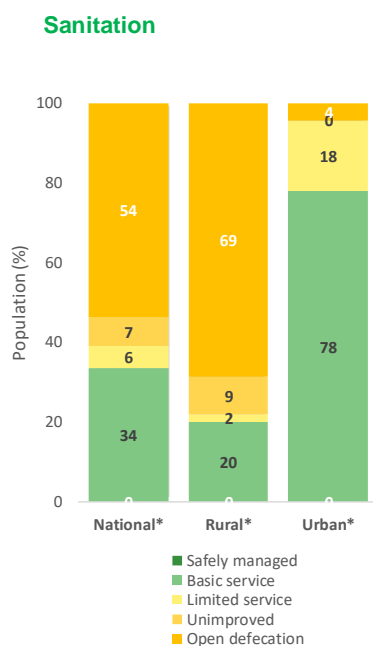
Figure 2.3: Solomon Islands – Progress on Access to Safe Sanitation (% of total population)



Source: WHO/UNICEF JMP 2019.

Based on JMP data, 78% of urban households in Solomon Islands have access to basic sanitation. In rural areas, however, this is only 20% and open defecation is reported at 69%. The remaining population use shared sanitation facilities and on-site unimproved sanitation systems.

Figure 2.4: Solomon Islands – Access to Sanitation for Urban/Rural Households



Source: WHO/UNICEF JMP 2019.

In Honiara, Solomon Water serves about 10% of the population with a basic sewerage system. In Gizo, Auki, and Noro there also exist basic, rundown sewerage systems, but these are not operational. In urban communities not served by Solomon Water, sanitation facilities mainly consist of shared toilets and on-site unimproved sanitation systems such as hand-dug pit latrines. Rivers are often used for laundry, bathing, and open defecation, to which about 4% of the urban population resort regularly. Diarrheal diseases are the sixth-most common cause of deaths in Solomon Islands, accounting for 4% of deaths. A study conducted between 2008 and 2012 found that more than 8% of children are underweight. The link between poor water, sanitation and hygiene services and diarrhea, child undernutrition, and other enteric infections has been documented. A major diarrhea outbreak was reported in Gizo as recent as 2021. Environmental enteric dysfunction, a gut disorder caused in part by chronic ingestion of pathogenic microorganisms, is hypothesized to be the primary causal pathway between poor water supply, sanitation and hygiene, and child growth.

2.3 WSS Service Providers in the Solomon Islands

2.3.1 Institutional Framework for Water Supply and Sanitation

The Ministry of Mines, Energy and Rural Electrification (MMERE) plays a policy and planning role with regards to the urban water sector. It oversees the implementation of the National Water and Sanitation Sector Plan, which was adopted by the Government in 2013 and lays out a 10-year plan to implement the goals and objectives of the National Development Strategy 2011–2020 and other Government initiatives and strategies, including the National Infrastructure Investment Plan.

The Ministry of Health and Medical Services (MHMS) is responsible for setting water quality standards and oversees policies, planning, and implementation of rural water supply services.

The Ministry of Environment, Climate Change, Disaster Management, Conservation and Meteorology is responsible for permitting and environmental monitoring of water abstraction and pollution discharges to water bodies.

Solomon Water is a state-owned enterprise (SOE) responsible for delivering water supply and sewerage services on a commercial basis to urban centers in Solomon Islands. Solomon Water's Board reports to MMERE and to the Minister of Finance and Treasury (MoFT).

The responsibility for sanitation in principle lies with the individual household. The government pursues a "non-subsidy" approach to sanitation, in which households are stimulated and incentivized to arrange for their own sanitation facilities and adopt hygienic behavior. Honiara City Council and municipal authorities in other cities are responsible for the monitoring of septic tanks.

Collection and disposal of municipal solid waste is under the responsibility of the Honiara City Council and of respective councils in other urban centers.

2.3.2 Rural Areas – the Department of Rural Water Supply and Sanitation

Within the MHMS, the Rural WaSH Programme within the Environmental Health Division is charged with, coordination, funding and implementation of rural water supply and sanitation. According to the National WaSH Strategic Plan 2015–2020, national staff are responsible for setting standards and guidelines, oversight of technical design, contracting the service delivery partners and consolidating planning, budgeting, and monitoring undertaken in the provinces. At the provincial level, Rural WaSH Programme staff carries out some direct implementation but mostly oversees the work of private sector agencies and/or NGOs which are contracted as "Service Delivery Partners".

In the National Water and Sanitation Implementation Plan 2017–2033, the MHMS, and the provincial governments have the task to focus on the development of WSS services in rural areas in Solomon Islands, by the following:

- assessing WSS needs and developing and implementing programs to support community-owned and -operated systems in rural areas
- carrying out skills training for rural water supply and sanitation system management, operation, and maintenance
- rolling out public WSS education and awareness campaigns across rural areas
- monitoring and reporting on storages, rates of extraction, water quality, supply systems, energy use, non-revenue water, and physical and financial condition of WSS systems for all rural centers
- ensuring safe WSS facilities in health clinics and health care centers in rural areas

In addition, the Ministry of Education and Human Resources Development has the task to ensure that all schools have safe WSS facilities.

2.3.3 Urban areas – Solomon Water

The Solomon Islands Water Authority, which operates under the name Solomon Water, is an SOE created under the Solomon Islands Water Authority Act, 1993. Solomon Water is mandated to manage and develop the supply of drinking water and sewerage services in urban areas of the Solomon Islands.

The Solomon Islands Water Authority Act, Article 9, provides that the area of operation may cover anywhere in the Solomon Islands, and these areas of operation are to be determined by the Minister. Chapter 130 of the Act has a schedule that identifies 10 areas where Solomon Water is mandated to operate. Solomon Water presently provides municipal water and wastewater services in Honiara, and

municipal water services in three provincial urban centers (Auki, Noro, and Tulagi), as these areas that have been declared as its areas of operation. There are another nine urban centers that are not covered by Solomon Water. Solomon Water is currently planning to start operations in Gizo and in Munda.

Solomon Water delivers water supply services to about 60% of the households living in its service areas. It operates basic sewerage systems in Honiara, where about 10% of households are connected to them. Water is supplied to about 100,000 people in Honiara and over 8,000 people in the provincial centers, which would amount to about 16% of the total population of Solomon Islands.

The urban population in Solomon Islands is increasing at about 4% per year, almost twice the rate of national population growth, meaning urban inhabitants will double in less than 20 years. A recent report states the rate of growth of settlement populations is estimated at 26% per year.¹ This significant urban growth puts enormous pressure on any existing services.

Water in other urban centers is formally under the provincial governments but provided by the Works Department of the Ministry of Infrastructure Development.

Households that are not connected to the sewerage system typically rely on private flush toilets connected to septic tanks (or pit latrines / open defecation commonly in informal areas), which are often inadequate to prevent groundwater pollution. Sludge generated from communal and household septic tanks is managed by Honiara City Council or by the private sector and transported near Lungga River estuary to a landfill disposal site that does not meet sanitary confinement requirements (when it is not illegally dumped elsewhere). It is estimated that about 60% of households use those septic tanks emptying services. Flooding, common on the larger islands such as those where Honiara and Auki are located, can be a major health hazard. For example, in 2014, a flash flood event in Honiara triggered more than 4,200 cases of diarrhea (notably among children), which ultimately turned into a nationwide epidemic.

In June 2017, MMERE published a detailed National Water and Sanitation Implementation Plan 2017-2033, which was approved by Cabinet. The Implementation Plan aims at achieving the objectives and targets in the National Water and Sanitation Policy 2015-2036. In the plan, Solomon Water has the task to focus on the development of WSS services in urban areas, by

- assessing WSS needs and developing and implementing masterplans for urban areas
- assessing the needs for safe sanitation and design and implementing additional sewerage capacity and outfalls where appropriate
- metering of all connections in urban areas and introducing/applying equitable system of water tariffs for all urban piped water systems, which encourages the efficient use of water and recovers the costs of water supply
- analysis of losses from piped water systems in urban centers and planning and implementation of water loss reduction programs
- carrying out skills training for water supply and sanitation system management, operation, and maintenance for urban centers
- rolling out public WSS education and awareness campaigns across urban areas
- monitoring and report on storages, rates of extraction, water quality, supply systems, energy use, non-revenue water and physical and financial condition of supply systems for all urban centers

Apart from the development and implementation (where appropriate and feasible) of sewerage systems in urban areas, Solomon Water has no responsibility for the development or the operation and maintenance of sanitation facilities and systems.

¹ Water and Sanitation Program (WSP) 2015: Water and Sanitation in Urban Settlement Communities of the Pacific.

3 DIAGNOSTIC ASSESSMENT – SOLOMON WATER

3.1 Solomon Water: Earlier Assessments and Action Plans

An earlier assessment of the performance of Solomon Water² was carried out in 2012 as part of preparing the PWWA Benchmarking Report of that year. Since 2012, progress has been mixed as can be seen in Table 3.1:

Table 3.1: Solomon Water Assessment 2012 vs Current Performance

Key Performance Indicator	Unit	2012	2020
Number of water and wastewater connections	Number	9,551	13,956
Water coverage in service area	%	71	64
Wastewater coverage in service area	%	10.3	4.5 ³
Residential volume of water consumed	l/c/d	136	98
Continuity of water supply	Hours/day	14.2	23.4
Non-Revenue Water as compared to production	%	55.6	59.3
Percentage of water treated	%	100	81
Part of samples compliant with residual chlorine standards	%	80	80
Staff WS&WW per 1,000 connections WS&WW	Number	11.2	11.5
Metering level	%	68	92
Customer complaints per number of W&WW connections	%	0.21	0.12
Operating Cost Recovery Ratio	%	79	87
Collection Ratio	%	83	100

Source: IBNET/PWWA Benchmarking Reports 2013 and 2021

From the above table, the following can be concluded:

- Even though the number of Solomon Water’s connections has increased with about 50%, the population in the service areas has almost doubled, largely due to the high level of urbanization, which means that both water and wastewater coverage have decreased.
- The proportion of metered connections has increased from 68% to 92%; this has probably contributed to a reduction in per capita water consumption.
- The continuity of water supply has significantly improved. Solomon Water started chlorinating water in Auki in 2020 and in Tulagi in 2021. In Honiara, the quality of water has remained constant, which again is reflected in a lower rate of complaints.
- Non-revenue water (NRW) has remained the same, but it should be noted that metering has considerably improved over the period. This could mean that the 2012 figures are less reliable.
- The financial performance of Solomon Water has also improved over the past decade, which is reflected in both an improved collection ratio and an improved cost recovery and has undoubtedly contributed to the improved service levels.

Based on the Assessment of 2012, a short Action Plan was formulated by Solomon Water management, as shown in Table 3.2:

² PWWA – Solomon Water Utility Performance Assessment Report 2012.

³ 4.5% probably relates to the whole service area of Solomon Water. In Honiara, Solomon Water serves an estimated 10%–15% of the population.

Table 3.2 Solomon Water 2012 Action Plan

Objective	Achievement
1 To achieve improved continuity of supply (on average 18 hours per day by 31 December 2013)	Solomon Water achieved > 18 hours of supply in 2014 and has further improved this to an average 23.4 hours per day in 2020.
2 To achieve a reduction in the percentage of NRW expressed as a % of water produced to 40% by 31 December 2013.	Notwithstanding sustained and considerable efforts by Solomon Water throughout the past decade, this objective has not been achieved. Obviously, the objective was too optimistic. Solomon Water has since carried out various assessments, formulated a NRW strategy, and this has resulted in gradual but small decreases over the past years from some 62% in 2017 to 59% in 2020. Significant reductions in NRW can only be achieved by replacing substantial lengths of old pipes in the WSS systems.
3 To achieve an improvement in the safety of potable water supplied to more than 95% compliance by 31 December 2013.	This objective has not been achieved and results have varied throughout the years. Achieving a continuous quality of water in terms of residual chlorine in combination with a very high level of NRW and often very high levels of water turbidity is difficult.

NRW = non-revenue water.

Source: Authors.

After 2012, various other assessments of Solomon Water have been carried out as part of the formulation of its Two-Year Plan 2013–2015, its 30-Year Strategic Plan 2017–2047 and the Asian Development Bank (ADB)- and World Bank (WB)-funded Urban Water Supply and Sanitation Sector Project (UWSSSP).

3.2 Solomon Water: Service Delivery

Water utilities, within their mandates and service areas, significantly contribute to realizing access to WSS services. It is important to review key performance indicators, such as coverage, reliability and continuity of services, quality of the water supplied, and responsiveness to customers. At the utility level, these indicators in most cases are readily available from the PWWA benchmarking system, but consultants will, in collaboration with the utilities, collect more detailed data on specific areas where needed and identify potential areas for improvement (Table 3.3).

Table 3.3: Solomon Water Service Delivery Indicators

Performance Area	Key Performance Indicators	Unit	2018	2019	2020
Water Supply	Continuity of service	hours/day	23.5	23.3	23.4
	Continuity (customers with discontinuous supply)	%	20	18	21
	Total Water Consumption	l/c/d	194	186	146
	Residential Water Consumption	l/c/d	121	124	98
	% of annual required number of microbiological tests taken	%	91	100	81
	Compliance tests: Samples passing on residual chlorine	%	69.5	75.2	79.7
Wastewater	Availability of on-site sanitation services	descriptive	Houses in urban areas mostly have septic tanks and pit latrines. Tanks in Honiara are reportedly emptied		

Performance Area	Key Performance Indicators	Unit	2018	2019	2020
			by City Councils (60%) and private sector operators.		
	Wastewater and Fecal Sludge Quality passing primary and secondary level of treatment	%	0	0	0
Inclusiveness	Drinking Water Coverage in service area	%	56.2	60.6	63.9
	Sewerage Service Coverage in service area	%	5.1	4.7	4.5
Responsiveness to customers	Is there a customer charter and has the charter been made known?	Descriptive	Yes, Solomon Water has issued a Customer Charter which can be found on its website and specifies the service levels it is committed to achieve.		
	Complaints about W&WW services	% of the number of connections	9	12	12

Note: Percentages probably relate to Solomon Water's whole service area, whereas only in Honiara does it operate a sewerage system. In Honiara, Solomon Water serves approximately 1,000 customers.
Source: IBNET/PWWA benchmarking system.

Solomon Water supplies water to about 64% of households living in its service areas in Auki, Honiara, Noro, and Tulagi. Water supply coverage in the service area has increased despite a strong growth in the urban population with support of donor-funded upgrade works in Honiara and Auki since 2016. Also, continuity of service has gradually improved over the past 10 years and there is only a small percentage of households experiencing discontinuity in supply. Ongoing problems with illegal logging and earthworks in certain catchment areas cause shutdowns of the water supply following heavy rains due to high turbidity. The quality of water has improved considerably over the past 5 years, especially in Honiara. Water quality in the provincial towns is not yet up to standard. Solomon Water plans to increase its water supply coverage to 95% of the population of Honiara by 2047 (or 296,000 people).

The sewerage network in Honiara services about 1,000 customers and comprises 15 discrete gravity collection systems, of which 13 discharge to ocean outfalls and two discharge to river outfalls. Wastewater coverage has slowly decreased over the past years and has obviously not kept pace with growth of the urban population. The sewerage system, constructed in the 1960s and 1970s, consists of 36 km of pipes. Most of the sewer outfalls operate under gravity. Most sewage is not or very poorly treated before discharge to the outfalls. The environmental impact of the discharge of raw effluent to the sea and rivers is serious. Limited remedial work has commenced but more detailed analysis of the issue will be carried out under the "Urban Water Supply and Sanitation Sector Project, Project Preparation Assistance Consultancy", funded by ADB. Solomon Water's corporate targets for sewerage services in Honiara are to increase its coverage to 20% of residential and most nonresidential properties by 2022 and subsequently to 30% of residential properties by 2047.

Additional proposed water and sewerage works largely funded by ADB in accordance with Solomon Water's 30 Year Strategic Plan will enhance water and sewerage coverage and improve levels of service in the supply area. The major project that is currently ongoing is the Urban Water Supply and Sanitation Sector Project, which is a major investment in the quality and reliability of WSS systems in Honiara, Auki, Noro, Tulagi and new water piped supply to customers in Munda and Gizo. The project is funded by ADB and World Bank and the European Union (EU).

3.3 Solomon Water: Performance

The ability and willingness of utilities to improve access to WSS in a country also depends on its performance. This includes technical, commercial, financial, HRM and organizational performance. Key data on utility performance are available from the PWWA benchmarking system, including operating cost coverage, billing efficiency, debt ratios, etc. (Table 3.4).

Table 3.4: Solomon Water Performance Indicators

Performance Area	Key Performance Indicators	Score	2018	2019	2020
Technical	Non-Revenue Water	%	60.7	59.9	59.3
	Energy costs as % of operational costs	%	29.5	28.8	22.1
Commercial	Collection Ratio	%	97.5	89.2	100
	Water sold that is metered	%	88.7	91.4	91.8
Financial	Operating Cost Recovery Ratio	%	93	90	87
HRM	Staff per 1,000 connections	FTE	5.5	9.1	7.8
Organization & Strategy	Aggregate Performance Ratio (AGPAR)	AGPAR score	1.0	1.0	1.0

HRM = human resources management, FTE = full-time equivalent.

Note: AGPAR Score is an overall performance ratio measuring WSS coverage, NRW, collection period, revenues in relation to gross national income and operating costs coverage. The maximum score is 10.

Source: PWWA/IBNET Benchmarking System.

- Non-revenue water: NRW is high but slowly coming down. Main causes of NRW are physical leakage, and unmetered and illegal connections. A detailed NRW reduction strategy has been formulated and is being implemented by Solomon Water. Solomon Water has established district meter areas for different water networks to gain an understanding of the distribution of NRW in networks so that high NRW areas may be targeted. Significant replacement of pipework has been planned for future construction although it is not yet fully funded. Skills in NRW management and reduction will need to go together with proposed new water supply infrastructure.
- The collection ratio has improved over recent years up to 100% in 2020. This is an indicator for the determination of Solomon Water to improve its financial performance as well as the appreciation of customers for improved services. Most connections are metered, and Solomon Water is experimenting with new pre-paid Cash Water meters and about 6,000 units have been installed. Unfortunately, start-up problems have caused some problems, but hopefully these will be overcome soon. High debt in terms of unpaid bills by government departments (Dec 2020: SI\$1.9 million) are a matter of concern.
- Energy efficiency: From the Solomon Water annual report 2020 it is understood that the costs of power amount to 30% of total costs. Energy efficiency has been low partly due to the condition of pumps and to the small diameters of pipes in large parts of the distribution network. Replacements of the most critical parts are being planned and implemented. An energy efficiency assessment was carried out in 2019 and various measures implemented, including pump replacements in early 2021 to reduce energy consumption by up to 10%.
- The operating cost recovery ratio remains below 100%, which is insufficient to ensure the long-term sustainable operation for Solomon Water. Partly this is caused by inefficiencies in Solomon Water operations, such as high NRW rates and relatively low energy efficiency. On the other hand, the Government is hesitant to allow increases in water tariffs, which prevent Solomon Water from generating sufficient revenue to recover its costs and implement the necessary rehabilitation works. During 2019 and 2020, Solomon Water has suffered from loss of revenues due to the COVID-19 pandemic. This loss has partly been partially compensated by the Government. Nevertheless, the financial situation remains challenging.⁴

⁴ Solomon Water Annual Report 2020.

- The ratio of staff per 1,000 connections varies between 5.5 and 9.1. The variation in this indicator is special but the ratio is quite normal for utilities of a similar size and with similar conditions. Solomon Water continues to experience problems in recruiting skilled staff, especially in engineering and finance.
- The AGPAR Score is relatively low, caused by low coverage for both water and sewerage, a high NRW and a relatively poor financial performance.

3.3.1 Solomon Water: Maturity of Utility Systems

In addition to service delivery and performance, it is also important to assess the maturity of utility systems and available resources to cope with possible extension of services (Table 3.5).

Table 3.5: Solomon Water Indicators of Maturity of Utility Systems

Performance Area	Key Performance Indicators	Unit	2018	2019	2020
Technical Systems	% Water production capacity used	Descriptive	Average daily demand in Honiara is 32 m ³ /d. In conjunction with NRW this exceeds the sustainable yield from Solomon Water's water sources by 3 m ³ /d. NRW represents about 59% of water production. A substantial reduction of NRW is required to close the gap between demand and sustainable yield in addition to measures to reduce per capita demand. To meet demand of the fast-growing population of Honiara and its direct environment, additional water sources are needed. Also, the transport and distribution system of Solomon Water needs rehabilitation and extension. Investments are scheduled to take place under the ADB/WB/EU-funded Urban Water supply and Sanitation Sector Project.		
	% Sewerage capacity used	Descriptive	Solomon Water operates a sewerage system in Honiara with about 1,000 customers. Most of the sewage collected in the system is discharged untreated via outfalls in the environment. For this reason, any increase in connections to the sewerage will first require construction of a wastewater treatment facility or deep ocean outfall. Part of this investment is scheduled under the ADB/WB/EU-funded Urban Water Supply and Sanitation Sector Project.		
	Power Supply Reliability	descriptive	There appear to be no limitations in power, which is supplied by Solomon Power, except for the fact that it is rather expensive and takes up some 30% of Solomon Water's operational costs.		
	Monitoring of pressure and quantities in networks	descriptive	Most of Solomon Water's network is now metered and district meter areas have been established in the network which can be isolated for pressure measurement and NRW reduction programs. SCADA systems are being upgraded.		
Financial	Borrowing Capacity: debt to equity ratio	%	In 2020, Solomon Water signed a concessional loan agreement with ADB and World Bank for a total amount of approximately SI\$353 million. An initial amount of SI\$35.4 million does appear on Solomon Water's balance sheet for 2020. Principal repayments will start in 2025. The latest debt to equity ratio of Solomon Water, as reported in the Annual Report of 2020, is approximately 68%, which would allow for additional borrowing. Once the loan is fully utilized, and assuming an upper limit of		

Performance Area	Key Performance Indicators	Unit	2018	2019	2020
			the debt-to-equity ratio of 2, the borrowing capacity of Solomon Water will be significantly reduced, and additional equity will be needed to allow for further growth and investments.		
Transparency	Timely and accurate financial reporting available and accessible for public	descriptive	Regular and timely Annual Reports with the audited financial statements are prepared and accessible for the public.		
HRM	Training policy and implementation: number of employees undergoing training disaggregated per category and gender	descriptive	Normally, Solomon Water spends 2% of its budget on training. All staff undergo a performance and needs appraisal, based on which an annual training program is designed. In general, there are two priorities for training: i) Water Technical Training for operational staff and ii) Water Leadership Training for (middle) managers and young staff with potential. In view of newly constructed Water Treatment Plants in the coming 1–2 years, there is a huge need to train plant operators, pump technicians, etc.		
	Gender equality and social inclusivity policies in place. ^a	descriptive	More than 70 staff participated in the Waka Mere Commitment to Action which aims to advance gender-equality by promoting leadership, building a respectful and supportive workplace, and increasing opportunities for women in jobs traditionally held by men. Solomon Water has several women employed in non-traditional roles, and four women in leadership positions. Eight women participated in the Women Drivers training during 2019. Non-discriminatory recruitment practices and encouragement of women to be employed in all roles. Have Equal Employment Opportunity, respectful workplace and recruitment / behavior policies in place.		
Organization & Strategy	Strategy Document	descriptive	Weaknesses in the capacity of the organization to manage efficiently and effectively have been reduced but some remain. The executive leadership of Solomon Water has stabilized and the current focus on rebuilding staff relationships, organizational capacity, and culture is well advanced. Ongoing difficulties in securing quality and skilled staff, particularly in engineering, accounting, and project management roles remains a concern.		
	Organization Charts	descriptive	Outlines of organization charts are included in the annual reports.		
Innovation	Use of advanced technology	descriptive	Major Supervisory Control and Data Acquisition System (SCADA) upgrade in 2022 will improve efficiency of operations and reduce vehicle use. Use of handheld devices in the field and ongoing increased training and use of technology.		
	Use of advanced billing systems	descriptive	Solomon Water has rolled out a pre-paid Cash Water system of water meters, especially for low-income groups. High numbers of failures of these meters have caused complaints from customers, but these are being		

Performance Area	Key Performance Indicators	Unit	2018	2019	2020
			addressed. The system is on hold and Solomon Water is currently tendering for a new supplier of meters.		
Resilience	Technical resilience	descriptive	Major infrastructure upgrades will make Solomon Water assets more climate-resilient. Solomon Water is planning a program for catchment management and payment for ecosystem services to protect water catchments and enhance revenue for landowners to avoid logging.		
	Organizational resilience	descriptive	Independent board of directors - Internal audit and Risk committee - Risk and compliance officer manages risk and oversees compliance management - Whistle blower policy - Annual external audit - Board members and senior executive undergo Institute of Directors New Zealand training in Good Governance		

HRM = human resources management, NRW = non-revenue water, m/l/d = million liters a day, ADB = Asian Development Bank, WB = World bank, EU = European Union.

Note:

^aThe types of policies in place for flexible work arrangements; maternity/paternity leave, family leave, etc.

Source: Authors.

3.4 General Environment

3.4.1 Topographic and Environmental Conditions

The Solomon Islands is hot and humid all year round, with an average temperature of 27 degrees Celsius. There are two distinct seasons: a wet season from November to April and a dry season from May to October. Honiara has a marked wet season when on average almost 70% of the yearly total rain falls.

Most of the existing infrastructure essential to development in the Solomon Islands, such as roads, bridges, airstrips, and wharves, as well as economic activities such as cash crops, are in coastal areas and thus exposed to climate-driven extremes such as intense storms, tropical cyclones, and flash floods. Moreover, as a mountainous country, increased floods are also a concern.

In terms of climate change, projections suggest that temperatures in the Solomon Islands have been steadily rising and are expected to increase by 0.4–1.0°C by 2030. Increases in extreme rainfall days are expected in terms of both frequency and duration. Changes to drought incidence are uncertain but may decrease. Sea level rise recorded in Honiara from 1994 to 2009 shows an increase of 7.7 mm/year, which may or may not be due to climate change but is nevertheless an issue that needs to be considered in long-term infrastructure development. Sea-surface temperatures have also gradually risen around the Solomon Islands since the 1950s and ocean acidification has increased, which puts the health of coral reefs at risk. These are important because coral reefs protect the shoreline from the impacts of storms and support the vital tourism and fishing industries (Table 3.6).

Table 3.6: Solomon Water Environmental Indicators

Issues	Indicators	Assessment
Topographic conditions	Type of landscape	The Solomon Islands are the third-largest archipelago in the South Pacific, comprising 992 islands ranging from large landmasses with rugged mountains and virgin forests to low-lying coral atolls. Distances are large and transportation and accessibility of towns and villages is difficult in many cases.

Issues	Indicators	Assessment
Water Resources	Availability Type	On the larger islands such as those where Solomon Water operates, surface water from springs or rivers is the main source of drinking water and is often complemented with groundwater. In Honiara, the reticulated system draws from various springs, small rivers and bores, with a production capacity of 32.5 m/l/d. Raw water quality is generally satisfactory outside of bacteriological parameters (requiring chlorination), except during the rainy season, when surface water sources become highly turbid. There are currently no water resource protection management plans. The current demand, based on a per capita consumption of 169 liters per day and in conjunction with physical losses in the network, exceeds Solomon Water’s water production capacity by 6.3 m/l/d. Even with a major reduction of physical losses and a decrease in per capita consumption, the gap could reach 50 m/l/d in 2040 as the population grows and networks expand in urban areas. The development of water production capacity on the Lungga river, about 5 km south of Honiara, has been identified as the best option to address this long-term supply gap and improve energy efficiency of the system of the capital, which now relies heavily on substantial pumping from underground sources. Other considered options included desalination and more distant surface water sources, which would not be cost-competitive. While water production capacity is usually sufficient to meet average water demand, in the urban centers of Auki, Noro, and Tulagi, shortages are frequent during the dry season.
Extreme weather events	Occurrence Severity	The Solomon Islands are exposed to a wide range of geological, hydrological, and climatic hazards, including tropical cyclones, landslides, floods, and droughts. Between 1980 and 2009, the country experienced 17 major disaster events, costing over \$20 million and affecting almost 300,000 people. Of these events, there were six major natural disasters: two earthquakes and four tropical cyclones, as well as associated floods and storms, directly impacting over 100,000 people and resulting in more than 100 deaths.

Source: Solomon Islands National Infrastructure Investment Plan 2013.

In conclusion, both the physical geography and climate change issues offer serious challenges to infrastructure providers in Solomon Islands.

3.4.2 Socioeconomic and Demographic Conditions

Poverty in the Solomon Islands is widespread and characterized by a lack of access to essential services and income-earning opportunities, rather than hunger or severe destitution. The Solomon Islands has one of the lowest average incomes in the region, with an estimated gross domestic product (GDP) per capita of \$2,258 (2020, current prices). Income distribution is inequitable, with rural expenditure levels significantly below expenditure levels in urban areas. Similarly, social and health indicators, although improving, are among the worst in the region (Table 3.7).

Table 3.7: Solomon Water Socioeconomic and Demographic Indicators

Performance Area	Indicators	Assessment
Economic Development	Per capita GDP	\$2,258 (2020, current)
Socioeconomic development	Per capita GNI	\$2,300 (2020, current)
Affordability of 6 m ³ water	% of per capita GNI	In 2020, the annual bill of a household using 6 m ³ per month amounts to \$155 per year which is 6.7% of average per capita GNI, which is quite high.
Urban population	%	24% of people live in urban areas which are growing at an estimated rate of 4.7% per year
Rural Population	%	76% of the population lives in rural areas. Growth in rural areas much lower (e.g., Malaita 1.2%).
Population growth	%	Average growth of 2.60% per year (UN Population Data)
Population density	Persons/km ²	Average population density is low and estimated at about 20 persons/km ² .

GNI = gross national income, GDP = gross domestic product.

Source: Authors.

The UN Population Division estimates the current population at about 687,000 and current population growth at 2.6% per year for 2015–2020. The Solomon Islands has a relatively young population, and this could result in increasing growth rates.

Population density is low at approximately 24 people/km². The urban population is around 24% of the total, while urban growth is estimated at 3.91% per year for 2015–2020⁵ (UN population division). At the time of the Census, the average household size was 5.5.

Projections clearly reveal a shift from rural to urban areas. This is reflected in provincial growth with the fastest growing population being in Guadalcanal province at 4.4% per annum. Many of the people live in the areas surrounding Honiara, with 'Greater Honiara' spreading significantly in recent years. There is no official record of the population of the wider urban area. However, Solomon Water carried out its own survey of properties from satellite imagery and used it to estimate the urban population at around 100,000. By contrast, population growth in Malaita province was only 1.2% per annum.

Rural to urban migration is likely to continue, resulting in an increasing proportion of the population requiring urban services. While there are plans to develop provincial centers, these are unlikely to slow the rural to urban shift significantly over the next 10 years.

The average water bill of a household using 6 m³ per month amounts to \$155 per year. This is a considerable amount as compared to the average per capita GNI of \$2,300 per year and there will be a considerable number of households which will not be able to afford a connection. According to a 2016 survey, 86% of both formal and informal households are willing to pay for improvements to piped water, including better water quality, reliability, and access. However, 61% of these households think the cost of water from Solomon Water is too high. The average monthly water bill equals 16.9% of the average income for households in informal areas, 10.9% for low-income households, and 6.1% for average income households. This is more than three times higher than the estimated affordability threshold of 3%–5% of total income.

A recent tariff study⁶ carried out for Solomon water, shows that the current combined water and wastewater bill for a 20 m³/month customer is approximately 5.9% of the median urban household income. In many jurisdictions, 5% of household income is used as an affordability threshold for

⁵ UN population division data: [World Population Prospects - Population Division - United Nations](#)

⁶ Wedgewood White Ltd, May 2021: Solomon Water Tariff Review.

spending on water and wastewater services. Based on that benchmark, Solomon Water’s tariffs are currently assessed as unaffordable.

3.5 The Policy and Institutional Environment

3.5.1 Government WSS policies

Government policies and strategies have a profound effect on the functioning of the WSS sector. Table 3.8 provides a summary of the current policy and institutional environment in which Solomon Water operates.

Table 3.8: Solomon Water Policy and Institutional Environment

Performance Area	Indicators	Assessment
Policy/Strategy	Approved Water Sector Policy in place	<p>The following policy documents are relevant:</p> <ul style="list-style-type: none"> • Solomon Islands National Water and Sanitation Policy • MMERE 2013: Solomon Islands Water and Sanitation Sector Plan • MHMS 2014: The Solomon Islands Rural WaSH Policy • MMERE 2017: Solomon Islands WSS Implementation Plan 2013-2033 • Solomon Water 30-Year Strategic Plan 2017 to 2047 • Solomon Islands National Infrastructure Investment Plan 2013
Community Service Obligations (CSOs)	Descriptive	<p>In the past, CSO funding has been aimed at supporting unsustainable provincial operations of Noro, Tulagi, and Auki. Based on Solomon Water’s annual reports of the past years, the following amounts have been received:</p> <p>2015: no CSO contribution 2016: SI\$4.6 million 2017: no CSO contribution 2018: SI\$3.0 million 2019: SI\$4.3 million 2020: SI\$3.7 million</p> <p>As Solomon Water is initiating operations in Gizo and other provincial capitals, it is expected that the CSO contribution of the Solomon Islands government will increase.</p>
Funding (gap)	Utility access to financial resources	<p>Solomon Water has prepared a 30-year Strategic Plan 2017-2047 with investment requirements of \$370 million (SI\$2.9 billion). The financial performance of Solomon Water in the past has been poor and it has been dependent on CSO grants from the Solomon Islands government and development partners. Only in recent years has the improved financial performance allowed Solomon Water to gain access to loans and other financial instruments. In 2019, Solomon Water has obtained grant and loan funding from ADB, WB, and EU for a loan of about SI\$353 million (\$43.8 million). These funds will be utilized for the priority investments of the Strategic Plan. In future, Solomon Water will need additional equity from its shareholder to be able to obtain additional loans for financing of future investments.</p>
Human Resources	Availability and use of WSS training facilities	<p>There are training institutions in Solomon Islands which could provide vocational type of training, such as the following:</p> <ul style="list-style-type: none"> • the Campus of the University of the South Pacific • Pacific Technical and Further Education • the University of the Solomon Islands • the Australia Pacific Training Coalition • Don Bosco Technical Centre • Rural Training Centers

		<ul style="list-style-type: none"> • MASE Business Training Centre <p>In addition, Solomon Water sends senior management and technical staff to international training courses, such as a training program for Directors by the New Zealand Institute of Directors and various courses in Australia and New Zealand.</p>
Gender issues	Specific Policy for women and underprivileged groups	Solomon Water applies respectful workplace and behavior policies and non-discriminatory recruitment practices and encouragement of women to be employed in all roles and have equal employment opportunity. More than 70 Solomon Water staff participated in the Waka Mere Commitment to Action program, which aims to advance gender-equality by promoting leadership; building respectful and supportive workplace; increasing opportunities for women in jobs traditionally held by men Solomon Water has several women employed in non-traditional roles, and four women in leadership positions. Eight women participated in the Women Drivers training during 2019
Monitoring	Monitoring System in place and producing regular and reliable reporting	Solomon Water produces annual reports with audited financial statements on an annual basis. A major SCADA upgrade in 2022 will improve monitoring and efficiency of water and wastewater operations and reduce vehicle use. Use of handheld devices in the field will allow for online entering and use of data in Solomon Water’s monitoring systems. Solomon Water participates in the annual PWWA benchmarking program.

MHMS = Ministry of Health and Medical Services, MMERE = Ministry of Mines, Energy and Rural Electrification, WaSH = water, sanitation, and hygiene, PWWA = Pacific Water and Wastewater Association, WSS = water supply and sanitation, ADB = Asian Development Bank, WB = World Bank, EU = European Union.

Source: Authors.

3.5.2 Institutional and regulatory framework

Politics of the Solomon Islands takes place within the framework of a parliamentary representative democratic, constitutional monarchy. Solomon Islands is an independent Commonwealth realm, where executive power is exercised by the government. Legislative power is vested in both the government and a multi-party parliament.

Solomon Water was created and legislated under the Solomon Islands Water Authority Act 1992 and is regulated by this and the subsequent State-Owned Enterprises Act 2007 and State-Owned Enterprises Regulations 2010.

Solomon Water is governed by a Board of Directors that reports to MMERE and MoFT. The Board is responsible for employing the Chief Executive, charting the company’s strategic direction, setting objectives and policy guidelines and for the management of goals that monitor the achievement of these matters.

Additionally, the Board is also responsible for reviewing Solomon Water’s Statement of Corporate Objectives, annual performance through the Annual Report and approves the company’s operating and capital budgets each year. The Board also reviews matters of a major or unusual nature, which are not in Solomon Water’s ordinary course of business.

Oversight and management of the water and sanitation subsector within the Solomon Islands falls under the jurisdiction of two ministries. The Water Resources Division of the MMERE looks after the national water sector policy which has a direct bearing on Solomon Water, while the MHMS is in charge of water quality standards and policy relating to rural water supply and sanitation (Table 3.9).

Table 3.9: Solomon Water Institutional and Regulatory Framework

Performance Area	Indicators	Assessment
Service Standards	Existence, responsiveness, and predictability of service standards	Solomon Water is obliged to produce and distribute water in accordance with the Solomon Islands Water Authority Act 1992. MMERE and MoFT may issue instructions with which Solomon Water has to comply. Solomon Water has prepared its own Customer Charter which is published on the Solomon Water website.
Service area of the Utility	Mandate for water supply Mandate for sanitation	<p>Solomon Water has a mandate to supply water and sewerage services in urban areas in Solomon Islands and is currently operating in Honiara, Noro, Auki, and Tulagi and planning to extend services to Gizo and Munda.</p> <p>Solomon Water is operating a sewerage system in Honiara for some commercial and industrial customers as well as a limited number of adjacent residential customers with design works in progress to extend this area. At present, there are no water or sewage treatment plants managed by Solomon Water.</p>
Sector Regulation	Existence, responsiveness, and predictability of regulatory system	Solomon Water is subject to the State-Owned Enterprises Act 2007, the Solomon Islands Water Authority Act 1992 and the State-Owned Enterprises Regulations 2010.
Tariff Setting	Reliability, transparency, and effectiveness of tariff setting system	<p>Solomon Water was established by the Solomon Islands government in 1993 under the Solomon Islands Water Authority Act. The Act provides the basic legal framework in which Solomon Water applies user charges and implements changes to these charges. Under the authority of the Act, regulations specifying financial practices and procedures to be employed by Solomon Water were enacted in 1994.</p> <p>In 2007, Solomon Islands government enacted the State-Owned Enterprises Act, the main objective of which is to improve the performance and accountability of the country's state-owned enterprises, which includes Solomon Water. The State-Owned Enterprises Act provides a supportive legal framework through which Solomon Water can implement measures needed to improve its financial performance.</p> <p>Several price reviews over recent years have all concluded that the current level of tariffs is not sustainable. Current tariffs are sufficient to recover direct operating costs but are insufficient to fund end-of-life replacement of assets and service the debt associated with the UWSSSP without real price rises or increased government subsidy.</p> <p>The current combined water and wastewater bill for a 20 kL/month customer is approximately 5.9% of the median urban household income. In many jurisdictions, 5% of household income is used as an affordability threshold for spend on water and wastewater services. Based on that benchmark, Solomon Water's tariffs are currently assessed as unaffordable.</p>

Performance Area	Indicators	Assessment
		The challenge for Solomon Water is to increase revenue to achieve water supply and wastewater service sustainability targets and to obtain sufficient cash flow to meet UWSSSP debt repayment, and simultaneously to decrease tariffs to achieve affordability benchmarks. This outcome is only partially achieved by the UWSSSP, despite it significantly increasing Solomon Water's water supply and wastewater customer base and achieving material reductions in NRW. Further investments and enhanced efficiencies will be required in the future.
Institutional Framework	Clarity of responsibilities and level of overlap	Solomon Water is responsible for water supply for the towns of Honiara, Noro, Auki and Tulagi and has agreed to start water supply operations in Gizo and Munda. MHMS is overseeing WSS in rural areas in collaboration with provincial authorities. Institutionally there appears to be no overlap. There might be scope for additional collaboration, e.g., in the operation or maintenance of rural water supply systems.
Level of Utility Autonomy	Formal and actual level of autonomy of utility management	Solomon Water is a State-Owned Enterprise with a Board of Directors, reporting to the Ministers of MMERE and MoFT. In general, Solomon Water has a reasonable level of autonomy, but there is no adequate regulation for setting water tariffs. There is a regulation regarding CSOs and related payments, but it is not always fully adhered to.

CSO = customer service obligations, UWSSSP = Urban Water and Sanitation Sector Project, NRW = non-revenue water, MHMS = Ministry of Health and Medical Services, MoFT = Ministry of Finance and Treasury, MMERE = Ministry of Mines, Energy and Rural Electrification.

Source: Solomon Water Tariff Review 2021.

3.6 Summary of the Diagnostic Analysis

To summarize the results of the diagnostic analysis use is made of a spider diagram,⁷ which depicts the scores of the various factors which jointly determine Solomon Water's contribution to achieving SDG-6 in Solomon Islands. The spider diagram is based on scores for each of the internal and external factors as presented in Table 3.10.

⁷ The use of a spider diagram for this purpose was suggested by officials of the Australian Department of Foreign Affairs and Trade in the review of the draft Interim Report of the project.

Table 3.10: Summary of Diagnostic Analysis

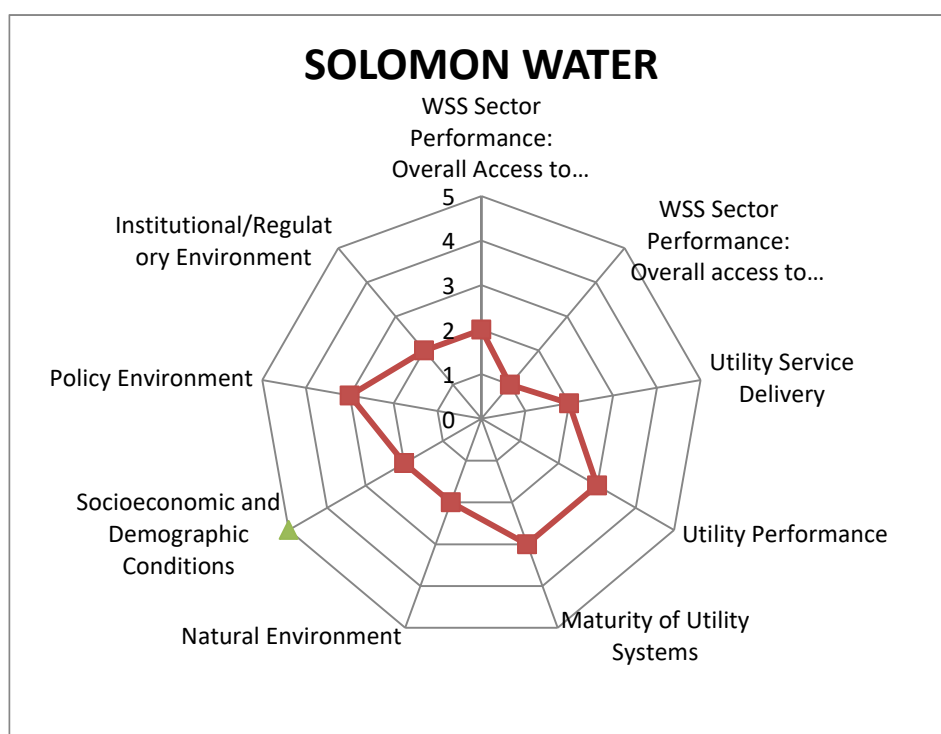
Nr	Indicator	Score	Remarks
1	WSS Sector Performance: Overall Access to safe Water Supply	2	JMP
2	WSS Sector Performance: Overall access to adequate sanitation	1	JMP
3	Utility Service Delivery	2	SDG-6 assessment: average of Continuity 4, Water Quality 3, water consumption 2, Water Coverage 2, Sewerage Coverage 1
4	Utility Performance	3	SDG 6 Assessment: average of NRW1, Staff ratio 3, operational cost ratio 2, metering ratio 4 and collection ratio 5
5	Maturity of Utility Systems	3	Technical Systems 2, Financial Systems 4, Organization, 5, Innovation 3 & Resilience 3
6	Natural Environment	2	Topography 2, water resources 3, Extreme weather events 2
7	Socio Economic and Demographic Conditions	2	GNI 3, Demography 2
8	Policy Environment	3	Policy 4, Access to finance 2, Access to training 3
9	Institutional/Regulatory Environment	2	Population in Mandate 1, Tariff system 2

JMP = Joint Management Program, SDG = Sustainable Development Goal, SWA = Samoa Water Authority, NRW = non-revenue water, GNI = gross national income.

Source: Consultants

The scores vary between 1 and 5 for each of the factors, where 1 is a very poor or low score and 5 is a very good or high score. The explanation of the scores is presented in Annex 2 of this report. The results are presented in the spider diagram in Figure 3.1 below.

Figure 3.1: Summary of Diagnostic Assessment



WSS = water supply and sanitation.

Source: Consultants

Coverage Water Supply:	Relatively low with countrywide an average 68% access to basic water supply
Coverage Sanitation:	Very low with countrywide an average 35% access to basic sanitation
Solomon Water Service Level:	Reasonable service levels: low on coverage, but relatively high on continuity and moderate scores on, water quality and water consumption
Solomon Water Performance	Relatively poor performance on NRW and operational cost recovery; strong performance on organization, HRM, metering, and collection of bills.
Solomon Water System Maturity	Currently no spare capacity for water supply and sewerage; stronger in organizational, HRM and financial systems and medium performance on resilience and innovation
Natural Environment	Difficult topography and environmental hazards. Relatively good water resources but issues with illegal logging and pollution.
Demography and Economy	Larger part of the population lives in rural areas, which are difficult to access; low incomes and very limited affordability to pay for water among the population
Policy Environment	Relatively clear policies but always implemented due to lack of resources; Solomon Water has limited access to both financial and qualified human resources and training facilities
Regulatory environment	Regulatory environment relatively clear but regulations are often not implemented or difficult to enforce; Solomon Water's service area limited to the urban population (24%).

4 SWOT ANALYSIS

The key internal Strengths and Weaknesses of Solomon Water and the key external Opportunities and Threats in relation with enhancing access to safe WSS have been put in Table 4.1. Not all the factors are equally important, and a first step is to identify the most important ones, say maximum 3 or 4 strengths, weaknesses, threats, and opportunities per square.

Table 4.1: Solomon Water SWOT

<p>Strengths</p> <ul style="list-style-type: none"> • Solomon Water has produced long and medium-term Strategic Plans which form the basis for further development • Solomon Water has been able to gradually improve and maintain WSS service levels in Honiara • Financial performance Solomon Water has improved and Solomon Water able to cover operation and maintenance costs • Solomon Water has invested in a stable and reliable staff base and has developed and implements a staff training plan 	<p>Weaknesses/constraints</p> <ul style="list-style-type: none"> • Ageing water supply System Honiara and provincial towns inadequate to (keep up) supply for current population and low coverage • Ageing sewerage system Honiara inadequate and lacks capacity and discharges untreated water into environment, low coverage • Provincial operations depend on subsidies from the Government • Water tariffs are relatively high as compared to prevailing (low) standards of living • Lack of possibilities to attract qualified staff
<p>Opportunities</p> <ul style="list-style-type: none"> • Credit line available to implement necessary investments to extend and improve WSS in Honiara, Tulagi, Auki, and Noro and (in the near future) in Munda and Gizo. • CSO mechanism in place and has been in some cases been applied in the past • Five provincial capitals and several other urban areas not yet covered by Solomon Water and Solomon Islands government has charged Solomon Water with extending services to other urban areas. • Twinning arrangement with Australian Water Corporation provides opportunities for training and technical assistance • For future use: Solomon Water has technical know-how to support O&M of rural WaSH systems 	<p>Threats</p> <ul style="list-style-type: none"> • Inadequate regulation of WSS tariffs to ensure cost recovery • High levels of urban population growth: Solomon Water is currently not able to meet the growing demand. • Solomon Water's borrowing capacity limited where additional equity and loans are needed for financing of future investments. Also, Solomon Islands is approaching its debt ceiling. • Use of water resources by Solomon Water is not adequately regulated and continued illegal activities without enforcement are a threat for the sustainable supply of water.

WSS = water supply and sanitation, O&M = operation and maintenance, WaSH = Water, Sanitation and Hygiene, CSO = customer service obligation, SWOT = strengths, weaknesses, opportunities, threats.

Source: Authors.

Based on the above SWOT analysis, Solomon Water has formulated the following strategic directions:

1. WSS service levels in Honiara have been steadily improving over the past decade and Solomon Water has been able to maintain and improve service levels and cover its operational costs. Issues such as the high level of NRW and the high costs of energy will need continued attention and investment.
2. Investments to satisfy the fast-growing demand for WSS services in Honiara and several other small towns are urgently needed and are being implemented. Along with these investments, existing inefficiencies will be reduced. These investments will require all Solomon Water's limited management and operational capacity over the coming 3–5 years.

3. The logical next step for Solomon Water would be to extend its services to other provincial capitals and urban centers and to start planning for that now.
4. Additional resources are needed to finance future investments in the form of increased equity of Solomon Water's shareholder (Solomon Islands government) and additional loans and grants from development partners.
5. Measures need to be taken to introduce an adequate mechanism to establish the annual tariffs for Solomon Water, including the recovery of O&M costs of WSS services in provincial urban centers.

5 SOLOMON WATER - SDG-6 STRATEGIC ACTION PLAN

5.1 Rationale

Based on the data collection and the SWOT analysis described in previous chapters, the management outlined the Strategic Priorities of Solomon Water to enhance its contribution to achieving SDG-6, as follows:

1. 2022–2030: Further develop, expand and maintain WSS facilities and services in Honiara, Auki, Noro, and Tulagi and construct new WSS systems in Gizo and Munda (2020–2025) and maximize WSS coverage in these service areas.
2. 2025–2030: Carry out feasibility studies and develop new WSS systems in Bina Harbor and Choiseul Bay (including Taro and Spizozae islands).
3. 2030 and beyond: Start planning for and prioritize extending WSS services to other provincial towns.
4. 2030 and beyond: Identify potential support to O&M of rural WaSH systems in the vicinity of urban centers currently served by Solomon Water.

The above priorities are based on the following considerations:

- a. Solomon Water's mandate extends to providing water supply and sewerage services in urban areas only. The WSS Policy and Implementation Plan of MMERE charges Solomon Water with extending WSS services to the urban areas which are currently not served. It is therefore logical for Solomon Water, in enhancing its SDG-6 achievement, to expand services in the (parts of) provincial towns and urban areas which are currently not served.
- b. Solomon Water is a State-Owned Enterprise and is obliged to recover (a large part of) the costs of the services it provides from its customers. This is another justification for Solomon Water to focus on urban areas, as in these areas there is in most cases an economic basis for operations.
- c. Solomon Water has a large ongoing project aimed at developing and enhancing the capacity of WSS systems in Honiara, Auki, Noro, Gizo, Tulagi and Munda. This project is expected to occupy most of the resources of the Solomon Water organization until 2025.
- d. Feasibility studies for WSS projects in Taro, Buala, Tinggoa, Kirakira, Binu Harbour and Lata are being planned or under preparation, and implementation of these projects has priority for the period 2025–2030.
- e. As Solomon Water is the only WSS utility in Solomon Islands, the organization has the technical and organizational skills to support ongoing efforts in expanding WSS services to rural areas, for example, by providing technical support services in operating and maintaining rural WSS systems. This would apply for the period beyond 2030. To satisfy the commercial obligations of Solomon Water as an SOE, these services would somehow have to be compensated for by, e.g., CSO contracts or contributions from customers.

5.2 Priority 1: Enhance capacity and extend coverage for WSS services in Honiara, Auki, Noro, Tulagi, Gizo, and Munda

Currently, Solomon Water provides water supply services in Honiara, Auki, Tulagi, and Noro and sewerage services to part of Honiara. The Solomon Island Urban Water and Sanitation Sector Project is ongoing to develop and/or enhance the capacity and rehabilitate WSS systems in these towns. The most effective and efficient means of making progress towards delivering SDG-6 goals is by making maximum use of the extended capacity in these WSS systems.

The advantages of making optimal use of existing water supply and sanitation capacity include:

- Low cost (as extension of services effectively “add onto” existing systems and use existing mains to assist in delivering the new services resulting in economy of scale.
- The largest unserved populations are generally on the outskirts of these centers and could be reached economically through expansion of services.
- Access to future skilled operations and maintenance (Solomon Water already has maintenance capacity and this can be increased more effectively than training an entirely new team).
- Access to (increased) revenue (generally willingness and ability to pay for services) is higher in major urban centers as compared to very remote areas.
- Access to skilled Water Utility management (Solomon Water already manages water supply and sewerage systems and can increase that capacity when expanding into new areas).

5.3 Priority 2: Extending WSS Services to Choiseul Bay (Taro and Sipozae) and Bina Harbor (Malaita)

At present, there are plans under the ADB funded “Urban Water Supply and Sanitation Sector Project, Detailed Engineering Design Phase 2” to undertake the Feasibility Studies and Detailed Design of water and sewerage at Choiseul Bay including Taro and Sipozae Islands (Choiseul Province). Given the present funding support, future construction of the proposed works may also be funded by development partners.

At present, the Bina Harbor (Malaita Province) tuna factory project is being implemented. To support this large-scale development, a feasibility study for the future provision of water and sanitation services to support this development is also being proposed. This economic development increases the priority and feasibility of providing WSS services in this area.

As mentioned above, the future expansion of water and sanitation services into the above locations will have a sizeable impact on achieving SDG-6 goals.

Recommendations:

- a) Water and sewerage services should be extended as far as possible in these areas with utilization of donor funding.
- b) Solomon Water should enhance its operational capacity to ensure that these new areas can be sustainably serviced.

5.4 Priority 3: Extending WSS Services to other Provincial Towns

The following key provincial towns do not currently have an operational piped water or sewerage system and no current initiatives exist to provide such services.

- Seghe (Western Province)

- Buala (Isabel Province)
- Tigoa (Rennell-Bellona Province)
- Maluu (Malaita Province)
- Apio (Malaita Province)
- Kirakira (Makira-Ulawa Province)
- Lata (Temotu Province)

As part of this study, a high-level technical review of each town was undertaken with the objective of preparing a prioritized action plan for the delivery of WSS services. The results of this review are presented in Part B of this report. The review has taken place at the conceptual level to allow for prioritization. The purpose of the technical reviews is to provide an indication of possible servicing arrangements. Each town will require a detailed feasibility study to determine appropriate solutions. In particular, the lack of hydrogeological data on water sources means that these will need to be investigated in detail as part of a future project.

Regarding sanitation, the provision of conventional sewerage systems in the towns is likely to be a phased process which will evolve over many years due to the high cost of such systems. The implementation of the improvements in sanitation may therefore be a phased approach, as follows:

- a) Installation of septic tanks in unserved areas in combination with the implementation of awareness campaigns and hygiene educational programs.
- b) Rehabilitation/replacement of damaged septic tanks and pit latrines.
- c) Making adequate arrangements for emptying and maintenance of septic tanks in collaboration with municipal authorities.
- d) Construction of conventional sewerage system in densely populated sections of town (such as Central Business District) and adjacent areas.
- e) Extension of sewerage system to the wider town area.

5.5 Prioritization for achieving SDG-6

5.5.1 Ongoing Projects

Under the Solomon Islands Urban Water and Sanitation Sector Project, plans exist for the rehabilitation, upgrading and development of WSS infrastructure and part of these plans are already being implemented. These projects are largely focused on the rehabilitation of existing infrastructure and expansion of services in the larger urban centers such as Honiara and Auki or for the provision of new, rehabilitated or expanded services in several small provincial towns, including Auki, Noro, Tulagi, Munda, and Gizo. In some towns, feasibility studies are planned or ongoing. A summary is presented in the table below.

Table 5.1: Summary of Development Plans under SI - UWSSP

Item	Town	Province	Action	UEWSS
1	Honiara	Honiara City Council	Expansion of water supply system into additional areas	UWSSP
2	Auki	Malaita	Expansion of water supply system into additional areas	UWSSP
3	Choiseul Bay, Taro and Sipozae	Choiseul Province	Feasibility Study for Water and Sewerage	UWSSP
4	Gizo	Western Province	Water Supply system	UWSSP
5	Munda	Western Province	Water Supply system	UWSSP
6	Tulagi	Central Province	Water Supply system	UWSSP
7	Bina Harbour	Malaita Province	Water Supply System	Not confirmed

SI UWSSP - Solomon Islands Urban Water Supply and Sanitation Sector Project

Source: Authors.

The most efficient and cost-effective way for Solomon Water to increase access to safe Water and Sanitation services (SDG-6) is to fully utilize the increased capacity of WSS infrastructure and to maximize coverage of WSS services in the above urban areas and connect the maximum number of households to the water supply and sewerage network.

5.5.2 Remaining provincial towns – water supply prioritization

The remaining provincial towns were investigated for prioritization, as follows:

- Seghe (Western Province)
- Buala (Isabel Province)
- Tigoa (Rennell-Bellona Province)
- Maluu (Malaita Province)
- Apio (Malaita Province)
- Kirakira (Makira-Ulawa Province)
- Lata (Temotu Province)

To prioritize water supply development in these towns, an evaluation matrix was developed in consultation with Solomon Water. The proposed evaluation criteria are shown below:

Table 5.2: Proposed Evaluation Criteria for Prioritization Water Supply

Nr	Evaluation Factor
1	Population size
2	Current Water borne disease risks – use past health records if available
3	Economic viability (industrial activity and employment)
4	Available water resources – river/borehole/other
5	Reliability of raw water supply (large rivers or just rainwater harvesting, etc.)
6	Raw water quality
7	Proximity and ease of staff and supplies access from Honiara
8	Availability of skilled potential operators in town
9	Existing water supply system-piped system/wells/other
10	Potential for gravity-based water supply
11	Estimated capital costs to provide water supply to town
12	Estimated operational costs to run water supply system
13	Ability to pay for water
14	Willingness to pay for water
15	Government and community willingness for Solomon Water to provide services

Source: Authors.

As part of this brief study, it became apparent that it would not be possible to acquire sufficient information on each of these centers to complete a full evaluation including all the proposed 14 factors. Issues such as the lack of available information, requirement for surveys at the towns (not possible within project timeframe) and financial analysis requirements has led to the exclusion of several proposed criteria.

A simplified evaluation matrix was therefore adopted for water supply which included:

- Population to be served
- Raw water availability (reliability)
- Relative complexity of water supply system
- Logistical issues (distance from Honiara for support)

A rating system and weighting of the factors was applied as follows:

Each category was rated using a 1-to-5-point score as follows:

Table 5.3: Prioritization Rating for Water Supply

Score	Population	Raw Water Availability	Relative Complexity of Water Supply System	Logistical (Technical Support) Factor
1	1 to 1,000	No surface water (needs boreholes or desalination plant)	More than four treated water pump stations to reservoirs and multiple water supply zones	> 400km from Honiara
2	1001 to 3,000	Limited surface water and > 10km from town	Three to four treated water pump stations to reservoirs	300 to 400km from Honiara
3	3,001 to 6,000	Adequate surface water available within 10km	Maximum two treated water pump stations to reservoirs	200 to 300km from Honiara
4	6,001 to 10,000	Abundant raw water within 10km of town	Single treated water pump station to single reservoir	100 to 200km from Honiara
5	> 10,000	Abundant raw water within 5km of town	Simple gravity supply system from source through to reservoir(s) then to town	Within 100km of Honiara

Source: Authors.

In addition to the scoring above, the scores were weighted as follows:

- Population – 40%
- Raw Water Availability – 30%
- Complexity of Water Supply System – 20%
- Logistical (remoteness) – 10%

As the SDG-6 goals target universal access to water and sanitation, the weighting of the “population” needs to be a significant factor in the evaluation process.

The assessment process was undertaken as per the table below:

Table 5.4: Prioritization Scores of Provincial Towns for water supply

Item	Town	Population Score	Raw Water Availability Score	Complexity of Water Supply System Score	Logistical Factors (From Honiara) Score	Final Score (out of 100)
1	Seghe (Western Province)	1	3	5	2	50
2	Buala (Isabel Province)	3	4	3	4	68
3	Tigoa (Rennell-Bellona Province)	1	1	4	3	36
4	Maluu (Malaita Province)	3	3	1	4	54
5	Apio (Malaita Province)	1	5	3	4	58
6	Kirakira (Makira-Ulawa Province)	3	4	4	3	70
7	Lata (Temotu Province)	1	4	3	1	46
	<i>Weighting</i>	40%	30%	20%	10%	

Source: Authors.

Based on the water supply assessment above, the prioritized implementation of the provincial towns to achieve SDG goals would be:

1. Kirakira (Makira-Ulawa Province)
2. Buala (Isabel Province)
3. Apio (Malaita Province)
4. Maluu (Malaita Province)
5. Seghe (Western Province)
6. Lata (Temotu Province), followed by
7. Tigoa (Rennell-Bellona Province)

It should be noted that the above simplified assessment was conducted on a conceptual level and with a lack of key data. Further investigation and feasibility studies are required to confirm a suitable implementation schedule.

5.5.3 Remaining provincial towns – sewerage prioritization

A sewerage assessment was also carried out for the remaining provincial towns:

- Seghe (Western Province)
- Buala (Isabel Province)
- Tigoa (Rennell-Bellona Province)
- Maluu (Malaita Province)
- Apio (Malaita Province)
- Kirakira (Makira-Ulawa Province)
- Lata (Temotu Province)

In order to prioritize the proposed development of these towns, a high-level evaluation matrix similar to the water supply assessment was developed.

A simplified evaluation matrix was therefore adopted for sewerage which included:

- Population to be served
- Complexity of Sewerage System
- Sewage Treatment Plant (STP) Site
- Ocean Outfall (or watercourse) discharge location
- Logistical issues (distance from Honiara for support)

A rating system and weighting of the factors was applied as follows:

Each category was rated using a 1-to-5-point scoring system as presented in Table 5.5.

Table 5.5: Prioritization Criteria and Rating for Sewerage

Score	Population	Complexity of Sewerage System Score	STP Site Score	Ocean/Watercourse Outfall Score	Logistical (Technical Support) Factor
1	1 to 1,000	Difficult terrain and multiple sewer catchments	No obvious location for STP	Will require remote ocean outfall or watercourse discharge >5km from town	> 400km from Honiara
2	1001 to 3,000	More than four sewer catchments	Possible STP site but in highly developed area	Will require remote ocean outfall or watercourse discharge >3km from town	300 to 400km from Honiara
3	3,001 to 6,000	Three or four sewer catchments	Possible STP site but within town area	Will require remote ocean outfall or watercourse discharge >1km from town	200 to 300km from Honiara
4	6,001 to 10,000	Two sewer catchments	Suitable open land near town	Will require remote ocean outfall or watercourse discharge <1km from town	100 to 200km from Honiara
5	> 10,000	Single sewer catchment to low point	Government owned land close to town but suitably separated from town	Existing jetty to attach outfall pipeline or suitable watercourse nearby	Within 100km of Honiara

In addition to the scoring above, the scores were weighted as follows:

- Population – 40%
- Sewerage System Complexity – 30%
- STP Site – 10%
- Ocean/watercourse – 10%
- Logistical issues (remoteness) – 10%

The assessment process was undertaken as per Table 5.6:

Table 5.6: Prioritization Scores of Provincial Towns for Sewerage

Item	Town	Population Score	Complexity of Sewerage System	STP Site Score	Ocean Outfall Score	Logistical Factors (From Honiara) Score	Final Score (out of 100)
1	Seghe (Western Province)	1	4	5	5	2	56
2	Buala (Isabel Province)	3	3	1	5	4	62
3	Tigoa (Rennell-Bellona Province)	1	5	4	4	3	60
4	Maluu (Malaita Province)	3	1	4	5	4	56
5	Apio (Malaita Province)	1	4	3	5	4	56
6	Kirakira (Makira-Ulawa Province)	3	4	3	4	3	68
7	Lata (Temotu Province)	1	3	5	5	1	48
	<i>Weighting</i>	40%	30%	10%	10%	10%	

STP = Sewerage Treatment Plant

Source: Authors.

Based on the assessment above, the prioritized implementation of the provincial towns for sewerage to achieve SDG-6 goals would be:

1. Kirakira (Makira-Ulawa Province)
2. Buala (Isabel Province),
3. Tigoa (Rennell-Bellona Province)
4. Maluu (Malaita Province) and Apio (Malaita Province) and Seghe (Western Province), followed by
5. Lata (Temotu Province)

It should be noted that the above simplified assessment was conducted on a conceptual level and with a shortage of key data. Further investigation and feasibility studies are required to confirm a suitable implementation schedule.

5.6 Conclusions and Recommendations

The achievement of the SDG-6 goal, i.e., providing universal access to water and sanitation in Solomon Islands by 2030, remains a significant challenge for both the government and Solomon Water.

Table 5.7 presents a Strategic Action Plan for Solomon Water to reach significant progress into achieving the SDG-6 objectives. The Chapter summarizes the current initiatives plus outlines a strategic path in a prioritized order for servicing currently unserved areas. It is noted that the methodology adopted in the assessment process can be refined in future as more and improved data become available and specific technical assessments are undertaken for the nominated areas.

It should be noted that, traditionally, water supply systems are installed prior to sewerage schemes. Where feasibility studies are conducted, it is advisable to simultaneously assess the water supply and sewerage feasibility (item 3 activity) so that the planning is already in place for rapid implementation if funding becomes available.

As mentioned earlier in the report, because the construction of sewerage systems involves high capital investments, it may be appropriate to first investigate and possibly implement the improvement of on-site sanitation systems such as septic tanks and pit-latrines instead of constructing sewerage systems.

Table 5.7: Solomon Water Summary of SDG-6 Action plan

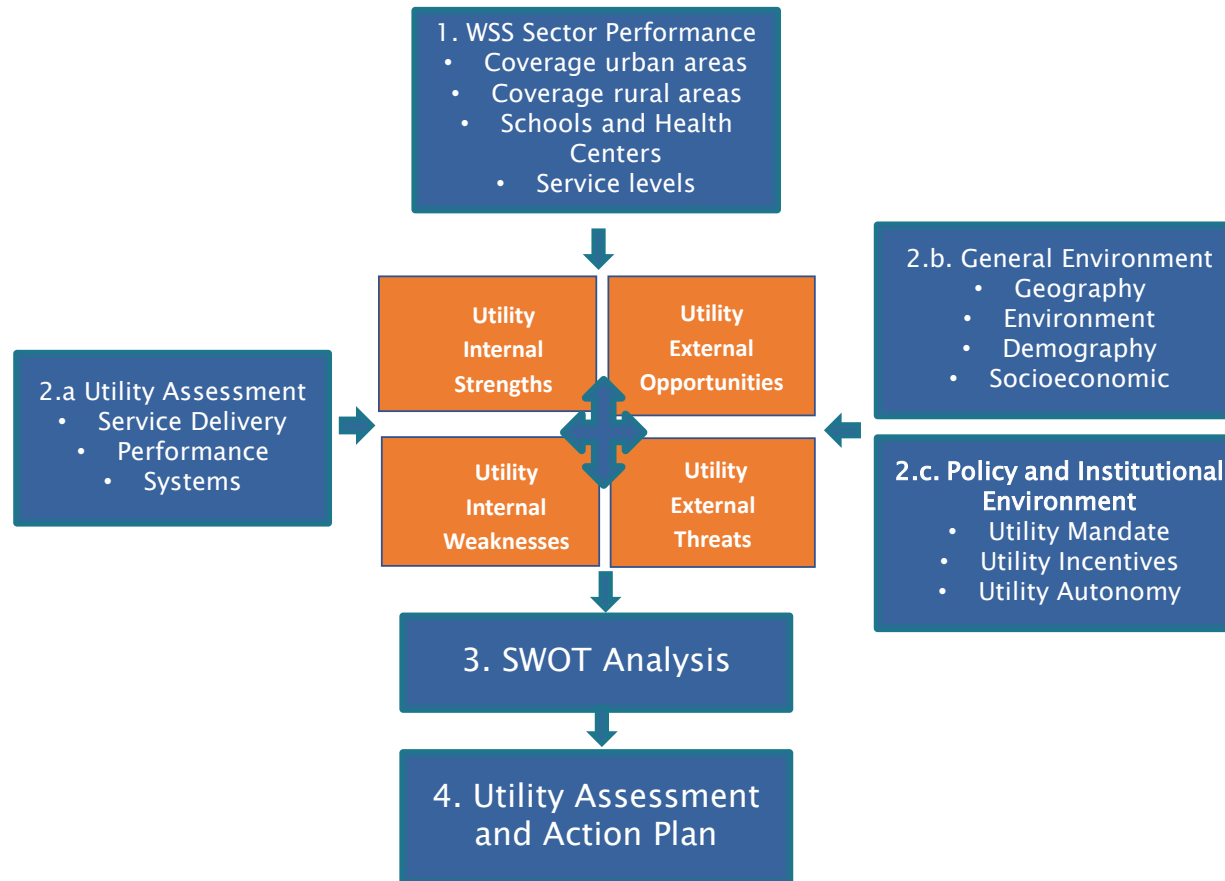
Item	Town	Water Supply	Sewerage	Recommendations
1. CURRENT WATER AND SEWERAGE PROJECTS IN KEY TOWNS				
1,1	Honiara	Current SI UWSSSP funding to expand system	Current SI UWSSSP funding to rehabilitate and expand system	Keep expanding Honiara water and sewerage systems to achieve full coverage
1,2	Auki	Current SI UWSSSP funding to expand system	Not yet provided	Keep expanding Auki water supply system and investigate new sewerage system for Auki
1,3	Noro	Current SI UWSSSP funding to expand system	Not yet provided	Keep expanding Auki water supply system and investigate new sewerage system for Auki
1,4	Gizo	Current SI UWSSSP funding to expand system	Current SI UWSSSP funding to expand system	Upgrade Gizo Water and Sewerage Systems under SI UWSSSP funding
1,5	Munda	Current SI UWSSSP funding to expand system	Current SI UWSSSP funding to expand system	Upgrade Gizo Water and Sewerage Systems under SI UWSSSP funding
1,6	Choiseul Bay (Taro and Sipozae)	Current SI UWSSSP funding to expand system	Current SI UWSSSP funding to expand system	Provide new water and sewerage systems under SI UWSSSP funding
1,7	Bina Harbour	Funding to be confirmed	Funding to be confirmed	Provide new water and sewerage systems
SI UWSSSP = Solomon Islands Urban Water Supply and Sanitation Project				
2. PROVINCIAL TOWNS - PRIORITISED WATER SUPPLY SYSTEMS IMPLEMENTATION				
2,1	Kirakira (Makira-Ulawa Province)	No funding allocation yet	N/A	Undertake Feasibility Study
2,2	Buala (Isabel Province)	No funding allocation yet	N/A	Undertake Feasibility Study
2,3	Apio (Malaita Province)	No funding allocation yet	N/A	Undertake Feasibility Study
2,4	Maluu (Malaita Province)	No funding allocation yet	N/A	Undertake Feasibility Study
2,5	Seghe (Western Province)	No funding allocation yet	N/A	Undertake Feasibility Study
2,6	Lata (Temotu Province)	No funding allocation yet	N/A	Undertake Feasibility Study
2,7	Tigoa (Rennell-Bellona Province)	No funding allocation yet	N/A	Undertake Feasibility Study
3. PROVINCIAL TOWNS - PRIORITISED SEWERAGE SCHEMES IMPLEMENTATION				
3.1	Kirakira (Makira-Ulawa Province)	N/A	No funding allocation yet	Undertake Feasibility Study
3.2	Buala (Isabel Province)	N/A	No funding allocation yet	Undertake Feasibility Study
3.3	Tigoa (Rennell-Bellona Province)	N/A	No funding allocation yet	Undertake Feasibility Study
3.4	Maluu (Malaita Province)	N/A	No funding allocation yet	Undertake Feasibility Study
3.5	Seghe (Western Province)	N/A	No funding allocation yet	Undertake Feasibility Study
3.6	Apio (Malaita Province)	N/A	No funding allocation yet	Undertake Feasibility Study
3.7	Lata (Temotu Province)	N/A	No funding allocation yet	Undertake Feasibility Study

SDG = Sustainable Development Goal.

Source: Authors.

Appendix 1 – Diagnostic Framework Key Indicators

Diagnostic Framework



List of Indicators^a

Performance Area	Key Performance Indicators ^b	Data Source	Score
Overall WSS Sector Performance			
Water Supply	Overall Coverage (urban/rural) *	JMP	%
	Contribution Water Utilities	Utility/JMP	%
	Contribution Other Sector Organizations	Govt/JMP	%
	Service Levels*	Utility/JMP	1 safely managed 2 basic level 2 limited 4 unimproved 5 no
Sanitation	Overall Coverage (urban/rural) *	JMP	%
	Contribution Water Utilities	Utility/JMP	%
	Contribution Other Sector Organizations	Govt/JMP	%
	Service Levels*	Utility/JMP	1 safely managed 2 basic level 2 limited 4 unimproved 5 no
	Proportion of household wastewater safely treated	UN/Habitat monitoring data	%
	Coverage and Service Levels in Schools and Health Facilities	JMP	1 safely managed 2 basic level 2 limited 4 unimproved 5 no
Gender Equality and Social Inclusion (GESI)	Minimum standards for mainstreaming GESI	JMP, Government	Descriptive
Utility Service Level			
Inclusiveness	Drinking Water Coverage in service area*	Benchmarking	%
	Sanitation Service Coverage in service area*	Benchmarking	%
Water Supply	Continuity of service*	Benchmarking	hours/day
	Continuity (customers with discontinuous supply)	Benchmarking	%
	Quantity of water supply (residential consumption) *	Benchmarking	l/p/d
	Nr of microbiological tests taken per year	Benchmarking	No

Performance Area	Key Performance Indicators ^b	Data Source	Score
	Percentage of non-compliant tests*	Benchmarking	%
Wastewater	Availability of on-site sanitation services	Utility	descriptive
	Wastewater and Faecal Sludge Quality passing primary and secondary level of treatment		%
Responsiveness to customers	Is there a customer charter and has the charter been made known?	Benchmarking	Descriptive
	Nr. of complaints /1,000 connections	Benchmarking	Number
Utility Performance			
Technical	Non-Revenue Water *	Benchmarking	%
	Energy Efficiency (Energy costs as % of operational costs)	Benchmarking/ Utility	%
Financial	EBITDA Margin (% of Revenues)	Benchmarking	%
	Operating Cost Recovery Ratio*	Benchmarking	%
HRM	Staff per 1,000 connections*	Benchmarking	Number FTE
Organization & Strategy	Aggregate Performance Ratio (AGPAR)	Benchmarking	AGPAR score
Commercial	Metering Ratio*	Benchmarking	%
	Collection Ratio*	Benchmarking	%
Maturity of Utility Systems			
Technical Systems	% Water production capacity used *	Utility	%
	% Sewerage capacity used *	Utility	%
	Power Supply Reliability *	Utility	descriptive
	Monitoring of pressure and quantities in networks *	Utility	descriptive
Financial Systems	Borrowing Capacity: debt to equity ratio *	Benchmarking System, Utility	%
	Timely and accurate financial reporting available and accessible for public *	Utility/Govt	descriptive
Organization	Training policy and implementation: number of employees undergoing training disaggregated per category and gender	Utility	descriptive
	Gender equality and social inclusivity policies in place* ^c	PWWA Benchmarking Report 2020/Utility	descriptive
	Strategy Document *	Utility	descriptive
	Organization Charts *	Utility	descriptive

Performance Area	Key Performance Indicators ^b	Data Source	Score
Innovation	Use of advanced technology *	Use of electromagnetic flowmeters, smart meters, SCADA and GIS	descriptive
	Use of advanced billing systems *	Payment by bank, automatic transfer, annual meter readings, etc.	descriptive
(Climate) Resilience	Technical resilience *	Construction, spare storage capacity, backup generators, IT backup systems.	descriptive
	Organizational resilience *	Use of emergency plans, data, emergency drills, design standards, etc.	descriptive
Natural Environment			
Topographic conditions	Type of landscape *	Utility/Govt	Accessibility
Water Resources	Availability and type *	Utility	Descriptive
Extreme weather events	Occurrence and severity *		Descriptive
Socio Economic Conditions and Demography			
Socio-economic development	Per capita GNI *	ADB/WB	GNI/capita
Affordability of 6m ³ water	% of per capita GNI	Benchmarking	%
Urban population	% Population in urban areas *	UN population data	%
Rural Population	% Population in rural areas *	UN population data	%
Outer Island Population	% Population in outer islands	UN population data	%
Population density	Nr of persons/km ²	UN population data	Number
WSS Policy Environment			
Policy/Strategy	Approved Water Sector Policy in place *	Utility/Govt	Descriptive
Gender issues	Specific Policy for women and underprivileged groups	Govt/Utility	Descriptive
Funding (gap)	Utility access to financial resources *	Utility/Govt	Descriptive
Human Resources	Availability and use of WSS training facilities *	Utility/Govt	Descriptive
Monitoring	Monitoring System in place and producing regular and reliable reporting *	Utility/Govt	Descriptive

Performance Area	Key Performance Indicators ^b	Data Source	Score
Institutional and Regulatory Environment			
Service area of the Utility	% of total population within Utility mandate*	Utility/Govt	%
	% of urban population within Utility mandate*	Utility/Govt	%
	% of rural population within utility mandate*	Utility/Govt	%
Sector Regulation (including quality standards)	Existence, responsiveness, and predictability of regulatory system	Utility/Govt/Regulator	descriptive
Tariff Setting	Reliability, transparency, and effectiveness of tariff setting system *	Utility/Govt/Regulator	descriptive
Institutional Framework	Clarity of responsibilities and level of overlap	Utility/Govt	descriptive
Level of Utility Autonomy	Formal and actual level of autonomy of utility management	Utility/Govt	descriptive

Notes:

^a The table in Appendix 1 presents the key indicators that have been identified to assess the status of the various performance areas. During the study, data have been collected on a number of these indicators to assess progress on SDG-6 in the various countries. However, it has not been possible to find data for all indicators. The results of the assessments are presented in the spider diagrams in Figure 3.5. The indicators for which no data were available have not been used in the spider diagrams.

^b Those indicators marked with an (*) have been used in developing the spider diagrams in chapter 3 of this report. Indicators with a source “benchmarking” are defined according to the World Bank operated IBNET Benchmarking System (www.ib-net.org). Indicators with a source JMP are defined in accordance with the WHO/UNICEF Joint Monitoring Program (<https://washdata.org>). Other indicators are defined in Appendix 2 below.

^c The types of policies in place for flexible work arrangements; maternity/paternity leave, medical leave, family leave, part-time employment, flexible core hours, rules and/or regulations to prevent sexual harassment, gender targets for share of female employees, separate toilets for men/women/gender neutral/unisex at all sites, menstrual hygiene management facilities, childcare facilities, lactation rooms, etc.

Source: Authors.

Appendix 2: Spider Diagram Scoring Table (Figure 3.1)

Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
Overall WSS Sector Performance					
Country wide access to safe water (safely managed and basic service level)	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
Country wide access to safe Sanitation (safely managed and basic service level)	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
Utility Service Levels					
Water Coverage Service Area	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
Sewerage Coverage Service Area	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
Continuity of service	24 hours	23 hours	22 hours	21 hours	≤20 hours
Drinking Water Quality	100%	95%–100%	90%–95%	85%–90%	≤80 %
Drinking Water consumption	175–150lcd	125–150lcd	100–125lcd	75–100lcd	<75lcd
Utility Performance					
Non–Revenue Water	<25%	25%–35%	35%–45%	45–55%	>55%
Staff Ratio	<5	5–7	7–9	9–11	>11
Operational Cost Ratio	>150%	125%–150%	100%–125%	75%–100%	<75%
Metering Ratio	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
Collection Ratio	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
Maturity of Utility Systems					
Technical Systems	Ample excess capacity in water/sewage capacity available, reliable power and adequate monitoring in place	Some excess capacity in water and sewerage systems, reliable power most of the time and most of system monitored.	Water/sewage systems operate at full capacity, regular power outages and about 75% of system is monitored.	Water/sewage systems lack capacity during peak hours, regular power outages and about 50% of system is monitored.	Water/sewage systems lack capacity to meet demand, power outages do occur often and about 50% of system is monitored.

Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
Financial Systems	Regular and timely Annual Reports with the audited financial statements are prepared and accessible for the public. Debt to equity ratio < 1	Annual Reports with the audited financial statements are prepared with 1–2 years delay and accessible for the public. Debt to equity ratio 1–1.5	Annual Reports with the audited financial statements are prepared with > 2 years delay and not accessible for the public. Debt to equity ratio 1.5–2	Annual Reports with financial statements are prepared but audits are >2 years delayed and not accessible for the public. Debt to equity ratio 2 or more.	Annual Reports are not regularly prepared and not accessible to the public. Debt to equity ratio >2
Organization	Strategy document, organization structure, training policy and gender policy all available, implemented and monitored.	Strategy, organization structure, training policy and gender policy available, but only partly implemented and monitored.	Strategy, organization structure, training policy and gender policy all available, but no clear implementation or monitoring	Strategy, organization structure, training and gender policy only partly available, without clear implementation or monitoring	Strategy, organization structure, training and gender policy are mostly lacking.
Innovation	SCADA fully implemented throughout WSS systems; Smart meters installed for all customers, various payment methods in place	SCADA only partly implemented; smart meters partly installed, various payment methods in place	SCADA installed but not yet operational; Smart meters being piloted, some payment methods in place	Plans for SCADA and smart meters but not yet implemented, limited payment methods in place	SCADA not implemented; no smart meters installed, only cash payment methods in place
Resilience	Utility infrastructure is resilient against extreme events. Resilience plan in place and being implemented.	Utility infrastructure is being made resilient against extreme events. Resilience plan in place but not implemented.	Utility infrastructure is only partly resilient against extreme events. Resilience plan in place but not implemented.	Utility infrastructure is not resilient against extreme events. Resilience plan in place but not implemented.	Utility infrastructure is not resilient against extreme events. No resilience plan in place.
Natural Environment					
Topography	Easy access to towns and villages	Ease of access to towns and villages is moderate	100 to 200 islands. Ease of access to towns and villages is moderate to difficult	200 to 1000 islands. Access to towns and villages is difficult	Above 1000 islands. Access to towns and villages is very difficult

Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
Water Resources	good water resources available for all of the country with excess to meet demand	good water resources available for ALL of the country but does not meet the demand	good water resources available for SOME of the country and these areas exceeds the demand	good water resources available for SOME of the country but does not meet the demand	poor water resources available for most of the country.
Exposure to extreme weather events	Extreme weather events do not normally occur	Extreme weather events only in rare cases, less than once every 10 years	Extreme weather events do occasionally occur: less than once every 5 years	Extreme weather events occur regularly, once every 1–5 years.	Extreme weather events occur often, at least once every year
Socio Economic Conditions and Demography					
Average GNI per capita	>\$10,000	\$10,000–\$5,000	\$5,000–\$2,000	\$2,000–\$1,000	< \$1,000
Urban Population	> 80%	60%–80%	40%–60%	20%–40%	< 20%
WSS Policy Environment					
Water and Sanitation Policy	Clear WaSH policy in place, implemented and monitored	WaSH policy in place but only partly implemented and monitored due to lack of resources	WaSH Policy in place but not implemented nor monitored	Only parts of a WaSH Policy in place and only partial implementation and monitoring	No WaSH Policy in place
Access to Finance	Policies allow utility to independently generate sufficient revenues and/or borrow sufficient funds for investments	Policies allows utility to generate revenues for most investments and government assists with remaining funding and/or provides access to third party funding	Policies restrict utility in generating sufficient revenues, but government assists with sufficient funding and/or provides access to third party funding	Policies restrict utility in generating sufficient revenues and only partial support for funding from government and development partners	Policies restrict utility in generating sufficient revenues and there is limited support from government and development partners
Access to Training	Wide access to national and regional training programs for training of staff	Wide access to national training programs, moderate access to regional training programs	moderate access to national and regional training programs	moderate access to national training programs and limited access to regional programs	limited access to national and regional training programs
Institutional and Regulatory Environment					

Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
Service Area	Utility has mandate for 85%–100% of the population	Utility has mandate for 70%–85% of the population	Utility has mandate for 55%–70% of the population	Utility has mandate for 40%–55% of the population	Utility has mandate for > 40% of the population
Tariff System	Tariff system well regulated, transparent, and implemented with good balance between financial sustainability for the utility and affordability for the public.	Tariff system well regulated, but only partly implemented, but with reasonable outcomes for financial sustainability for the utility and affordability for the public.	Tariff system well regulated, but not implemented with political interference and poor outcomes for either financial sustainability or affordability.	Tariff system not well regulated and implemented without balance between financial sustainability for the utility and affordability for the public.	No regulated tariff system and poor outcomes for either financial sustainability of affordability.

Note:

^a In developing the spider diagrams, use has been made of the list of Indicators presented in Appendix 1. However, as it has not been possible to find sufficient data, not all indicators listed in Appendix 1 have been used in developing the spider diagrams and only those indicators for which data for all countries and utilities were available, have been used.

Source: Authors.



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