



# Diagnostics of Pacific Water and Wastewater Association Water Utilities

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## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
EU	European Union
GNI	Gross national income
IBNET	International Benchmarking Network (WB)
JMP	<b>WHO/UNICEF Joint Monitoring Program</b>
L/C/D	Liters per capita per day
MISE	<b>Ministry of Infrastructure and Sustainable Energy (Kiribati)</b>
PPUC	Palau Public Utilities Corporation
PRIF	Pacific Region Infrastructure Facility
PUB	Public Utilities Board, Kiribati
PWWA	Pacific Water and Wastewater Association
SDG	Sustainable Development Goal
SOE	State-owned enterprise
SWA	Samoa Water Authority
SWOT	Strengths Weaknesses, Opportunities and Threats
TA	Technical assistance
<b>UoF</b>	<b>Utility of the Future Program, World Bank</b>
WAF	Water Authority of Fiji
WaSH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization
WSS	Water Supply and Sanitation

# EXECUTIVE SUMMARY

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## Background

The latest data from the WHO/UNICEF Joint Monitoring Program on access to safe water and sanitation in the Pacific show that currently only 55% of people in the Pacific have access to safe water and only 30% to adequate sanitation. There are big differences between countries and sub-regions and between urban and rural areas. The Pacific region, compared to other regions of the world, is lagging.

This Technical Assistance project was undertaken by the Pacific Region Infrastructure Facility in cooperation with the Pacific Water and Wastewater Association (PWWA). The overall objective has been to formulate recommendations, propose measures, and develop tools to assist Pacific Island Countries and PWWA in achieving United Nations Sustainable Development Goal 6 (SDG-6; excerpted below):

*“Universal and equitable access to safe and affordable drinking water supply, adequate sanitation, and hygiene by 2030”.*

The focus of the study has been on how PWWA’s member utilities can best contribute to enhance the achievement of SDG-6 in their respective countries. The focus of this Technical Assistance has been on water utilities in Fiji, Kiribati, Palau, Samoa, and Solomon Islands.

## Results

The outcome of the study has been a Diagnostic Framework and tools for PWWA to assess the potential contribution of member utilities to achieving SDG-6. This Diagnostic Framework has been applied to the water utilities participating in the study, resulting in SDG-6 Assessment Reports and Action Plans for four out of five utilities, which are summarized in chapter 3 of this report. A separate report was prepared for Public Utilities Board in Kiribati.

## Conclusions

Chapter 4 of the report concludes that, without a major shift in policies and a significant increase in funding, SDG-6 will not be achieved in Solomon Islands and Kiribati. This, most likely, also applies to several other countries in the region, especially in Melanesia and Micronesia.

The water utilities participating in the study do not have the financial resources to significantly enhance their contribution to achieving SDG-6 and for this they depend on the support from governments and development partners. The lack of financial resources applies to many water utilities in the Pacific region. Some water utilities have legally defined service areas, which is understandable, but limits them in extending services to other areas. All water utilities in the study operate sewerage systems, but on-site sanitation is not within their mandate.

Because of poor financial performance, the possibilities and incentive for water utilities to invest in enhancing SDG-6 are limited. In addition, water utilities do normally not have a mandate to become involved in on-site sanitation. Because of these limitations, the technical expertise and existing know-how of water utilities may only be partly utilized.

## Recommendations

1. The study recommends that governments support water utilities in strengthening their financial performance by
  - a) Creating and or implementing a regulatory framework that allows them to propose appropriate tariffs, with due consideration to the need for cost recovery and customers' ability to pay.
  - b) In case revenues from tariffs are insufficient, it is recommended that governments provide financial support to water utilities to cover their operational and capital costs and to invest in achieving SDG-6.
2. Governments are encouraged to incentivize water utilities to contribute to SDG-6 by
  - a) Extending, where appropriate, mandates (e.g., for on-site sanitation) and service areas and by setting of targets.
  - b) Allowing the reinvestment of utility "profits" in increasing access to safe water supply and sanitation.
  - c) Assessing, where appropriate, if and how the technical and organizational capacity of water utilities can be utilized for providing water supply and sanitation services to small towns and rural areas against adequate financial compensation.
  - d) Encouraging water utilities in working with other agencies in developing and implementing a holistic approach to improve wastewater management in its service areas, including measures for enhanced on-site sanitation.
3. PWWA and its member utilities are encouraged to make use of and further develop the Diagnostic Framework developed under this study, preferably by carrying out in-country assessments and by involving other sector agencies in the process.
4. Water utilities could contribute to achieving SDG-6 by
  - a) Making optimal use of the capacity of current water supply and sewerage systems by connecting the maximum number of customers and improving performance.
  - b) Increase coverage in urban areas by extending services to informal settlements.
  - c) Improve water quality in small water supply systems by investing in improved water treatment and distribution systems.
  - d) Development of and/or extending operational services to piped water supply systems in peri-urban and rural areas currently not covered.
  - e) Work with other agencies in developing a holistic approach to improve wastewater management and on-site sanitation in its service areas.

# 1 INTRODUCTION

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## 1.1 Background

The latest data from the WHO/UNICEF Joint Monitoring Program (JMP) on access to safe water and sanitation in the Pacific show that currently only 55% of people in the Pacific have access to safe water and only 30% to adequate sanitation. There are big differences between countries and sub-regions and between urban and rural areas. The Pacific region, compared to other regions of the world, is lagging far behind.

The Pacific Water and Wastewater Association (PWWA) represents 31 water utilities in the Pacific region. In 2010, PWWA, with the assistance of the Pacific Region Infrastructure Facility (PRIF) and the World Bank operated International Benchmarking Network (IBNET), initiated a benchmarking program to collect and analyze data, and enhance the performance of its member utilities. While significant improvements have been made, the challenges for Pacific water and wastewater utilities remain huge.

The overall objective of the current study called “Diagnostics of PWWA Water Utilities” is to formulate recommendations, propose measures and develop tools to assist Pacific Island Countries, PWWA water utilities and PWWA in achieving United Nations Sustainable Development Goal 6 (SDG-6): “Universal and equitable access to safe and affordable drinking water supply, adequate sanitation, and hygiene by 2030”. The focus of the study is on how PWWA’s member utilities can best contribute to enhance the achievement of SDG-6 in their respective countries.

The stated objectives of this Technical Assistance (TA) project are as follows:

- a) Prepare a framework for PWWA to assess and monitor the constraints in member countries to provide universal access to water and sanitation (SDG-6) by their water utilities.
- b) To assist member utilities and their governments in formulating policies and determine priorities for investments in water to meet the 2030 agenda for SDG-6.
- c) Improve the efficiency and performance of water utilities in the Pacific Region.
- d) Highlight the water and sanitation needs of rural communities, vulnerable groups, and the poor.
- e) Inform Pacific Water Ministers Forum, PWWA and its Secretariat to formulate and advocate appropriate interventions on a regional and national basis to accelerate universal access to water and sanitation.

The focus of this TA has been on water utilities in five Pacific Island Countries, which expressed their interest in participating in this project, as follows:

- Water Authority of Fiji (WAF)
- Public Utilities Board (PUB) of Kiribati
- Palau Public Utilities Corporation (PPUC)
- Samoa Water Authority (SWA)
- Solomon Water

Implementing this TA involved the following steps:

- a) Develop a “Diagnostic Framework” to assess and monitor universal access to water supply and sanitation (WSS) in each of the countries and the (potential) contribution of water utilities to this.

- b) Apply and test the diagnostic framework in each of the five participating countries.
- c) Assess the internal strengths and weaknesses of the water utilities and how this affects their potential contribution to achieving SDG-6.
- d) Assess how external factors such as demography, the environment, level of socio-economic development, topography, Water, Sanitation and Hygiene (WaSH) policies, the institutional and regulatory framework, etc. affect water utilities in contributing to achieving SDG-6 and identify opportunities and threats.
- e) Formulate action plans with recommendations for policies, strategies, measures, and priority investments that would help PWWA utilities and governments to accelerate access to safe WSS.

In the above process, there has been special attention to the water and sanitation needs of rural communities and vulnerable groups and the poor.

## 1.2 Outline of this Report

This Final Report consists of the following sub reports:

1. General Report, providing an overview of project activities, conclusions, and recommendations, consisting of three parts
  - a. A summary of the approach and methodology and work done
  - b. A description of the diagnostic framework
  - c. Conclusions and recommendations
2. Four country and utility reports, describing i) the status of SDG-6 achievement in the country ii) the assessment of the (potential) contribution of the water utility to this, iii) a SWOT analysis and iv) SDG-6 Action Plans for each of the water utilities. The following documents are part of this final report:
  - a. SDG-6 Profile of Fiji and the Water Authority of Fiji
  - b. SDG-6 Profile of Palau and the Palau Public Utilities Corporation
  - c. SDG-6 Profile of Samoa and the Samoa Water Authority
  - d. SDG-6 Profile of Solomon Islands and Solomon Water
3. Country report for Kiribati: On request of the Chief Executive Officer of the Public Utilities Board of Kiribati (PUB), a different approach was adopted. Because PUB's WSS Systems are undergoing a full rehabilitation under the Asian Development Bank's (ADB) South Tarawa Water Supply Project and the World Bank's South Tarawa Sanitation Project, and because also the management of water and sewerage operations will be overhauled as part of the same projects, it was decided not to undertake an assessment of PUB at this stage. Instead, a Rapid Response Plan was prepared for WSS in South Tarawa with the purpose of keeping systems operational until new production capacity has been installed. In addition, the project assisted Kiribati's Ministry of Infrastructure and Sustainable Energy (MISE) in formulating a draft Strategy for enhancing SDG-6 in the Outer Islands of Kiribati. As a result, the report on Kiribati consists of two parts:
  - a. PUB – South Tarawa Water Supply and Sewerage – Rapid Response Plan



- b. Kiribati Outer Islands – draft Strategy Note for SDG-6 in the Outer Islands<sup>1</sup>

## 2 SUMMARY OF APPROACH AND METHODOLOGY

During the inception phase, the project was divided into three phases, as follows:

1. Development of the diagnostic framework
2. Applying and testing of the diagnostic framework in the five countries
3. Develop conclusions and recommendations

Each of these phases is summarized in the sections below.

### 2.1 Development of the Diagnostic Framework

During the inception phase, a start was made with the development of a diagnostic framework and a first outline was presented in the Inception Report. Various existing monitoring programs and tools were reviewed (Table 2.1):

**Table 2.1: Existing Monitoring and Assessment Frameworks and Methodologies**

Program	Summary Description	Relevance for the Diagnostic Study
The WHO/UNICEF Joint Monitoring Program (JMP) ( <a href="https://washdata.org">https://washdata.org</a> )	The JMP collects data on universal access to safe WSS for each country. JMP focuses on SDG targets 6.1 and 6.2. The JMP produces regular global reports and data for each country on WSS coverage and hygiene to facilitate sector planning and management, to support countries in their efforts to improve their monitoring systems, and to provide information for advocacy. In 2017, JMP published a global baseline for the SDG WSS targets.	JMP provides regular and relatively up to date data for each country on access to safe WSS and hygiene and it provides data on different service levels.  JMP does not provide information on who supplies the WSS services and how the services are supplied (e.g., piped or non-piped).  For this study, JMP data have been used as the source of data on SDG-6 targets 6.1 and 6.2 in each country.
The World Bank/IBNET/PWWA Benchmarking Program ( <a href="http://www.ib-net.org">www.ib-net.org</a> )	IBNET/PWWA collects data on the operations and performance of water utilities in (among others) the Pacific Region. The objective of IBNET is to support access to comparative information that will help to promote best practice among water supply and sanitation providers worldwide and eventually will provide consumers with access to high quality and affordable WSS services. It provides a common set of data definitions, a minimum set of core indicators and software to allow easy data collection and calculation of the	The IBNET/PWWA Benchmarking program provides very useful data and indicators on service level and performance of water utilities. It also provides some general information about their operations.  IBNET mostly focuses on the water utility and does not provide much information about other WSS providers or the WSS situation in each country.  For this study, IBNET/PWWA Benchmarking data have been used for service delivery and performance of water utilities.

<sup>1</sup> This part of the report is still under preparation and expected to become available by mid-2022.

Program	Summary Description	Relevance for the Diagnostic Study
	indicators, while also providing resources to analyze data and present results.	
Utility of the Future Program (UoF), World Bank	To guide WSS utilities to reinvent and strengthen themselves, the World Bank has developed “Utility of the Future” (UoF), a program designed to catalyze, materialize, and maintain transformation efforts in WSS utilities. The goal is to become the UoF, a future-focused utility, which provides reliable, safe, inclusive, transparent, and responsive WSS services through best-fit practices that allow it to operate in an efficient, resilient, innovative, and sustainable manner. This is achieved through the strengthening of the essential processes of a WSS utility to face their current challenges and develop future-thinking capabilities. A UoF provides high-quality services in a highly efficient manner while also being innovative, inclusive, market- and customer-oriented, and resilient.	The UoF program provides a comprehensive framework and resources for assessing the current performance of a water utility and help it to prepare a 100 days action plan and develop strategic development plans to provide high quality services in an efficient, resilient, innovative and sustainable manner.  The approach and methodology of the UoF program have been very useful in developing (parts of) the diagnostic framework used in this study. Due to travel restrictions and the need to work on a remote basis and the limited resources and duration of the current study, the full methodology could not be applied.

SDG = United Nations Sustainable Development Goal, WSS = water supply and sanitation.  
Source: Authors; [www.worldbank.org/en/topic/water/publication/utility-of-the-future](http://www.worldbank.org/en/topic/water/publication/utility-of-the-future).

Following approval of the Inception Report, consultants worked out the diagnostic framework in further detail and refined the model and the various steps in the analytical process. Based on that, key indicators were identified to measure the impact of the various internal and external factors affecting SDG-6 achievement. Also, the approach for a SWOT analysis was developed. The results were presented in a short report called “The SDG-6 Diagnostic Framework”, which was submitted to PRIF and PWWA and presented to both organizations on 17 August 2021. At a later stage, scoring tables were produced to rank the results of the assessment and present these in the form of spider webs. A detailed description of the diagnostic framework is presented in Chapter 3 of this report.

## 2.2 SDG-6 Diagnostic Review and Preparation of Action Plans

The next step involved the application and testing of the SDG-6 Diagnostic Framework in the five countries and participating water utilities. For this purpose, meetings were organized with all participating water utilities and the project was explained. Water utilities were encouraged to establish working groups to jointly carry out the diagnostic review and formulate the action plans.

With support of the working groups, consultants collected and reviewed relevant reports and data. A list of documents is attached as Annex 1 to this report. The information obtained has been used to produce SDG-6 Country and Utility Profiles in line with the draft Diagnostic Framework methodology. Use was also made of the IBNET/PWWA Benchmarking database and data available from the JMP. Once the assessment reports had been completed, the SWOT analysis was conducted as much as possible in consultation with the Utility Working Groups. Based on the outcomes, the Action Plans

were produced. All Utility Assessment Reports and Action Plans were reviewed and commented upon by the Utility Working Groups.

An overview of the composition of the Utility Working Groups and a list of the meetings with water utilities is provided in Annex 4 to this report.

### **2.3 Formulation of Conclusions and Recommendations**

Once the Assessment Reports and Action Plans had been completed, consultants reviewed and summarized the results and prepared a set of conclusions and recommendations, which are presented in Chapter 4 of this report.

### 3 DESCRIPTION OF THE DIAGNOSTIC FRAMEWORK

#### 3.1 The SDG-6 Diagnostic Framework

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, level of service delivery and maturity of its systems and by external factors such as the topography, demography, the 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 3.1 below.<sup>2</sup>

**Figure 3.1: 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.

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 JMP, and data available from the utilities and governments. A list of indicators is attached as Annex 2 to this report.

<sup>2</sup> In the development of this framework, use has been made of the UoF program.



### *Step 1 – Assess current state of SDG-6 achievement*

As a starting point, the status of access to safe water and adequate sanitation in a country is assessed (WSS Sector Performance). To measure SDG-6 achievement, data available from the JMP have been used. The JMP has defined various service levels; for the purpose of this study, those households that have access to “safely managed” and “basic” water supply and sanitation are considered to have access to safe WSS services. Data on hygiene are not available for most countries.

Following this, a high-level assessment was made of the key stakeholders in the WaSH Sector in a country and responsibilities for Water Supply, Sewerage, Sanitation and Hygiene have been identified. It appeared that in some countries the water utility is the only provider of WSS services (e.g., Palau and Fiji), whereas in other countries the water utility only was responsible for WSS services in urban areas (e.g., Solomon Islands and Kiribati). Also, in most countries, water utilities have a mandate for sewerage services in often selected areas, but do not have a mandate for on-site sanitation in private households.

### *Step 2 – Carry out the diagnostic analysis*

The second step involved the collection of data on each of the indicators that were identified to measure the impact of the various internal and external factors on the contribution of water utilities to achieving SDG-6. Data were obtained from the IBNET/PWWA Benchmarking database, from the utilities, and from reviewing documents received from other sources. Consultants have held various remote meetings with working groups of the five participating utilities.

Working on a remote basis, it has been quite difficult for consultants to check the quality of the data obtained from various sources. It is difficult to assess the quality of data generated by the JMP. In general, consultants feel that the data from the IBNET/PWWA Benchmarking System are reasonably accurate. This is because the definitions of the various indicators are clear and because the benchmarking system has been used for over 10 years and has various internal checks to control the consistency of the data over multiple years. In all cases, consultants have asked utility staff to check the data in the various reports.

To summarize the findings and enable the graphic presentation of the results of the diagnostic analysis in the form of a spider graph, a scoring table has been prepared to rank the indicators for each of the above internal and external factors. A copy of the scoring table used for the spider graphs is attached as Annex 3 to this report.

### *Step 3 - SWOT Analysis*

To obtain a better understanding of the potential contribution of a utility to achieving universal access to safe WSS in a country, 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.

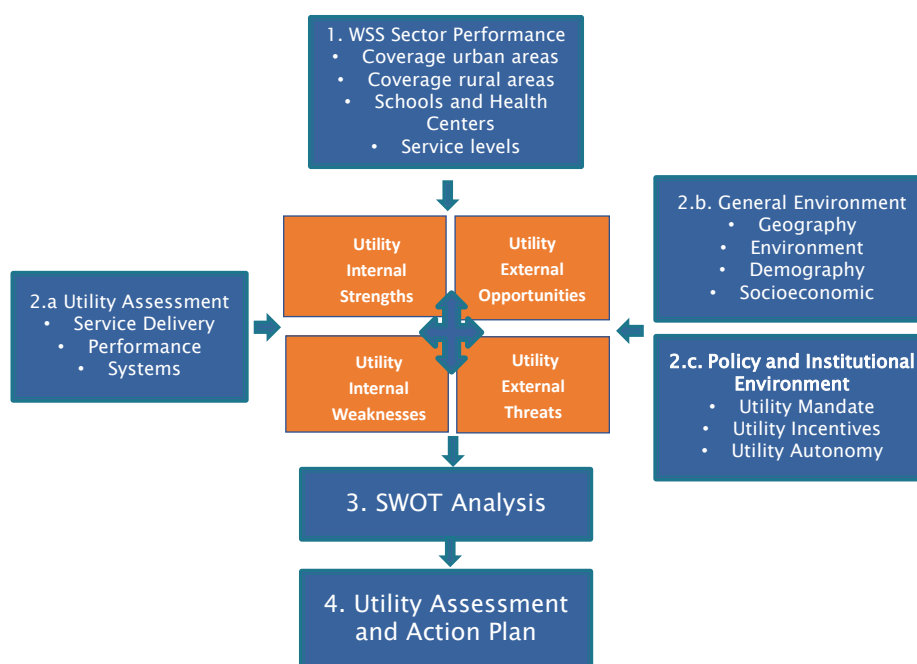
In the SWOT analysis the internal strengths and weaknesses of a utility are identified as well as the external opportunities and threats to assess the utilities’ potential to (contribute to) achieving universal access to safe WSS.

#### Step 4 – Prepare an SDG-6 Action Plan

Following the SWOT Analysis, the working groups of the various utilities and consultants identified potential projects and actions to enhance SDG-6 achievement and formulated an SDG-6 Strategic Action Plan for each utility. For two or three of the utilities, e.g., Palau, where access to safe WSS services is almost universal, the type of action is focused on improving the quality and safety of utility services. In Solomon Islands, a country with a relatively low access to WSS services, the emphasis is on extending services to additional towns and villages in the country.

The various steps in the Diagnostic Framework are schematically presented in Figure 3.2.

**Figure 3.2: Flow Diagram of SDG-6 Diagnostic Analysis for PWWA Utilities**



PWWA = Pacific Water and Wastewater Association, SWOT = strengths, weaknesses, opportunities, threats, WSS = water supply and sanitation.

Source: Authors.

## 3.2 Results of the SDG-6 Diagnostic Analysis

The Diagnostic Framework has been applied and tested in four water utilities, these being the Water Authority of Fiji, the Palau Public Utilities Corporation, the Samoa Water Authority, and Solomon Water, and the results are presented in the respective country and utility reports.

The results of the diagnostic analysis are schematically presented in the so-called spider diagrams, which are presented in Figures 3.3 and 3.4. The wider the web extends to the outer limits of the diagram (scores 4–5), the higher the potential contribution of the utility to achieving SDG-6. The scores for each of the utilities of the various indicators along with the spider diagrams are also presented in Annex 5 of this report.<sup>3</sup> The results for each of the performance areas are summarized below.

1. **Overall WSS Sector Assessment:** A summary of progress on the SDG-6 targets for each of the five participating countries is presented in Table 3.1 below and is based on the JMP data. Solomon Islands and Kiribati score very low on access to safe water and sanitation, and Fiji, Palau, and Samoa show high coverages.

**Table 3.1: Progress on SDG-6 targets in Five Participating Countries**

Country	Population X 1,000	Population %		Access to safe water supply SDG 6.1 %		Access to basic Sanitation SDG 6.2 %	
		Urban	Rural	Urban	Rural	Urban	Rural
Fiji	896	56%	44%	98%	89%	99%	99%
Kiribati	119	53%	47%	80%	64%	57%	39%
Palau	18	81%	19%	100%	100%	100%	100%
Samoa	198	18%	82%	100%	97%	99%	98%
Solomon Islands	687	24%	76%	91%	61%	78%	20%

SDG = United Nations Sustainable Development Goal.

Note:

<sup>a</sup> Red = < 75%, orange = between 75% and 90%, green = > 90%.

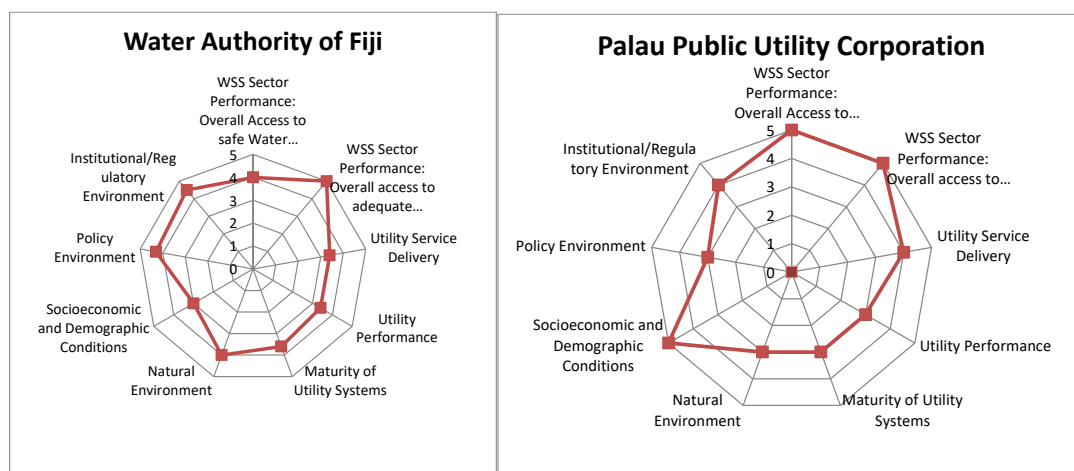
Source: WHO/UNICEF Joint Monitoring Program, data 2020 and UN Population Data 2020.

2. **Utility service levels:** Water supply coverage in the utilities' service areas is high, except for Solomon Water. Apart from PPUC, coverage for sewerage is very low. Most utilities experience problems to maintain water quality, especially in smaller, peri-urban and rural systems. Average residential water consumption for Solomon Water is 98 l/c/d, which is below the Pacific Standard (150 l/c/d), and in Palau it is very high at 256 l/c/d.
3. **Utility performance:** All utilities have ongoing non-revenue water reduction programs but nevertheless still have high (average 47%) levels. Except for Palau, all utilities are adequately staffed. Except for Samoa, none of the utilities is able to recover operation and maintenance costs and all utilities in the study depend on third parties for funding of capital works and system extensions. In all utilities, most connections are metered, but billing efficiency is low in Fiji and Samoa.
4. **Maturity of Utility Systems:** Apart from Solomon Water, technical facilities function reasonably well, although there is not much spare capacity to extend water supply nor

<sup>3</sup> Scores vary between 1 (very weak/poor) to 5 (very strong/excellent).

sewerage to new customers. High levels of non-revenue water also reduce the ability of a utility to expand services to more customers. Adequate financial reporting and transparency is shown by SWA and Solomon Water, whereas WAF and PPUC do not perform very well in this area. Except for PPUC, water utilities score well on organization and reasonably well on innovation. The organizational resilience with regards to extreme weather events and calamities can be further improved.

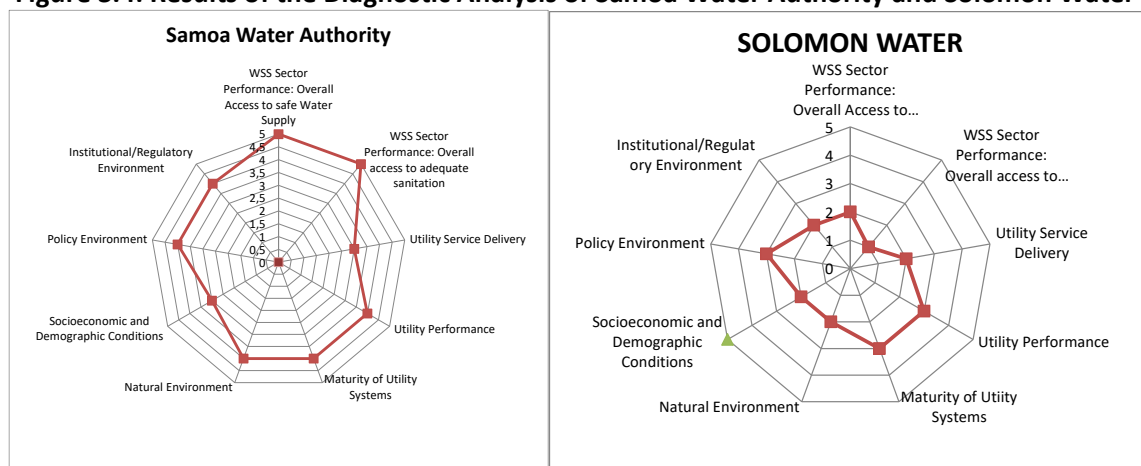
**Figure 3.3: Results of the Diagnostic Analysis of Water Authority of Fiji and Palau Public Utility Corporation**



WSS = Water supply and sanitation.

5. **Natural Environment:** In Solomon Islands, the topography provides serious challenges in terms of logistics and accessibility; further, illegal economic activities and improper use of land (e.g., illegal logging) threaten the safety of water resources. All countries are facing regular extreme weather events which threaten the continuity of service delivery and assets.
6. **Economic and Demographic Conditions:** Average per capita gross national income (GNI) in Palau is significantly higher as compared to the other countries in the study. Apart from Palau, a relatively high proportion of the population lives in rural areas, which are more costly and difficult to serve.

**Figure 3.4: Results of the Diagnostic Analysis of Samoa Water Authority and Solomon Water**



WSS = Water supply and sanitation.



7. Policy Environment: All countries in the study have WSS policies, but these are not always implemented. All utilities participating in the study are state-owned enterprises (SOEs) and expected to at least recover their costs. Although in principle this is a sound policy, in some cases it may be a disincentive for utilities to expand services to (unprofitable) small towns or rural areas or to get involved in, e.g., on-site sanitation. All utilities depend (in varying degrees) on governments and development partners for financial support. None of the utilities can borrow independently. Because of the lack of financial access, the technical know-how and experience of water utilities may not be fully utilized. For Solomon Islands and Kiribati, the SDG-6 targets will not be achieved, unless there is a major shift in policies and levels of funding. It appears that this also applies to several other countries in Melanesia and Micronesia.
  
8. Institutional and Regulatory Environment: Solomon Water and PUB Kiribati are restricted by law to only serve urban areas. None of the utilities has a mandate for on-site sanitation. All countries require water utilities, being SOEs, to recover their costs, but none of the countries allows the utility to set tariffs on such a basis. In all countries, governments provide subsidies for the costs of operations and/or development, but these contributions are in most cases insufficient. The regulatory framework for setting appropriate water tariffs is lacking or not properly implemented. With legal restrictions in place and without sufficient revenues from either tariffs or subsidies, water utilities are not able to operate on a cost recovery basis nor incentivized to expand and further develop their services.

Based on the results of the diagnostic analysis, a SWOT analysis was conducted for each of the utilities; based on that, Action Plans were prepared by the utility working groups, with support of the consultants. The purpose of the Action Plans is to enhance the contribution of the utility to achieving SDG-6. In some utilities, parts of the Action Plans make use of existing plans and projects (e.g. SWA, PPUC), in some utilities the Action Plan is based on a wider masterplan (e.g., Solomon Water) and in Fiji, the WAF Action Plan may become the basis for future master planning for WaSH in rural areas. As it has not been possible to conduct field visits and consultation could only take place on a remote basis, and because data and information were sometimes lacking, the Action Plans are somewhat generic; however, they represent the priorities expressed by the utilities. A summary of the outcomes of the SWOT analysis and the Action Plans is provided in Table 3.2.

**Table 3.2: Overview of Results of the SWOT Analysis and the Utility Action Plans**

Utility	Service Area	Summary SWOT Analysis	Summary of Opportunities and Action Plan
WAF, Fiji	Country-wide	<ul style="list-style-type: none"> <li>Reasonable service levels but ageing infrastructure</li> <li>Depends on third parties for funding</li> <li>Supported by Govt &amp; Dev. Partners</li> <li>Ambitious policy environment for SDG-6</li> </ul>	<ol style="list-style-type: none"> <li>Enhance WSS coverage in informal settlements in urban areas</li> <li>Increase piped water supply coverage in rural areas</li> <li>Improve hygiene education</li> </ol>
PUB, Kiribati	Urban areas	<ul style="list-style-type: none"> <li>Infrastructure in dilapidated condition</li> <li>Depends on third parties for funding</li> <li>Support from Development partners.</li> <li>SDG 6 achievement by 2030 depends on further support for outer islands.</li> </ul>	<ol style="list-style-type: none"> <li>Under this study, a Rapid Response Plan was formulated to assist PUB management in keeping the current system operational</li> <li>Develop and implement a strategy for outer islands and realize WSS services for remaining 5,000 households</li> </ol>
PPUC Palau	Country-Wide	<ul style="list-style-type: none"> <li>Good service levels, but operational issues</li> <li>Infrastructure in fair condition</li> <li>Depends on third parties for funding</li> <li>Weak policy environment.</li> </ul>	<ol style="list-style-type: none"> <li>Stimulate policy environment to reduce PPUC's dependence on third parties</li> <li>Resolve remaining operational issues with water quality and sewage treatment</li> </ol>
SWA Samoa	Country-Wide	<ul style="list-style-type: none"> <li>Service levels OK, low sewerage coverage</li> <li>Infrastructure in fair condition</li> <li>Partly depends on third parties for funding</li> <li>Govt recommendation for IWSA villages</li> <li>Population moving away from coastal areas</li> </ul>	<ol style="list-style-type: none"> <li>SWA to extend WSS services to IWSA villages</li> <li>Increase sewerage coverage in urban areas (depending on outcome feasibility study)</li> <li>Improve quality and reliability of drinking water supply in coastal areas (ring main?) and prepare and implement masterplan</li> </ol>
SOLOMON WATER Solomon Islands	Urban areas only	<ul style="list-style-type: none"> <li>Infrastructure in poor condition, but support from development partners</li> <li>Water service levels at acceptable level</li> <li>Serious external challenges in terms of topography, economic development, extreme weather events, policy environment and regulatory framework.</li> <li>Depends on third parties for funding.</li> </ul>	<ol style="list-style-type: none"> <li>Optimize operations and use of new and rehabilitated infrastructure in current service area (2022–2026)</li> <li>Expand WSS services to seven other provincial towns (2025–2030)</li> <li>Extend technical support to rural schemes close to urban areas (2030 onwards)</li> <li>Achieving SDG-6 requires extensive support for rural WaSH</li> </ol>

SWOT = strengths, weaknesses, opportunities, threats, WSS = water supply and sanitation, WAF = Water Authority of Fiji, PUB = Public Utilities Board () of Kiribati, PPUC = Palau Public Utilities Corporation, SWA = Samoa Water Authority.

Note:

<sup>a</sup> A masterplan will be supported by ADB in the second half of 2022.

Source: Authors.

### 3.3 Further Development of the Diagnostic Framework and Follow Up

The approach of the study has been to review the performance of the WSS sector in a country and assess the potential of water utilities to contribute to enhanced SDG-6 achievements by carrying out a utility assessment followed by a SWOT analysis and the development of action plans.

The study has faced constraints in applying the Diagnostic Framework, as consultants had to work on a remote basis due to the COVID-19 pandemic. Because of this, consultants have mostly worked with the utilities, and have not been able to involve other stakeholders in the WaSH sector in the countries that were part of the study. Because of this the review of WSS sector performance has been very high level and limited in scope and depth of analysis.

Because no country visits could be made, it has also been more difficult to collect and validate data and information on a range of indicators and this is reflected in the quality of the Utility Assessments and Action Plans. Also, if visits to the various utilities and countries could have been made, it would have been easier to involve management and staff of the utilities and to create ownership for the resulting reports and action plans.

For these reasons, there is still scope to further develop and improve the Diagnostic Framework and Action Plans in the following ways:

- Improve the WSS Sector Assessment in a country and identify scope for collaboration with other institutions and organizations.
- Improve the quality of data by carrying out field visits and validating information with other stakeholders.
- Pay more attention to identifying opportunities for collaboration in the WSS sector and reduce the focus on the assessment of internal utility processes and operations.
- Possibly reduce the number of indicators and focus on those indicators that are directly linked to enhancing SDG-6 achievement.

As part of the project activities, consultants will organize a remote training session with PWWA staff to train them in the application of the Diagnostic Framework. Also, the CEOs of PWWA water utilities will be briefed on the outcomes of the study.

## 4 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

1. Average access to safe water and sanitation (SDG-6) in Polynesian countries is relatively high, as well as medium in Micronesia, and low in Melanesia. Households living in urban areas do have much better access compared to households living in rural areas. Because most people in the Pacific live in Melanesia, average access to safe water and sanitation for the Region as a whole is also low. Table 4.1 provides the figures.

**Table 4.1: Universal Access to Safe Water and Sanitation in the Pacific Region**

Subregion	Population (* 000)	Average access to basic/safely managed water SDG 6.1 %	Average access to basic sanitation SDG 6.2 %
Melanesia	10,235	49	22
Micronesia	310	80	72
Polynesia	337	98	96
Total/Average	10,882	55	30

SDG = Sustainable Development Goal.

Source: WHO-UNICEF Joint Monitoring Program 2020; for details per country see Inception Report Table 1.1.

2. Even though service levels of utilities in Fiji, Palau, and Samoa are relatively high, there are still issues with maintaining water quality standards, especially in water supply systems in smaller towns and villages. Supplying safe water is important for achieving SDG-6!
3. Four out of five utilities in the study are not able to cover their operational costs and all utilities depend on third parties for funding for the replacement of current assets and for system extensions. In Fiji, the government provides substantial subsidies to the utility to cover for operational and capital costs. In the other countries, the governments also provide financial support, but often too little and/or too late. In all utilities, development partners provide grants and loans to support capital investments.
4. All utilities participating in the study have been experiencing extreme weather events on a regular basis. Some utilities have ongoing capital investment projects and climate proofing of assets is a component of such projects. Most utilities have emergency plans to ensure continuity of services in the case of calamities, but it is unclear to what extent such plans can be operationalized when necessary.
5. Except for Palau, all utilities in the study have a considerable number of customers living in rural areas. Population density in such areas is often much lower and therefore it is more difficult and costly to provide water and sanitation services. With regard to sewerage, it could be argued that sewerage systems as a technical option for sanitation are too expensive for



rural areas and that the obvious choice is to work with on-site sanitation technological options. Because on-site sanitation is not in their mandate, most utilities are not involved.

6. Several utilities have limitations in service areas (e.g., Solomon Water and PUB in Kiribati are only allowed to serve in urban areas) and mandates (none of the utilities has a mandate for on-site sanitation).
7. In some countries (e.g., Fiji), utilities are challenged by government policies or strategies to enhance achievement of SDG-6 and financially supported to expand their services into rural areas. However, this does not apply to all countries and utilities. Also, all utilities in the study are SOEs and are expected to at least cover their operational costs. For many utilities this is a dis-incentive for expanding services to often unprofitable rural areas.
8. Poor financial performance and limitations in mandate or service area may lead to underutilization of the technical and organizational capacity of water utilities. Provided there is financial support, the skills and expertise of water utilities could be utilized in rural WaSH or in developing approaches for improved wastewater management and on-site sanitation.
9. Without a major shift in policies and a significant increase in funding, SDG-6 will not be achieved in Solomon Islands and Kiribati. The same may apply for WaSH in rural areas in other countries of the Pacific, especially in Melanesia and Micronesia.

## 4.2 Recommendations

The terms of reference for the study on Diagnostics of PWWA Water Utilities asked for recommendations to

*“Inform the Pacific Water Ministers Forum, PWWA and its Secretariat to formulate and advocate appropriate interventions on a regional and national basis to accelerate universal access to water and sanitation”.*

Based on the analysis of the utilities participating in this study and the resulting assessment reports and action plans, the project team would like to make the following recommendations:

### **Policies**

1. Currently,<sup>4</sup> only half of water utilities in the Pacific Region cover their operating costs. To enable water utilities to extend services to new customers and increase access to safe WSS, it is strongly recommended that governments strengthen the financial sustainability of water utilities by either allowing them to charge tariffs that are sufficient to recover operational and capital costs or by providing adequate subsidies on operational and capital investments.
2. Governments incentivize water utilities to contribute to SDG-6 by:

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<sup>4</sup> Source: IBNET/PWWA Benchmarking Data 2020: 50% of water utilities have an operating cost ratio that is < 1, which means they do not generate sufficient revenues to cover their operating costs.

- a. Where appropriate, extending service areas and mandates (e.g., for on-site sanitation) and setting targets.
- b. Allowing the reinvestment of utility “profits” in increasing access to safe WSS.
- c. Where appropriate, assessing whether the technical and organizational capacity of water utilities can be utilized for providing WSS services to small towns and rural areas against adequate financial compensation.
- d. Encouraging water utilities to work with other agencies in adopting a more holistic approach to wastewater management and assessing relevant components of the sanitation system and service delivery chain to identify where water utilities could add value. The approach on citywide inclusive sanitation (CWIS) could be an example.

### **Investments**

3. Currently most water utilities are not financially sustainable and therefore will need to be financially supported and/or compensated by governments and/or development partners for investments in system extensions and development.
4. To achieve SDG-6 in the Pacific Region, it appears that significant additional support and funding is required, especially for rural WaSH projects in Melanesia and Micronesia. Development partners will need to support this effort.

### **Use of the Diagnostic Framework**

5. This study has been carried out on a remote basis with consultants working from their home offices and assessments based on secondary data. PWWA and governments are encouraged to work with water utilities in further applying and developing the PWWA Diagnostic Framework for SDG-6 and stimulate and support utilities in carrying out (self-) assessments and develop action plans to enhance their contributions to achieving the SDG-6 targets. Suggestions for this have been made in section 3.3 of this report.

As part of this project, a training session for PWWA staff will be organized in the use of the Diagnostic Framework and a short “User Guide” will be prepared for applying the diagnostic framework. CEOs of PWWA member utilities will be briefed on the outcomes of the study.

There is scope to improve the design and use of the diagnostic framework, e.g. by involving other WSS sector institutions in the assessment and by improving the quality of data and information and by carrying out the assessments in-country. Also, it may be possible to somewhat reduce the number of indicators used in the diagnostic framework. Suggestions for this will be made to PWWA during the training of PWWA staff in the use of the framework.

### **Recommendations for Water Utilities**

6. Water utilities could contribute to achieving SDG-6 by making the following type of investments:
  - a. Making optimal use of the capacity of current water supply and sewerage systems by connecting the maximum number of customers (e.g., Solomon Water)
  - b. Improve water quality in small water supply systems by investing in improved water treatment and distribution systems (e.g., PPUC, SWA, Solomon Water)

- c. Development of piped water supply systems in urban and rural areas along with improved on-site sanitation and hygiene (WAF, Solomon Water)
- d. Increase coverage in urban water supply and sewerage systems by investing in informal settlements (WAF, Solomon Water)
- e. Where feasible, outsource maintenance of rural water supply systems to water utilities and provide adequate financial compensation for utilities to cover the additional costs (WAF, Solomon Water).

## Appendix 1 – List of Key Documents

### General

- PWWA Benchmarking Report 2011
- PWWA Benchmarking Report 2012
- PWWA Utility Profiles 2012
- PWWA Utility Profiles 2013
- PWWA Benchmarking Report 2013
- PWWA Benchmarking Report 2016
- PRIF 2016 - Sanitation Options for Pacific Island Countries
- WHO 2016 – Sanitation, Drinking Water and Health in Pacific Island Countries
- PWWA Benchmarking 2017
- PWWA Benchmarking Report 2020
- WHO UNICEF 2021 - Joint Monitoring Program – Monitoring Data SDG-6

### Fiji

- ADB 2019 – Support to Water Utilities from ADB -Experience in the Water Authority of Fiji
- ADB Urban Water Supply and Wastewater Management Investment Program – Water Authority of Fiji – Financial Assessment
- New Tap 2018 – ADB Urban Water Supply and Wastewater Management Investment Program, Suva, Fiji
- UN-Habitat 2015 – Water Operator Partnership Case Study – HWA Australia – WAF Fiji
- Water Authority of Fiji 2016 Annual Report
- PRIF – Water Authority of Fiji Tariff and Finance Strategic Review and Action Plan
- PRIF 2017 – Utility Report Water Authority of Fiji
- PRIF 2017 – Investment Report Water Authority of Fiji
- ADB 2021 - Urban Water Supply and Wastewater Management Investment Program, Tranche 1 Project Data Sheet
- Government of Fiji 2007 – Promulgation of the Water Authority of Fiji

### Kiribati

- Government of Kiribati 2012: State Owned Enterprise Act 2012
- ADB 2014: the Economic Costs of Inadequate Water and Sanitation, South Tarawa, Kiribati
- SPC 2015 - Anna Rios Wilks: Bonriki Inundation Vulnerability Assessment
- Government of Kiribati 2016: 20-year Vision 2016-2036
- Pierre Mukheibir, Lousie Boronyak-Vasco, Pelenise Alofa 2016 - Dynamic adaptive management for drinking water security in Kiribati
- SPC 2018 – Kiribati Results Summary
- World Bank 2019: Kiribati Adaptation Program phase III – Implementation Completion and Results Report
- ADB 2019: RRP South Tarawa Water Supply Project
- New Tap 2019: ADB - South Tarawa Water Supply Project, Kiribati



- IFAD 2020 – Outer Island Food and Water Project – Supervision Report
- Government of Kiribati 2020 - WaSH COVID-19 Response in Kiribati

### **Palau**

- ADB 2010: Palau Sector Assessment for Water Supply and Sanitation
- Govt of Palau 2013: PPUC Consolidation Act
- ADB 2017: Validation Report of the Palau Water Sector Improvement Program
- UNICEF 2017: Situation Analysis of Children in Palau
- ADB 2020: RRP for the PPUC Reform Program
- IFRC 2020: Emergency Plan of Action Republic of Palau, Typhoon Surigae
- US Dept of the Interior 2020: Palau Water Treatment Plants – Preliminary Assessment
- PPUC 2020: Corporate Plan 2020-2022
- PPUC2020: Marson Aderiano – Outlying States Operations Report
- PPUC 2020: Outlying States Water Resources
- PPUC 2020: Outlying States – Water Treatment Plan Operations

### **Samoa**

- Govt of Samoa – Samoa Water Authority Act 2003
- Min of Natural Resources and Environment: Water and Sanitation Sector Plan 2016-2020
- Samoa Corporate Plan 2021-2024
- Samoa Water Authority – Statement of Corporate Objectives 2017-2020
- Samoa Water Authority – Corporate Plan 2021-2024
- Samoa Water Authority – Annual Report 2017-2018
- Samoa Water Authority – Annual Report 2019-2020
- SOPAC 2007: National Integrated Water Resource Management Diagnostic Report Samoa
- Ministry of Finance 2021: Samoa 2040

### **Solomon Islands**

- Government of Solomon Islands 1996: Solomon Water Authority Act 1993
- Min of Mines, Energy and Rural Electrification 2013: Solomon Islands National Water Resources and Sanitation Policy
- Min of Mines, Energy and Rural Electrification 2013: Solomon Islands National Water Supply and Sanitation Plan
- Govt of Solomon Islands 2014: Solomon Islands National Infrastructure Investment Plan
- Ministry of Health and Medical Services 2014: The Solomon Islands Rural WaSH Policy
- Ministry of Health and Medical Services 2015: The Solomon Islands Rural WaSH Strategic Plan 2015-2020
- AusAID 2016: Independent Evaluation of Phase 2 of the Australian Aid Program’s Urban Water Program in Solomon Islands
- Water Aid 2016: Solomon Islands WaSH Sector Analysis
- Engineers Australia 2016: Rainwater Harvesting Augmentation of Domestic Water Supply in Honiara, Solomon Islands
- Min of Mines, Energy and Rural Electrification 2017: Solomon Islands National Water and Sanitation Implementation Plan 2017–2033

- Solomon Water 2017: 30 Year Strategic Plan 2017-2047
- Solomon Water Annual Report 2018
- Solomon Water 2018: Energy Efficiency and Self Generation Plan
- ADB 2018: Solomon Islands: Preparing the Urban Water Supply and Sanitation Sector Project – Project Readiness Financing Report
- ADB 2018: Sector Assessment Summary: Solomon Islands Water and other Urban Infrastructure and Services
- Government of Solomon Islands/UNDP 2018: Solomon Islands Development Finance Assessment
- World Bank 2019: Project Appraisal Document for the Solomon Islands Urban Water and Sanitation Project
- Government of Solomon Islands 2020: Solomon Islands’ First Voluntary National Review Report on the Sustainable Development Goals

## Appendix 2 – Diagnostic Framework - List of Indicators<sup>a</sup>

Performance Area	Key Performance Indicators <sup>b</sup>	Data Source	Score
<b>Overall WSS Sector Performance</b>			
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
<b>Utility Service Level</b>			
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

Performance Area	Key Performance Indicators <sup>b</sup>	Data Source	Score
	Nr of microbiological tests taken per year	Benchmarking	No
	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
<b>Utility Performance</b>			
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	%
<b>Maturity of Utility Systems</b>			
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* <sup>c</sup>	PWWA Benchmarking Report 2020/Utility	descriptive
	Strategy Document *	Utility	descriptive
	Organization Charts *	Utility	descriptive

Performance Area	Key Performance Indicators <sup>b</sup>	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
<b>Natural Environment</b>			
Topographic conditions	Type of landscape *	Utility/Govt	Accessibility
Water Resources	Availability and type *	Utility	Descriptive
Extreme weather events	Occurrence and severity *		Descriptive
<b>Socio Economic and Demographic Conditions</b>			
Socio-economic development	Per capita GNI *	ADB/WB	GNI/capita
Affordability of 6m <sup>3</sup> 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 <sup>2</sup>	UN population data	Number
<b>WSS Policy Environment</b>			
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 <sup>b</sup>	Data Source	Score
<b>Institutional and Regulatory Environment</b>			
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:

<sup>a</sup> The table in Appendix 2 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.

<sup>b</sup> Those indicators marked with an (\*) have been used in developing the spider diagrams in chapter 3 of this report. The indicators with Benchmarking as a source are taken from the World Bank operated International Benchmarking Network (IBNET) and definitions of Indicators are available from the IBNET website: [www.ib-net.org](http://www.ib-net.org). Indicators with JMP as a source are taken from the WHO/UNICEF Joint Monitoring Program and definitions are available from this website <https://washdata.org>. Other indicators are defined in Appendix 3 below.

<sup>c</sup> 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 3: Spider Diagram Scoring Table<sup>a</sup>

Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
<b>Overall WSS Sector Performance</b>					
Countrywide access to safe water (safely managed and basic service level)	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
Countrywide access to safe sanitation (safely managed and basic service level)	100%–95%	95%–85%	85%–75%	75%–50%	50%–0%
<b>Utility Service Levels</b>					
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
<b>Utility Performance</b>					
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



Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
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.
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.
<b>Natural Environment</b>					

Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
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
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
<b>Socio Economic and Demographic Conditions</b>					
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%
<b>WSS Policy Environment</b>					
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

Remarks	Scores				
	Strong-5	4	3	2	1 – Weak
<b>Institutional and Regulatory Environment</b>					
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:

<sup>a</sup> In developing the spider diagrams, use has been made of the list of Indicators presented in Appendix 2. However, as it has not been possible to find sufficient data, not all indicators listed in Appendix 2 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.

## Appendix 4: Summary of Consultations with Utilities

After establishing contact with the utilities, meetings have taken place with representatives of all five utilities involved in the study. The utilities were asked to establish small working groups to work on this study. The meetings with the utilities have been structured as follows:

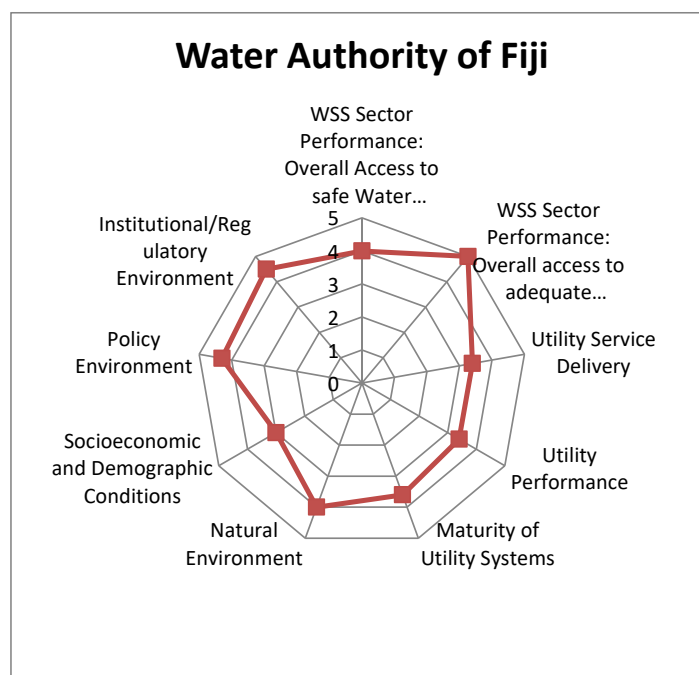
- Meeting 1: Explain the purpose of the study and the draft diagnostic framework, discuss the information needed and how to obtain the required data. Suggest that a small working group be established within the utility to work with consultants on the study.
- Meeting 2: This meeting was used to i) review the draft SDG-6 Profile, ii) discuss data gaps and the collection of missing information, iii) carry out the SWOT analysis together with the utility working groups, and iv) identify potential strategies and measures that could be taken by the utility to enhance the achievement of SDG-6.
- Meetings 3/4: Work out a detailed (outline of a) SDG-6 Strategy/Action Plan for the utility, together with the utility working groups.

A summary of the meetings with the various utilities is presented in the table below.

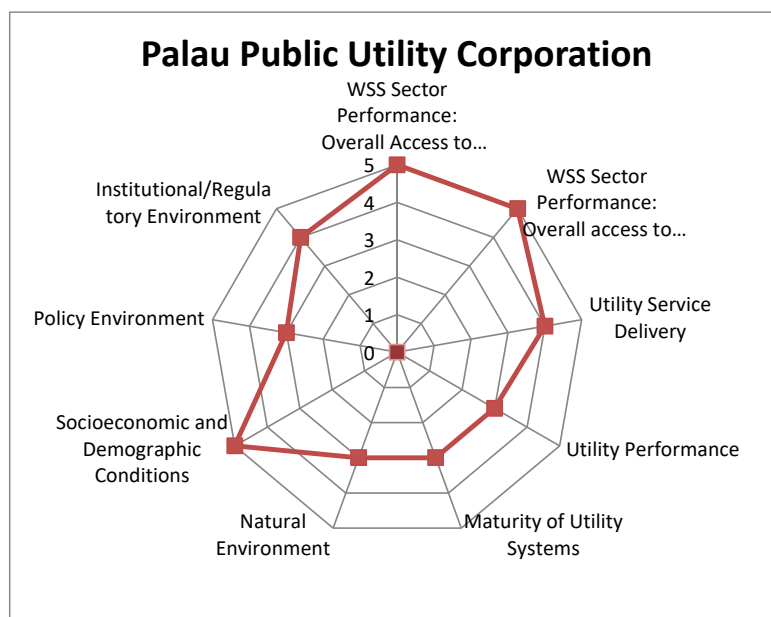
Country/Utility	Proposed Scope of Action Plans	Contact persons Utility
<b>Water Authority of Fiji (WAF)</b> <b>Meetings in</b> June 2021 October 2021 December 2021 February 2022	To enhance SDG-6 achievement, WAF has proposed that the focus of the diagnostic analysis will be on WSS in informal settlements and rural communities in Fiji. WAF has a database listing informal settlements and rural communities without adequate WSS services, and these communities have been mapped out with the assistance of the WAF GIS Unit and the consultants' data specialist. Based on the data provided by WAF, consultants and the working group have formulated WAF's Action Plan for SDG-6.	<ul style="list-style-type: none"> <li>Mr. Seru Soderberg, Acting CEO</li> <li>Mr. Manasa Tusulu, Head of Strategic Planning, WAF</li> <li>Ms. Reema Deo, Business Analyst WAF</li> <li>Mr. Miteshwar Chand, Planning Dept. WAF</li> <li>Ms. Ferlisa Jane Valentine, GIS expert</li> </ul>
<b>Kiribati Public Utility Board (PUB)</b> <b>Meetings</b> June 2021 July 2021 October 2021  <b>Min. of Infrastructure and Sustainable Energy (MISE)</b> <b>Meetings</b> Nov 2021 January 2022 February 2022 March 2022	The South Tarawa Water Supply Project is currently ongoing, but it will not be until the end of 2023 before the new Water Treatment Plants will become operational and up to 5 years before the distribution network is fully rehabilitated. At the request of PUB and in view of the dire status of WSS services on South Tarawa, the focus of the diagnostic analysis will be to assist PUB in assessing current service delivery on South Tarawa and prepare a Rapid Response Plan to safeguard the continuation of water supply until the Water Treatment plants become operational.  Simultaneously, consultants have approached the Ministry of Infrastructure and Sustainable Energy (MISE) to review the status of access to basic WSS services in the outer islands of Kiribati and propose measures to accelerate the achievement of SDG-6. Sessions have been had with a small working group of MISE, which has been established for this purpose and an SDG-6 strategy document has been prepared for the Outer Islands in Kiribati.	<ul style="list-style-type: none"> <li>Mr. James Young, CEO PUB</li> <li>Mr. Itienang Timona, Head of Water Division</li> <li>Mr. Tibwe Taraua, Water Manager MISE – Outer Islands</li> <li>Mr. Joshua Chappelow, Project Manager STWSP</li> <li>Tarema Henry, PUB project coordinator</li> <li>Mr. Robert Matthews, Adviser</li> </ul> <p><b>MISE</b></p> <ul style="list-style-type: none"> <li>Ms. Taina Tamaroa Head Water Technical Unit</li> <li>Ms. Tibwe Taraua</li> <li>Ms. Maiango Enota</li> </ul>

Country/Utility	Proposed Scope of Action Plans	Contact persons Utility
<b>Palau Public Utility Corporation (PPUC)</b> Meetings: July 2021 September 2021 14 Dec 2021 11 Jan 2022	<p>Access to basic water and sanitation services in Palau is high (100% according to JMP). However, in terms of quality, there are still several issues. Turbidity is often high and bacteriological standards are not always met. Improving water treatment and the quality of drinking water is a key component of the PPUC Action Plan. In addition, PPUC intends to assess the capacity of its water and sewerage plants to assess whether spare capacity needs to be developed. A third component of the Action Plan concerns the mitigation of regular droughts and the impact on several of the smaller water supply systems the preparation of water safety plans for all systems in Palau.</p>	<ul style="list-style-type: none"> <li>• Mr. Frank Kyota, CEO</li> <li>• Mr. Marson Aderiano, Outer States Water System Supervisor</li> <li>• Mr. Dave Dengokl, Water Operations Manager</li> <li>• Mr. Clarence Masayos, Wastewater Operations Manager</li> <li>• Mr. Anthony Rudmich, Project Planning and Implementation Manager</li> <li>• Mr. Naveen Kumar, Wastewater Operations Engineer</li> </ul>
<b>Samoa Water Authority (SWA)</b> Meetings 01 July 2021 16 Sept 2021 24 Nov 2021 Feb 2022	<p>Following the meetings with SWA in July and September, a draft SDG-6 Report of Samoa was prepared by consultants and submitted to SWA early October 2021 for review. Several follow up meetings have taken place to finalize the report and formulate the outline of the Action Plan, which includes the following measures: i) SWA to take over water supply service delivery from villages served by the Independent Water Schemes Association (IWSA); ii) improve sewerage coverage and sanitation in Apia, iii) prepare a masterplan for water supply and sanitation for Samoa and investigate feasibility of a ring main and iv) capacity building.</p>	<ul style="list-style-type: none"> <li>• Mr. Dominic Schwalger, CEO</li> <li>• Ms. Irasa Mauala, Manager Urban Operations</li> <li>• Mr. Philip Kerlake, Technical Manager</li> </ul>
<b>Solomon Water</b> Meetings 23 June 2021 14 Sept 2021 26 October 2021 26 Nov 2021	<p>Consultants prepared a draft SDG-6 Assessment Report on Solomon Islands and Solomon Water and submitted this to Solomon Water for review. The meeting on 26 October was scheduled to discuss the draft report and jointly carry out a SWOT analysis. Based on this an SDG-6 Action Plan was prepared to extend WSS services to other provincial towns in Solomon Islands which are currently not served.</p>	<ul style="list-style-type: none"> <li>• Mr. Ian Gooden, CEO</li> <li>• Mr. Scravin Tongi, Chief Operations Officer</li> <li>• Mr. Ray Andresen, Strategic Manager</li> </ul>

## Appendix 5: Scoring Tables and Spider Diagrams

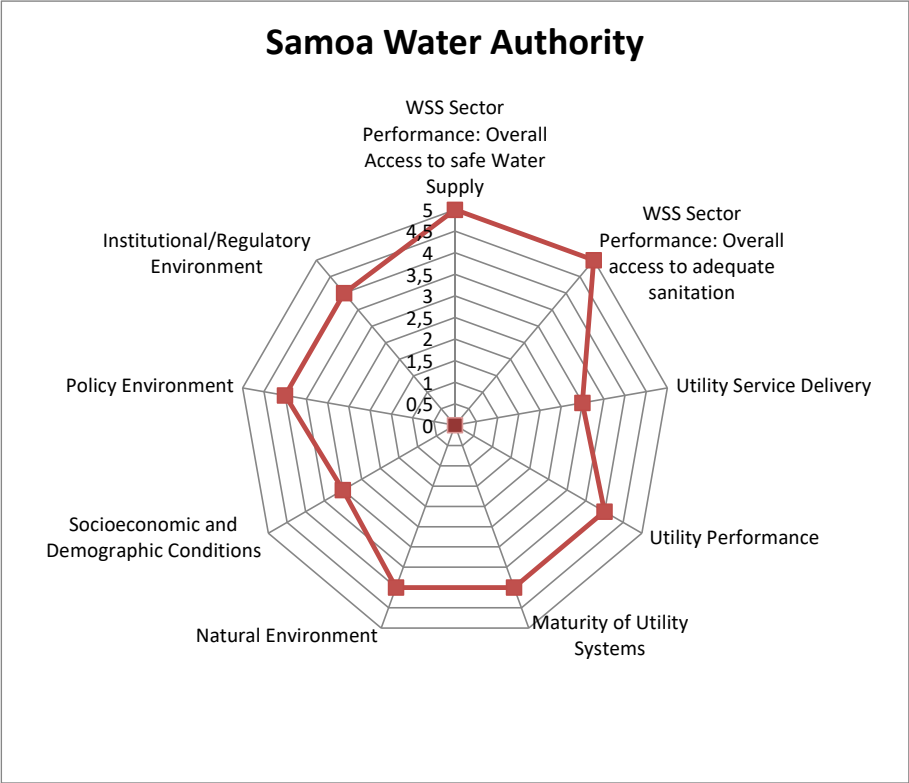


Nr	Indicator	Score	Remarks
1	Country wide SDG 6 Access to safe Water Supply	4	JMP
2	Country wide SDG 6 access to adequate sanitation	5	JMP
3	Level of Service Delivery	3	Average of Continuity 3, Water Quality 4, water consumption 5, Water Coverage in service area 5, Sewerage Coverage in service area 0
4	Utility Performance	3	SDG 6 Assessment: average of NRW 2, Staff ratio 5, operational cost ratio 2, metering ratio 5 and collection ratio 3
5	Maturity of Utility Systems	4	Technical Systems 3, Financial Systems 3, Organization, 5, Innovation 4, Resilience 3
6	Topography and Environment	4	topography 4, water resources 5, Extreme weather events 3
7	Economy and Demography	3	GNI 3, Demography 3
8	Policy Environment	4	Policy 5, Access to finance 3, Access to training 5
9	Regulatory Environment	5	Population in Mandate 5, Tariff system 4

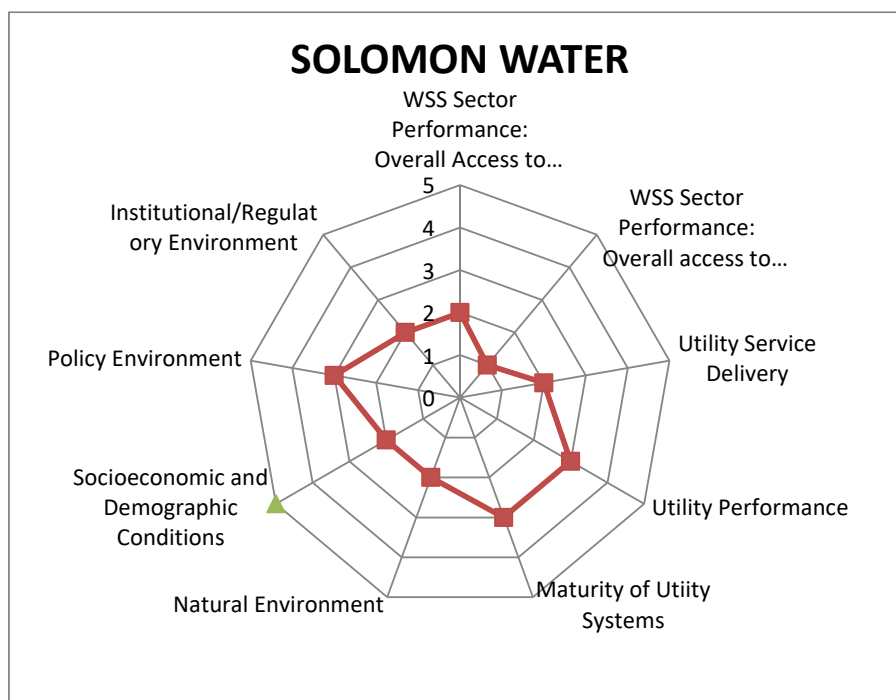


Nr	Indicator	Score	Remarks
1	Country wide SDG 6 Water Coverage	5	JMP
2	Country wide SDG 6 Sanitation Coverage	5	JMP
3	Level of Service Delivery	4	Service Level : average of Continuity 5, Water Quality 3, water consumption 3, Water Coverage 5, Sewerage Coverage 3
4	Utility Performance	3	SDG 6 Assessment: average of NRW 3, Staff ratio 1, operational cost ratio 2, metering ratio 5 and collection ratio 5
5	Maturity of Utility Systems	3	Technical Systems 4, Financial Systems 3, Organization, 3, Innovation 3, Resilience 3
6	Topography and Environment	3	Topography 5, water resources 4, Extreme weather events 2
7	Economy and Demography	5	GNI 5, Demography 5
8	Policy Environment	3	Policy 3, Access to finance 3, Access to training 3
9	Regulatory Environment	4	Service Area 5, Tariff system 3





Nr	Indicator	Score	Remarks
1	Country wide SDG 6 Water Coverage	5	JMP
2	Country wide SDG 6 Sanitation Coverage	5	JMP
3	Level of Service Delivery	3	Service Level : average of Continuity 5, Water Quality 3, water consumption 5, SWA Water Coverage 4, SWA Sewerage Coverage 1
4	Utility Performance	4	SDG 6 Assessment: average of NRW 2, Staff ratio 5, operational cost ratio 4, metering ratio 5 and collection ratio 3
5	Maturity of Utility Systems	4	Technical Systems 4, Financial Systems 4, Organization, 5, Innovation 4, Resilience 3
6	Topography and Environment	4	Topography 5, water resources 5, Extreme weather events 3
7	Economy and Demography	3	GNI 3, Demography 3
8	Policy Environment	4	Policy 5, Access to finance 3, Access to training 4
9	Regulatory Environment	4	Population in Mandate 5, Tariff system 4



Nr	Indicator	Score	Remarks
1	SDG 6 Water Coverage	2	JMP
2	SDG 6 Sanitation Coverage	1	JMP
3	Level of Service Delivery	2	SDG-6 assessment: average of Continuity 4, Water Quality 3, water consumption 2, Water Coverage 2, Sewerage Coverage1
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, Innovation3 & Resilience 3
6	Topography and Environment	2	Topography 2, water resources 3, Extreme weather events 2
7	Economy and Demography	2	GNI 3, Demography 2
8	Policy Environment	3	Policy 4, Access to finance 2, Access to training 3
9	Regulatory Environment	2	Population in Mandate 1, Tariff system 2



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