

# BENCHMARKING REPORT 2020

Pacific Water and Wastewater Association

10 years of Performance Improvement Recorded (2009 – 2019)



## Preface

*Dear PWWA Members*

*I am pleased to present you this report, a 10 year report (2009-2019) of data compilation from our Pacific community of water and wastewater utilities. The performance statistics that are presented in this report were collected from our PWWA member utilities.*

*I need not impress upon our utility members the importance of this yearly data compilation exercise and the performance results gathered and analyzed from it; the intention is to measure each utility's performance not just against others in the membership but also similar utilities in other parts of the world. The outcome of the results is the expectation that the data and analyses will assist us with long-term planning, strategy development and investment planning. We here at PWWA Secretariat will continue to support utilities in identifying gaps from this report and work closely in highlighting areas where training for capacity building, twinning and water operating partnerships may assist.*

*PWWA utilities provides services to a total population of 2.8million for water and 761,000 for wastewater. This clearly indicates there is still a lot of effort to be accomplished in the Pacific in ensuring that we are on target to meet SDG6 – clean water and sanitation for all. PWWA is committed to making sure that we work collectively with members in contributing to progressing the achievement of this SDG.*

*Getting this data out within the original timeframe envisaged for this year was interrupted severely by the COVID-19 pandemic that has affected the whole world, and disabling a number of efforts to engage utilities as they faced priority changes in their daily operations. These are unique challenges and the impact it has on our utilities are immense. You will discover as part of this report, results of a quick survey that was circulated to gauge the impact of this global pandemic on our members.*

*The COVID-19 pandemic has and continues to serve to remind us the crucial importance of safe and secure access to water and sanitation in our daily lives for everyone in our Pacific communities. We continue to urge you all to make use of the results as outlined in this report to incorporate into your sector planning and draw more attention for investment in water in the Pacific.*



**Pitolau Lusia Sefo Leau**  
**Chief Executive Officer**  
**Pacific Water and Wastewater Association**

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## 1. EXECUTIVE SUMMARY

In 2009, PWWA commenced a process of baseline data collection and benchmarking of their members. The indicators used and agreed to by PWWA members were included in the PWWA's strategic plan and formed the basis for the core set of indicators adopted in the 2011 benchmarking study.

In the 2011 benchmarking study, those indicators were expanded upon against the background of the international IB-Net benchmarking<sup>1</sup> framework indicators to allow for possible future inclusion in that program. The benchmarking process methodology and approach were further developed to match with characteristics of the Pacific Island Countries.

This report presents benchmarking analysis results of data from 2011 up to 2019 of 31 utilities in the Pacific Region and has been prepared together by the Pacific Water and Wastewater Association (PWWA) and World Bank IB-NET. According to data collected for 2019, the PWWA utilities are supplying water to 2.8 million people (compared to 1.8million in 2011) and wastewater to 0.7million people (compared to 0.5million in 2011).

The summary of the PWWA performance as of 2019 data is recapped below:

WATER	
Number of utilities:	31
Total number of people supplied with drinking water by PWWA utilities:	2.8 million or 89.5% of total residents living in service responsibility zones
Annual turnover of the PWWA water services:	US\$290 million (2019)

WASTEWATER	
Number of utilities:	20
Total number of people connected to wastewater network by the PWWA utilities:	761,000 or 47.5% of total residents living in service responsibility zones
Annual turnover of PWWA wastewater services:	US\$51 million (2019)

### 1.1 Partnership with World Bank

The World Bank through the International Benchmarking Network for Water and Sanitation Utilities (IBNET) have been working closely with PWWA since 2011 in providing guidance and facilitating data collection and analysis for its Pacific Region Utilities. Over the years this partnership has strengthened, and data being used by utilities and regional organizations to gauge investment support in the region. Through this exercise PWWA was able to identify areas that collectively need capacity building on for utilities to ensure these areas are being built on for improved services.

PWWA has been fortunate to receive some funding support from the World Bank to assist with the data collection, development of manuals and especially support with collection of COVID-19 responses from Utilities. The two organizations will continue to work together in supporting each other and especially in capacity building to ensure these gaps are being identified and supported for utilities. PWWA will similarly

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<sup>1</sup> IB-NET is a benchmarking tool developed by the World Bank Water Supply and Sanitation Program. The initiative was started in the late 1990s as an important activity to improve the performance of water and sanitation utilities worldwide.

prioritize developing skills and embed the process into its operation to ensure sustainability and continuation of this program.

## 1.2 Data Collection Process

Since 2011, PWWA together with World Bank have been collecting technical and financial performance data from its utility members through its benchmarking initiative. For such purpose, PWWA uses a standardized Excel-based data collection toolkit based on the methodology developed by the World Bank IBNET program ([www.ib-net.org](http://www.ib-net.org)). This was later simplified to cater for very small utilities. The PWWA-IBNET toolkit collects more than 90 parameters from each company per year. It has internal checks that prevent common errors and allows for basic consistency. This tool is also multilingual and allows the use of US Imperial units (such as gallons and miles), which are common in the Northern Chapter of the PWWA that consists of American territories, Marshall Islands, Federated States of Micronesia and Palau. The collected data are reviewed, cleaned and analyzed by the PWWA Secretariat with close assistance from the World Bank. After the review, the collected information is uploaded to the PWWA benchmarking portal at [www.pwwa.ws](http://www.pwwa.ws). The toolkit is also accompanied by the *PWWA Manual for the Data Collection* issued in September 2020 and the *PWWA Data Verification Protocol* that is in use with some modifications since 2015.

The first round of Benchmarking was financed by the Asian Development Bank. From 2012-2018, the PWWA was able to finance data collection and preparation of the performance reports. Since 2018 some financial assistance is provided by the World Bank Group.

The following table presents the list of member countries with number of utilities that serve them and the total number of residents in each country/territory served by PWWA utilities.

**Population served by PWWA utilities (2020)**

<b>Country</b>	<b>Number of utilities</b>	<b>Joined benchmarking</b>	<b>Population served by PWWA utilities</b>	<b>Total Population</b>
<u>Papua New Guinea</u>	2	2011-2019	916,325	8.5 million
<u>Fiji</u>	1	2011-2019	855,300	896,445
<u>New Caledonia</u>	1	2015-2019	193,722	278,500
<u>Samoa</u>	2	2011-2019	182,199	199,052
<u>Guam</u>	1	2011-2015	117,400	172,400
<u>French Polynesia</u>	1	2015-2019	90,608	275,918
<u>Solomon Islands</u>	1	2011-2019	64,817	667,044
<u>Vanuatu</u>	2	2011-2019	60,965	304,500
<u>Tonga</u>	1	2011-2019	59,992	100,651
<u>Northern Marianas Islands</u>	1	2011-2014	53,900	56,200
<u>American Samoa</u>	1	2011-2019	53,000	56,700
<u>Republic of Kiribati</u>	1	2011-2019	38,605	120,100
<u>Federated States of Micronesia</u>	6	2011-2019 (not all states)	37,758	103,000
<u>Marshall Islands</u>	2	2011-2018	17,909	55,500
<u>Palau</u>	1	2011-2014, 2016-2017	14,128	21,000
<u>Nauru</u>	1	2012-2018	12,012	10,084
<u>Cook Islands</u>	2	2011-2019	10,600	18,100
<u>Tuvalu</u>	1	2011-2019	5,200	10,640

Wallis and Futuna	1	2018	3,800	11,700
Tokelau	1	2017-2018	3,000	1,499
Niue	1	2011-2018	1,900	1,611
<b>Total</b>	<b>31</b>		<b>2,793,140</b>	

The objective of this *PWWA 10 years of benchmarking: Performance improvement recorded* Report is to

- (i) Update PWWA utilities customers and their authorities on performance improvement during the last 10 years,
- (ii) Review and compare performance of the water providers by organization type and population, Measure performance trends from 2010 to 2019
- (iii) Evaluate utilities' revenue sources and their development trends, tariffs and ability to finance O&M
- (iv) And provide all relevant information related to the performance and its external factors, such as the Government support, customer orientation and investment practice.

## 2. COVID-19 in PWWA

As part of the 2020 data collection process, a COVID-19 survey was used for assessment of the pandemic effects on PWWA member utilities. Utilities operations and their sustainability was tested by the on-going COVID-19 pandemic. The pandemic itself did not affect all countries, many places continued to be COVID-19 free. Whilst the overall COVID-19 related protection was well controlled quickly by Governments, still the pandemic seriously affected the overall economy of all PWWA countries. In addition, the quarantine restrictions disrupted supply of spare parts and disposables to many of PWWA water providers. For example, in Fiji, where no cases were reported within the WAF-Fiji operation area, many businesses were closed, and tourism activity was halted. The Government, protecting citizens, imposed leniency to the water bill payments from March 1 to March 31, 2020, and this immediately resulted in 50 percent drop in revenue collection. The situation was aggravated by the halt of shipping of spare parts and chemicals. WAF Fiji had to stop its US\$32 million investment program until the COVID-19 situation gets cleared. The company developed a COVID-19 recovery plan that estimates that it may need up to US\$23.5 million to restart normal operations after the COVID-19 pandemic is over.

Similar effects were reported from other places, perhaps with lower magnitude. Eda Ranu from Papua-New Guinea assessed loss of 10 percent of the annual revenue. In Central Yap Water Company with just above 1000 connections there were no COVID-19 cases until now. Still, due to reduction of economic activities, reduced travel and increase delivery costs of disposables, the water demand dropped by 14 percent, payment collection has fallen by 12.5 percent, and associated accounts receivables grew by five percent in annual terms. The total loss of revenue for the period of March-August 2020 is assessed at US\$68,000 or by 13 percent.

However, a few isolated countries, such as Nauru, Tokelau and similar did not report any COVID-19 related issues to their water operations.

### 3. CROSS CUTTING ISSUES and Benchmarking

PWWA is actively engaged into a dialog with its members and donor organizations on not only streamlining but developing tools to gauge performance of utilities on some cross-cutting issues such as gender, services for disabled and climate change. By evaluating these issues PWWA can be in a better position together with utilities to identify gaps and obtain support to address those gaps.

#### 3.1 Gender

Since 2015, the benchmarking process developed and implemented the gender assessment tool for 2018 performance. The finding and results of this study was published by the World Bank<sup>2</sup>. The indicators from that assessment tool have been incorporated into the benchmarking process and data are now being collected annually.

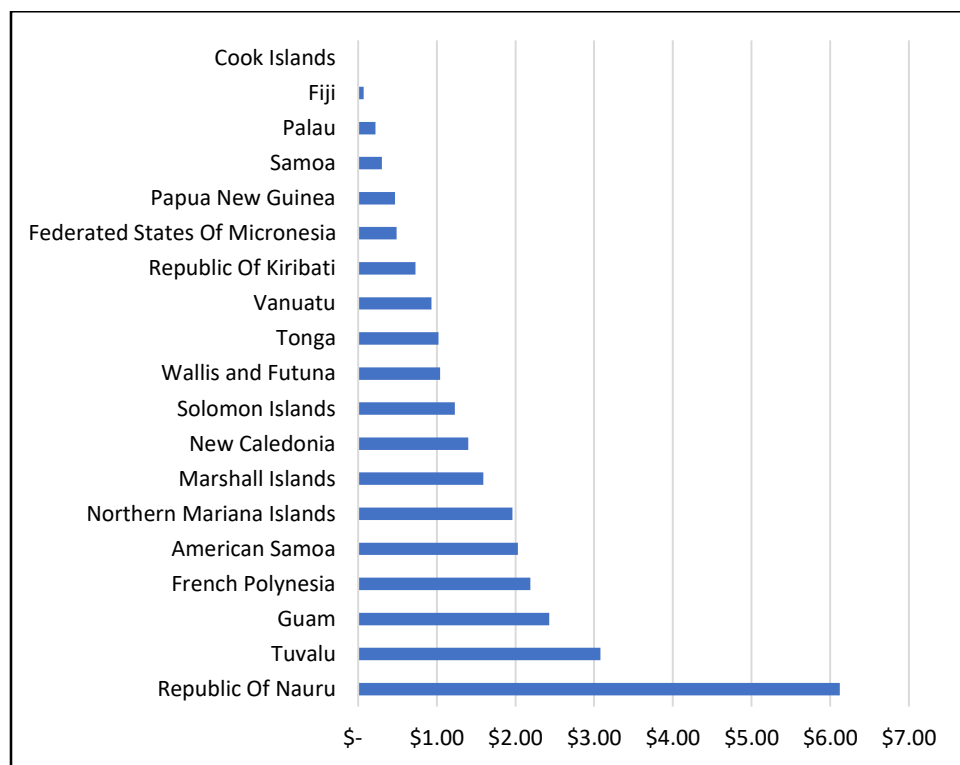
#### 3.2 Climate Change and Disability

PWWA together with IBNET will develop indicators to include climate change and services to disability in the data collection process in 2021. These data will be collected and included in the next Benchmarking Report.

#### 3.3 Water Tariffs

19 of 31 PWWA members formally publish their tariffs. The graph below presents residential tariffs per m3 as of December 1, 2020. PWWA will prepare a special tariff review for the next benchmarking report.

**Fig.1. Residential tariffs in PWWA (average, US\$/m<sup>3</sup>)**



<sup>2</sup> <https://www.worldbank.org/en/news/feature/2019/08/27/breaking-barriers>



#### 4. PWWA Utilities performance assessment and development trends

There are three distinguished groups of PWWA utilities determined by the economic development of their host countries:

**Group 1 (High-income countries utilities)** - consists of five (5) well-established and developed utilities from countries and territories with Atlas GNI per capita of US\$20,000 and above. These are American Samoa Water and Power Authority, ASPA (American Samoa); Caledonniene-des-Eaux (New Caledonia), Guam Water Authority (Guam); Polynésienne-des-Eaux (French Polynesia); and Commonwealth Utilities Corporation (Northern Mariana Islands).

*Guam and Northern Mariana Islands did not participate in benchmarking work since 2015. Their performance will be presented just for comparison purposes.*

**Group 2 (Middle-income countries utilities)** - consist of twenty-four (24) utilities in countries with transitional economies with GNI per capita from US\$3,000 to US\$20,000. These are Water Authority of Fiji (WAF); Central Yap State Public Service Corporation; Chuuk Public Utilities Corporation; Department of Transportation and Infrastructure, Kosrae; Northern Yap Gagil Tomil Authority; Pohnpei Utilities; and Southern Yap Water Authority (all six Federated States of Micronesia); Kwajalein Atoll Joint Utility Resources, KAJUR; and Majuro Water and Sewer Company Inc., MWSC, (Marshall Islands); Palau Public Utilities Corporation, PPUC (Palau); Eda Ranu and Water-PNG (Papua New Guinea); Kiribati Public Utilities Board (Kiribati); Samoa Water Authority (Samoa); Solomon Islands Water Authority (Solomon Islands); Tonga Water Board (Tonga); Tuvalu Ministry of Utilities and Industries (Tuvalu); and Unelco Vanuatu Limited (Vanuatu); and Water And Electricity company from Wallis and Futuna.

*Due to COVID-19 limitations, some, specifically smaller companies did not participate in 2020 benchmarking work. Their 2018 performance reporting will be used in this report for comparison purposes.*

**Group 3 (Utilities in transitional and development stage)** – consist of seven (7) utilities operating either in a decentralized environment, where a utility type benchmarking is impossible at this stage, or recently established small companies. These are Independent Water Schemes Association, Samoa; Niue Public Works Department (Niue); Vanuatu Department of Water Resources (Vanuatu); Cook Islands Ministry of Infrastructure and Planning (ICI) and To Tatou Vai (both Cook Islands); Nauru Utilities Corporation (Nauru); and Tokelau Division of Environment (Tokelau).

*Only Nauru, To Tatou Vai and IWSA utilities submitted their performance data in 2020.*

#### 4.1 Performance of utilities in Group 1

##### 4.1.1 Group 1: Coverage with services

Since utilities of Guam and Northern Mariana Islands did not participate in the performance evaluation in 2015-2020, this Group 1 consists of American Samoa Water and Power Authority, (ASPA, American Samoa); Caledonniene-des-Eaux (CdE, New Caledonia), and Polynésienne-des-Eaux (PdE, French Polynesia). The latter two utilities joined PWWA in 2015.

All three utilities increased length of water pipes, accelerated repair effort, and do provide water to all customers 24/7. All water quality indicators were excellent for these utilities.

All these three utilities are well established and have a long and successful history of performance reporting. Population-wise, ASPA is the smallest, and CdE is the largest. Their customer base grew during the observed period; however, they were able to maintain the 100 percent coverage.

Name of the utility	Population under administrative authority and change, %	Water coverage, %	Wastewater services coverage within admin area, %
ASPA (2011-2019)	55,000 (+10%)	100% (+0%)	100% (+0%)
PdE (2015-2019)	91,056 (+26%)	100% (+0%)	100% (+0%)
CdE (2015-2019)	206,941 (+5.5%)	96% (+3%)	71% (+4%)

PdE operates with water services on all islands of French Polynesia and could maintain its services at 100 percent level. However, only 27 percent of its water customers do have wastewater connection. The remaining population has wastewater septic and latrines - those are operated by respective municipalities. All collected fecal and septic waste is treated by PdE at its secondary wastewater treatment plants.

It is important to know that the CdE operates with water all through the entire area of the New Caledonia and several smaller islands of the territory. Some remote areas are hard to serve and they do rely on municipal solutions such as boreholes and self-service. Wastewater services are provided to 88 percent of water users. CdE is targeting areas with lower water and wastewater services coverage in its development plans aiming for 100 percent water and wastewater services coverage by 2030.

While all American Samoa residents are covered with ASPA water, its wastewater operations are limited to about 41 percent of ones connected with water. This is explained by a very complex terrain of the Pago-Pago and other islands that prevent direct wastewater connection to the wastewater sewers. However, all pit latrines are listed by the respective towns and served by them. All wastewater and latrine sludge are treated at the ASPA Utulei Sewage Treatment Plant, Pago Pago.

##### 4.1.2 Group 1: Water production and consumption, non-revenue water

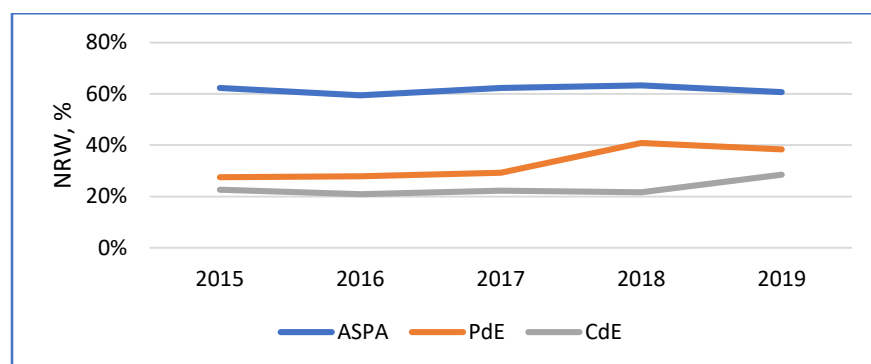
All three companies increase water operations in recent years to cover demand.

Name of the utility	Water production, million m3/year	Water consumption, million m3/year	NRW, %	NRW, m3/km of the network a day
ASPA (2011-2019)	16.3 (-4%)	6.4 (+1%)	61% (-2%)	54 (-84)
PdE (2015-2019)	14.8 (+59%)	9.1 (+36%)	38% (+11%)	30 (+6)

CdE (2015-2019)	30.6 (+18%)	21.9 (+9%)	28% (+5%)	11 (+0.2)
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The ASPA still having significant losses was able to reduce them by expanding network and providing water to more people. ASPA drop in physical losses (in m3/km-day) is explained by a doubling of the network length in 2018. Both PdE and CdE started operations in more complex service areas, and thus have some difficulties to adjust to the services. It is important to notice that all water of ASPA and CdE was and is metered for sale, however PdE achieved 100 percent metering in 2018 only. The following graph Fig. 1 presents NRW challenges to these three companies. Still for all three companies there is room for improvement.

**Fig.2 Group 1 NRW, %**



**Note:** NRW, %: Guam GWA (2015) 55%, Saipan, Northern Marianas, (2013) 70%.

Total per capita consumption remains similarly high in all three utilities of the Group 1, at the range of 230-300 liters per capita a day, lpcd). There are some specificities, however: PdE increases services to residential places, and ASPA expands its services to industrial users. CdE did not provide breakdowns for consumption.

Name of the utility	Total water consumption, lpcd	Residential water consumption, %	Residential water consumption, lpcd
ASPA (2011-2019)	325 (-17)	52% (-9%)	169 (-41)
PdE (2015-2019)	274 (+40)	59% (+12%)	161 (+40)
CdE (2015-2019)	290 (+2)	n/a	n/a

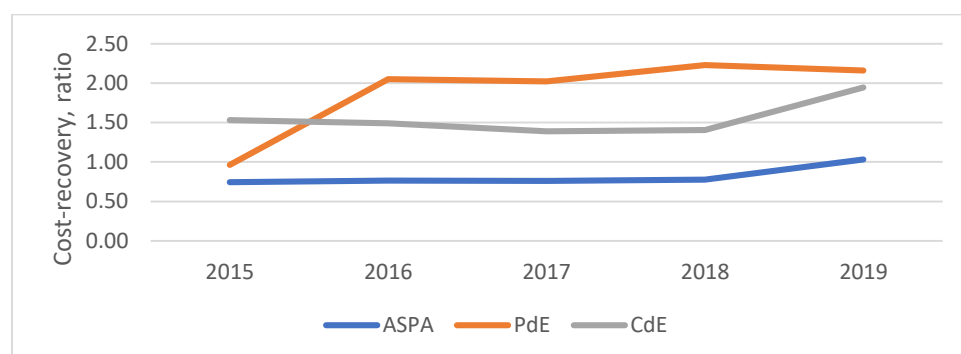
#### 4.1.3 Group 1 Financial performance, cost, revenues, collection and account receivable

All three utilities of the Group 1 were able to reduce costs and significantly improve their financial performance during the observed period. ASPA was able to move up the cost recovery to a positive in 2019.

Name of the utility	Unit cost, water and wastewater 2019 and change to 2011 (US\$/m3)	Revenue, water and wastewater 2019 and change to 2011(US\$/m3)	Cost-recovery, ratio 2019, and change to 2011
ASPA (2011-2019)	1.91 (-0.03)	1.97 (+0.54)	1.03 (+0.27)
PdE (2015-2019)	1.40 (-1.26)	3.03 (+0.85)	2.16 (+1.19)
CdE (2015-2019)	1.23 (-0.32)	2.39 (+0.02)	1.94 (+0.49)

The following graph Fig. 2 present cost-recovery progress to these companies.

**Fig. 3 Group 1. Cost-recovery improvement 2015-2019**



**Note:** Cost-recovery, ratio: Guam GWA (2013) 1.07, Saipan, Northern Mariana, (2013) 0.84.

The break-down of costs by services explains the internal cross-subsidies: water brings higher profit to ASPA but generates lower profit to PdE and brings very little profit to CdE. Please see the table below. Also, note the wastewater treatment services are very different: while ASPA uses advanced primary treatment, both PdE and CdE employ secondary treatment, and PdE has enhanced tertiary treatment and wastewater recycling at its major wastewater treatment plant on the Bora Bora Island<sup>3</sup>, the costs of wastewater collection and treatment are quite similar. The financial improvement in all three companies was significantly due to per unit cost reduction actions: separately water and wastewater services improved their financial performance during the last five years in all cases.

Name of the utility	ASPA (2015-2019)	PdE (2015-2019)	CdE (2015-2019)
Unit revenue, water only, US\$/m3	1.18 (-0.42)	1.05 (-0.91)	0.87 (+0.05)
Unit revenue, water only, US\$/m3	1.30 (+0.13)	2.49 (+0.56)	0.92 (+0.02)
<b>Cost recovery, water only, ratio</b>	<b>1.14 (+0.27)</b>	<b>2.36 (+1.38)</b>	<b>1.05 (+0.05)</b>
Unit cost, wastewater only, US\$/m3	0.98 (-0.04)	1.16 (-0.84)	0.81 (-0.62)
Unit revenue, wastewater only, US\$/m3	0.84 (+0.20)	1.81 (+0.17)	1.72 (0)
<b>Cost recovery, wastewater only, ratio</b>	<b>0.85 (+0.26)</b>	<b>1.55 (+0.70)</b>	<b>2.13 (+0.88)</b>

Collection rate was also improved. ASPA keeps close to 100 percent of bill collection since 2015. In PE and CdE financial parameters are also excellent with collection rate close to 100 percent and accounts receivables below 90 days.

Name of the utility	Collection rate 2019 (and change to 2011), %	Account receivable (and change to 2011), days
ASPA (2011-2019)	100 (+9)	36 (-1)
PdE (2015-2019)	99% (-1)	53 (+20)
CdE (2015-2019)	100% (+1)	1 (-54)

<sup>3</sup> The plant produces 85,000 m3 of recycled water per year, or nearly 10 percent of the demand of the Bora Bora Island. Source: <https://www.suez.com/en/our-offering/success-stories/our-references/bora-bora-drinking-water-sewerage-and-wastewater-recycling>

#### 4.1.4 Group 1. Overall performance

All three utilities well-maintained their high overall performance status, and their vulnerability is very low as it is set by the IBNET Water Utility Vulnerability Index (WUVI).

Name of the utility	WUVI Standard: probability of bankruptcy 2019, (and change to 2011) ,%	WUVI 5: Probability of default with cost-recovery (and change to 2011), %	WUVI 7: Probability of default due to investment obligations (and change to 2011), %
ASPA (2011-2019)	1.04 (+0.42)	8.74 (+4.01)	6.93 (+5.03)
PdE (2015-2019)	0.23 (-0.64)	2.96(-2.01)	1.89 (+1.23)
CdE (2015-2019)	0.81 (-0.59)	7.77 (-5.74)	3.07 (-29.15)

#### 4.1.5 Group 1: Gender balance performance

Since 2015, PWWA collects information on gender balance of the utilities. The largest increase was reported from CdE Company that hired 13 women. Now 26 percent of its staff are females. The salary of women is close in all three companies, and do correlate with the average GNI per capita for these territories.

Name of the utility	Number of women in the company, (and change to 2015), staff	Percent of women in the company staff 2019 (and change to 2015), %	Percent of women engineers of women (and change to 2015), staff	Average monthly salary of women ((and change to 2015), US\$/month
ASPA (2015-2019)	14 (+2)	14 (0)	84	3,023
PdE (2015-2019)	39 (+9)	21 (+4)	54	3,429
CdE (2015-2019)	64 (+13)	26 (+5)	38	3,509

#### 4.1.6 Conclusions for the Group 1

- Technologically, utilities of these groups are more advanced than utilities from others mainly due to easier access to finances and new technologies through their continental ties. Also, they are relatively large, and the economy of scale allows more than in smaller utilities. Still, the new issues such as COVID-19 and Climate change are real threat to their financial sustainability. This is very applicable to PdE due to reduction of tourism and travel that may badly affect the economy of French Polynesia, and as a result it's utility.
- Non-revenue water remains an issue for ASPA and getting attention in PdE, where the NRW grew in last five years. This can be addressed in coming years.
- Per unit water revenue is going down in ASPA and PdE along with reduction of costs.
- The Group 1 utilities continue improvements through the years of reporting results. Benchmarking and IBNET monitoring brought the connection between technical and financial performance that allowed the utilities of the Group one reduce costs, improved collection and specifically for ASPA get closer to sustainable cost-recovery. PdE and CdE are exceptionally strong utilities and can clearly serve as an example for other PWWA members.

## 4.2 Performance of utilities in Group 2

Seven utilities of this Group 2 are relatively large utilities: WAF-Fiji from Fiji, Eda Ranu and PNG-Water from Papua New Guinea<sup>4</sup>, SWA from Samoa, SIWA from Solomon Islands, TWA, Tonga and Unelco from Vanuatu. All seven provided their performance results for 2011-2019.

The remaining utilities are substantially smaller. These are two companies from Cook Islands, six companies from Federative States of Micronesia, two utilities from Marshall Islands, utilities from Kiribati, Palau, Tuvalu and Wallis and Futuna

In our analysis we will separate performance of large utilities with others to give a fair comparison for utilities with large economy of scale and ones without such economy.

### 4.2.1 Group 2 Large utilities: Coverage with services

Large utilities generally increased their administrative responsibilities, except TWB Tonga where the service was reduced and transferred to municipalities. Water PNG and SIWA, Solomon Islands increased their population responsibility by three-fourth. Only two utilities (Eda Ranu, Water PNG) were able to coop with urbanization. TWB Tonga had an increase in coverage due to reduced area of services. All utilities put a significant investment in extension of water network as well. In 2012-2019 Samoa SWA added 552 km to its network or 79 percent to the 2011 level.

Wastewater services are substantially underdeveloped. While Eda Ranu provides all its population within wastewater operations with services, the area for that services is one-fifth of area under the water services. Two companies, TWB Tonga and Unelco Vanuatu do not provide wastewater services. Table below describes the progress with coverage.

Name of the utility	Population under administrative authority, and change in 2011-2019, %	Length of water mains 2019, and increase from 2011, %	Water coverage 2019, (increase since 2011), %	Wastewater services coverage within admin area, %
Eda Ranu, PNG	521,862 (+16%)	622.40 (+47%)	100% (0%)	100%
Samoa SWA	199,243 (+38%)	1,252.72 (+79%)	88% (-8%)	7%
SIWA, Solomon Islands	124,839 (+64%)	323.92 (+33%)	61% (-5%)	5%
TWB, Tonga	43,763 (-29%)	261.80 (+59%)	100% (+5%)	No sewerage services
Unelco Vanuatu	78,723 (+57%)	246.00 (+15%)	55% (-5%)	No sewerage services
WAF-Fiji	895537 (+24%)	4,103.30 (+28%)	93% (-7%)	34%
Water PNG	500,725 (+77%)	724.00 (+20%)	95% (+20%)	13%

### 4.2.2 Group 2. Large utilities: Water production, consumption and NRW

Water production doubled in Unelco Vanuatu during last 10 years. It also grew in most of countries with two-digit rate. In Water-PNG there are several water treatment plants under construction, and it is expected that the company will make a great leap in water production in 2020.

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<sup>4</sup> As of July 1, 2020, Eda Ranu and Water PNG have merged. However, for the purposes of this report, we will analyze performance of these two companies separately.

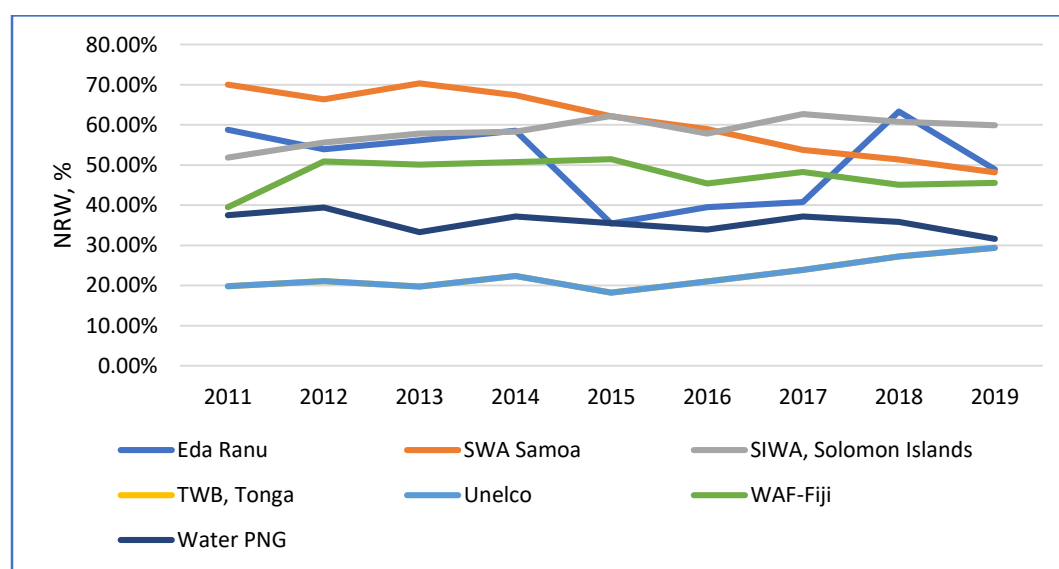
Samoa SWA not only increased water sales, but it greatly reduced non-revenue water by 22 percent. NRW reduction was reported from both PNG companies as well. In four other companies water losses continued to grow. Only Unelco Vanuatu and Water PNG have “tolerable” losses. All other companies unfortunately did not perform well recently.

Physical losses were reduced in Eda Ranu, Water PNG and Samoa SWA. The rapid increase in Unelco Vanuatu is an anomaly, as it even physical losses are lowest among the Group 2 Large utilities.

Name of the utility	Water production 2019, million m3/year (And change to 2011, %)	Water consumption 2019, million m3/year (and change to 2011, %)	NRW 2019, %, (And change to 2011, %)	NRW, m3/km of the network a day (and change to 2011, %)
Eda Ranu, PNG	64.93 (+16%)	33.16 (+43%)	49% (-10%)	139.85 (-35%)
Samoa SWA	25.44 (+29%)	13.18 (+123%)	48% (-22%)	26.81 (-50%)
SIWA, Solomon Islands	12.85 (+37%)	5.15 (+14%)	60% (+8%)	65.16 (+20%)
TWB, Tonga	4.17 (+17%)	2.52 (0%)	34% (+4%)	17.23 (+1%)
Unelco Vanuatu	6.39 (+51%)	4.52 (+33%)	29% (+10%)	20.88 (+94%)
WAF-Fiji	134.25 (+28%)	73.09 (+15%)	46% (+6%)	40.84 (+15%)
Water PNG	25.84 (+4%)	17.67 (+14%)	32% (-6%)	30.90 (-20%)

The graph below (Fig. 3) presents challenges of the utilities with NRW in percentage terms.

**Fig. 4 Large utilities Group 2: Non-revenue water trends**



Consumption pattern is also very different. Papua New Guinea utilities are mainly serving non-residential customers 83 and 62 percent of water going to industries from Eda Ranu and Water-PNG respectively. Residential consumption in both companies remains low.

Tonga water also changing pattern as industrial demand grows quickly. For other utilities of Group 2 Large utilities, residential consumption is stable with minimal changes during the last decade.

Name of the utility	Total water consumption 2019, lpcd (and change to 2011, %)	Residential water consumption 2019, %, (And change to 2011, %)	Residential water consumption 2019, lpcd (And change to 2011, %)
Eda Ranu, PNG	174 (+24%)	17% (-4%)	30 (+0%)
Samoa SWA	206 (+76%)	76% (+0%)	155 (+0%)
SIWA, Solomon Islands	187 (+15%)	67% (-3%)	124 (-20%)
TWB, Tonga	158 (+34%)	60% (-30%)	94 (-21%)
Unelco Vanuatu	283 (-9%)	No data	No data
WAF-Fiji	242 (+0%)	71% (+1%)	172 (+1%)
Water PNG	102 (-49%)	38% (+1%)	39 (-48%)

#### 4.2.3 Group 2 Large utilities: Financial performance, cost, revenues, collection and account receivable

All utilities of the Group 2 Large Utilities, except utilities of the Papua New Guinea are attempting cost-recovery. The financial success is explained in part by a price-discrimination of industrial users. In 2019 the per unit revenue for non-residential users was 204 percent for Eda Ranu and 404 percent for Water PNG (was 217 percent and 520 percent in 2011, respectively). Such cross-subsidy of domestic consumers are in practice by all other companies, but at lower scale.

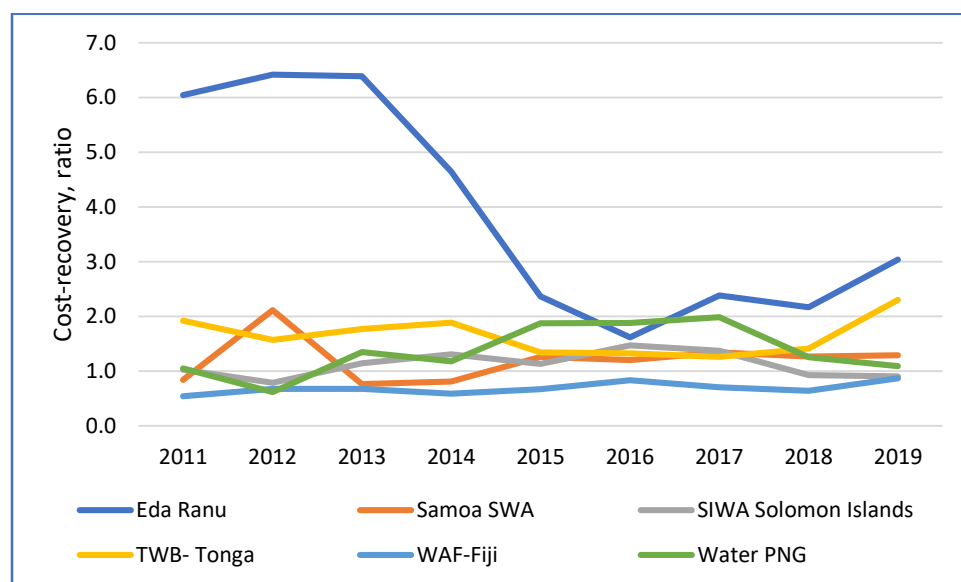
Samoa SWA achieved this in 2017 and is continuing its successful path to cost recovery over since. SIWA Solomon Islands, maintained high cost recovery for 2013-2017, but recently dropped to 0.90 ratio of revenues to costs.

Name of the utility	Unit cost, water and wastewater 2019 and change to 2011 (US\$/m3)	Revenue, water and wastewater 2019 and change to 2011(US\$/m3)	Cost-recovery, ratio 2019, and change to 2011
Eda Ranu, PNG	0.36 (+0.06)	1.09 (-0.63)	3.04 (-3.00)
Samoa SWA	0.62(-0.36)	0.79 (+0.13)	1.29 (+0.40)
SIWA, Solomon Islands	2.61 (+1.94)	2.35 (+1.65)	0.90 (-0.12)
TWB, Tonga	0.50 (-0.30)	1.14 (-0.29)	2.30 (+0.38)
Unelco Vanuatu	0.68 (+0.01)	0.94 (-0.02)	1.37 (-0.13)
WAF-Fiji	0.36 (+0.05)	0.31 (+0.11)	0.87 (+0.23)
Water PNG	1.68 (-0.34)	1.83 (-0.59)	1.09 (0.04)

The graph (Fig. 4) below summarizes cost-recovery efforts of the Group 2 Large Utilities. There is a clear trend that all utilities of these group are targeting cost-recovery as a common goal.



**Fig. 5. Group 2 Large utilities: Cost recovery**



All large utilities of the Group 2 were active in reducing accounts receivables and improvement of their collection rate and reduce accounts receivables. Most impressive achievements have Samoa SWA that reduced accounts receivables by 197 days of collection and Water PNG that increase collection by 89 percent and reduced accounts receivables by 223 days. Other utilities presented good results and stable improvement trends.

Name of the utility	Collection rate 2019 (and change to 2011), %	Account receivable (and change to 2011), days
Eda Ranu, PNG	97.94% (-2%)	260.61 (+124)
Samoa SWA	78.31% (-6%)	47.63 (-197)
SIWA, Solomon Islands	89.24% (+26%)	112.92 (-84)
TWB, Tonga	98.92% (+18%)	45.77 (-7)
Unelco Vanuatu	106.12% (+11%)	165.39 (+15)
WAF-Fiji	96.19% (-4%)	325.05 (-7)
Water PNG	98.53% (+89%)	169.28 (-223)

#### 4.2.4 Overall performance. Group 2 Large utilities

Overall performance index as per IBNET standard remains challenging for all utilities in this group. Significant progress was achieved by Eda Ranu and Water PNG, both Papua New Guinea and by TWB Tonga, but even for them the investment risk without additional guarantees is high.

The major risk factors are low coverage with water services, increase of water losses per km of the network, and some additional factors related to instability of collection and accounts receivables from year to year. Also, Solomon Islands and Unelco Vanuatu have relatively high-water tariffs that result in annual water cost per customer above five percent of the average GNI per capita for the country.

Name of the utility	WUVI Standard: probability of	WUVI 5: Probability of default with cost-	WUVI 7: Probability of default due to investment
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	<b>bankruptcy 2019, (and change to 2011), %</b>	<b>recovery (and change to 2011), %</b>	<b>obligations (and change to 2011), %</b>
Eda Ranu, PNG	5 (-24)	26 (-34)	96 (+4)
SWA Samoa	20 (-4)	62 (-4)	91 (-9%)
SIWA, Solomon Islands	97 (+35)	100 (0)	100 (0)
TWB, Tonga	14 (-6)	45 (-13)	58 (-25)
Unelco Vanuatu	76 (-4)	99 (-1)	100 (0)
WAF-Fiji	10 (+6)	49 (+21)	100 (0)
Water PNG	26 (-67)	69 (-31)	100 (0)

#### 4.2.5 Group 2, Large utilities: Gender performance

Large utilities of the Group 2 have more employed women, however almost none of them are engineers. Salaries also are substantially lower than in the Group 1 utilities. The average women's salary increase is observed when a utility employs a woman-engineer.

<b>Name of the utility</b>	<b>Number of women in the company, (and change to 2015), staff</b>	<b>Percent of women in the company staff 2019 (and change to 2015), %</b>	<b>Percent of women engineers of women (and change to 2015), staff</b>	<b>Average monthly salary of women ((and change to 2015), US\$/month</b>
Eda Ranu, PNG	74 (+31)	21 (+5)	1 (0)	2,105 (-478)
SWA Samoa	66 (+12)	24 (+3)	1 (0)	909 (-37)
SIWA, Solomon Islands	32 (+3)	20 (0)	0 (0)	1,359 (+220)
TWB, Tonga	28 (+8)	26 (+2)	0 (0)	683 (+552)
Unelco Vanuatu	35 (+3)	27 (+1)	5 (+3)	1,855 (+160)
WAF-Fiji	145 (+31)	13 (+4)	0 (0)	788 (+161)
Water PNG	59 (-16)	16 (-2)	3 (+2)	2,111 (+389)

#### 4.2.6 Conclusions for Group 2 Large Utilities

- Large Utilities of the Group 2 seems to be the largest beneficiaries of the PWWA performance benchmarking. All seven of them, without exception, improved their performance in a last decade, and are moving forward to new achievements.
- It is important to move from performance assessment to development of the performance improvement actions that will become a cornerstone for investment planning.
- There are still issues with NRW in many of them; additional focus has to be given to sanitation.

#### 4.2.7 Group 2 Small utilities: Introduction

These Group 2 Small Utilities consists of Central Yap State Public Service Corporation; Chuuk Public Utilities Corporation; Department of Transportation and Infrastructure, Kosrae; Northern Yap Gagil Tomil Authority; Pohnpei Utilities; and Southern Yap Water Authority (all six Federated States of Micronesia); Kwajalein Atoll Joint Utility Resources, KAJUR and Majuro Water and Sewer Company Inc., MWSC, (Marshall Islands); Palau Public Utilities Corporation, PPUC (Palau); Kiribati Public Utilities Board (Kiribati); Tuvalu Ministry of Utilities and Industries (Tuvalu); and Water company from Wallis and Futuna.

Participation of these companies significantly varies through the observed period. Utility of Northern Yap participated in 2011-2013, and then did not provide its results. So, its results will be used as a reference.

Name of the utility	Participation
Central Yap State Public Service (CYSPS), Micronesia	2011-2015, 2017-2019
Chuuk Public Utilities (CPU), Micronesia	2011-2019
Dept. of Transportation and Infrastructure, Kosrae, Micronesia	2011-2019
Pohnpei Utilities, Micronesia	2011-2017
Southern Yap Water Authority (SYWA), Micronesia	2011-2017
Gagil Tomil Water Authority, Northern Yap	2011-2014
Kajur, Marshall Islands	2011-2019
Majuro, Marshall Islands	2012-2019
Ministry of Utilities and Industries, Tuvalu	2011-2019
Palau Public Utilities Corporation (PPUC), Palau	2011-2013, 2016-2017
Public Utilities Board, Kiribati	2011-2019
EEWF, Wallis and Futuna	2018

For the purposes of this report, we will be using the first and last year of participation for the performance comparison purposes, without a reference for these years.

#### 4.2.8 Group 2 Small utilities: Coverage with services

All small utilities of the Group 2 are struggling to maintain water and sewerage coverage, except utilities of Central Yap and Southern Yap. PPUC Palau also report 100 percent water coverage, however no data are available on its network and number of connections.

Name of the utility	Population under administrative authority, and change in 2011-2019, %	Length of water mains 2019, and increase from 2011, %	Water coverage 2019, (increase since 2011), %	Wastewater services coverage within admin area, %
Central Yap, FSM	2,400 (+5%)	54 (+20%)	100% (+50%)	100% (0)
Chuuk, FSM	13,856 (+0)	40 (+14%)	29% (+9.85%)	20% (+6%)
Kosrae, FSM	8,000 (+180%)	27 (+149%)	75% (+25%)	32% (+0)
Pohnpei, FSM	30,666 (+0)	81 (+2%)	73% (+12%)	65% (+23%)
Southern Yap, FSM	3,850 (+380%)	80 (+186%)	100% (+0)	No sewerage
Northern Yap, FSM	no data	32	90%	no data
Kajur, MI	9,769 (+7%)	4 (+0)	85% (+1%)	85% (+0)
Majuro, MI	27,921 (+2%)	116 (+0)	29% (+2%)	60% (+7%)
MUI, Tuvalu	6,000 (+12%)	No data	87% (+0)	No sewerage
PPUC, Palau	14,128 (0)	322 (+133%)	100% (+1)	68% (+14%)
PUB, Kiribati	60,446 (+12%)	181 (+129%)	70% (+8%)	32% (-10%)
EEWF W&F	11,558	132	72%	No sewerage

#### 4.2.9 Group 2 Small utilities: Water production, consumption and NRW

All small utilities of the Group 2 have little or no potential for the economy of scale of water services. Many solutions are tailor-made, and hardly replicable in other places.

Water production dropped in Central Yap, and PUB Kiribati due to water unavailability related to climate change. Significant increase in water production and consumption in Kajur MI<sup>5</sup> is due to a new reverse osmosis water treatment plant financed by ADB. Several small desal plants were completed in Tuvalu to cover the water demand as well.

Very high level of non-revenue water (e.g., in Kosrae, FSM and PUB, Kiribati) is explained that a significant proportion of treated water is legally given for free for the residential and many commercial customers. On the contrary, in Southern Yap and Kajur MI all water is sold without reported losses as a substantial proportion of the water system is new.

<b>Name of the utility</b>	<b>Water production 2019, 000 m3/year (And change to 2011, %)</b>	<b>Water consumption 2019, 000 m3/year (and change to 2011, %)</b>	<b>NRW 2019, %, (And change to 2011, %)</b>	<b>NRW, m3/km of the network a day (and change to 2011, %)</b>
Central Yap, FSM	548 (-16%)	329 (-5%)	40% (-7%)	11 (-40%)
Chuuk, FSM	929 (+294%)	334 (+38%)	64% (+24%)	41 (+52%)
Kosrae, FSM	549 (+142%)	19 (+25%)	94% (0%)	15 (-57%)
Pohnpei, FSM	3,815 (+40%)	2,153 (-13%)	43% (+35%)	56 (+50%)
Southern Yap, FSM	43 (+189%)	44 (+246%)	0% (-17%)	0%
Kajur, MI	126 (+661%)	124 (+846%)	1% (-27%)	7 (+191%)
Majuro, MI	439 (-22%)	254 (-23%)	22% (-30%)	4.37 (-56%)
MUI, Tuvalu	28 (+180%)	25 (+150%)	10% (0%)	No data
PPUC, Palau	5,051 (+2%)	2,972 (+2%)	41% (-1%)	18 (-57%)
PUB, Kiribati	597 (-16%)	80 (-94%)	86% (+43%)	7.7 (+78%)
EEWF W&F	1,1785	1,040	42	15

While all utilities of the Group 1 and Large utilities of the Group 2 operating 24/7, the issue of hours of operations is very critical for Small utilities of the Group 2. The following presents the progress in hours of operation for the utility of this group. Chuuk FSM was able to upgrade its services to 24/7, however both utilities of Marshall Islands and PUB Kiribati still struggle providing water 1-4 hours a day only. In Kiribati water services quality worsened recently; water is available only two hours a day vs. four hours in 2011.

<b>Name of the utility</b>	<b>Hours of operations in 2019, hours per day on average</b>	<b>Hours of operations in 2011, hours per day on average</b>
Central Yap, FSM	24	24
Chuuk, FSM	24	3
Kosrae, FSM	24	20
Pohnpei, FSM	24	24
Southern Yap, FSM	20	24
Northern Yap, FSM	No data	24
Kajur, MI	1	1 hour a week
Majuro, MI	4	4
MUI, Tuvalu	24	24

<sup>5</sup> [http://www.jwrc-net.or.jp/aswin/en/newtap/report/NewTap\\_IWP03.pdf](http://www.jwrc-net.or.jp/aswin/en/newtap/report/NewTap_IWP03.pdf)

PPUC, Palau	24	24
PUB, Kiribati	2	4
EEWF W&F	24	n/a

Per capita consumption varies dramatically among utilities of this Group 2 Small utilities generally due to water availability. The most difficult situation is in PUB Kiribati, Kosrae FSM and MUI Tuvalu, where water is hardly available.

Name of the utility	Total water consumption 2019, lpcd (and change to 2011, %)	Residential water consumption 2019, %, (And change to 2011, %)	Residential water consumption 2019, lpcd (And change to 2011, %)
Central Yap, FSM	209 (-56%)	58% (+9%)	121 (-45%)
Chuuk, FSM	66 (-76%)	50 (-20%)	33 (-76%)
Kosrae, FSM	9 (+2%)	90% (+3%)	34 (no data)
Pohnpei, FSM	264 (-19%)	77% (-7%)	202 (-26%)
Southern Yap, FSM	32 (-13%)	95% (+7%)	30 (-5%)
Kajur, MI	35 (+800%)	No data	No data
Majuro, MI	86 (+32%)	52% (-48%)	45 (-30%)
MUI, Tuvalu	13 (+140%)	No data	No data
PPUC, Palau	577 (+20%)	60% (no data)	344 (no data)
PUB, Kiribati	5 (-86%)	57% (no data)	3 (no data)
EEWF W&F	342	100%	342

#### 4.2.10 Group 2: Small utilities, cost, revenues and financial performance

Water availability is a key driving force for water cost of production. Water revenue is determined by its affordability by utilities customers that is also reflected by low residential consumption. Only Pohnpei FSM has water cost below US\$1. Only four utilities of this group recover costs and only three, Majuro, MI, PPUC Palau and PUB Kiribati, improved financial performance during the last ten years. But for Kiribati this achievement costs its customers almost US\$20 per cubic meter of water. Majuro, MI increased water sales by 60 percent in 2019, and this allowed the company to collect more revenue and balanced costs with revenues for the first time since 2015.

Extreme costs of water services underline the reality of climate change and accelerate costs for new solutions that will be necessary for the sustainable water supply in very new future for all utilities in this group.

Name of the utility	Unit cost, water and wastewater 2019 (and change to 2011, US\$/m3)	Revenue, water and wastewater 2019 (and change to 2011, US\$/m3)	Cost-recovery, ratio 2019, and change to 2011
Central Yap, FSM	1.92 (+0.71)	1.55 (+0.03)	0.81 (-0.46)
Chuuk, FSM	2.42 (+1.68)	1.52 (+0.47)	0.63 (-0.24)
Kosrae, FSM	1.19 (+0.40)	0.29 (no data)	0.24 (no data)
Pohnpei, FSM	0.56 (+0.25)	0.63 (+0.13)	1.32 (-0.32)
Southern Yap, FSM	3.02 (+0)	1.18 (-2.27)	0.50 (-0.35)
Kajur, MI	5.92 (no data)	1.86 (no data)	0.31 (no data)

Majuro, MI	5.37 (-1.84)	5.59 (-1.39)	1.04 (+0.09)
MUI, Tuvalu	No data	No data	No data
PPUC, Palau	1.56 (+0.52)	1.88 (+1.65)	1.2 (+0.88)
PUB, Kiribati	15.82 (+13.83)	19.18 (+16.55)	1.21 (+0.11)
EEWF W&F	No data	1.57	No data

The financial status of the utilities is further affected for many of them by poor collection rate and growing account receivable.

Name of the utility	Collection rate 2019 (and change to 2011), %	Account receivable (and change to 2011), days
Central Yap, FSM	84.6% (-2.4%)	36 (+4)
Chuuk, FSM	99.15% (+0.03)	238 (+230)
Kosrae, FFSM	38% (no data)	No data
Pohnpei, FSM	No data	1,275
Southern Yap, FSM	No data	55 (-64)
Kajur, MI	93% (no data)	1,834 (no data)
Majuro, MI	85% (+31%)	587 (+15)
MUI, Tuvalu	No data	No data
PPUC, Palau	71% (-13%)	68 (+54)
PUB, Kiribati	66% (+22%)	225 (-878)
EEWF W&F	100%	No data

#### 4.2.11 Small utilities of the Group 2: Gender performance

The team was able to collect almost no data on this issue from small utilities. Only Kosrae FSM reported that all four staff of this utility are women. One of them is an engineer.

#### 4.2.12 Conclusions for Group 3 Small Utilities

- It is critical to maintain performance assessment and bring more attention to performance improvement.
- All utilities of this group are badly affected by the climate change. Water is getting more expensive to produce, and it becomes less affordable from year to year. More attention is needed to access new technology and new solutions to sustainable water supply. Communication to utilities of the Group1 and Large utilities of the Group 2 is the must. PWWA will make an effort to get more resources to such communication and training.

### 4.3 Performance of utilities in Group 3

Utilities of this Group 3 utilities operate either in a decentralized environment, where a utility type benchmarking is impossible at this stage, or recently established small companies. These are Independent Water Schemes Association, Samoa (IWSA); Niue Public Works Department (Niue); Vanuatu Department of Water Resources (Vanuatu); Cook Islands Ministry of Infrastructure and Planning and To Tatou Vai (both Cook Islands), Nauru Utilities Corporation (Nauru); and Tokelau Division of Environment (Tokelau). Only To Tatou Vai (Cook Islands), Nauru Utilities Corporation (Nauru) and IWSA (Samoa) utilities submitted their performance data in 2020.

PWWA assesses performance of the utilities of the Group 3 on individual basis due to their variation of activities, institutional structure and performance pattern.

#### 4.3.1 Independent Water Schemes Association, IWSA, Samoa

The IWSA aim is to ensure reliable and sustainable access to clean, safe, and affordable water for all Independent Water Schemes of Samoa. It comprises of more than 29 registered networks serving 55 villages. This comprises of 12 percent of the total Samoa population as per 2016 National Census. All networks are community managed and operated. The IWSA supports with technical assistance of:

- Capacity building, training and workshops
- Technical support such as Operations and Maintenance of Water Networks
- Support with development and implementation of Drinking Water Safety Plans
- Funding applications support

IWSA received EUR 490,000 grant from the European Union to “tie all stakeholders to achieve the outcome that is, *“A more resilient and sustainable water supply for independent water scheme villages, with less water outages and fewer poor water quality events”*”.

Water fees are collected by the communities for the maintenance of their networks, so each community handle their own water fees (at least US\$15 per connection a month). Water metering is not practiced.

The IWSA has two salaries staff and one Australian volunteer. Started to pay for electricity supply in 2019. The bill of US\$1,000 was paid from the budget of the Association. IWSA produces annual reports.

Samoa has one COVID-19 case as of December 1, 2020, so quarantine and other Level “Yellow” response actions are imposed in the country. However, since the beginning of the pandemic in March the travel, food supply, and even level of remittances transfers from Samoans living outside of the country, significantly dropped. So far, no losses for IWSA are reported, however, the expectations are negative.

#### 4.3.2 Conclusion

It is important that IWSA will set up a performance assessment at the individual network basis, so it can participate in the PWWA performance assessment at the higher level.

#### 4.3.3 Niue Public Works Department (NPWD, Niue)

Niue joined performance assessment in 2011, however, it did not provide data for 2018-2019. The NPWD service area covers one town Aloft and 14 villages with total population of 1,600. Water is pumped from the water lens, and then distributed through 91 km of the network. The breakdown of consumption: Water is pumped from groundwater lenses to each village's water system. Community manages the water services.

- Population 622,400 m<sup>3</sup>
- Tourism 116,800m<sup>3</sup>
- Commercial users and car rentals 127,7500m<sup>3</sup>
- Businesses – 59,860m<sup>3</sup>

NPWD manages pit latrines emptying and collection of sewage sludge.

Water is free of charge and not metered. The Government subsidizes all operations, and specifically electricity consumption by water production in a range of NZ\$ 150,000 (US\$98,000). The annual report of the Ministry has a separate chapter on water and sanitation.

#### 4.3.4 Conclusion

PWWA hopes that NPWD will restart its participation in performance and performance assessment programs.

#### 4.3.5 Vanuatu Department of Water Resources (VDWR, Vanuatu)

The VDWR joined PWWA performance assessment in 2015 and provided data from 2016-2018. It did not participate in 2019 assessment. The VDWR operates in all areas outside of Port Villa and few other towns under the services of UNELCO, the largest water and electricity provider in the country. VDWR serves nearly 25,000 of residents. The summary performance is below:

Department of Water, Vanuatu	2016	2017	2018
1.1 - Water Coverage (%)	75.00%	75.00%	79.17%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)		0.34	0.28
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	1.13	1.13	0.89
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.24	0.25	0.21
2.1 - Sewerage Coverage (%)			
23.1 - Collection Period (days)		96.28	92.56
23.2 - Collection ratio (%)			
24.1 - Operating Cost Coverage (ratio)		0.73	0.76
4.1 - Total Water Consumption (liters/person/day)	272.7	281.89	241.9
6.1 - Non-Revenue Water (%)	43.00%	43.00%	43.00%
6.2 - Non-Revenue Water (m3/km/day)	42.86	41.97	45.62
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%

#### 4.3.6 Conclusion

The VDWR achieved stable performance in 2016-2018 and can join the PWWA Group 2 utilities shortly. PWWA hopes that this organization will rejoin performance assessment in 2021.

#### 4.3.7 Cook Islands Ministry of Infrastructure and Planning (CIMIP)

CIMIP provided data from 2011-2016.

The CIMIP is a developing utility of the Cook Island of Rarotonga serving 24/7 about 10,300 residents through about 3,000 connections. It has also several standpipes that serve 550 residents. It is actively developing the distribution network (90 km in 2016), adding 3-5 km per year and connecting more people.

More than 1,000 residents are connected to the sewerage system through 2 km main in Avarua district of Rarotonga.

Water wastewater services are free.



#### 4.3.8 Conclusion

PWWA hopes that CIMIP will restart its participation in performance and performance assessment programs.

#### 4.3.9 To Tatou Vai (Cook Islands)

To Tatou Vai (Our Water) is a new Cook Islands authority established to operate and maintain our water and wastewater infrastructure. It joined PWWA with performance assessment in 2019. As newly established entity, it is at its early stages of performance reporting. Water is free of charge (as of December 1, 2020).

To Tatou Vai , Cook Islands	2019
1.1 - Water Coverage (%)	99.95%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	5.52
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	1.77
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.0
2.1 - Sewerage Coverage (%)	
23.1 - Collection Period (days)	
23.2 - Collection ratio (%)	
24.1 - Operating Cost Coverage (ratio)	0.0
4.1 - Total Water Consumption (liters/person/day)	3.54
4.7 - Residential Consumption (liters/person/day)	
6.1 - Non Revenue Water (%)	20.00%
6.2 - Non Revenue Water (m3/km/day)	0.08
8.1 - Water sold that is metered % (%)	

#### 4.3.10 Nauru Utilities Corporation (Nauru)

Nauru Utilities Corporation restarting development of the piped water supply system by 2021, and we hope, that it can easily join the Group 2 of performers. The below table summarizes its performance in 2019.

All water produced by desal. The cost of production (plus trucking) is about US\$5.71 per m<sup>3</sup>.

Do you provide piped water to population?	No
Do you provide wastewater services to population?	Limited to several latrines
Do you provide other services	No
Type of service provider	State own enterprise
Nature of service area	whole island of Nauru
More than 50% owned by the State or other authority?	Yes
Number of Towns served with water	18 towns and villages
Number of Towns served with sewage	Hospitals and health facilities
Total population living in the service area - water supply	10,756
Total population living in the service area - wastewater	-
Population served - water	10,756
Population served - direct water supply & shared taps	10,765 through water trucking
Do you have water distribution system?	No
If yes, how much water you produced?	210,706 m <sup>3</sup>

Water sold	90,574 m <sup>3</sup>
Residential supply	32, 109
Non-residential	60,465
Length of water distribution system	No network
Do you charge/having fees for water?	Yes
Does your utility have permanent staff?	Yes
How many staff members?	34
Number of female staff	25
Does your company pay to your staff from collected revenues?	Yes

#### 4.3.11 Tokelau Division of Environment (Tokelau)

Tokelau has only boreholes water supply system. All water supply is privately distributed. The Tokelau Environment Division monitors water quality. Its staff is one individual per island.

#### 4.3.12 Conclusion

It is important that Tokelau will set up a performance assessment at the individual island basis, so it can participate in the PWWA performance assessment at the higher level.

#### 4.3.13 Conclusions to Group 3

It is critically important the each of the utility of the Group 3 maintain its performance assessment. PWWA will help to all who are ready to move up to the Group 2 such as Department of Water Resources, Vanuatu and To Tatou Vai, Cook Islands, both are already established utilities. To others, PWWA will help in setting adequate monitoring targets and tools to address all issues related to proper monitoring and transition to utilities.

## 5. Overall Conclusions for the Report

1. Almost all PWWA utilities are fully capable of collecting data in a standard and systematic way. Information is available on most of the technical and financial parameters. However, there seems to be lack of incentive or drive among the utilities and the decision-makers to pursue this practice on a regular basis. Only 18 PWWA members submitted their data, and only six returned COVID-19 information requests. PWWA is ready to help, however the utilities need to be more responsive.
2. Data quality remains an issue, however this can be managed as vast majority of utilities are reporting their information consistently from year to year and within the sample of all PWWA reports. From 2021, the PWWA will implement its *PWWA Data Verification Protocol* that will be used for the data quality assessment.
3. It is important to make use of utilities' performance results for mid- and long-term planning and strategy development and investment planning. PWWA will start communicating with its members and agree on this activity. It is important to have a list of all investment programs that can be used for tracking investments, and, at the same time attract new funding.

4. Water providers of small utilities of the Group 2 have significant issues with production capacity that forces them to reduce hours of operations or switch to costly desalination. Many of them practice intermittent supply that further contributes to pipe breaks and accelerated depreciation of water systems, which are already not in a good shape. Climate change accelerates this production cost run.
5. Many PWWA utilities have prohibitively high losses.
6. Tariffs are in the range of US\$0.5-1.0 for majority of utilities, except Cook Islands, where water is free of charge and in Nauru, where tariffs are in the range of US\$7-10 per m<sup>3</sup> depending on consumption. These rates, however, are not enough to significantly expand water services, and especially wastewater services. From our exercise it is also not clear who is finally in charge of the tariff setting and approval and it seems that utilities have limited power to influence tariffs, as tariffs have not changed in the last few years in majority of cases.
7. Collection rate and accounts receivables can be addressed.
8. PWWA is ready to support performance assessment of its utilities and call for all PWWA members to participate in 2020 data collection.

## Annex 1. Performance of PWWA Utilities

### Group 1

American Samoa Power and Water Authority, ASPA	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	100.00%	100.00%	100.00%	100.00%	96.36%	96.36%	96.36%	96.36%	97.30%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	1.94	2.04	2.28	2.41	2.3	2.1	2.31	2.38	1.91
12.3 - Staff Water/000 Water pop served (#/000 W pop served)				1.42	0.98	1.26	1.0	1.3	1.37
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.43	1.83	1.84	1.81	1.71	1.61	1.76	1.85	1.97
2.1 - Sewerage Coverage (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
23.1 - Collection Period (days)	37.44	37.83	41.01	38.89	39.64	32.39	37.75	27.05	35.88
23.2 - Collection ratio (%)	90.42%	93.76%	97.88%	94.97%	100.00%	96.71%	98.30%	100.00%	100.00%
24.1 - Operating Cost Coverage (ratio)	0.74	0.9	0.81	0.75	0.74	0.77	0.76	0.78	1.03
4.1 - Total Water Consumption (liters/person/day)	343.82	331.67	338.89	326.84	336.27	351.54	331.75	319.75	325.71
4.7 - Residential Consumption (liters/person/day)	210.85	196.88	188.32	181.19	182.86	183.02	182.86	174.05	169.49
6.1 - Non Revenue Water (%)	62.60%	65.38%	65.00%	67.24%	62.34%	59.50%	62.33%	63.36%	60.65%
6.2 - Non Revenue Water (m3/km/day)	139.0	151.28	152.07	162.94	61.1	55.94	59.47	59.5	54.86
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	66.76%	100.00%	100.00%	100.00%	100.00%	100.00%

Polynésienne des Eaux	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	100.00%	100.00%	100.00%	100.00%	100.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	2.26	1.22	1.44	1.36	1.4
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	1.21	1.13	1.18	1.16	1.15
18.1 - Average Revenue W&WW (US\$/m3 water sold)	2.18	2.51	2.91	3.03	3.03
2.1 - Sewerage Coverage (%)	44.95%	100.00%	100.00%	100.00%	100.00%
23.1 - Collection Period (days)	27.32	10.95	55.26	52.33	53.49
23.2 - Collection ratio (%)					
24.1 - Operating Cost Coverage (ratio)	0.96	2.05	2.02	2.23	2.16
4.1 - Total Water Consumption (liters/person/day)	230.39	225.16	266.07	268.21	274.66
4.7 - Residential Consumption (liters/person/day)	108.61	138.22	153.2	155.58	161.6
6.1 - Non Revenue Water (%)	27.47%	27.84%	29.29%	40.90%	38.32%
6.2 - Non Revenue Water (m3/km/day)	24.16	25.85	22.47	36.12	29.77
8.1 - Water sold that is metered % (%)	63.48%	72.73%	100.00%	100.00%	100.00%

Caledonienne des Eaux	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	93.90%	91.47%	95.24%	97.25%	96.51%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	1.55	1.66	1.69	1.59	1.23
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.45	0.45	0.43	0.32	0.52
18.1 - Average Revenue W&WW (US\$/m3 water sold)	2.37	2.48	2.35	2.23	2.39
2.1 - Sewerage Coverage (%)	67.31%	67.46%	70.70%	72.03%	71.38%
23.1 - Collection Period (days)	76.59	42.79	59.92	0.15	0.08
23.2 - Collection ratio (%)	99.29%	100.00%	100.00%	100.00%	100.00%
24.1 - Operating Cost Coverage (ratio)	1.53	1.49	1.39	1.41	1.94
4.1 - Total Water Consumption (liters/person/day)	288.32	298.32	295.73	287.6	290.07
4.7 - Residential Consumption (liters/person/day)					
6.1 - Non Revenue Water (%)	22.69%	20.84%	22.27%	21.59%	28.45%
6.2 - Non Revenue Water (m3/km/day)	10.66	9.61	10.61	10.0	10.82
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	100.00%

Commonwealth Utilities Corporation, Northern Mariannas	2011	2012	2013	2014 - 2019
1.1 - Water Coverage (%)	96.15%	96.15%	100.00%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	1.84	1.84	2.83	
12.3 - Staff Water/000 Water pop served (#/000 W pop served)				
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.85	1.76	2.39	
2.1 - Sewerage Coverage (%)		61.54%	43.75%	
23.1 - Collection Period (days)	43.94	46.17		
23.2 - Collection ratio (%)	83.26%	85.42%	100.00%	
24.1 - Operating Cost Coverage (ratio)	1.01	0.96	0.84	
4.1 - Total Water Consumption (liters/person/day)	373.15	373.15	255.17	
4.7 - Residential Consumption (liters/person/day)				
6.1 - Non Revenue Water (%)	47.58%	47.58%	70.01%	
6.2 - Non Revenue Water (m3/km/day)	70.26	70.26	50.97	
8.1 - Water sold that is metered % (%)	95.01%	95.01%	98.41%	

Guam Water Authority	2011	2012	2013	2014	2015	2016 - 2019
1.1 - Water Coverage (%)	94.90%	95.76%	93.19%	93.93%	72.61%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	2.74	2.78	2.99	0.0		
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.6	0.58	0.66	0.61		
18.1 - Average Revenue W&WW (US\$/m3 water sold)	2.9	3.01	3.21	0.0		
2.1 - Sewerage Coverage (%)	46.64%	46.78%	48.40%	46.61%		
23.1 - Collection Period (days)	52.27	63.64	69.54			
23.2 - Collection ratio (%)	96.67%	97.35%	98.03%		99.05%	
24.1 - Operating Cost Coverage (ratio)	1.06	1.08	1.07			
4.1 - Total Water Consumption (liters/person/day)	419.98	411.94	425.77	416.46		
4.7 - Residential Consumption (liters/person/day)	242.23	230.42	253.85	240.07		
6.1 - Non Revenue Water (%)	57.45%	56.30%	53.16%	55.34%		
6.2 - Non Revenue Water (m3/km/day)	66.8	63.29	56.22	60.71		
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%		

**Group 2: Large Utilities**

Ncd Water & Sewerage Ltd Trading As Eda Ranu	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.28	0.29	0.28	0.4	0.44	0.55	0.39	0.75	0.36
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.37	0.4	0.45	0.45	0.21	0.21	0.2	0.16	0.13
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.72	1.87	1.8	1.87	1.03	0.89	0.93	1.63	1.09
2.1 - Sewerage Coverage (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
23.1 - Collection Period (days)	136.14	97.97	118.63	126.68	134.9	173.13	150.56	154.36	260.61
23.2 - Collection ratio (%)	100.00%	99.83%	99.99%	96.40%	96.00%	100.00%	99.08%	92.39%	97.94%
24.1 - Operating Cost Coverage (ratio)	6.04	6.42	6.39	4.65	2.37	1.62	2.38	2.17	3.04
4.1 - Total Water Consumption (liters/person/day)	140.74	149.28	144.59	141.18	220.86	200.56	202.91	125.79	174.09
4.7 - Residential Consumption (liters/person/day)	29.65	29.24	28.78	29.74	30.97	29.63	29.81	18.87	29.82
6.1 - Non Revenue Water (%)	58.77%	53.90%	56.17%	58.56%	35.46%	39.54%	40.79%	63.33%	48.93%
6.2 - Non Revenue Water (m3/km/day)	213.92	189.4	205.15	226.41	97.55	108.08	117.61	182.13	139.85
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



Samoa Water Authority	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	95.70%	87.91%	87.51%	81.09%	80.62%	81.67%	76.57%	80.58%	87.84%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.99	0.36	1.0	0.86	0.75	0.65	0.68	0.67	0.62
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.0	0.0	0.0	1.86	1.06	0.93	0.89	0.97	0.79
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.83	0.77	0.76	0.69	0.95	0.78	0.92	0.85	0.79
2.1 - Sewerage Coverage (%)	0.00%	0.00%	1.00%	1.00%	6.47%	6.50%	6.60%	7.84%	6.68%
23.1 - Collection Period (days)	245.03	163.99	153.62	116.34	52.16	44.54	50.48	61.02	47.63
23.2 - Collection ratio (%)	84.23%	74.79%	84.84%	87.52%	59.01%	74.42%	69.16%	70.09%	78.31%
24.1 - Operating Cost Coverage (ratio)	0.84	2.12	0.76	0.81	1.26	1.2	1.34	1.27	1.29
4.1 - Total Water Consumption (liters/person/day)	117.49	153.4	156.04	181.03	204.31	197.58	201.66	211.94	206.27
4.7 - Residential Consumption (liters/person/day)	0.0	0.0	0.0	136.82	157.74	155.3	153.08	159.52	155.29
6.1 - Non Revenue Water (%)	70.02%	66.38%	70.37%	67.42%	62.11%	58.98%	53.81%	51.34%	48.19%
6.2 - Non Revenue Water (m3/km/day)	54.01	44.2	48.2	46.62	37.62	38.64	30.67	29.78	26.81
8.1 - Water sold that is metered % (%)	64.97%	93.67%	93.75%	100.00%	100.00%	89.00%	97.00%	100.00%	100.00%

Solomon Islands Water Authority	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	87.48%	71.25%	69.87%	66.79%	55.25%	61.64%	55.41%	56.19%	60.57%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.77	1.06	1.3	1.52	2.29	1.41	1.66	2.73	2.61
12.3 - Staff Water/000 Water pop served (#/000 W pop served)				1.05	2.8	1.12	1.31	0.87	1.34
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.79	0.84	1.49	1.99	2.58	2.07	2.28	2.53	2.35
2.1 - Sewerage Coverage (%)	11.15%	10.27%	9.20%	10.68%	9.09%	6.23%	6.13%	5.06%	4.72%
23.1 - Collection Period (days)	196.68	404.98	295.02	255.33	146.24	150.3	143.49	116.44	112.92
23.2 - Collection ratio (%)	62.95%	94.39%	92.04%	100.00%	84.15%	100.00%	96.33%	97.52%	89.24%
24.1 - Operating Cost Coverage (ratio)	1.02	0.79	1.14	1.31	1.13	1.47	1.37	0.93	0.9
4.1 - Total Water Consumption (liters/person/day)	184.62	207.86	206.57	209.49	258.44	193.91	212.36	194.32	186.59
4.7 - Residential Consumption (liters/person/day)		145.12	135.68	131.7	177.16	129.29	144.24	121.54	124.37
6.1 - Non Revenue Water (%)	51.87%	55.58%	57.80%	58.35%	62.22%	57.79%	62.71%	60.74%	59.93%
6.2 - Non Revenue Water (m3/km/day)	54.4	58.74	63.66	57.94	67.72	74.5	71.51	64.09	65.16
8.1 - Water sold that is metered % (%)	58.22%	71.97%	67.20%	75.00%	99.42%	100.00%	94.89%	91.52%	92.00%

Tonga Water Board	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	96.27%	100.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.8	0.38	0.72	0.79	0.86	1.16	1.44	0.85	0.5
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	1.8	1.7	1.61	1.34	1.37	1.58	1.68	1.56	2.17
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.53	0.59	1.28	1.49	1.15	1.54	1.81	1.2	1.14
2.1 - Sewerage Coverage (%)									
23.1 - Collection Period (days)	52.57	64.42	38.95	53.96	60.27	44.79	21.72	27.97	45.77
23.2 - Collection ratio (%)	80.83%	100.00%	81.26%	80.87%	84.60%	86.88%	62.57%	100.00%	98.92%
24.1 - Operating Cost Coverage (ratio)	1.92	1.57	1.77	1.89	1.34	1.32	1.26	1.41	2.3
4.1 - Total Water Consumption (liters/person/day)	117.68	168.88	141.21	117.34	136.71	98.33	91.73	105.46	157.82
4.7 - Residential Consumption (liters/person/day)					129.54	90.4	79.83	60.11	94.69
6.1 - Non Revenue Water (%)	28.93%	25.61%	22.28%	34.71%	25.46%	53.70%	60.70%	43.38%	39.50%
6.2 - Non Revenue Water (m3/km/day)	17.1	20.92	14.61	14.88	11.15	26.6	33.08	19.03	17.23
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Unelco Vanuatu Limited	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	60.00%	68.41%	70.09%	70.83%	74.95%	60.89%	69.15%	67.68%	55.44%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.67	0.72	0.66	0.64	0.67	0.74	0.72	0.7	0.68
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.0	0.0	0.36	0.42	0.36	0.31	0.28	0.28	0.34
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.01	1.01	1.03	1.01	0.82	0.88	0.97	0.95	0.94
2.1 - Sewerage Coverage (%)									
23.1 - Collection Period (days)	150.64	157.36	157.73	169.39	165.71	158.39	148.87	157.53	165.39
23.2 - Collection ratio (%)	95.12%	95.49%	95.74%	94.94%	100.00%	98.73%	96.52%	100.00%	100.00%
24.1 - Operating Cost Coverage (ratio)	1.5	1.41	1.57	1.58	1.23	1.18	1.34	1.36	1.37
4.1 - Total Water Consumption (liters/person/day)	310.5	306.74	318.22	328.87	343.54	306.0	288.92	292.41	283.43
4.7 - Residential Consumption (liters/person/day)									
6.1 - Non Revenue Water (%)	19.81%	21.08%	19.74%	22.36%	18.20%	21.03%	23.85%	27.22%	29.34%
6.2 - Non Revenue Water (m3/km/day)	10.75	11.31	10.97	13.39	11.11	13.57	16.92	19.37	20.88
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Water Authority of Fiji	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	100.00%	100.00%	100.00%	100.00%	99.58%	99.31%	96.66%	84.73%	92.58%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.41	0.43	0.42	0.48	0.4	0.36	0.46	0.51	0.36
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	1.02	0.96	0.95	0.92	1.53	1.37	1.11	1.19	1.2
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.22	0.29	0.28	0.28	0.27	0.3	0.32	0.33	0.31
2.1 - Sewerage Coverage (%)	48.93%	86.67%	66.28%	66.98%	91.28%	35.31%	34.19%	26.55%	34.44%
23.1 - Collection Period (days)	332.5	201.6	316.89	174.01	115.19	327.57	303.7	299.72	325.05
23.2 - Collection ratio (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.56%	93.40%	96.19%
24.1 - Operating Cost Coverage (ratio)	0.54	0.67	0.67	0.59	0.67	0.83	0.7	0.64	0.87
4.1 - Total Water Consumption (liters/person/day)	240.87	204.73	206.76	203.83	206.1	236.98	224.27	263.21	241.52
4.7 - Residential Consumption (liters/person/day)	168.15	140.71	144.21	141.9	162.26	175.72	162.76	187.51	172.57
6.1 - Non Revenue Water (%)	39.51%	50.91%	50.10%	50.72%	51.49%	45.39%	48.26%	45.06%	45.56%
6.2 - Non Revenue Water (m3/km/day)	35.51	47.93	41.91	41.94	42.24	39.2	45.11	40.45	40.84
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Water PNG	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	75.05%	71.19%	72.45%	69.62%	63.72%	63.90%	87.57%	93.85%	95.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	1.3	1.72	1.47	1.75	1.0	0.97	1.02	1.51	1.68
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.0	0.0	0.0	1.31	0.53	0.56	0.69	0.69	0.65
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.37	1.06	1.98	2.05	1.87	1.81	2.03	1.89	1.83
2.1 - Sewerage Coverage (%)	6.40%	6.70%	7.87%	7.71%	10.93%	11.00%	11.09%	13.00%	13.41%
23.1 - Collection Period (days)	392.38	661.32	319.03	329.84	370.94	102.6	85.79	172.49	169.28
23.2 - Collection ratio (%)	9.21%	13.65%	7.30%	97.76%	93.92%	89.00%	98.26%	97.24%	98.53%
24.1 - Operating Cost Coverage (ratio)	1.05	0.62	1.35	1.17	1.88	1.88	1.99	1.26	1.09
4.1 - Total Water Consumption (liters/person/day)	199.56	199.09	200.54	204.97	149.79	157.4	101.57	99.42	101.79
4.7 - Residential Consumption (liters/person/day)				75.03	54.38	53.06	42.16	39.25	38.72
6.1 - Non Revenue Water (%)	37.50%	39.45%	33.26%	37.19%	35.49%	33.95%	37.20%	35.80%	31.60%
6.2 - Non Revenue Water (m3/km/day)	42.18	43.74	34.55	41.44	38.99	35.72	37.28	36.04	30.9
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	98.67%	97.85%	97.38%	100.00%	96.80%

**Group 2 Small utilities**

Central Yap State Public Service Corporation, Micronesia	2011	2012	2013	2014	2016	2017	2018	2019
1.1 - Water Coverage (%)		50.00%	46.67%	100.00%	80.00%	99.80%	100.00%	100.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	1.21	1.21	0.0	1.84	1.32	1.87	2.0	1.92
12.3 - Staff Water/000 Water pop served (#/000 W pop served)		0.0	0.0	2.89	4.58	2.34	2.75	2.09
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.53	1.53	1.45	1.57	1.35	1.58	1.58	1.55
2.1 - Sewerage Coverage (%)		100.00%	62.50%	62.50%	64.58%	64.58%	100.00%	100.00%
23.1 - Collection Period (days)	40.16	40.16	0.0	31.9	30.04	22.71	31.67	36.5
23.2 - Collection ratio (%)	89.00%	89.38%	90.00%	91.26%	100.00%	93.78%	85.35%	84.60%
24.1 - Operating Cost Coverage (ratio)	1.27	1.27		0.86	1.02	0.84	0.79	0.81
4.1 - Total Water Consumption (liters/person/day)		471.88	446.94	179.53	356.81	286.47	213.19	209.44
4.7 - Residential Consumption (liters/person/day)			219.77	100.39	205.26	166.27	126.53	121.31
6.1 - Non Revenue Water (%)	46.91%	46.91%	38.44%	42.25%	39.29%	35.89%	35.26%	40.02%
6.2 - Non Revenue Water (m3/km/day)	18.5	16.71	11.38	11.48	11.67	8.85	8.56	11.08
8.1 - Water sold that is metered % (%)			90.61%	99.87%	98.91%	100.00%	100.00%	100.00%

Chuuk Public Utilities Corporation, Micronesia	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	19.50%	48.75%	17.67%	22.29%	20.39%	22.39%	29.15%	100.00%	100.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)		0.76	2.68	2.99	2.89	1.85	3.14	3.07	2.42
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.0	0.0	2.45	1.94	2.12	2.9	3.22	0.87	0.94
18.1 - Average Revenue W&WW (US\$/m3 water sold)		0.2	1.08	1.38	1.46	1.03	1.46	1.61	1.52
2.1 - Sewerage Coverage (%)	13.50%	50.00%	11.77%	24.29%	17.62%	20.26%	81.43%	20.26%	20.26%
23.1 - Collection Period (days)	0.0	133.89	247.71	261.47	309.52	246.96	239.62	265.08	288.83
23.2 - Collection ratio (%)	100.00%	97.72%	53.30%	82.95%	86.48%	100.00%	100.00%	96.80%	99.15%
24.1 - Operating Cost Coverage (ratio)	0.29	0.26	0.4	0.46	0.51	0.55	0.47	0.52	0.63
4.1 - Total Water Consumption (liters/person/day)		352.26	270.71	222.08	237.79	371.26	188.35	55.45	66.18
4.7 - Residential Consumption (liters/person/day)			188.2	137.34	143.96	134.3	92.06	31.03	33.33
6.1 - Non Revenue Water (%)		39.29%	82.17%	75.33%	75.26%	51.17%	64.23%	71.39%	63.98%
6.2 - Non Revenue Water (m3/km/day)		26.94	91.55	62.76	58.66	22.73	25.72	36.1	40.81
8.1 - Water sold that is metered % (%)			100.00%	100.00%	99.86%	68.09%	100.00%	100.00%	100.00%



Department of Transportation and Infrastructure, Kosrae, Micronesia	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	53.33%	64.00%	81.67%	90.00%	25.00%	25.00%	25.00%	75.00%	75.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)			0.0	0.0	0.96	0.88	0.89	1.05	1.19
12.3 - Staff Water/000 Water pop served (#/000 W pop served)			0.0	0.5	0.5	0.5	0.5	0.17	0.17
18.1 - Average Revenue W&WW (US\$/m3 water sold)			0.0	0.0	0.18	0.21	0.22	0.29	0.29
2.1 - Sewerage Coverage (%)	100.00%	66.67%	40.00%	19.58%	31.88%	31.88%	31.88%	31.88%	31.88%
23.1 - Collection Period (days)					0.0	0.0	0.0	0.0	0.0
23.2 - Collection ratio (%)					0.00%	0.00%	0.00%	0.00%	38.18%
24.1 - Operating Cost Coverage (ratio)					0.18	0.24	0.25	0.28	0.24
4.1 - Total Water Consumption (liters/person/day)			8.47	6.96	31.11	35.78	37.34	9.51	8.64
4.7 - Residential Consumption (liters/person/day)			0.0	6.09	28.05	32.2	33.6	8.56	7.78
6.1 - Non Revenue Water (%)			93.33%	93.44%	95.45%	94.39%	94.97%	96.21%	96.55%
6.2 - Non Revenue Water (m3/km/day)			36.09	28.26	62.45	53.43	51.47	52.88	53.07
8.1 - Water sold that is metered % (%)					100.00%	100.00%	100.00%	10.00%	10.00%

Pohnpei Utilities. Micronesia	2011	2012	2013	2014	2015	2016	2017	2018 - 2019
1.1 - Water Coverage (%)	60.71%	60.82%	61.25%	61.48%	66.43%	69.63%	72.78%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.31	0.27	0.33	0.29			0.56	
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	1.1	1.1	1.33	1.51		0.99	1.12	
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.5	0.61	0.55	0.63			0.63	
2.1 - Sewerage Coverage (%)	21.75%	100.00%	100.00%	100.00%	64.76%	64.73%	64.94%	
23.1 - Collection Period (days)	73.23	365.0	947.8	784.94	965.16	1,275.11	1,275.11	
23.2 - Collection ratio (%)	84.48%	99.37%	70.55%	50.17%				
24.1 - Operating Cost Coverage (ratio)	1.6	2.25	1.69	2.14		1.57	1.11	
4.1 - Total Water Consumption (liters/person/day)	324.57	254.16	325.6	365.43			264.28	
4.7 - Residential Consumption (liters/person/day)	272.14	199.43	260.04	279.07			202.2	
6.1 - Non Revenue Water (%)	9.01%	11.17%	10.36%	8.79%			43.57%	
6.2 - Non Revenue Water (m3/km/day)	8.51	8.48	10.06	9.22			56.61	
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%			100.00%	

Southern Yap Water Authority, Micronesia	2011	2012	2013	2014	2015	2016	2017	2018 - 2019
1.1 - Water Coverage (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	2.95	2.91	2.93	3.02	0.0	0.0	0.0	
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	4.16	4.08	4.0	3.91	1.05	1.05	1.05	
18.1 - Average Revenue W&WW (US\$/m3 water sold)	3.45	3.1	3.18	3.17	1.18	1.18	1.18	
2.1 - Sewerage Coverage (%)								
23.1 - Collection Period (days)	93.25	119.14	96.26	97.29	55.42	55.42	55.42	
23.2 - Collection ratio (%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
24.1 - Operating Cost Coverage (ratio)	1.17	1.07	1.09	1.05				
4.1 - Total Water Consumption (liters/person/day)	36.08	34.94	33.77	33.6	31.5	31.5	31.54	
4.7 - Residential Consumption (liters/person/day)	31.66	30.63	29.28	28.73	29.97	29.97	30.01	
6.1 - Non Revenue Water (%)	16.67%	16.67%	16.67%	16.67%	0.26%	0.26%	0.26%	
6.2 - Non Revenue Water (m3/km/day)	0.25	0.24	0.24	0.25	0.0	0.0	0.0	
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Northern Yap Gagil Tomil Authority, Micronesia	2011	2012	2013	2014 - 2019
1.1 - Water Coverage (%)	90.00%	90.48%	100.00%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	0.61	0.63	0.62	
12.3 - Staff Water/000 Water pop served (#/000 W pop served)			0.0	
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.58	0.55	0.63	
2.1 - Sewerage Coverage (%)				
23.1 - Collection Period (days)	186.69	130.46	160.09	
23.2 - Collection ratio (%)	89.72%	96.88%	100.00%	
24.1 - Operating Cost Coverage (ratio)	0.95	0.87	1.03	
4.1 - Total Water Consumption (liters/person/day)	136.99	144.2	94.84	
4.7 - Residential Consumption (liters/person/day)			0.0	
6.1 - Non Revenue Water (%)	0.00%	9.09%	0.00%	
6.2 - Non Revenue Water (m3/km/day)	0.0	1.3	0.0	
8.1 - Water sold that is metered % (%)	100.00%	90.00%	100.00%	

Kwajalein Atoll Joint Utility Resources (KAJUR), Marshall Islands	2012	2013	2014	2015	2016	2017	2018 - 2019
1.1 - Water Coverage (%)	100.00%	100.00%	100.00%	90.69%	100.00%	100.00%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	95.91	113.12	194.17	285.53	3.45	5.92	
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.93	0.93	0.92	0.86	1.02	1.02	
18.1 - Average Revenue W&WW (US\$/m3 water sold)	27.51	38.36	60.09	32.65	1.16	1.86	
2.1 - Sewerage Coverage (%)	84.46%	84.52%	84.58%	100.00%	85.00%	100.00%	
23.1 - Collection Period (days)	535.02	792.4	874.64	1,035.39	1,855.24	29.16	
23.2 - Collection ratio (%)		100.00%	100.00%	100.00%	100.00%	93.02%	
24.1 - Operating Cost Coverage (ratio)	0.29	0.34	0.31	0.11	0.34	0.31	
4.1 - Total Water Consumption (liters/person/day)	3.73	2.04	1.25	1.6	43.73	34.89	
4.7 - Residential Consumption (liters/person/day)	0.0	0.0	0.0	0.31	1.12	0.0	
6.1 - Non Revenue Water (%)	20.52%	56.37%	63.03%	54.41%	8.51%	1.26%	
6.2 - Non Revenue Water (m3/km/day)	2.33	6.39	5.18	4.41	61.76	6.77	
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%	2.31%	3.13%	

Majuro Water And Sewer Company (MWSC), Inc. Marshall Islands	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	26.83%	28.52%	18.54%	26.47%	29.29%	29.29%	29.29%	29.29%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	7.21	5.29	5.04	4.23	5.83	8.88	12.08	5.37
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	6.9	6.23	9.79	2.17	2.09	2.33	2.58	2.46
18.1 - Average Revenue W&WW (US\$/m3 water sold)	6.88	5.09	6.31	5.58	5.48	5.44	9.17	5.59
2.1 - Sewerage Coverage (%)	53.22%	53.21%	55.56%	60.07%	60.07%	60.07%	60.07%	60.07%
23.1 - Collection Period (days)	569.61	275.25	445.39	450.45	394.83	462.96	583.96	587.58
23.2 - Collection ratio (%)	58.24%	90.47%	61.86%	83.25%	81.13%	71.29%	95.42%	84.86%
24.1 - Operating Cost Coverage (ratio)	0.95	0.96	1.25	1.32	0.94	0.61	0.76	1.04
4.1 - Total Water Consumption (liters/person/day)	68.08	99.63	139.65	99.1	98.78	97.78	45.44	85.73
4.7 - Residential Consumption (liters/person/day)	60.51	99.63	139.65	46.66	27.86	35.22	45.12	44.8
6.1 - Non Revenue Water (%)	72.31%	45.10%	50.00%	29.56%	9.30%	38.06%	72.11%	42.04%
6.2 - Non Revenue Water (m3/km/day)	11.1	5.43	6.03	2.64	0.71	4.22	8.25	4.37
8.1 - Water sold that is metered % (%)	88.89%	100.00%	100.00%	93.17%	41.27%	100.00%	100.00%	87.70%

Ministry of Utilities and Industries, Tuvalu	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	98.00%	100.00%	94.00%	90.00%	98.00%	96.00%	98.00%	94.55%	86.67%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)									
12.3 - Staff Water/000 Water pop served (#/000 W pop served)		1.2	1.49	1.56	1.43	1.46	1.43	1.35	1.35
18.1 - Average Revenue W&WW (US\$/m3 water sold)									
2.1 - Sewerage Coverage (%)									
23.1 - Collection Period (days)									
23.2 - Collection ratio (%)									
24.1 - Operating Cost Coverage (ratio)									
4.1 - Total Water Consumption (liters/person/day)		5.48	5.83	8.4	7.72	9.02	8.83	13.17	13.17
4.7 - Residential Consumption (liters/person/day)									
6.1 - Non Revenue Water (%)		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.71%
6.2 - Non Revenue Water (m3/km/day)									
8.1 - Water sold that is metered % (%)									

Palau Public Utilities Corporation (PPUC), Palau	2011	2012	2013	2014 - 2015	2016	2017	2018 - 2019
1.1 - Water Coverage (%)		94.74%	99.47%	NO DATA	99.20%	100.00%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	1.04	1.42	2.11		2.21	1.56	
12.3 - Staff Water/000 Water pop served (#/000 W pop served)					5.16	6.37	
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.23	0.58	0.57		2.0	1.88	
2.1 - Sewerage Coverage (%)		52.63%	58.95%		100.00%	68.92%	
23.1 - Collection Period (days)	14.15		49.79		48.6	68.12	
23.2 - Collection ratio (%)	98.52%	68.29%	100.00%		80.57%	71.78%	
24.1 - Operating Cost Coverage (ratio)	0.22	0.41	0.27		0.9	1.2	
4.1 - Total Water Consumption (liters/person/day)		447.49	437.78		436.44	576.25	
4.7 - Residential Consumption (liters/person/day)					245.79	344.43	
6.1 - Non Revenue Water (%)	41.45%	40.85%	50.49%		59.32%	41.18%	
6.2 - Non Revenue Water (m3/km/day)	40.9	36.59	42.19		34.52	17.71	
8.1 - Water sold that is metered % (%)	83.85%	74.83%	69.87%		100.00%	100.00%	



Public Utilities Board, Kiribati	2011	2012	2013	2014	2015	2016	2017	2018	2019
1.1 - Water Coverage (%)	89.75%	62.30%	67.26%	65.56%	62.89%	68.54%	67.36%	70.60%	69.83%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)	1.99	5.16	6.48	14.53	17.8	14.66	18.0	16.91	15.82
12.3 - Staff Water/000 Water pop served (#/000 W pop served)				0.88	0.79	0.8	0.7	0.63	0.66
18.1 - Average Revenue W&WW (US\$/m3 water sold)	2.63	7.61	6.0	18.2	12.55	27.35	19.53	21.91	19.18
2.1 - Sewerage Coverage (%)	42.46%	25.79%	31.69%	36.43%	34.89%	33.17%	27.72%	32.48%	31.75%
23.1 - Collection Period (days)	1,103.48	1,128.12	0.0	81.08	184.62	66.94	145.61	153.75	225.27
23.2 - Collection ratio (%)	43.99%	41.65%	66.20%	50.97%	13.82%	75.55%	70.16%	69.19%	65.58%
24.1 - Operating Cost Coverage (ratio)	1.32	1.47	0.93	1.25	0.71	1.87	1.09	1.3	1.21
4.1 - Total Water Consumption (liters/person/day)	37.39	15.71	11.31	5.26	4.07	5.27	5.24	5.49	5.2
4.7 - Residential Consumption (liters/person/day)	0.0	0.0	0.0	5.26	0.5	2.06	1.63	2.0	3.01
6.1 - Non Revenue Water (%)	30.99%	74.95%	80.56%	91.08%	92.44%	88.37%	89.13%	85.72%	86.61%
6.2 - Non Revenue Water (m3/km/day)	4.34	10.61	11.43	12.76	11.76	10.92	11.66	8.4	7.7
8.1 - Water sold that is metered % (%)		22.22%	100.00%	100.00%	100.00%	60.83%	68.95%	100.00%	100.00%

Eau et Electricite de Wallis et Futuna	2018	2019
1.1 - Water Coverage (%)	72.10%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)		
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	0.6	
18.1 - Average Revenue W&WW (US\$/m3 water sold)	1.57	
2.1 - Sewerage Coverage (%)		
23.1 - Collection Period (days)		
23.2 - Collection ratio (%)	100.00%	
24.1 - Operating Cost Coverage (ratio)		
4.1 - Total Water Consumption (liters/person/day)	341.98	
4.7 - Residential Consumption (liters/person/day)	341.98	
6.1 - Non Revenue Water (%)	41.71%	
6.2 - Non Revenue Water (m3/km/day)	15.44	
8.1 - Water sold that is metered % (%)	0.04%	

**Third Group (selected utilities)**

Department of Water, Vanuatu	2016	2017	2018	2019
1.1 - Water Coverage (%)	75.00%	75.00%	79.17%	NO DATA
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)		0.34	0.28	
12.3 - Staff Water/000 Water pop served (#/000 W pop served)	1.13	1.13	0.89	
18.1 - Average Revenue W&WW (US\$/m3 water sold)	0.24	0.25	0.21	
2.1 - Sewerage Coverage (%)				
23.1 - Collection Period (days)		96.28	92.56	
23.2 - Collection ratio (%)				
24.1 - Operating Cost Coverage (ratio)		0.73	0.76	
4.1 - Total Water Consumption (liters/person/day)	272.7	281.89	241.9	
4.7 - Residential Consumption (liters/person/day)				
6.1 - Non Revenue Water (%)	43.00%	43.00%	43.00%	
6.2 - Non Revenue Water (m3/km/day)	42.86	41.97	45.62	
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	

Nauru Utilities Corporation	2011	2012	2013	2014	2015 - 2017	2018	2019
1.1 - Water Coverage (%)	98.18%	99.10%	99.11%	98.84%	NO DATA	100.00%	100.00%
11.1 - Unit Operational Cost Water and Wastewater (W&WW) (US\$/m3 sold)							
12.3 - Staff Water/000 Water pop served (#/000 W pop served)						3.19	3.16
18.1 - Average Revenue W&WW (US\$/m3 water sold)	122.45	122.45	122.45	120.0		6.94	7.12
2.1 - Sewerage Coverage (%)							
23.1 - Collection Period (days)							
23.2 - Collection ratio (%)	100.00%	100.00%	100.00%	100.00%		100.00%	100.00%
24.1 - Operating Cost Coverage (ratio)							
4.1 - Total Water Consumption (liters/person/day)	20.0	20.0	20.0	20.0		25.47	23.57
4.7 - Residential Consumption (liters/person/day)	16.0	16.0	16.0	16.0		15.78	8.18
6.1 - Non Revenue Water (%)	0.00%	0.00%	0.00%	0.00%		67.57%	56.08%
6.2 - Non Revenue Water (m3/km/day)							
8.1 - Water sold that is metered % (%)	100.00%	100.00%	100.00%	100.00%		100.00%	100.00%