PACIFIC WATER AND WASTES ASSOCIATION

Pacific Water and Wastewater Utilities Benchmarking Report 2012

PREPARED BY THE PACIFIC WATER AND WASTES ASSOCIATION WITH THE TECHNICAL SUPPORT OF THE PACIFIC INFRASTRUCTURE ADVISORY CENTRE.

PACIFIC WATER AND WASTES ASSOCIATION

Pacific Water and Wastewater Utilities

Benchmarking Report

2012

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This report was prepared by Albert Thiadens and Ernest Betham as individual consultants under the guidance and with support of the Pacific Water and Wastes Association (PWWA) and the Pacific Infrastructure Advisory Centre (PIAC). PIAC operates under the Pacific Region Infrastructure Facility (PRIF), a partnership for improved infrastructure in the Pacific Region between the Asian Development Bank (ADB), the Australian Agency for International Development (AusAID), the European Commission (EC) and the European Investment Bank (EIB), the New Zealand Ministry for Foreign Affairs and Trade, and the World Bank Group.

Preface

Benchmarking is a powerful tool intended to assist water utilities improve their performance and to enhance the availability of information on water sector performance in the Pacific region. Data collection and benchmarking has not been fully utilised or established in the Pacific water industry, which is why on behalf of the Pacific Water and Wastes Association (PWWA), I am proud to present the 2012 *Water and Wastewater Utilities Benchmarking Report*. The Board Members of the PWWA hold this regional achievement in high regard.

We sincerely thank the Pacific Region Infrastructure Facility (PRIF) and its partners for funding the engagement of two competent consultants who worked with us closely to bring this benchmarking project to a successful finish.

The process of developing a set of appropriate benchmarks for utilities in the region has been a challenging one, with an early lack of proactive involvement of many members. However, the completion now of two comprehensive reports and the establishment of agreed performance indicators and benchmarks, has enhanced the PWWA's and its members' appreciation and consequent commitment to develop and participate in benchmarking as an ongoing exercise.

With the current level of motivation to continue benchmarking activity at the regional level, it is suggested that PWWA provides continued and ongoing coordination, communications and support to each utility through overall data collection and analysis – something that the Secretariat cannot actively implement at this stage without sufficient funds and support from all the PWWA partners and members.

Taking these recommendations into consideration, the PWWA Board in January approved the Benchmarking Strategy incorporated in this report and intends to continue and institutionalise the benchmarking of water utilities in the Pacific Region in close collaboration, and with support from, its members and the development partners active in the region

We wish to thank everyone that contributed to this project and the production of this very important document: the PWWA, the consultants, the PRIF team and the Pacific Infrastructure Advisory Centre (PIAC); and also members of the PWWA Benchmarking steering committee and all the Active Members (Water Utilities) management and staff.

Faafetai tele lava.

Latu Kupa
Executive Director
Pacific Water and Wastes Association

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ABBREVIATIONS

ASPA	American Samoa Power Authority
CEO	Chief Executive Officer
CED	Common Efficient Drainage
CPUC	Chuuk Public Utilities Corporation
CUC	Commonwealth Utilities Corporation (Saipan)
DERM	Department of Environment and Resource Management
DWSP	Drinking Water Safety Plan
FSM	Federated States of Micronesia
FTE	Full Time Equivalent
FTP	File Transfer Protocol
GNI PPP	Gross National Income (based on Purchasing Power Parity (PPP)
IWA	International Water Association
IWSA	Independent Water Schemes Association
kL	Kilo-Litre (1,000 litres)
km	Kilometre
KRA	Key Result Area
kWH	Kilo-Watt hours
MDG	Millennium Development Goals
ML	Mega-litre (1,000,000 litres, or 1,000 m^3)
MoU	Memorandum of Understanding
MWSC	Majuro Water and Sewer Company
NUC	Nauru Utilities Corporation
NZ	New Zealand
NZWA	Water New Zealand
NRW	Non-Revenue Water
O&M	Operation and Maintenance
OEI	Overall Efficiency Indicator
OPEX	Operational Expenditure
OPI	Overall Performance Indicator
PIAC	Pacific Infrastructure Advisory Centre
PICTs	Pacific Island Countries and Territories
PNG	Papua New Guinea
PRIF	Pacific Region Infrastructure Facility
PUB	Public Utilities Board of Kiribati
PUC	Public Utilities Corporation of Pohnpei
PWWA	Pacific Water and Wastes Association
RMI	Republic of the Marshall Islands
SEA	South East Asia
SEAWUN	South East Asian Water Utilities Network
SIWA	Solomon Islands Water Authority
SOE	State Owned Enterprise
SPC–SOPAC	Secretariat of the Pacific Community – Applied Geosciences and Technology Division of SPC
STP	Sewage Treatment Plant
SWA	Samoa Water Authority
TA	Technical Assistance
TOR	Terms of Reference
TWB	Tonga Water Board
UNELCO	Electrique du Vanuatu Ltd
US$	US Dollar
WAF	Water Authority of Fiji
WOP	Water Operators Partnership
WSAA	Water Services Association of Australia
WSP	Water Service Provider
WTP	Water Treatment Plant

Executive Summary

This report presents the 2012 benchmarking results of 22 water utilities in the Pacific Region, prepared under the direction of the Pacific Water and Wastes Association (PWWA) and with the support of the Pacific Infrastructure Advisory Centre (PIAC). Collectively, the utilities that participated in this year's benchmarking survey are supplying water to some 1.8 million people and provide wastewater services to approximately half a million people.

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[1] framework indicators to allow for possible future inclusion in that program. Indicator definitions are included in Appendix D. In 2011 the benchmarking process methodology and approach were further developed to match with characteristics of the Pacific Island Countries.

The 2012 benchmarking is a continuation of the 2011 approach with some adjustments modelled on lessons learned from last year's benchmarking exercise.

Based on these lessons, the 2012 benchmarking adopted the following approach:

- simplifying and adjusting the questionnaire (e.g. taking out the overlaps in data collection);
- providing direct assistance (field visits) to those utilities which had difficulties with last year's questionnaire;
- conducting a sub-regional workshop for the Federated States of Micronesia (FSM) utilities, enabling the respective benchmarking representatives to share benchmarking data and to learn from each other's experiences;
- comparison of benchmarking results in groups depending on size of the utility; and
- developing a strategy for continued water utility benchmarking in the Pacific Region to be discussed during the Auckland Benchmarking Workshop of 29th and 30th of October 2012.

In 2011, the PWWA set so-called 'Pacific Benchmarks' which reflect target values for the Pacific Region for the various indicators measured in this report. In addition, the indicators calculated under this benchmarking initiative have been compared with the 2011 results and with a range of indicators available from other international studies.

KEY FINDINGS FROM THE 2012 BENCHMARKING

Although the quality of data is better as compared to the last year, accuracy still requires improvement. Table A below presents a summary of final benchmarking data.

[1] 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.

Notwithstanding data accuracy issues, the key statistics generated from the data collected as presented in Table A show the following observations:

Table A: Key Findings

▪ Collectively the participating utilities are serving about 314,000 water connections and 85,000 sewerage connections corresponding with a population served of respectively 1.8 million and 0.5 million. As compared to 2011 the number of connections increased with respectively 6.9 per cent and 8.4 per cent. This increase is caused both by expansion of the utilities and the inclusion of three new utilities.
▪ One third of all utilities are faced with a lack of fresh water resources with no improvements since last year.
▪ One third of utilities are not able to provide 24/7 water supply, sometimes due to a shortage of water and in some cases due to a lack of capacity in the distribution network.
▪ Average coverage within the service areas is 82 per cent for water supply and 48 per cent for sewerage. Both indicators improved as compared to last year.
▪ 38 per cent of utilities do not maintain a residual chlorine concentration in their networks and only 67 per cent of sewage produced is treated to primary standard. Both indicators improved significantly compared to last year.
▪ Water production on a per connection basis slightly decreased but is still high (56 per cent above the Pacific Benchmark) with an average of 1.95 kL/connection/day.
▪ The average level of Non-Revenue Water (NRW) is 1.2 kL per connection per day or about 51 per cent of all water produced. This loss corresponds to a value of about US$60 Million per annum in terms of production costs and revenue foregone. Though efforts are initiated by the utilities only slight improvements were made as compared to last year.
▪ The average staff utilisation ratio remained almost the same with an average of 9.8 staff per 1000 connections, which is still above the Pacific Benchmark of eight, and about five times higher than the average staff utilisation rate of Australian utilities.
▪ Training provided to staff is very limited with an average of only one training day per FTE per year which is well below the Pacific benchmark of five staff training days per FTE.
▪ Customer complaints are very high with an average of 161 complaints per 1000 connections as compared to 138 last year, which demonstrates that the majority of the utilities are not meeting customer service expectations and is also partly due to the fact that more utilities have provided data for this indicator as compared to last year.
▪ Payments for new connections in the Pacific are affordable as compared with other parts of the world.
▪ Water tariffs in the Pacific are relatively low and the cost of basic water consumption (at 6kL per connection per month) is very affordable. However the average water bill is relatively high due to higher consumption rates.
▪ The average operating cost recovery ratio (excluding depreciation) is 85 per cent; two thirds of Pacific water utilities are not able to recover their operating costs without subsidies.
▪ The average collection ratio of water bills improved from 83 per cent last year to 87 per cent this year.
▪ Most of the small utilities and half of the medium sized utilities are not well prepared for climate change and natural disasters. Overall some 63 per cent of the utilities have adopted the risks of climate change and natural disasters in their operations.

KEY OBSERVATIONS ON OVERALL PERFORMANCE

Using the average score of a range of indicators, an Overall Performance Indicator (OPI) was developed, in order to facilitate overall comparison of water utilities. Chapter 2 of the report presents the basis of the OPI. It also presents an Overall Efficiency Indicator (OEI), which is essentially an overall indicator of financial performance. Key observations relating to overall performance include:

Table B: Key Observations

▪ Utilities with a high Overall Efficiency (i.e. OEI) from a revenue perspective are more likely to be in the higher overall performance group (i.e. both financial and technical) and similarly, utilities with good overall performance are more likely to have good revenue recovery.
▪ Those organisations with private sector participation (i.e. private companies or private/government joint companies) clearly perform better in terms of OPI and OEI.

- Government departments and statutory organisations were in the lower performance range, however, in terms of financial performance, the worst were the state owned enterprises (SOEs).
- Utility performance, both OPI and OEI, is related to size with the large and medium utilities performing best.
- The top five performing utilities are the PUC (FSM Pohnpei), UNELCO (Vanuatu), Eda Ranu (PNG), WaterPNG, and the TWB (Tonga).

Compared to last year's benchmarking exercise, the utilities improved their performance on coverage, drinking water quality; wastewater management, meter coverage, and billing collection (see Figure A).

No improvements have been made on the reduction of Non-Revenue Water (NRW), continuity of water supply (24/7), development of skills (training) and the staff utilisation ratio.

"Compared to last year, the utilities improved their performance on coverage, drinking water quality; wastewater management, meter coverage, and billing collection..."

Performance on the following indicators has deteriorated: customer complaints; and the financial indicators operational cost recovery, and average number of debtor days.

Figure A: General Performance Trends from 2011 to 2012

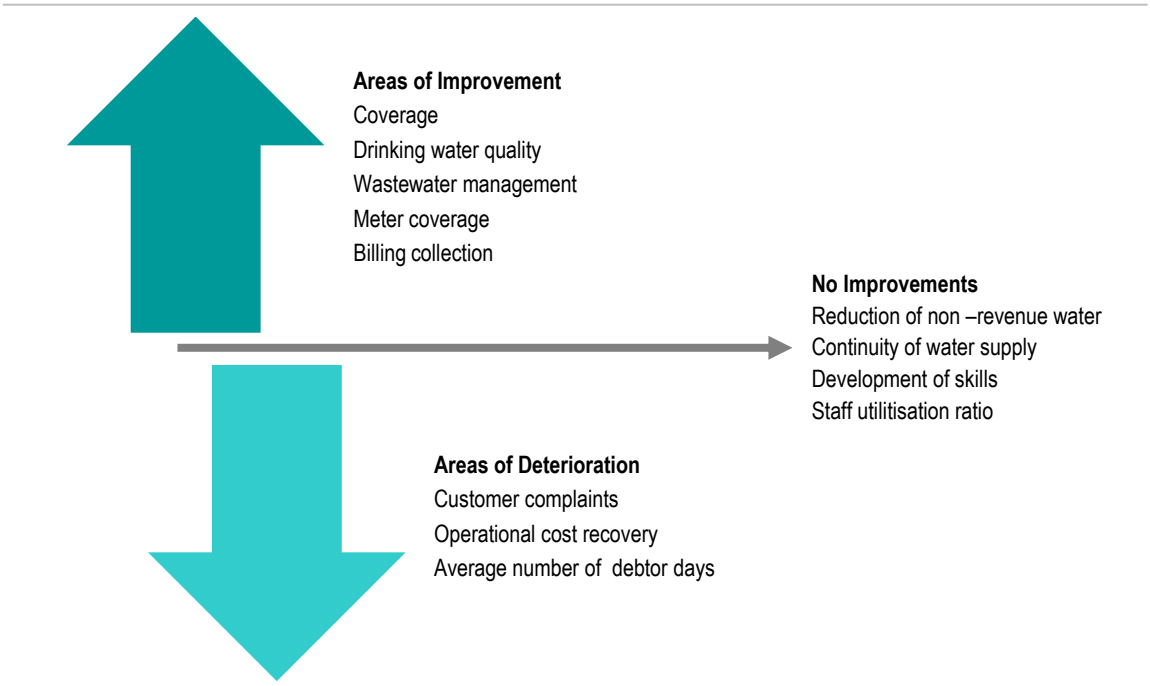


Table C provides a summary of the 2012 benchmarking results.

Table C: Summary Benchmarking Results 2012

No.	Indicator	Units	Pacific Benchmark	PWWA Previous Years					PWWA (2012)				WSAA	NZWA		Africa		SEA
				PWWA (2009)	PWWA (2010)	No valid answers	PWWA (2011) Median	PWWA (2011) average	Average	25th percentile	Median	75th percentile	WSAA Median	NZWA G1 Median	NZWA G2 Median	WOP Africa Average	WOP Africa Target	SEAWUN Median
KRA1 - Production							**note 1**	**note 1**										
V1	Volume of water produced	kL/conn/day	1.25	2.64	3.33		1.96	2.05	1.95	0.74	1.65	3.05	0.78	0.92	0.91	0.73	-	0.46
V1b	Volume of water produced	L/capita/day	250	-	-		306	442	380	196	307	431	363	385	473	145	-	249
V2	Volume of water sold (i.e. billed)	kL/conn/day	1.00	-	1.48		1.06	1.11	0.96	0.49	1.08	1.37	0.69	0.79	0.73	0.46	-	0.38
V2b	Volume of water sold (i.e. billed)	L/capita/day	150	-	-		139	179	161	16	163	258	328	324	356	91	-	196
V3	Volume of sewage produced	kL/conn/day	0.75	-	-		2.61	2.47	1.81	0.37	1.79	3.27	0.58	0.87	0.55	-	-	-
V3b	Volume of sewage produced	L/capita/day	200	-	-		317	380	291	192	250	350	216	389	385	-	-	-
KRA2 - Technical Performance																		
O1	Water supply coverage	% of population	95	-	76		90	82	83	70	89	96	-	-	-	73	90	50
O2	Continuity of water supply service (hours available)	hours/day	24	-	-		24	20.2	19.3	20.3	24.0	24.0	-	-	-	17	24	23
O3b	Non-Revenue Water	% of water produced	25	-	67		44	53	51	36	48	68	10	13	20	36	25	29
O3	Non-Revenue Water	kL/conn/day	0.3	-	-		0.9	1.3	1.2	0.3	1.2	1.3	-	0.1	0.2	0.6	0.3	0.4
O3c	Non-Revenue Water	kL/km/day	-	-	-		12.3	12.6	10.9	3.8	7.7	17.2	-	6.6	8.9	32.0	12.0	39.8
O4	Sewerage coverage	% of population	80	-	-		51	43	48	32	51	61	-	-	-	42	82	-
KRA3 - Health and Environment																		
HE1	Drinking Water quality compliance - residual chlorine	% compliance	100	-	-		86	57	62	0	83	96	-	-	-	-	-	90
HE1a	Percentage of customers on treated water	%	100	93	100		89	70	78	75	100	100	-	-	-	-	-	-
HE2	Drinking Water quality compliance - microbiological	% compliance	100	-	-		88	87	86	78	89	99	100	-	-	-	-	-
HE3	% of sewage produced which is treated to at least primary standard	% of sewage	100	-	-		81	54	64	25	81	100	100	-	-	-	-	-

No.	Indicator	Units	Pacific Benchmark	PWWA Previous Years					PWWA (2012)				WSAA	NZWA		Africa		SEA
				PWWA (2009)	PWWA (2010)	No valid answers	PWWA (2011) Median	PWWA (2011) average	Average	25th percentile	Median	75th percentile	WSAA Median	NZWA G1 Median	NZWA G2 Median	WOP Africa Average	WOP Africa Target	SEAWUN Median
KRA4 - Human Resources																		
HR1	Water and sewerage business staff/ 1000 connections	number of FTE/1000 conn	8	10.2	9.6		9.5	9.4	9.8	6.6	9.8	13.1	-	-	-	16.0	7.0	7.5
HR2	Training days	days/FTE/ year	5	-	-		0.69	0.97	1.34	0.26	0.62	1.15	-	-	-	9.00	-	1.80
HR3	Average cost of staff (total labour cost /number of staff/GNI)	%	-	-	-		220	340	355	116	231	392	-	-	-	-	-	259
KRA5 - Customer Service																		
CM1	Meter coverage rate for water supply customers	% of customers	100	-	-		98	69	73	54	92	100	-	45	23	74	100	100
CM2	Customer complaints	number/1000 conn	20	-	13		69	138	161	13	114	262	10	-	-	53	53	168
CM3	Affordability - new connection	% GNI per person	-	-	0.6		1.4	1.8	2.6	0.6	1.4	4.6	-	-	-	7.0	2.0	-
CM4a	Affordability - average household bill	% GNI per person	-	-	-		1.0	1.6	1.8	0.6	0.9	2.1	1.1	0.8	0.7	-	-	-
CM4b	Affordability – 6kL/month/connection	% GNI per person	-	-	-		0.3	0.3	0.34	0.29	0.33	0.42	-	-	-	7.0	3.0	0.9
KRA6 - Financial Sustainability																		
F1	Operating cost recovery ratio (excluding depreciation)	%	120	104	96		95	97	85	41	92	127	-	-	-	-	120	140
F2	Collection ratio - actual cash income vs. billed revenue	%	95	-	-		89	83	85	27	83	100	-	-	-	73	93	-
F3	Accounts receivable	days	90	-	-		121	154	199	64	134	283	-	-	-	243	90	67
OV1	**Overall Efficiency Indicator ((1-NRW)*collection ratio)**	**%**	**70**	**-**	**-**		**56**	**51**	**49**	**37**	**47**	**68**	**-**	**-**	**-**	**52**	**66**	**-**

BENCHMARKING WORKSHOP: FOCUS ON ACTION PLANNING

The 2012 Benchmarking Workshop was held in Auckland, New Zealand on the 29th and 30th of October 2012 to present the findings of the benchmarking results and engage Pacific Water Utilities in the analysis of their benchmarking scores and action planning.

Participants from 14 Pacific water utilities attended the workshop as well as representatives from PIAC, PWWA, Secretariat of the Pacific Community – Applied Geosciences and Technology Division of SPC (SPC-SOPAC), and the benchmarking consultants.

The 'balanced score card' method was introduced as a guide to action planning and the participants were tasked with completing action plans for their individual utilities. For those utilities that prepared Action Plans, individual utility profiles were prepared that focused and analysed the results of these utilities with the results of their peer groups.

Based on the Action Plans outlined by the utilities the priorities for next year can be broadly categorised into the following:

- Reduce Non-Revenue Water by improving billing and implementing leak detection programs
- Improve the quality of drinking water and laboratory standards
- Improve continuity of water supply
- Enhance the technical capacity of the utility staff and increase training programmes
- Improve customer service levels
- Improve cost recovery

It is expected that next year's benchmarking conference will provide an opportunity to follow up on the action plans outlined by the utilities above. It should be noted however that some of the actions plans may only be realistically achieved over a two year time frame rather than a one year time frame.

FUTURE BENCHMARKING OF WATER UTILITIES IN THE PACIFIC

At the conclusion of the benchmarking workshop a survey was circulated to the utilities to provide their comments on the future directions of the benchmarking process.

Future benchmarking strategy

The continuation of the benchmarking process was unanimously supported by all the utilities surveyed. This allows PWWA to support the on-going development of efficient and sustainable water and wastewater utilities in the Pacific Region. This will result in improved performance of member utilities as senior managers and stakeholders will have access to relevant management information. The summary of the draft future benchmarking strategy is outlined in Table D.

The benchmarking strategy has been developed for a five year period from 2013 to 2017. By 2017, PWWA will be able to independently manage and sustain a robust and high quality benchmarking system. The collection and reporting of data on an annual basis will be improved over the next five years as PWWA intends to gradually develop a web-based system for data collection. Refinements to the existing benchmarking questionnaire will be gradually implemented over the five years (where necessary).

Table D: Draft Future Benchmarking Strategy

PWWA SUMMARY OF DRAFT FUTURE BENCHMARKING STRATEGY	
MISSION	▪ Further develop efficient, sustainable and transparent Water and Waste Water Utilities in the Pacific Region.
VISION	▪ To support the improved performance and governance of its member utilities by providing relevant management information for senior managers and other stakeholders.
OBJECTIVES	▪ At the end of the five year time period, PWWA is able to independently manage and implement a high quality sustainable benchmarking system as part of its regular services to its members.
STRUCTURE AND STAFFING	▪ PWWA is the lead agency. ▪ Employ part time person(s) to undertake the annual benchmarking activity. ▪ Continue working with development partners, including the SPC-SOPAC and others. ▪ Benchmarking workshops held annually in conjunction with the PWWA annual meeting and sub-regional workshops to be considered.
SYSTEMS	▪ Continue to further develop benchmarking based on the existing benchmarking system and process. ▪ Collection and report data annually. ▪ Focus over the next five years is to improve the quality of data and to extend the system to capture more detailed and demand driven information from utilities. ▪ Web based collection of data also to be explored over the next five years.
RESOURCES	▪ Annual cost of the whole benchmarking exercise is US$100, 000 per annum. ▪ PWWA to contribute up to 30 per cent of these costs through utilities and the PWWA itself. ▪ Other stakeholders to pay for the data or contribute in-kind to the costs of implementing the benchmarking.
STYLE AND CONFIDENTIALITY	▪ PWWA to provide benchmarking as a service to its members and to deliver the service in an efficient and cost effective manner. ▪ PWWA members consider benchmarking as an important management tool. ▪ PWWA aims to conduct the collection and presentation of data in an open and transparent manner whilst retaining confidentiality within the association and stakeholders.

Benchmarking workshops will be held in conjunction with the PWWA annual meeting and sub-regional workshops will also be considered if efficiencies can be achieved.

For the benchmarking process to continue in the foreseeable future, it needs to be financially sustainable. Currently, funding from donors provides the financial basis of the benchmarking exercise supported by the limited resources made available by PWWA. Annual costs for developing and implementing the benchmarking system are estimated to be US$100, 000.

"By 2017, PWWA will be able to independently manage and sustain a robust and high quality benchmarking system."

The utilities and PWWA are prepared to contribute a certain percentage of the costs of the benchmarking exercise. In future, stakeholders (such as development partners, regional and international organisations, NGO's etc.) will be asked to pay for the data or contribute in-kind to the costs of implementing the benchmarking.

PWWA members consider benchmarking as an important management tool and realise that to be successful, it needs the support of all PWWA member utilities. Based on the public status of most of its members, PWWA aims to conduct the collection and presentation of benchmarking data in an open and transparent manner. The above draft strategy has been considered and approved by the Board of PWWA.

The PWWA benchmarking has been implemented over the past two years and it is recommended that the 2013 benchmarking reporting continue in the current format: that a full benchmarking report be prepared with a focus on the progress of the action plans established by the utilities.

Suggested timeline for future strategy

It is recommended that for the next five years benchmarking will be conducted annually, including the presentation of the benchmarking indicators at the annual PWWA conference. Once every two years, a benchmarking workshop will be held at the annual PWWA conference to review and evaluate the lessons learned from the previous two years and to set the strategy for the next period.

It is foreseen that an online system for data collection will be developed during the coming years. The focus in data collection will be on improving the quality of data and gradually, to further develop the level of detail and depth of the questionnaire based on demand from utilities.

It is expected that during the next three years country visits may still be required to assist utilities in data collection, create awareness and to provide a better understanding of the benchmarking process.

Table E summarises the above issues into a suggested time frame for implementing the future benchmarking strategy:

Table E: Draft Future Benchmarking Strategy Timeline

2013	2014-2015	2016-2017
▪ Continue with the current benchmarking format. ▪ Format the existing benchmarking questionnaire to include an 'indicators' worksheet. ▪ Develop a Microsoft Access database for benchmarking data analysis. ▪ PWWA to introduce a charge for the benchmarking report. ▪ Commence the benchmarking exercise early in 2013 – April/May. ▪ Optional: Conduct sub-regional workshops in Guam and Fiji. ▪ Produce the Full Version of the Benchmarking Report for 2013.	▪ Develop the PWWA website to accommodate online data entry and to publish benchmarking indicators reports online. ▪ Trial the on line data entry and also continue to use email questionnaires for those that prefer this option. ▪ Optional: Conduct sub-regional workshops in Guam and Fiji. ▪ Costs for the regional workshops in 2015 to be funded or partly funded by the utilities. ▪ Present benchmarking data at the annual PWWA conference and produce Benchmarking Report	▪ Optional: Conduct sub-regional workshops in Guam and Fiji. ▪ Full benchmarking workshop for all regions held at the annual PWWA conference ▪ Produce full version of Benchmarking Report. ▪ Review benchmarking strategy for next three years.

1 Introduction

1.1 GENERAL

Benchmarking of water utilities in the Pacific has become an established instrument for PWWA and its member utilities for the continued performance improvement of water utilities in the Pacific Region.

In 2009, PWWA commenced a process of baseline data collection and benchmarking of their members. Those indicators, agreed to by PWWA members and included in the PWWA's own strategic plan, formed the basis of the core set of indicators adopted in this benchmarking report.

In 2011, the indicators were expanded upon with a particular focus on the international IB-Net benchmarking framework indicators to enable future inclusion in that program. PWWA benchmarks have been set by PWWA based on the 2011 benchmarking results, reflect targeted values for the indicators concerned and may be adapted by PWWA from time to time.

Where deemed appropriate, the indicators calculated under this benchmarking initiative have also been compared with the range of indicators available in other international studies. Comparisons within the Pacific water utilities are complemented with assessment against results from previous initiatives from within the Pacific and with other jurisdictions for various purposes.

The PWWA benchmarking initiative for water utilities builds on the lessons learned in the previous exercise conducted in 2011. Some of the indicators were reformulated, while the questionnaire was modified and simplified to avoid duplication and inconsistencies. The questionnaire was further expanded with a section on maintenance.

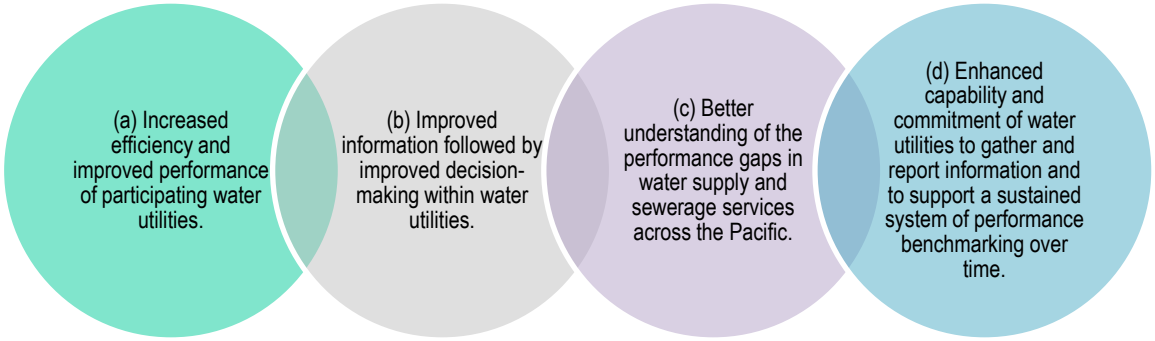
"The 2012 benchmarking provides data insight to all stakeholders with the overall goal of helping water utilities improve their performance and contribute to improved service delivery in the water and sewerage sector."

PRIF partners are supporting the water and sanitation sector in the Pacific region with technical and financial assistance. The current pipeline of water and sanitation projects in the region exceeds US$200 million in investments. Improved availability of data and enhanced performance of water operators in the region are therefore key objectives of PRIF. One of the means to achieve this is by supporting and stimulating benchmarking as an instrument for water utilities to compare performance and learn from each other.

It is in this context that the PWWA, on behalf of its members, has approached PRIF/PIAC to support continued benchmarking in 2012.

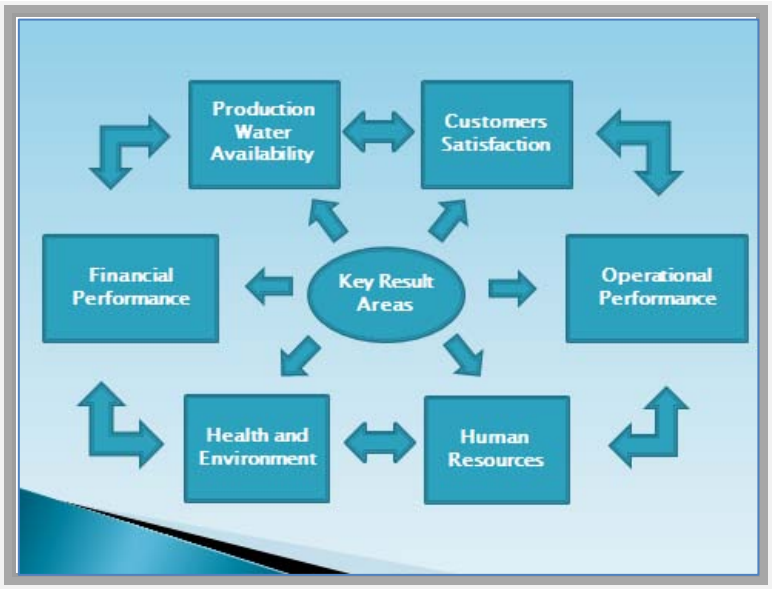
This report presents the results of the 2012 benchmarking of 22 water utilities in the Pacific region and shows the performance development of the Pacific water utilities as compared to the 2011 findings. The 2012 benchmarking provides data insight to all stakeholders with the overall goal of helping water utilities improve their performance and contribute to improved service delivery in the water and sewerage sector.

It is expected that continued benchmarking will result in:



Mirroring the approach adopted in 2011, the utilities were benchmarked across six Key Result Areas (KRAs), represented by 28 performance indicators, critical to the utility's performance (see Figure 1.1).

Figure 1.1 Key Result Areas



1.2 PEER GROUPS

The utilities have been divided into three peer groups depending on size (or, connections). This enables utilities of similar size to be compared with each other. The peer groups have been defined as follows:

1. LARGE UTILITIES	2. MEDIUM UTILITIES	3. SMALL UTILITIES
• More than 10, 000 connections	• In the range of 2, 000 - 10, 000 connections	• Less than 2, 000 connections

The three groups are presented in Table 1.1. Collectively, the total number of connections of the participating utilities amounts to approximately 315,000 water connections supplying a population of 1.8 million, and almost 85,000 sewer connections for a population of about 475,000. Details per utility are presented in Chapter 2 in Figures 2.1 and 2.2. The Water Authority of Fiji (WAF) is by far the largest utility.

Table 1.1: Peer Groups

Group 1 - Large	Group 2 - Medium	Group 3 - Small
>10,000	2,000- 10,000	< 2,000
Fiji - WAF	Cook Islands - Ministry of Infrastructure & Planning	FSM Chuuk - CPUC
Papua New Guinea - Eda Ranu	FSM Pohnpei - PUC	FSM Kosrae - Department of Transportation & Infrastructure
Papua New Guinea - WaterPNG	Kiribati - PUB	FSM Yap North - Gagil Tomil Water Authority
Saipan - CUC	Nauru - NUC	FSM Yap Central - Yap State Public Service Corporation
Samoa - SWA	Palau – Bureau of Public Works	FSM Yap South - Southern Yap Water Authority
Tonga - TWB	Samoa - IWSA	Niue - Public Works
	Solomon Islands - SIWA	RMI Majuro - MWSC
	Vanuatu - UNELCO	Tuvalu - Public Works

1.3 PARTICIPATING UTILITIES

The group of participating utilities increased from 19 in 2011, to 22 utilities in 2012. The MWSC (RMI Majuro), IWSA (Samoa) and NUC (Nauru) are the new participants. However the utilities of Saipan, Kosrae, FSM Yap South and Niue did not complete the 2012 questionnaire. For these utilities, their 2011 data has been used. A list of the utilities is shown in Table 1.2.

Table 1.2: Participating Countries and Water Service Providers

Country	Water Utility Name	A	B	C	D	E	F	G
		Size category	Response 2011	Response 2012	Water supply	Wastewater	PWWA Member	PIAC/ PRIF Focus
Cook Islands	Cook Islands Ministry of Infrastructure & Planning	M	Y	Y	Y	-	Y	Y
Fiji	Water Authority of Fiji (WAF)	L	Y	Y	Y	Y	Y	
Federated States of Micronesia	Yap North - Gagil Tomil Water Authority	S	Y	Y	Y	N	Y	Y
	Yap Central - Yap State Public Service Corporation	S	Y	Y	Y	Y		Y
	Yap South - Southern Yap Water Authority	S	Y	N	Y	N		Y
	Kosrae - Dept. of Transportation & Infrastructure	S	Y	N	Y	Y		Y
	Pohnpei Public Utilities Corporation	M	Y	Y	Y	Y		Y
	Chuuk Public Utilities Corporation (CPUC)	S	Y	Y	Y	Y	Y	Y
Kiribati	Public Utilities Board (PUB)	M	Y	Y	Y	Y	Y	Y
Marshall Islands	Majuro Water and Sewer Company (MWSC)	S	-	Y	Y	Y	Y	Y
	Kwajalein Atoll Joint Utility Resources (KAJUR)[a]	S	-	-	Y	Y	Y	
Nauru	Nauru Utilities Corporation (NUC)	M	-	Y	Y	N	Y	Y
Niue	Niue Public Works	S	Y	N	Y	-	Y	Y
Palau	Palau Bureau of Public Works	M	Y	Y	Y	Y	Y	Y
Papua New Guinea	Eda Ranu	L	Y	Y	Y	Y	Y	
	PNG Waterboard (WaterPNG)	L	Y	Y	Y	Y	Y	
Saipan	Commonwealth Utilities Corporation (CUC)	M	Y	N	Y	Y	Y	
Samoa	Samoa Water Authority (SWA)	L	Y	Y	Y	Y	Y	Y
	Independent Water Schemes Association (IWSA)	M	Y	Y	Y	-	Y	Y
Solomon Islands	Solomon Islands Water Authority (SIWA)	M	Y	Y	Y	Y	Y	Y
Tonga	Tonga Water Board (TWB)	L	Y	Y	Y	-	Y	Y
Tuvalu	Tuvalu Public Works	S	Y	Y	Y	-	Y	Y
Vanuatu	UNELCO	M	Y	Y	Y	-	Y	Y

Note: [a] *Kwajalein (KAJUR) of* Marshall Islands recently became member of PWWA and will join the benchmarking initiative in the next year.

1.4 LESSONS FROM LAST YEAR'S BENCHMARKING

Key lessons learned from the 2011 benchmarking exercise provide the following insights:

(a)	Data quality (both reliability and accuracy) requires ongoing improvement from the participating utilities. A system of data checking to be built into the questionnaire and future auditing of data quality, including some form of comparison with the previous year's data, calculated indicators, and realistic ranges to enable checks on units needs to be undertaken (e.g. kL vs. ML etc).
(b)	Some updates and clarifications to definitions are required in the questionnaire as it was recognised that few organisations used the guidance notes.
(c)	Utilities should be requested to submit financial statements if their data is to be accepted. There is no way to check financial data and ensure that the utility's own interpretation of the question is correct.
(d)	Additional questions were suggested to be incorporated into the questionnaire update, particularly focused on better understanding the recurrent operating cost of utilities if possible (e.g. power, chemicals, labour, maintenance), and a better understanding of staffing inclusions (e.g. is maintenance effort outsourced and therefore not included in the staffing numbers?).
(e)	The data questionnaire and analysis should be simpler, focusing on the technical outcomes rather than higher technology platforms.
(f)	Participating utilities will need require significant support from the PWWA to ensure that they understand the meaning of indicator definitions (i.e. ensure that inclusions and exclusions are consistently applied) and understand the means available to them to collect, store and check the data critical to the benchmarking study and to their own business management.
(g)	Further to the point above, the PWWA requires further support in terms of both coordination of data collection and the technical knowledge to continue this initiative. Seeking in-kind assistance from Active and Allied members may be a way to spread the workload; however, it must be stressed that the initiative must be owned by the PWWA and its members.

These lessons have been adopted in the current 2012 benchmarking approach by:

- Simplifying and adjusting the questionnaire (e.g. taking out the overlaps in data collection).
- Providing direct assistance (via field visits) to a selected number of utilities to provide support in data gathering e.g. Kiribati, Tuvalu, Fiji, Palau, FSM Yap, and the MWSC (RMI Majuro).
- Conducting a sub-regional workshop for the FSM utilities; this enabled the respective benchmarking representatives to share and to learn from each others' experiences.
- Preparation of Outlines profiles for the performance improvement of a number of individual utilities.
- Developing a strategy for continued water utility benchmarking in the Pacific Region, discussed with the utilities during the Auckland workshop and meeting.

As a general comment on this year's benchmarking process, it was observed that due to several delays in preparing for the benchmarking, utilities were given only a very short period for data collection leaving little time to verify and to improve on the quality of the data.

2

Overall Results

PWWA Benchmarking 2012

This chapter gives an overview with observations regarding the overall benchmarking results of the PWWA utilities. The results are illustrated across six Key Result Areas. The benchmarking indicators are compared with results from last year and with benchmarking results from other parts of the world.

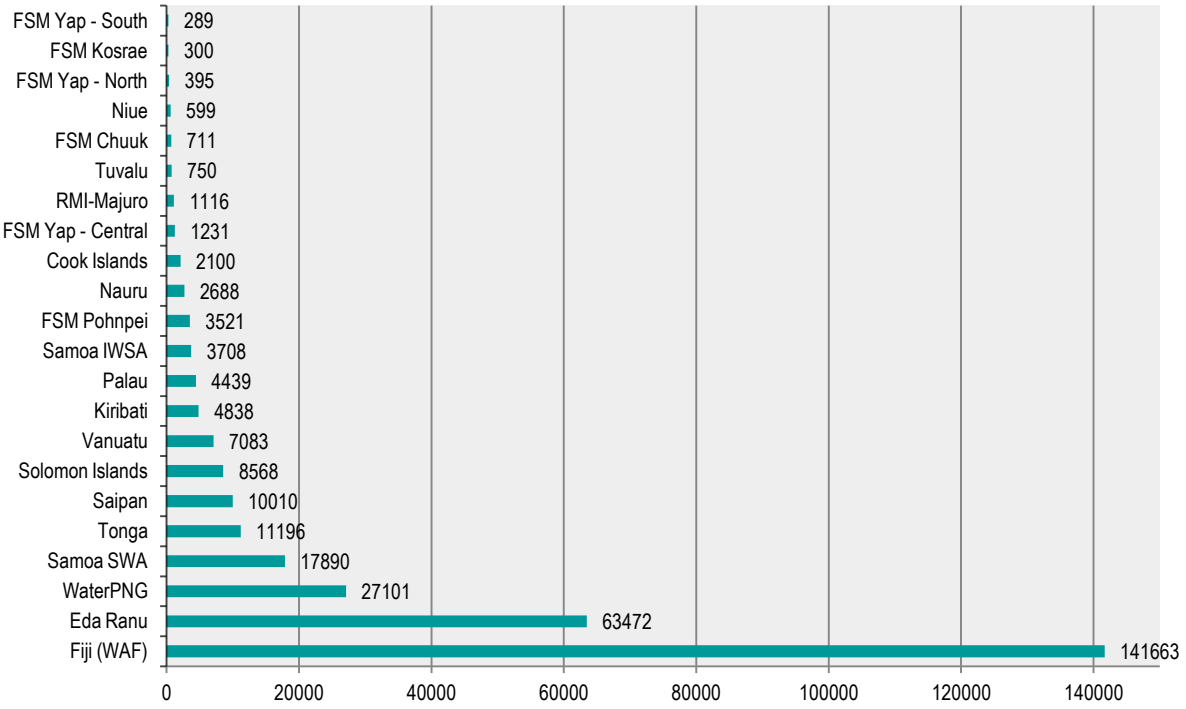
Each utility has unique characteristics depending on size, the way it is legally operated, the supply area, availability of water resources, but also country characteristics such as the economy, demography, geography and topography. The benchmarking analyses therefore require a knowledge and understanding of the environment and setting in which the utility is operating. General country information and a comparison of relevant Millennium Development Goals (MDG) to PWWA benchmarking indicators are shown in Table 2.1.

Table 2.1: General Country Information

Country	Population (2011)	GNI/ capita	Land area	MDG- Population coverage		PWWA utilities		Population covered by PWWA utilities			
	'000	US$	km²	National		Number of connections		Water		Sewerage	
				Water supply (%)	Improved Sanitation (%)	Water	Sewerage	Water	% of pop.	Sewerage	% of pop.
Cook Islands	10.2	15,813.00	237	95	100	2100	NA	8400	82	1000	10
Fiji	852.5	4,610.00	18273	98	83	141663	55930	520416	61	223720	26
Kiribati	105.3	3,300.00	811	63	34	4838	1912	31374	30	13384	13
Marshall Islands	55	3,910.00	181	94	75	1116	1796	7816	14	14370	26
Micronesia (FSM)	120.6	3,580.00	701	94	25	6447	2217	32487	27	11355	9
Nauru	10.2	5,000.00	21	88	65	2688	0	10752	100	0	0
Niue	1.6	15,813.00	259	100	100	599	0	1805	100	0	0
Palau	20.8	11,080.00	444	85	100	4439	2047	17990	86	10235	49
Saipan	48.2	10,000.00	123	98	25	10010	2796	50000	100	32000	66
Samoa	184.9	4,270.00	2785	96	98	21598	95	152130	82	120	0
Solomon Islands	539.9	2,350.00	30407	70	32	8568	983	64323	12	6881	1
Tonga	103.7	5,000.00	650	100	96	11196	NA	61608	59	0	0
Tuvalu	11.2	3,253.00	26	98	85	750	NA	5000	45	0	0
Vanuatu	251.8	4,330.00	12281	90	57	7083	NA	30112	12	0	0
Sub-total Pacific Islands (excl PNG)	2315.9	-	-	-	-	223095	67776	994213	43	313065	14
PNG	7000.0	2,570.00	462840	40	45	90573	17270	741080	11	158963	2
Total PWWA countries	**9315.9**					**313668**	**85046**	**1735293**	**19%**	**472028**	**5**

The total number of water connections increased by 20,000 connections, from 293,000 in 2011 to almost 314,000 connections in 2012.

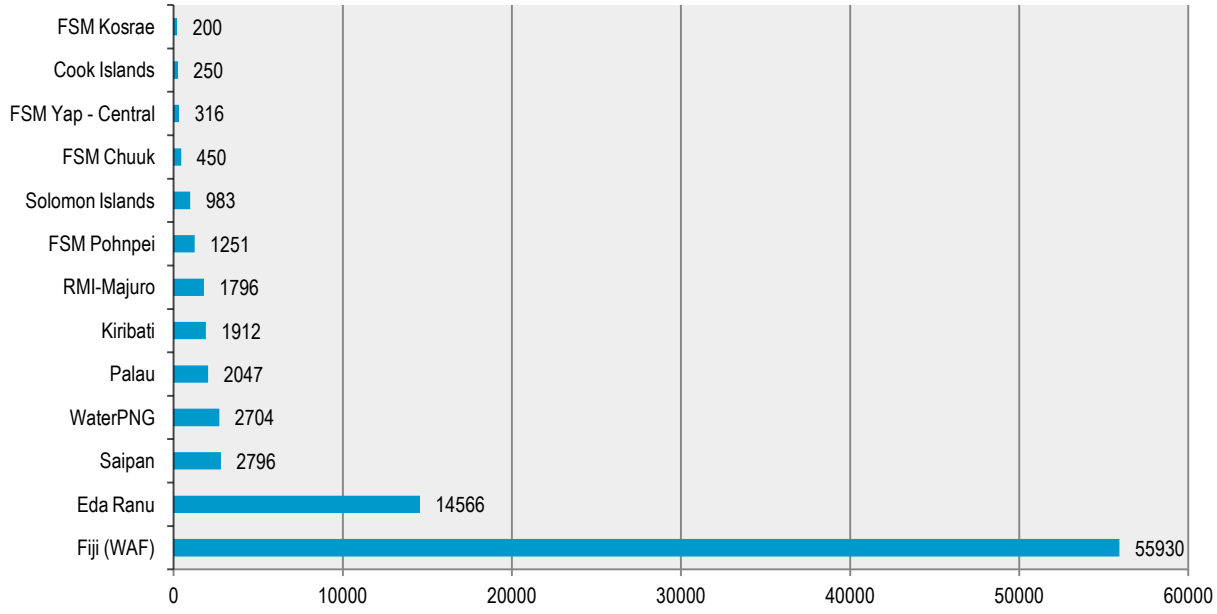
Figure 2.1: Number of Water Connections (total = 314,668)



Note: Saipan, Kosrae, FSM Yap South and Niue results are based on 2011 data.

The total number of sewer connections increased with about 6,500 additional connections from 78,500 in 2011 to 85,000 connections in 2012. Of this increase, 1,800 connections are attributable to the new participating utility, the MWSC (RMI Majuro).

Figure 2.2: Number of Sewer Connections (total = 85,280)



Note: Saipan and Kosrae results are based on 2011 data.

2.1 KEY OBSERVATIONS

Key observations which can be drawn from the data analysis, when compared to last year's results, accompany the following graphs. The results at a utility level are described in Chapter 3 (large utilities), Chapter 4 (medium utilities) and Chapter 5 (small utilities).

In the following tables the overall results of the benchmarking are compared with last year, in three categories, as follows:

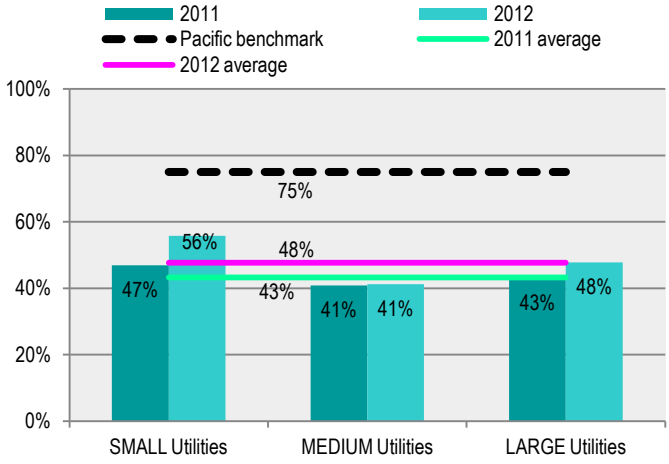
A. Overall improvements for indicators are observed for coverage of sewerage, drinking water quality, the percentage of customers supplied with treated water, the amount of sewage treated to at least primary standard, the volumes of water production and water consumption, the coverage of metered connections, and the collection ratio of billed water.

B. Indicators which more or less remain unchanged are: coverage of water supply, level of non-revenue water, the continuity of supply, the amount of training provided to utility staff, staff utilisation, water tariffs and operating cost recovery.

C. Indicators which show a deteriorating performance are: number of customer complaints operating cost recovery and average recovery period (debtor days) for accounts receivable.

A. *Indicators showing improved performance compared to 2011results*

Figure 2.3: Coverage of Sewerage (Indicator O4)



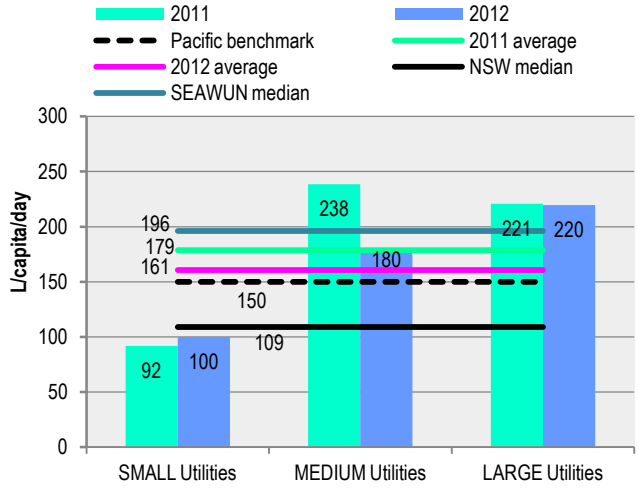
Coverage of Sewerage

The average population coverage of sewerage within the service areas of the utilities has increased from 43 per cent in 2011 to 48 per cent in 2012.

The small utilities increased most, mainly due to the new participating utility, the MWSC (RMI Majuro).

Observation: *The coverage figures are generally not very accurate as the geographical boundaries of service areas are usually not matching with the administrative areas.*

Figure 2.4: Volume of Water Billed per capita (Indicator V2)

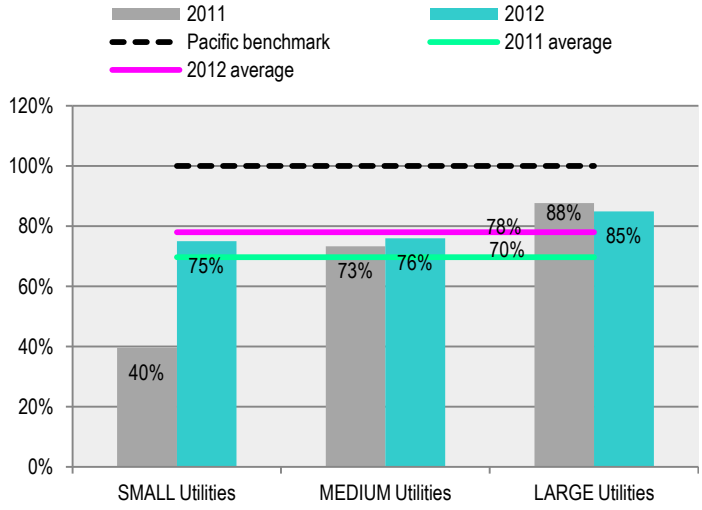


Volume of Water Billed

The volumes of water billed/water consumed decreased from 179 litres per capita per day (L/c/d) in 2011 to 161 L/c/d in 2012 which is close to the Pacific Benchmark of 150 L/c/d. The decrease is partly due to the effect of on-going metering programs and partly due to corrections of the 2011 data.

Observation: *Though the average results of this indicator are close to the Pacific Benchmark, the deviation among the utilities is still large. Countries with sufficient availability of water resources generally consume much more water than the Pacific Benchmark, while in countries with shortages of water resources; the consumption is much smaller than the Pacific benchmark.*

Figure 2.5: Percentage of Treated Water (Indicator HE1a)

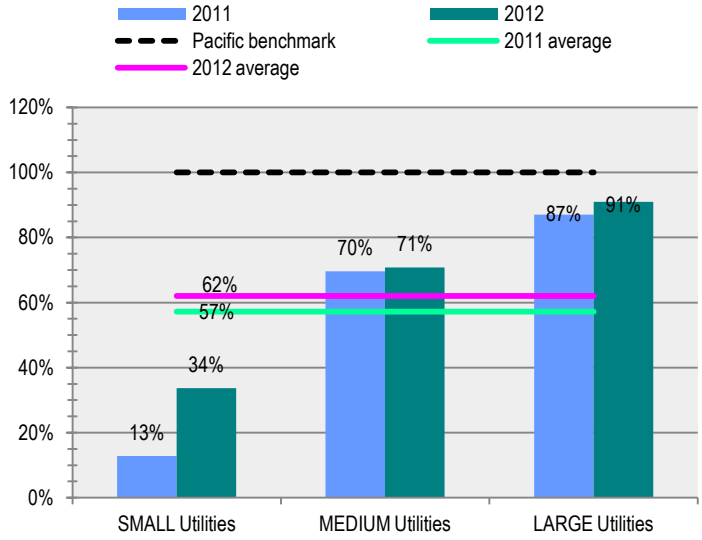


Treated Water

The average percentage of water produced and treated increased from 70 per cent in 2011 to 78 per cent in 2012.

Observation: *The small utilities in particular made considerable progress from 40 per cent in 2011 to 75 per cent in 2012, mainly through introducing the use of chemical disinfectants and the improvement of treatment facilities.*

Figure 2.6: Residual Chlorine (Indicator HE1)



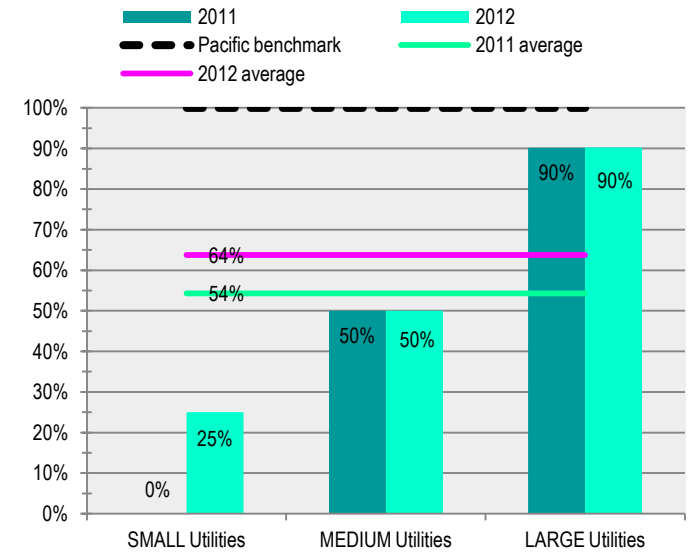
Residual Chlorine

The average percentage of tested samples with sufficient residual chlorine increased from 57 per cent in 2011 to 62 per cent in 2012. The large utilities show the best results. The small utilities improved significantly but still, most tested samples are non-compliant.

Observation: *Due to safety reasons, supply of chlorine in the region is provided by only a few shipping companies, sometimes causing delays such as in Samoa where last year chlorine chemicals were out of stock for several months.*

For that reason, the TWB (Tonga) has started to produce the chemicals on the island. Samoa is considering the adoption of this approach as well.

Figure 2.7: Wastewater Treated to Primary Standard (Indicator HE3)

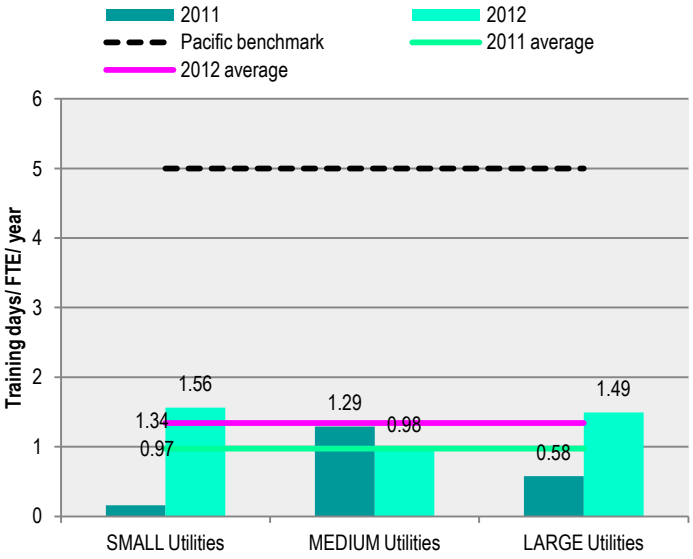


Wastewater Treatment

Primary treatment of wastewater only includes the removal of debris and sediments, and is normally the first measure adopted to improve and control environmental discharges. The percentage of wastewater treated to primary standard has increased from 54 per cent in 2011 to 64 per cent in 2012. The large utilities are performing much better than the medium and small size utilities.

Observation: *The development of wastewater facilities has gained high priority over the past years, particularly in the large utilities. For the medium and small utilities, large investments are required to cope with environmental standards.*

Figure 2.8: Training in Number of Days per FTE (HR2)

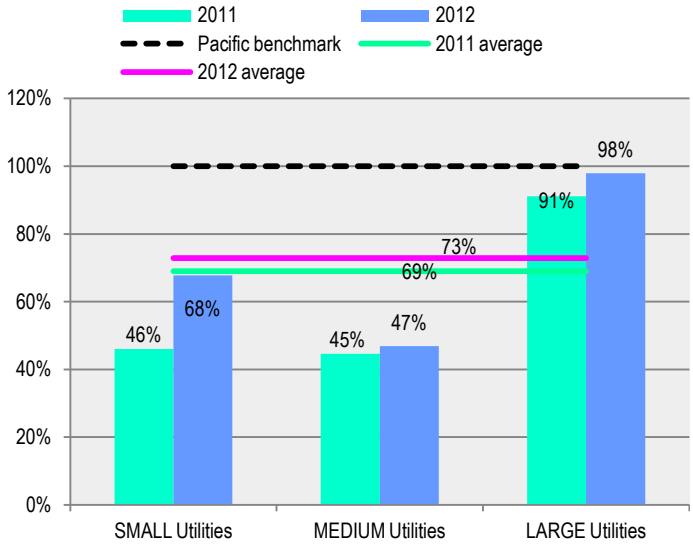


Training

The amount of training provided to the staff of the utilities improved significantly but is still very low. On average, 1.34 days per staff per year is reported, well under the Pacific Benchmark of five training days per employee per year.

Observation: *Staff qualifications and skills are still a major challenge for all utilities.*

Figure 2.9: Coverage Metering (Indicator CM1)

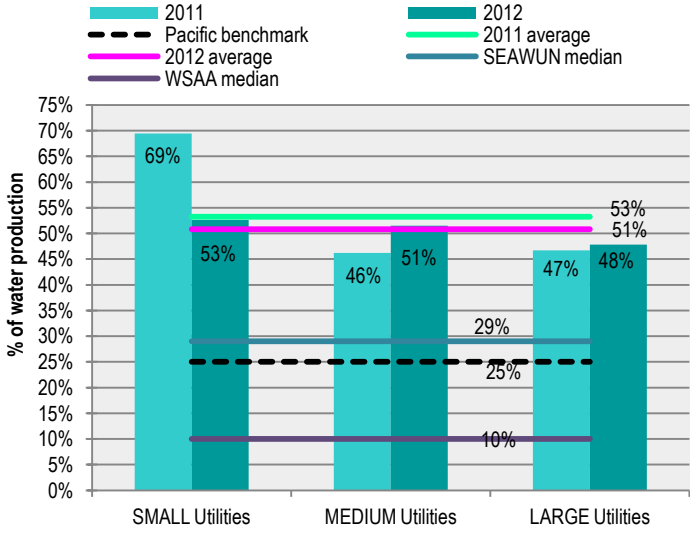


Coverage Metering

The average percentage of customers who are metered increased from 69 per cent in 2011 to 73 per cent in 2012.

Observation*: The high increase of the small utilities is mainly due to the MWSC (RMI Majuro - 100 per cent metered), which did not participate in last year's benchmarking.*

Figure 2.10: Non-Revenue Water (Indicator O3a)

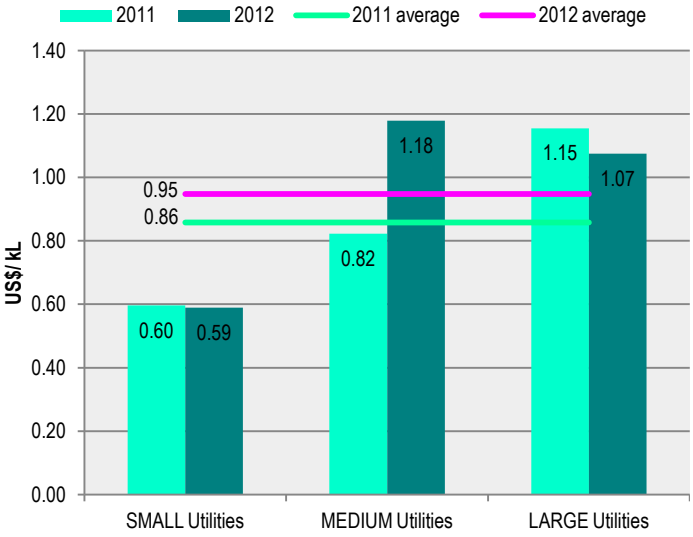


Non-Revenue Water (NRW)

The average NRW decreased slightly from 53 per cent in 2011 to 51 per cent in 2012, but is still very high compared to the Pacific Benchmark and international averages from the South Asian Utilities (SEAWUN) and Australian utilities (WSSA). The reduction seen in the small utilities is mainly due to the impact of leak reduction projects (e.g. CPUC – FSM Chuuk).

Observation: *Reduction of NRW remains a top priority for almost all the utilities. The total volume of NRW of all utilities corresponds with a value of about US$60 million per annum in terms of production costs and revenue foregone.*

Figure 2.11: Revenues from Water Sales (kL)

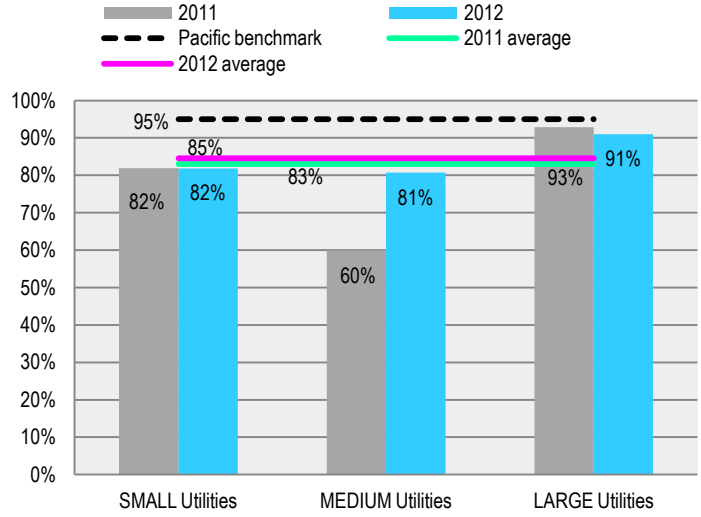


Revenues from Water Sales

Billed revenues from water sales increased from US$0.86/kL in 2011 to US$0.95/kL in 2012. The medium utilities show the highest increase, mainly due to data corrections, rather than tariff increases. It is noted that the small utilities charge the lowest tariff for water.

Observation: *Water tariffs in the Pacific are relatively low and the cost of basic water consumption (at six kL per connection per month) seems affordable.*

Figure 2.12: Collection Ratio (Indicator F2)

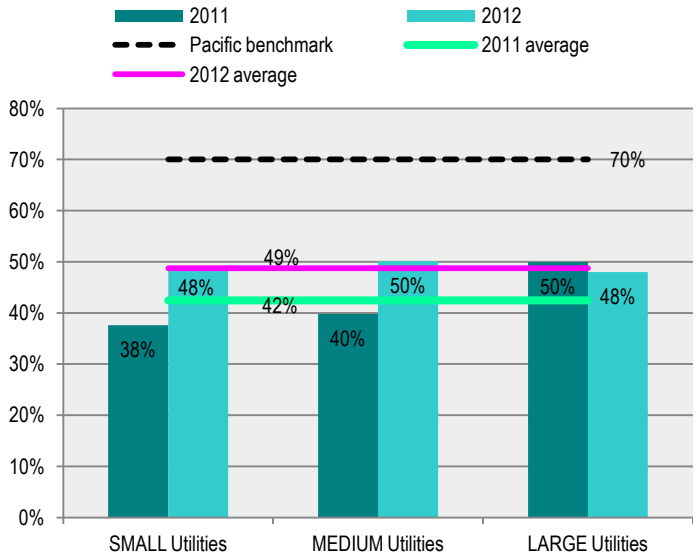


Collection Ratio

The average collection ratio increased from 83 per cent in 2011 to 85 per cent in 2012.

Observation: *In particular, the medium utilities made a considerable improvement from 60 per cent to 81 per cent. This increase is mainly attributable to two utilities which made significant improvements: the SIWA (Solomon Islands) and the PUC (FSM Pohnpei).*

Figure 2.13: Overall Efficiency Indicator (OEI)



Overall Efficiency Indicator

The Overall Efficiency Indicator (OEI) is a combined measure of the Non-Revenue Water and Collection Ratio using the equation:

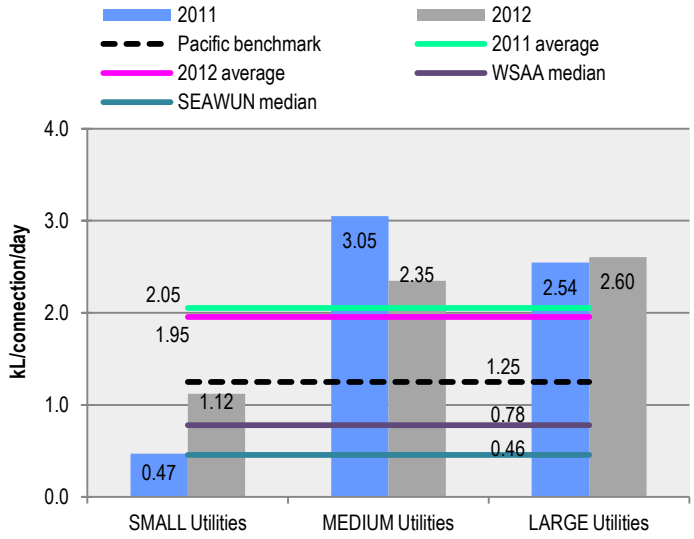
$$OEI = (1 - NRW)x\ Collection\ ratio.$$

The average OEI of all PWWA utilities increased from 42 per cent in 2011 to 49 per cent in 2012. While the large utilities decreased by two per cent, the small utilities showed the best improvements followed by the medium utilities.

Observation: *The OEI improved due to the effect of improved collection rates as well as reduced NRW.*

B. *Indicators showing equal performance compared to 2011results*

Figure 2.14: Volume of Water Produced (Indicator V1)

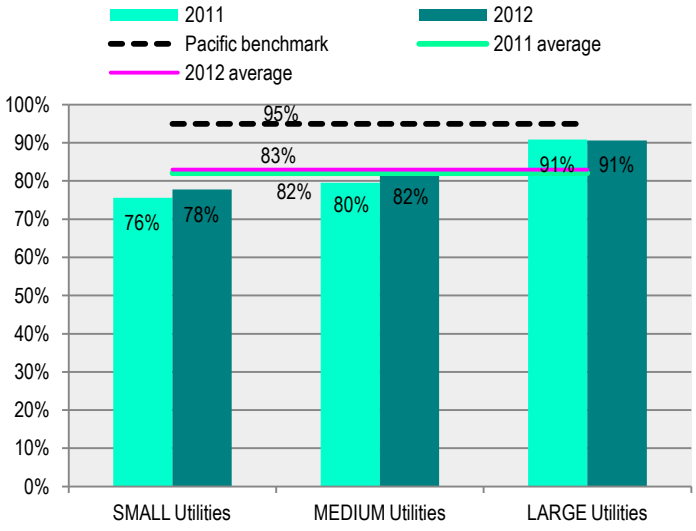


Volume of Water Produced

The average water production per connection in 2012 remained almost the same as compared to 2011, but for medium utilities this value strongly decreased. For small utilities, the value strongly increased.

Observation: *The decrease for medium utilities may be due to the effect of increased metering and inaccurate data, while the increase for the small utilities is strongly influenced by the new utilities which did not participate in last year's benchmarking exercise such as the MWSC (RMI Majuro).*

Figure 2.15: Coverage Water Supply (Indicator O1)

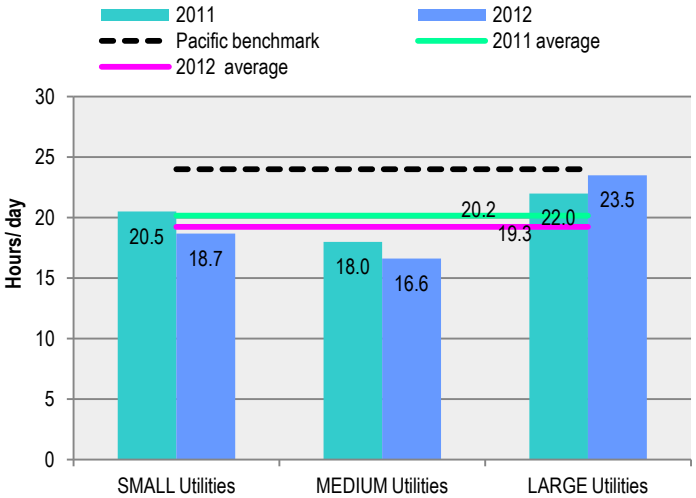


Coverage of Water Supply

The average water supply coverage (mean) within the service area of the participating utilities has slightly increased from 82 per cent in 2011 to 83 per cent in 2012. The highest increase was achieved by the small utilities.

Observation: *The coverage relates to the service area of the utility's jurisdiction. Thus, the indicator does not reflect the country's national population with access to water and sanitation facilities.*

Figure 2.16: Continuity of Water Supply (Indicator O2)



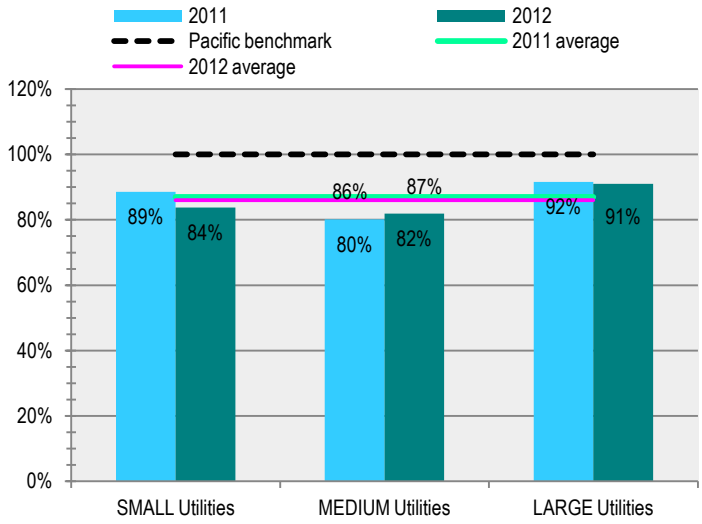
Continuity of Water Supply

32 per cent of utilities are not operating on a continuous 24 hours per day basis.

Observation: *Due to shortages in sufficient fresh water resources, some utilities are forced to ration the water distribution e.g. small size utilities of RMI Majuro and Tuvalu and the medium size utilities of Kiribati and Nauru.*

In other countries, utilities ration the supply as water production and/or distribution capacities are limited e.g. in Samoa (large), Cook Islands (medium), Solomon Islands (medium).

Figure 2.17: Microbiological Water Quality (Indicator HE2)

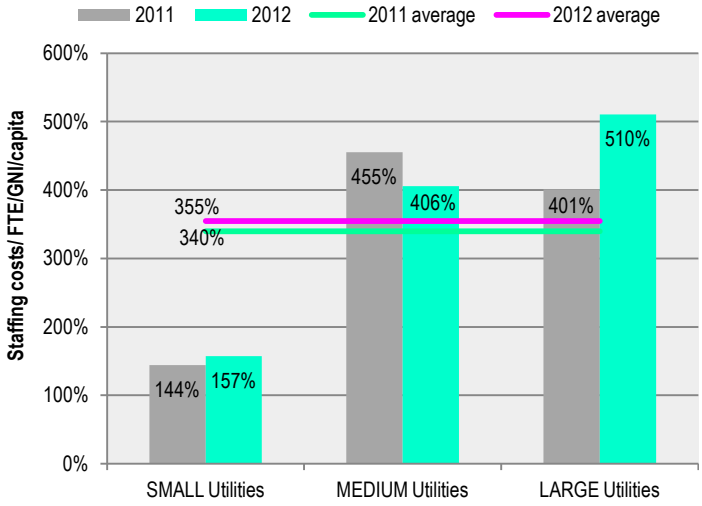


Microbiological Water Quality

A large percentage of the tested samples are still non compliant for the microbiological water quality standards. In 2012, only 86 per cent of the tested samples are compliant, which is more or less unchanged when compared to 2011 results.

***Observation**: Utilities are still underperforming in water quality control. Quite a number of utilities do not test the samples themselves. They rely on the government environmental departments who only monitor incidentally.*

Figure 2.18: Staff Salaries/GNI Ratio (Indicator HR3)



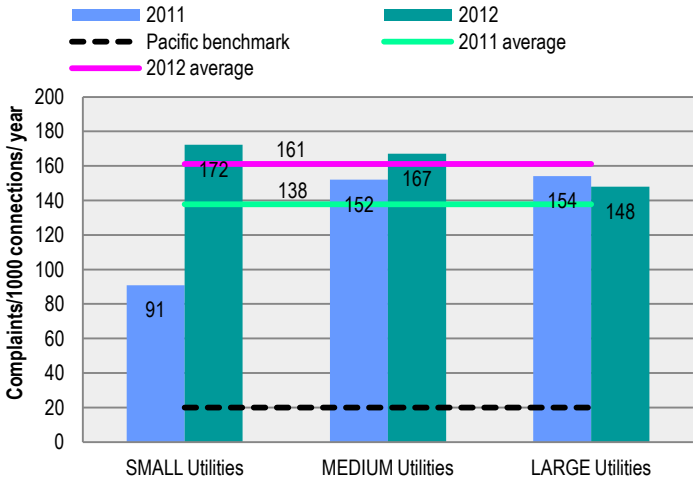
Staff Salaries

Staff salaries compared to Gross national Income (GNI) per capita shows the lowest figures for the small utilities. No significant changes are discernible when compared to 2011 results.

***Observation:** The results show that the ratio of staffing costs as compared to GNI for the large utilities per FTE is almost three times more than for small utilities.*

C. Indicators showing deteriorated performance compared to 2011results

Figure 2.19: Customer Complaints (Indicator CM2)



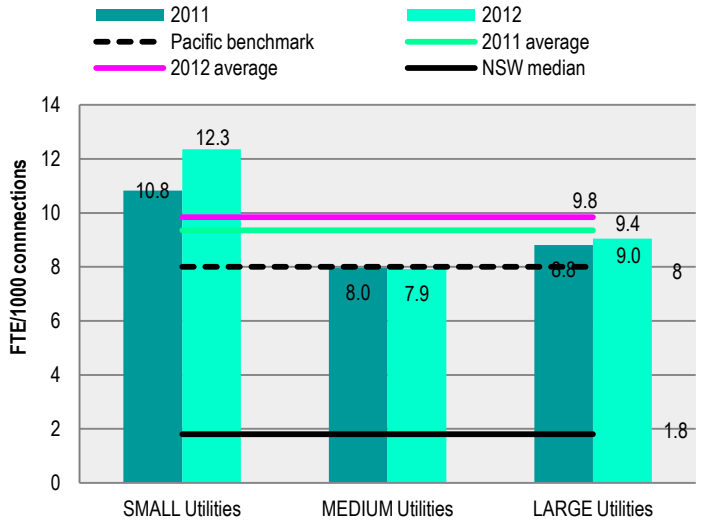
Customer Complaints

The average number of customer complaints increased from 138 per 1000 customers in 2011 to 161 complaints per 1000 customers in 2012.

***Observation**: The increase appears to be partly due to the fact that more utilities report complaints as compared to last year.*

The number of complaints is extremely high and it proves that the majority of the utilities are providing insufficient level of services. The most common complaints relate to continuity of water supply, water quality and billing.

Figure 2.20: Staff Utilisation per 1000 Connections (Indicator HR1)

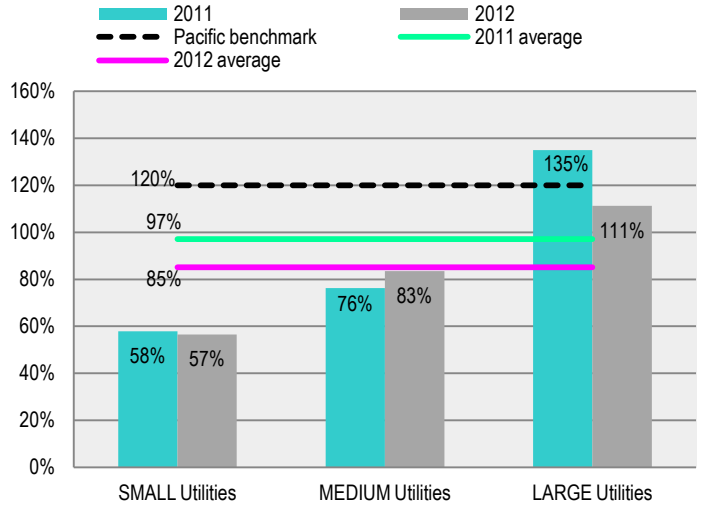


Staff Utilisation

The average staff utilisation ratio slightly deteriorated from 9.4 FTE per 1000 connections in 2011, to 9.8 FTE per 1000 connections. The median for the Australian NSW utilities is only 1.8 staff per 1000 connections. The Pacific Benchmark is set at eights.

***Observation**: Efficiency of staff utilisation is constrained by lack of economies of scale, labour intensive processes and a lack of qualified personnel. The small size utilities in particular face such constraints.*

Figure 2.21: Operating Cost Recovery (Indicator F1)

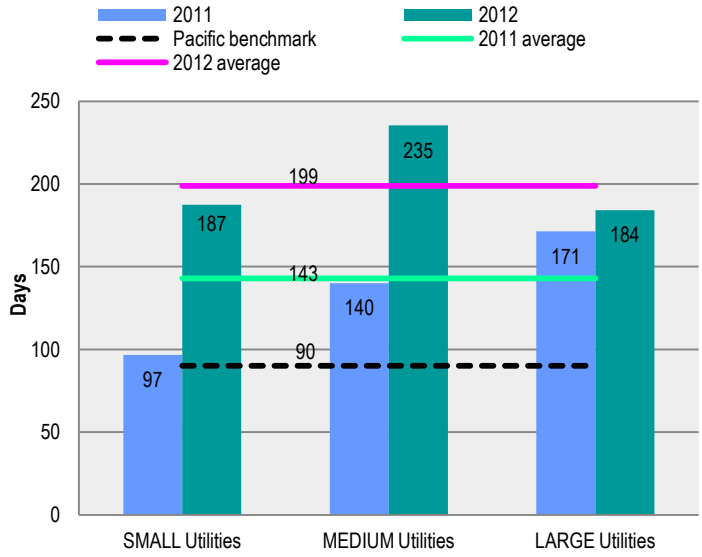


Operating Cost Recovery

The average Operating Cost Recovery ratio (excluding depreciation and operating subsidies) decreased from 97 per cent in 2011, to 85 per cent in 2012.

***Observation:** Generally, the small utilities show very low ratios and are relying on subsidies from their governments and/or development partners. The large utilities score better yet still some depend on operating subsidies. Only seven out of 22 utilities are able to recover their operating costs.*

Figure 2.22: Debtor Days (Indicator F3)



Debtor Days

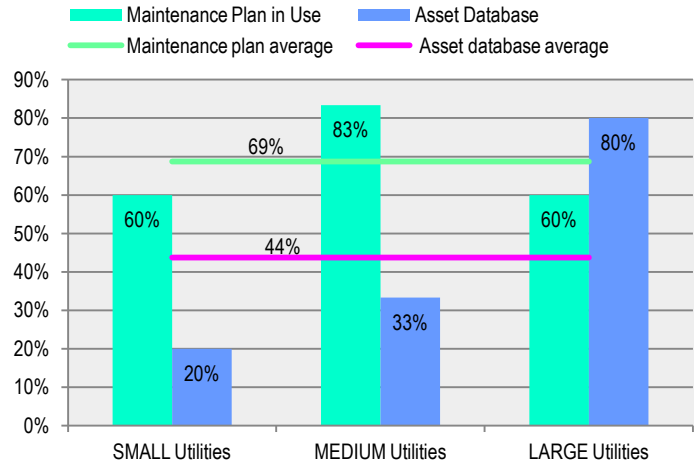
The average number or debtor days for accounts receivable increased significantly, from 143 days in 2011 to 199 days in 2012. This is more than two times the Pacific Benchmark.

***Observation:** The large increase is mainly due to an increase in the number of debtor days of some medium and small utilities and secondly, to the new participating utilities this year.*

MAINTENANCE

Maintenance is generally given little attention in the operations of Pacific utilities. PWWA and its members therefore included a specific topic on maintenance in this year's benchmarking for which an additional set of questions was added to the questionnaire. The observations made are as follows:

Figure 2.23: Maintenance Plan and Asset Database

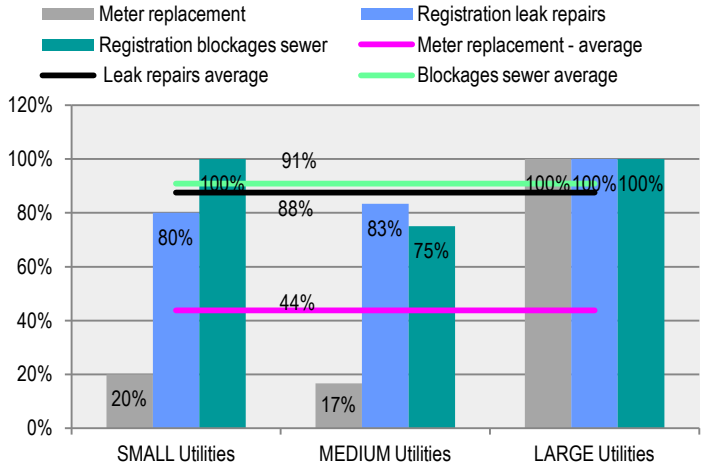


Maintenance Plan and Asset Database

While 69 per cent of the utilities work with a maintenance plan, only 44 per cent of the utilities maintain an asset database.

Observation: *The majority of small and medium utilities perform poorly on asset management. Improvement on maintenance is a prerequisite to develop and sustain the utilities in the future.*

Figure 2.24: Meter Replacement & Failure Registration



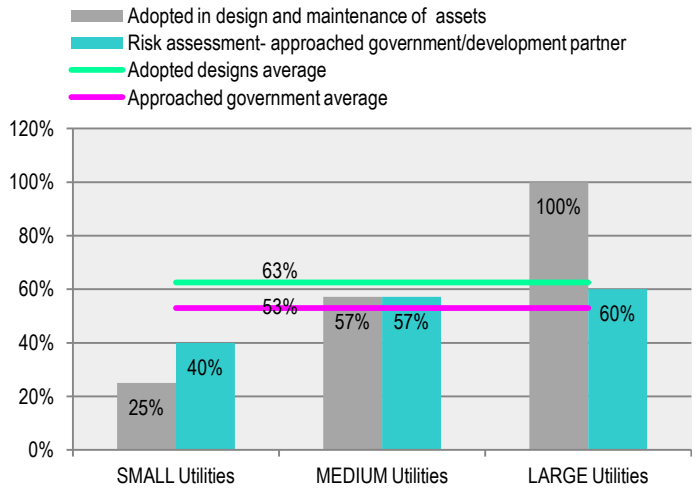
Meter Replacement and Failure Registration

100 per cent of the large utilities are registering leak repairs, blockages in the sewers and undertake a meter replacement program as part of their routine maintenance.

The small and medium utilities reported less positively, particularly on the meter maintenance programs.

Observation: *A substantial number of small and medium utilities do not have the means and facilities to undertake meter maintenance programs.*

Figure 2.25: Climate Change & Natural Disasters



Climate Change and Natural Disasters

Overall, some 63 per cent of the utilities have adopted the risks of climate change and natural disasters in their operations.

Observation: *Most of the small and half of the medium utilities are not well prepared for climate change and natural disasters.*

2.2 OVERALL PERFORMANCE

Using the data collected, an Overall Performance Indicator (OPI) was developed in order to facilitate an overall comparison of the water utilities. The OPI is essentially an average score based on a range of key performance indicators, which is then standardised using the standard normal distribution to create a dataset with a mean of zero and standard deviation of one. Each indicator used for the calculation is given equivalent weighting. This method for calculating and ranking utilities has been used in other similar benchmarking exercises such as the SEAWUN.

For the purpose of calculation of the OPI, the following criteria (same as those adopted in 2011) have been applied for the selection of key performance indicators for inclusion:

OPI Selection Criteria
▪ The ability of utilities to manage that indicator (e.g. volumes have been omitted as there are many variables which influence water production and consumption beyond the utilities control).
▪ The completeness of the dataset for that indicator (i.e. indicators which have been able to be calculated for the majority of utilities have been included).
▪ Ensuring the full range of key result areas are represented in the OPI.
▪ Ensuring that indicators reflect similar services, which has essentially meant removing wastewater services from the calculation.

Compared to last year, four indicators were added (HE2, HE3, HR2 and CM4) and one indicator was excluded (Water Supply Coverage O1), as the data provided by the utilities appeared to be inconsistent. The following key indicators[2] across the key result areas (KRA) have been used to calculate the OPI:

Table 2.2: Key Result Areas Used to Calculate OPI

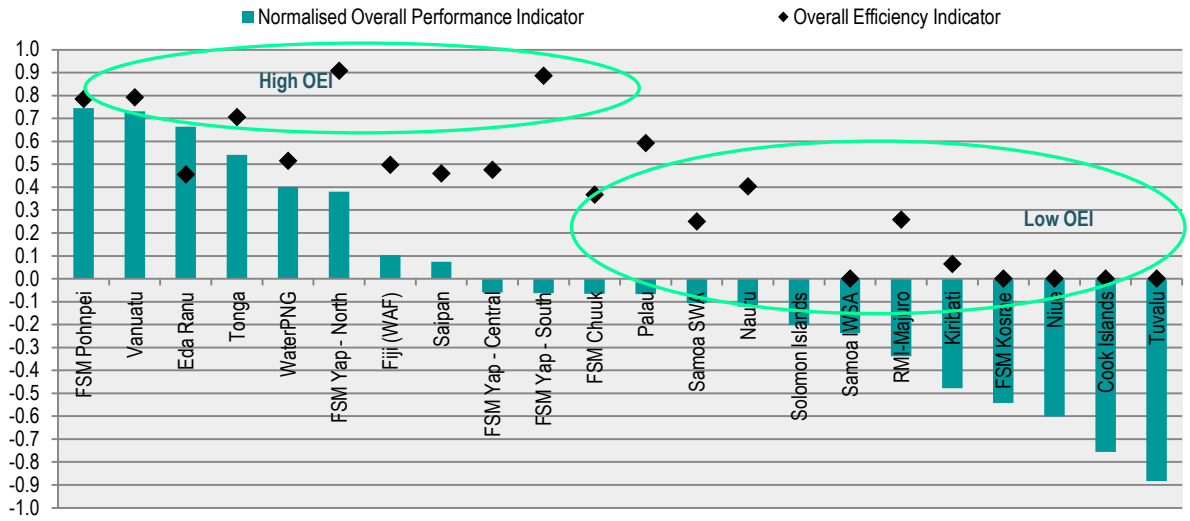
KRA 2 Technical Performance (Operational)	O1 O3	Continuity of water supply service (hours available) Non-Revenue Water (%)
KRA 3 Health and Environment	HE1 HE2 HE3	Drinking Water quality compliance - residual chlorine Drinking Water quality compliance - microbiological % of drinking water treated
KRA 4 Human Resources	HR1 HR2	Water and sewerage business staff/ 1000 connections Training days (no days/year)
KRA 5 Customers Management	CM2 CM4	Meter coverage rate for water supply customers (for all water meters) Customer complaints / 1000 connections
KRA 6 Financial Sustainability	F1 F3	Operating cost recovery ratio (excluding depreciation) Collection ratio - actual cash income versus billed revenue

For each KRA, the normalised scoring of the indicators is compounded to an average score per KRA. The KRA scores are then totalled for all the KRAs.

The normalised OPI results are illustrated in Figure 2.26, which ranks the overall performance of the 22 utilities.

[2] Indicators are provided with a code which refers to the reference indicators as used in the benchmarking tables, e.g. the indicators related to key result area Human Resources are coded with HR1, etc.

Figure 2.26: Overall Performance Indicator (OPI)



Observations on OPI

Based on the collected data, five clear observations can be made:

1 Utilities with a high Overall Efficiency (i.e. based on the Overall Efficiency Indicator, or, OEI) from a revenue perspective are more likely to be in the higher overall performance group (i.e. both financial and technical).

2 Similarly, utilities with good overall performance are more likely to have good revenue recovery.

> "The top five performing utilities are the PUC (FSM Pohnpei), UNELCO (Vanuatu), Eda Ranu (Papua New Guinea), the TWB (Tonga) and WaterPNG (Papua New Guinea)."

3 Those organisations with private sector participation (i.e. private companies or private/government joint companies) clearly perform better in terms of OPI and OEI.

4 It is also clear that utility performance, both OPI and OEI, are related to size, with the large and medium utilities generally performing better than the small utilities.

5 The top five performing utilities are the PUC (FSM Pohnpei), UNELCO (Vanuatu), Eda Ranu (Papua New Guinea), the TWB (Tonga) and WaterPNG (Papua New Guinea).

3

Benchmarking Results

Large Utilities

This chapter presents the benchmarking results for the six participating large utilities. These utilities include:

- Water Authority of Fiji (WAF);
- Commonwealth Utilities Corporation (CUC) (Saipan);
- Samoa Water Authority (SWA);
- Tonga Water Board (TWB);
- Eda Ranu and WaterPNG from Papua New Guinea.

The WAF (Fiji) is by far the largest utility with over 140,000 water connections and 55,000 sewerage connections, while the TWB (Tonga) is the smallest of the group with just over 11,000 water connections and no sewerage connections.

With the exception of Eda Ranu (PNG), the institutional setting of the utilities is based on a model where statutory entities are regulated by the government, with some services outsourced to the private sector. Eda Ranu (PNG) is a state owned enterprise (SOE) operating under commercial law.

Except for the CUC (Saipan), all utilities participated in this year's benchmarking, which makes a comparison possible on performance improvement during the previous year.

Brief country oversights and the main utility characteristics are presented in section 3.1 to help establish the context in which the utilities are operating, while the performance indicator results and observations are presented in sections 3.2 to 3.7.

3.1 CHARACTERISTICS OF THE LARGE UTILITIES

Participating utilities were asked to provide basic details about their characteristics to facilitate the interpretation and comparison of results across performance indicators. Table 3.1 presents the main characteristics of the large utilities.

Table 3.1: Characteristics of the Large Utilities

Utility Characteristics		Units	Eda Ranu (PNG)	WAF (Fiji)	WaterPNG	CUC (Saipan)	SWA (Samoa)	TWB (Tonga)	TOTAL
1	Legal status of the utility		Jointly owned (government and private)	Government statutory organisation	Government statutory organisation	Government statutory organisation	State owned enterprise	State owned enterprise	-
2	Services provided by utility **W**ater/**S**ewerage/**P**ower	W/S/P	W/S	W/S	W/S	W/S/P	W/S	W	-
Water									
3	Number of connections	number	63472	141663	27102	10010	17890	11196	271332
4	Population served	number	500000	520416	241080	50000	122837	61608	1495941
5	Number of schemes	number	1	31	17	15	35	5	104
6	Length of pipe mains (all diameters)	km	1560	3254	630	241	967	165	6817
7	Distribution reticulated yes/no	YES/NO	YES	YES	YES	YES	YES	YES	-
8	Estimated % of houses with a household tank	%	0	20	0	85	10	90	-
9	Water resources constraints during droughts	YES/NO	-	-	-	YES	YES	-	-
10	Volume of water produced	ML/year	55000	111801	26995	12988	23500	4922	235206
11	Drinking water quality guidelines used		WHO/PNG	Fiji standards	WHO & national	SDWA	SNDWS	WHO	-
12	Drinking water safety plan in use	number	n/a	4	No sure	15	2	5	26
13	Laboratory in house by utility	YES/NO	YES	YES	NO	YES	YES	YES	-
14	Number of microbiological samples	number/year	1116	4216	52	978	777	492	7631
15	Number of samples for residual chlorine	number/year	240	4216	720	978	622	444	7220
Sewerage									
16	Number of connections	number	14566	55930	2704	2796	79	N/A	76075
17	Population served	number	123811	223720	35152	32000	120	N/A	414803
18	Number of schemes	number	2	11	6	2	1	N/A	22
19	Length of sewer mains (all diameters)	km	210	520	130	77	6	N/A	943
20	Volume of sewage collected	ML/year	17812	17496	3205	3694	8	N/A	42215
21	Sewage treatment up to primary standard	%	95	100	66	0	100	N/A	-
22	Sewage treatment up to secondary standard	%	88	77	0	0	96	N/A	-
23	Number of effluent samples tested	number	108	174	60	210	46	N/A	598
Operations									
24	Maintenance plan in use	YES/NO	YES	NO	NO	N/A	YES	YES	-
25	Asset database in use	YES/NO	NO	YES	YES	N/A	YES	YES	-
26	Meter replacement programme in use	YES/NO	YES	YES	YES	N/A	YES	YES	-
27	Registration leak repairs in water network	YES/NO	YES	YES	YES	N/A	YES	YES	-
28	Registration of blockages/overflows in sewer	YES/NO	YES	YES	YES	N/A	YES	NO	-
29	Climate change/natural disasters management adopted	YES/NO	YES	YES	YES	N/A	YES	YES	-

Utility Characteristics		Units	Eda Ranu (PNG)	WAF (Fiji)	WaterPNG	CUC (Saipan)	SWA (Samoa)	TWB (Tonga)	TOTAL
Customers									
30	Customer complaints	number/year	1000	50252	112	3650	5770	122	60906
31	Customers - charter specifying service levels and response commitment?	YES/NO	YES	YES	YES	YES	YES	YES	-
32	Most common complaint		Leaks/billings & collections	Billing, metering issues	Water quality	NA	Burst pipes/ leakages	Billing, metering	-
Human Resources									
33	Number of staff (full time equivalent)	number	211	1844	365	131	193	101	2845
34	Technical staff with diploma in engineering or science	number	33	NA	40	0	18	4	95
35	Administrative staff with a higher business qualification	number	36	NA	120	14	9	2	181
Financial									
36	Total operating (recurrent) costs excluding depreciation	US$/year (millions)	25.4	34.8	22.1	12.5	6.2	2.4	103
37	Annual depreciation	US$/year (millions)	1.5	54.1	4.0	4.2	1.4	0.6	66
38	Annual interest on loans	US$/year (millions)	0.7	0.0	0.0	1.3	0.0	0.0	2
39	Total operating revenue excluding subsidies	US$/year (millions)	37.6	14.7	28.4	12.0	6.0	3.8	102
40	Operating subsidies and grants (for operating expenses only)	US$/year (millions)	0.0	21.0	0.0	0.6	2.3	0.0	24
41	Net book value of assets	US$ (millions)	15.0	999.8	110.6	NA	32.7	9.4	1168
42	Average water tariff per kL	US$/kL	1.19	0.22	1.56	1.58	0.70	1.19	-

Table of benchmarking results for large utilities

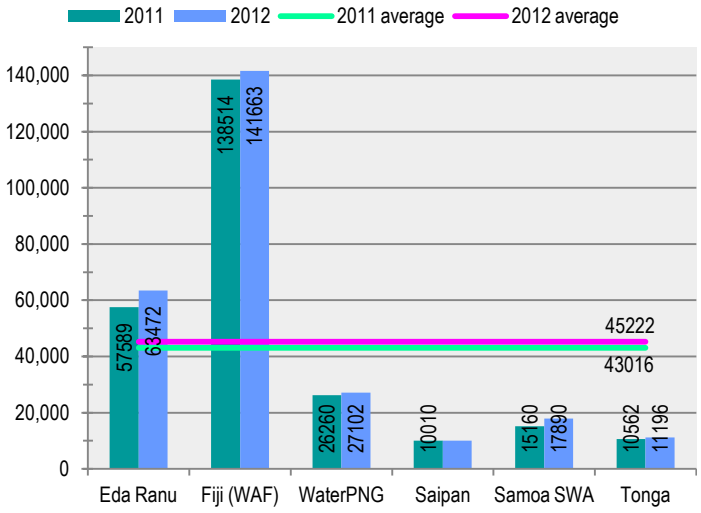
The benchmarking results for large utilities, including the Overall Efficiency Indicator (OEI) are shown in Table 3.2. Each KRA and associated performance indicators are carefully analysed with graphs and observations in the sections that follow.

Table 3.2: Performance Indicators for Large Utilities

No.	Indicator	Units	Eda Ranu (PNG)	WAF (Fiji)	WaterPNG	CUC (Saipan)	SWA (Samoa)	TWB (Tonga)
KRA1 - Production								
V1	Volume of water produced - total produced from sources and treatment	kL/conn/day	2.37	2.16	2.73	3.55	3.60	1.20
V1b	Volume of water produced	L/capita/day	301	589	307	712	524	219
V2	Volume of water sold (i.e. billed) - through meters or estimated unmetered	kL/conn/day	1.08	1.08	1.56	1.86	1.21	0.89
V2b	Volume of water sold (i.e. billed)	L/capita/day	137	294	176	373	176	163
V3	Volume of sewage produced - total	kL/conn/day	3.35	0.86	3.25	3.62	0.26	N/A
V3b	Volume of sewage produced	L/capita/day	394	214	250	316	174	N/A
KRA2 - Technical Performance								
O1	Water supply coverage	% of population	100	87	89	96	77	95
O2	Continuity of water supply service (hours available)	hours/day	24	24	24	21	24	24
O3b	Non-Revenue Water	% of water produced	55	50	43	48	66	26
O3	Non-Revenue Water	kL/conn/day	1.3	1.1	1.2	1.7	2.4	0.3
O3c	Non-Revenue Water	kL/km/day	19.2	17.2	18.3	25.6	16.1	7.7
O4	Sewerage coverage	% of population	88	75	13	62	1	N/A
KRA3 - Health and Environment								
HE1	Drinking water quality compliance - residual chlorine	% compliance	100	95	100	100	58	93
HE1a	Percentage of customers on treated water or % of water treated	% water produced	100	100	93	100	43	74
HE2	Drinking water quality compliance - microbiological	% compliance	100	89	100	99	70	88
HE3	% of sewage produced which is treated to at least primary standard	% of sewage	70	81	100	100	100	N/A
KRA4 - Human Resources								
HR1	Water and sewerage business staff/ 1000 connections	number of FTE/1000 connections	2.7	9.3	12.2	10.2	10.7	9.0
HR2	Training days	days/FTE/year	0.7	0.0	0.5	0.2	6.6	0.8
HR3	Average cost of staff (total labour cost / number of staff/GNI)	%	1126	116	1207	231	250	134
KRA5 - Customer Service								
CM1	Meter coverage rate for water supply customers (for all water meters)	% of customers	100	100	100	100	88	100
CM2	Customer complaints per 1000 connections	number/1000 connections	13	254	4	285	321	11
CM3	Affordability new connection	% of GNI per capita	10.0	4.4	N/A	0.6	2.1	2.4
CM4a	Affordability - average bill	% of GNI per capita	2.2	0.5	4.6	2.0	0.9	1.0
CM4b	Affordability – bill for 6kL/month/connection	% of GNI per capita	0.3	0.1	0.4	0.3	0.0	0.5
KRA6 - Financial Sustainability								
F1	Operating cost recovery ratio (excluding depreciation)	%	148	42	129	96	97	157
F2	Collection ratio - actual cash income vs. billed revenue	%	100	100	90	87	74	9
F3	Accounts receivable	days	114	478	201	46	201	64
OV1	**Overall Efficiency Indicator ((1-NRW)*collection ratio)**	**%**	**45**	**50**	**51**	**46**	**25**	**70**

3.2 TECHNICAL PERFORMANCE

Figure 3.1: Water Connections



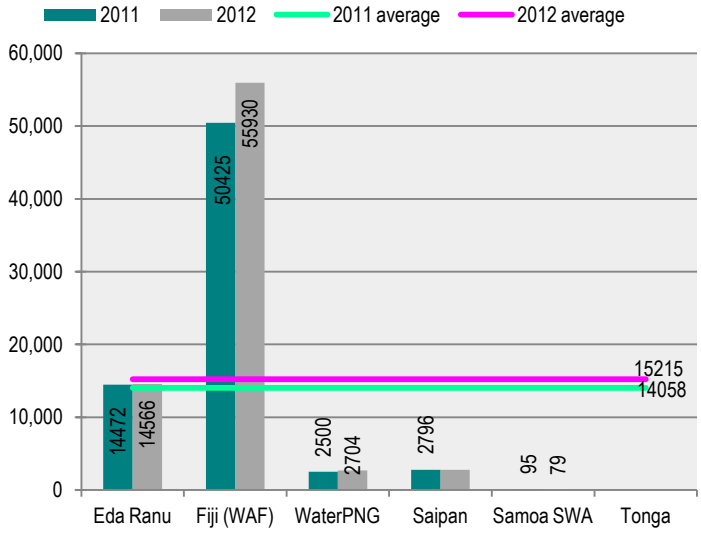
Water Connections

There is a five per cent increase in the number of water connections.

Compared to 2011, the average number of water connections of the six large utilities increased by approximately five per cent.

The total number of connections of the six large utilities increased from 258,095 connections in 2011, to 271,332 connections in 2012.

Figure 3.2: Sewerage Connections

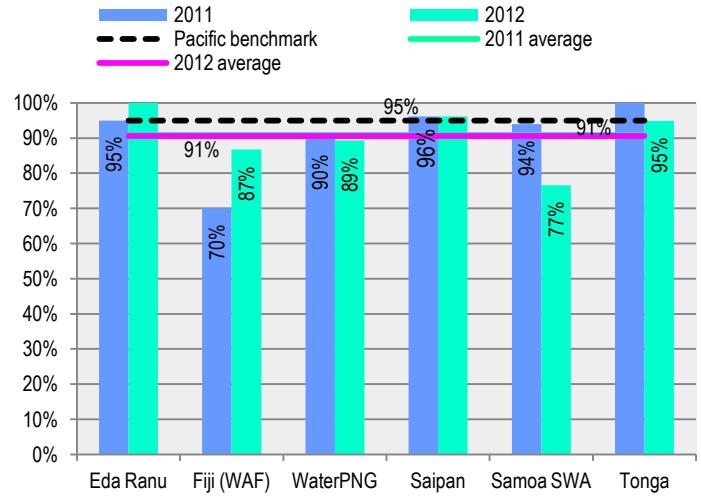


Sewerage Connections

The number of sewerage connections has increased with eight per cent as compared to 2011.

The total number of sewerage connections of the six large utilities increased from 70,288 connections in 2011, to 76,075 connections in 2012. This represents an increase of 8.2% from the 2011 data.

Figure 3.3: Population Coverage - Water Supply (Indicator O1)



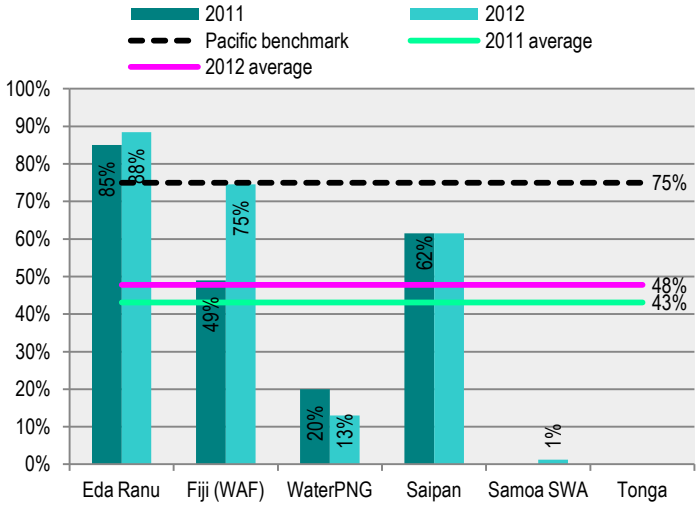
Population Coverage - Water Supply

Water supply coverage is high but limited to the service area of the utility.

The average population coverage for water supply within the service areas remained unchanged from the 2011 data at 91 per cent.

Changes are mostly related to correction of service areas and its corresponding population. For example the decrease of the SWA (Samoa) is due to a revised (higher) population in the service area as compared to last year.

Figure 3.4: Population Coverage – Sewerage (Indicator O4)



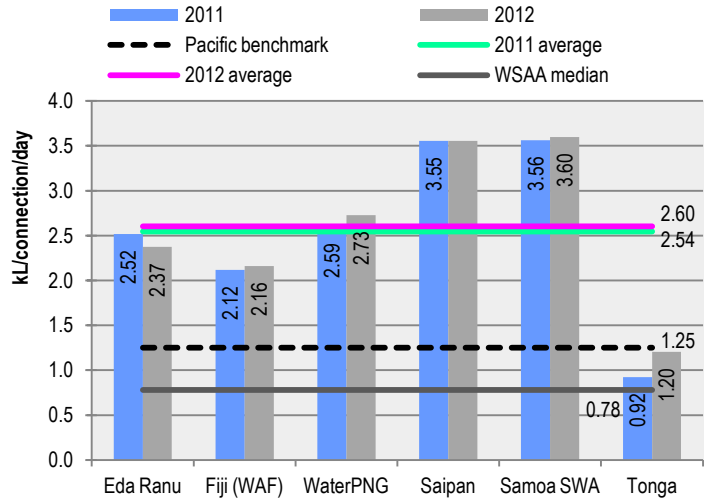
Population Coverage - Sewerage

Sewerage coverage is progressing well in Fiji.

Five out of the six large utilities are managing the collection and treatment of wastewater. The average coverage increased by five per cent, mainly due to a remarkable increase in WAF (Fiji). Only the WAF (Fiji) and Eda Ranu (PNG) are compliant with the Pacific benchmark.

For the past few years, the SWA (Samoa) has operated a very small pilot wastewater treatment system in its capital Apia.

Figure 3.5: Volume of Water Produced (Indicator V1)



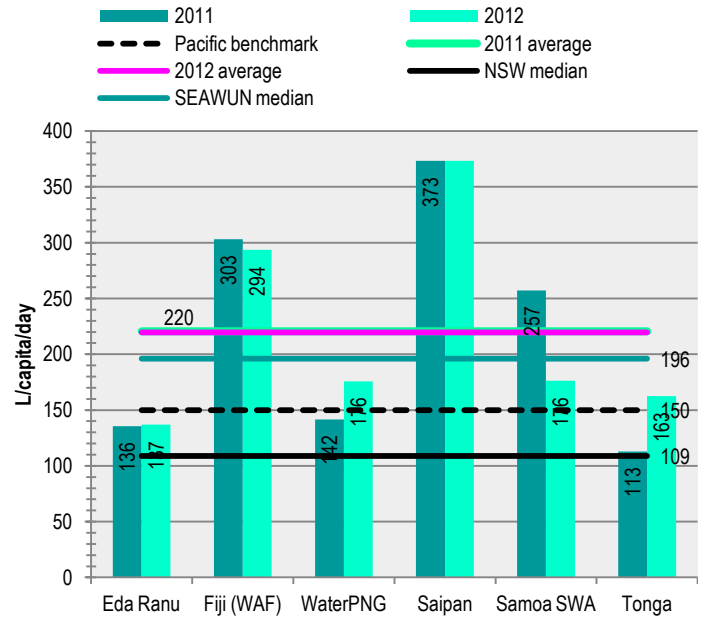
Volume of Water Produced

High volumes of water produced due to high water losses and insufficient demand management.

Water produced per connection remained almost the same as compared to 2011. The figures are still very high when compared to the Pacific and international benchmarks. Notably, the highest producers are the SWA (Samoa) and CUC (Saipan).

Key reasons for the high volumes of water produced, among other things, are (a) the high percentage of water losses; (b) lack of demand management practices such as campaigning, (c) price increases; and (d) metering.

Figure 3.6: Water Billed (L/capita/day) (Indicator V2)



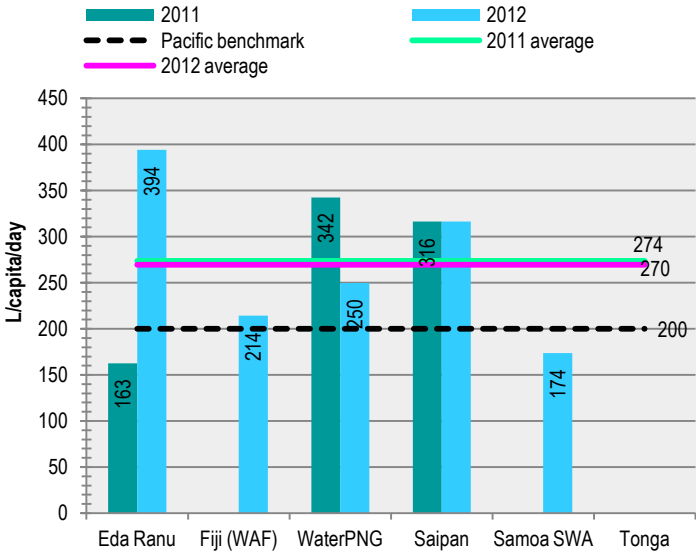
Water Billed

Water billed per capita high in the WAF (Fiji) and CUC (Saipan).

The per capita consumption levels vary between the utilities. The highest consumption figures are reported by the CUC (Saipan) and WAF (Fiji); both utilities well above the Pacific Benchmark of 150 litres per capita per day.

Eda Ranu (PNG), the SWA (Samoa), TWB (Tonga) and WaterPNG are on or just below the Pacific benchmark.

Figure 3.7: Volume of Sewage Collected (Indicator V3b)

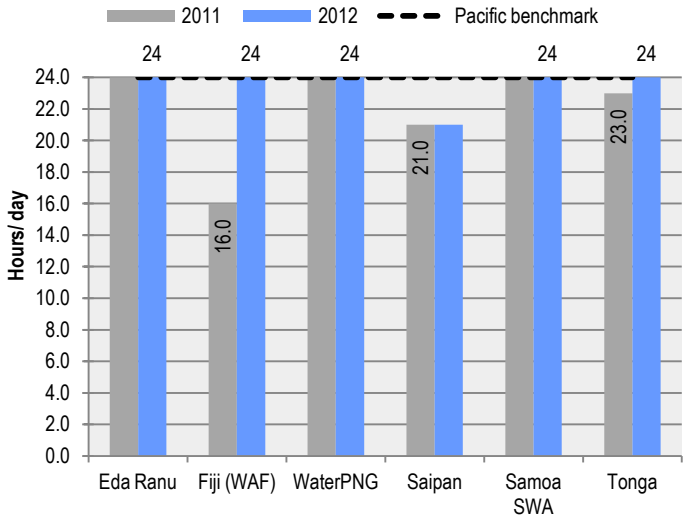


Volume of Sewage Collected

High volumes of collected sewage.

The average volumes of collected sewage remained unchanged at 270 litres per capita per day, still approximately 30 per cent more than the Pacific benchmark.

Figure 3.8: Continuity of Water Supply (Indicator O2)



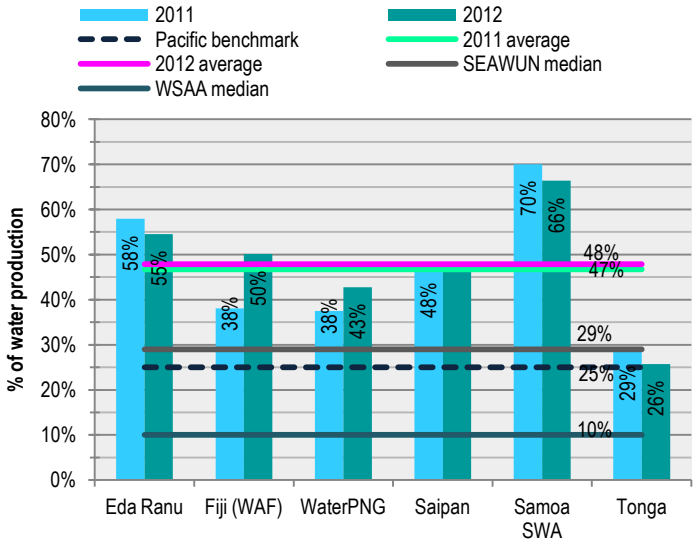
Continuity of Water Supply

Five out of the six utilities operate on a 24/7 basis, but under stress during droughts.

In 2011, the CUC (Saipan) reported intermittent supply while the other five utilities supply water to their customers on a continuous 24/7 basis.

Eda Ranu (PNG) and the SWA (Samoa) reported that they have to ration the supply during periods of severe drought.

Figure 3.9: Non-Revenue Water as % of Production (Indicator O3b)

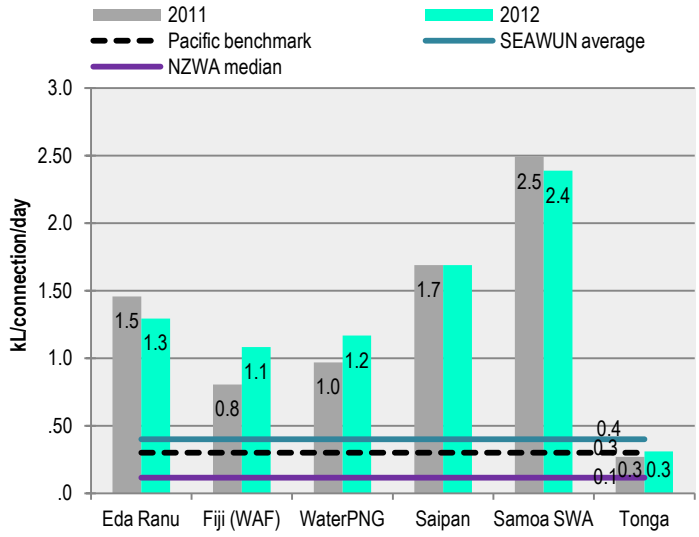


Non-Revenue Water (NRW)

NRW water has improved slightly but remains a concern.

Compared to 2011, Eda Ranu (PNG), the SWA (Samoa) and the TWB (Tonga) improved, while WaterPNG and the WAF (Fiji) deteriorated. Only the TWB (Tonga) meets the Pacific Benchmark of 25 per cent.

Figure 3.10: NRW per connection/day (Indicator O3)



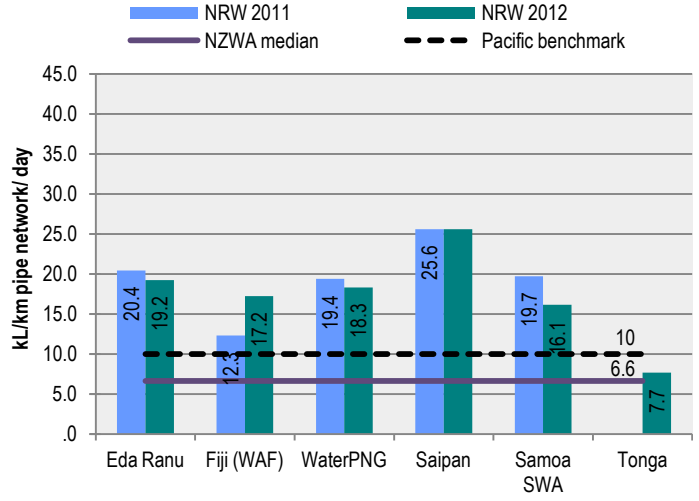
NRW per connection/day

On average, more than 1,200 litres of NRW per connection, per day in the Pacific region.

In order to analyse the NRW on system characteristics, the water losses are also expressed as volume of water losses per connection.

All utilities except for Tonga show very high volumes of Non-Revenue Water per connection, which is much higher as compared to, for example, South East Asia or New Zealand.

Figure 3.11: NRW per km of Main (Indicator O3c)



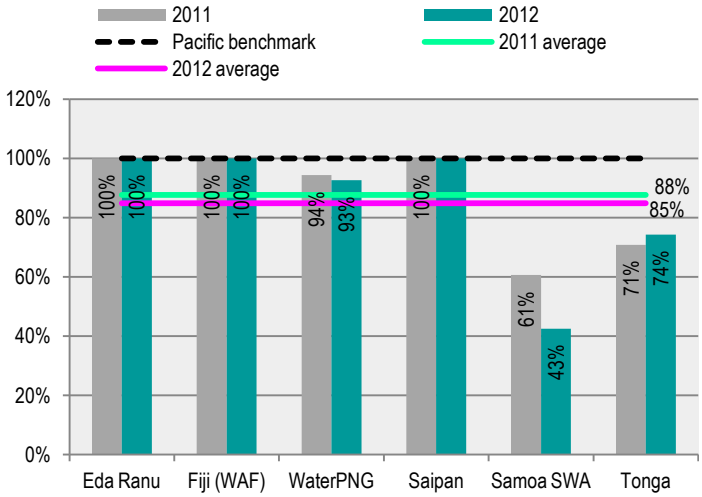
NRW per km of Main

2012 data records more than 10, 000 litres of NRW per day, per km of the pipe network.

NRW can also be expressed per kilometre of pipe network. Similar to the other NRW indicators, only the Tonga Water Board is compliant with the Pacific Benchmark which is set at 10 kL per km pipe length.

3.3 HEALTH AND ENVIRONMENT

Figure 3.12: Treated Water as a % of Water Production (Indicator HE1a)



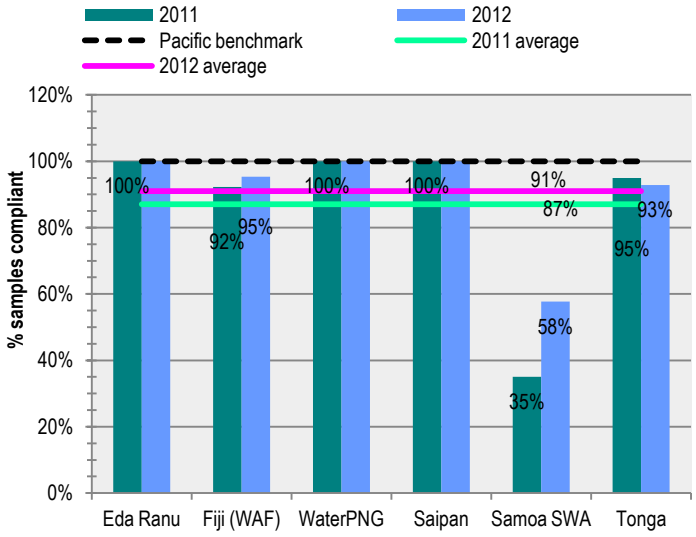
Treated Water

Fifteen per cent of water produced remains untreated.

Eda Ranu (PNG), the WAF (Fiji) and the CUC (Saipan) provide 100 per cent treated water, while the SWA (Samoa), TWB (Tonga) and WaterPNG do not meet the Pacific Benchmark.

The decline experienced last year by the SWA (Samoa) is attributable to a six month delay in chlorine delivery. Reportedly, only a few shipping companies are available to transport of chlorine. For that reason, the TWB (Tonga) has recently started to produce its own chlorine.

Figure 3.13: Drinking Water Quality – Residual Chlorine (Indicator HE1)

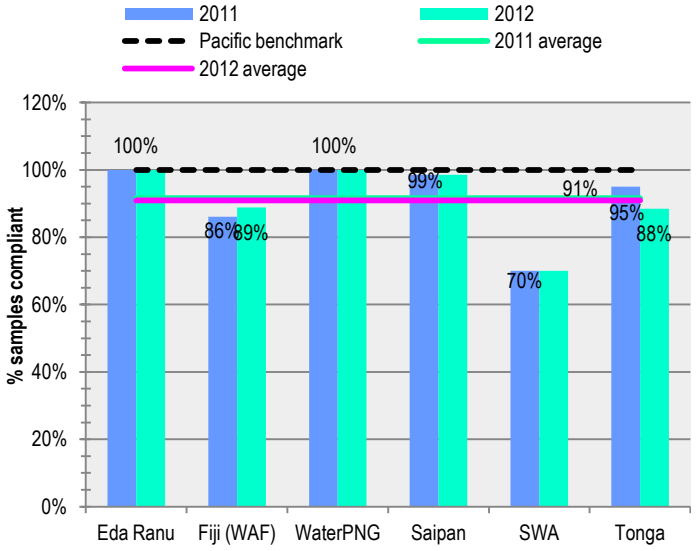


Residual Chlorine

Insufficient residual chlorine makes the quality of drinking water unreliable.

Overall, the compliance of the drinking water quality has improved. Eda Ranu (PNG), WaterPNG, CUC (Saipan - 2011 data) reported 100 per cent compliance for residual chlorine. The WAF (Fiji) (95 per cent) and TWB (Tonga) are approaching the benchmark. Only the SWA (Samoa) is still underperforming, though has improved considerably during last year.

Figure 3.14: Drinking Water Quality – Microbiology (Indicator HE2)

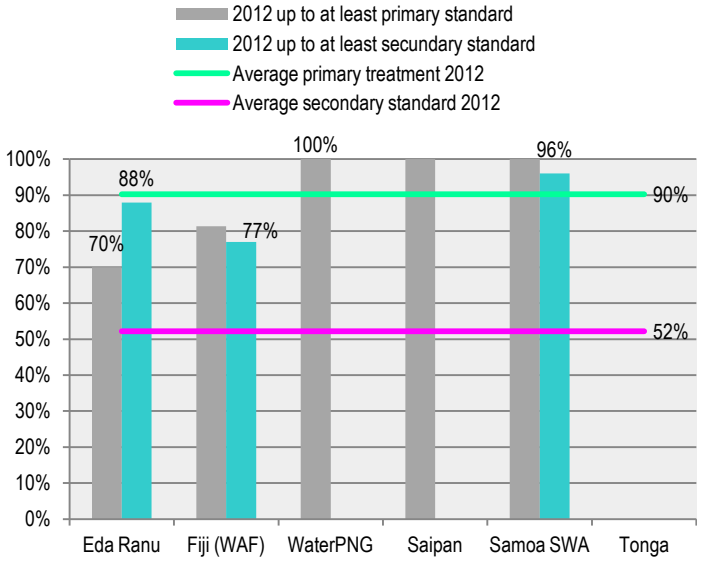


Microbiology

Half of the large utilities are fully compliant with microbiological water quality requirements.

The microbiological quality showed 100 per cent compliance for the tested samples of Eda Ranu (PNG), WaterPNG and the CUC (Saipan), whilst the WAF (Fiji), SWA (Samoa) and TWB (Tonga) still underperform.

Figure 3.15: Sewage Treatment (Indicator HE3)



Sewage Treatment

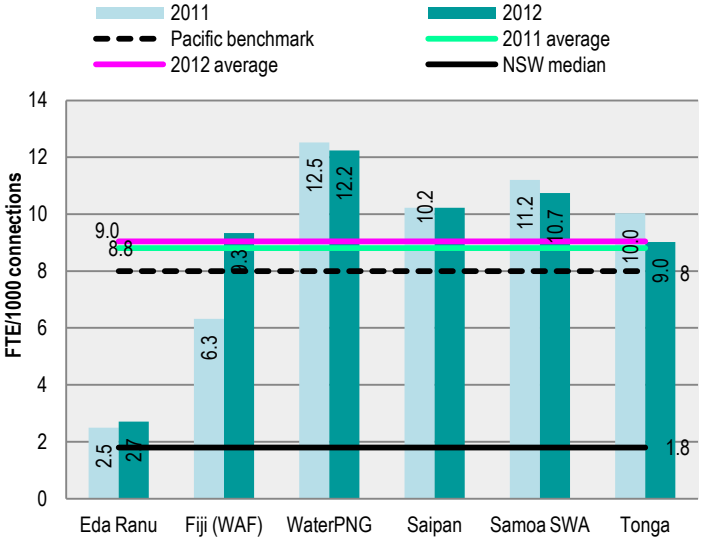
Four out of five large wastewater utilities treat wastewater to at least the primary standard.

Four out of the five large waste water utilities treat wastewater to at least primary standard while at the WAF (Fiji), Eda Ranu (PNG) and the SWA (Samoa), most of the treated water is also compliant to secondary standards.

In Fiji, the upgrading of existing plants is in progress and will bring the standard to an advanced level complying with international standards. The small treatment plant of the SWA (Samoa) is at a high standard, but is only treating a very small percentage of the sewage produced.

3.4 HUMAN RESOURCES DEVELOPMENT

Figure 3.16: Staff per 1000 Connections (Indicator HR1)



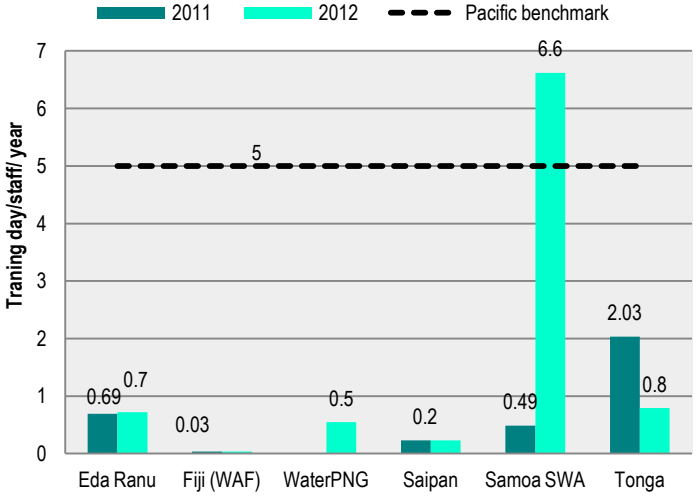
Staff per 1000 Connections

Average staff utilisation ratio stands at 9 FTE per 1000 connections.

The large staff utilisation ratio as reported by the utilities amounts to an average of 9 FTE per thousand connections. It is remarkable that Eda Ranu (PNG) has a very low ratio of 2.7, likely due to its private setting and the level of outsourcing of services.

A remarkable increase is seen at WAF (Fiji).

Figure 3.17: Training Days per Staff per Year (Indicator HR2)

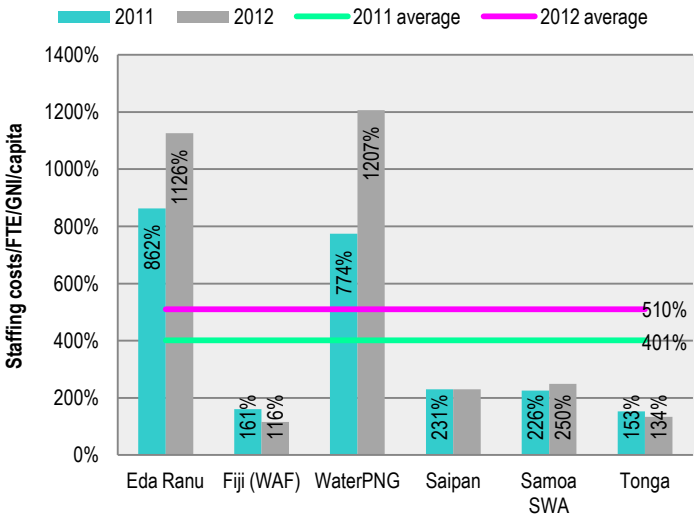


Training Days

Generally, insufficient training is provided to staff.

A common concern in the Pacific Islands is the level of staff qualifications. Most staff capabilities are learned 'on the job'. Little time and budget is allocated to train employees. The results illustrate that, with the exception of the SWA (Samoa), all utilities remain far under the Pacific Benchmark of five staff training days per year.

Figure 3.18: Average Cost of Staff/GNI Ratio (Indicator HR3)



Average staff costs as compared to average GNI

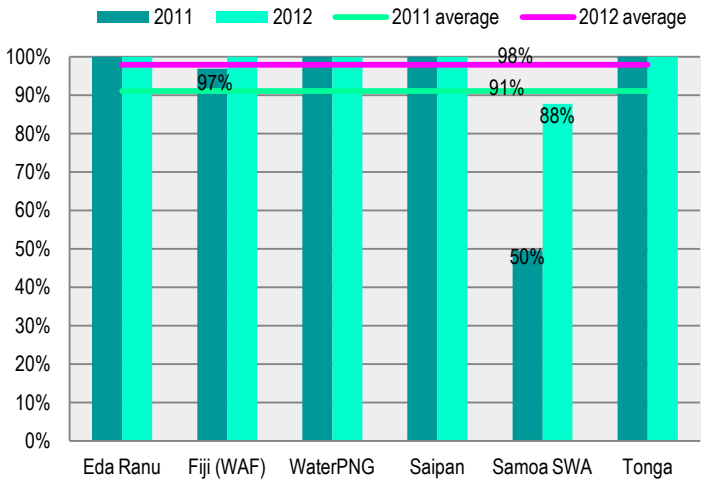
Average Cost of Staff/GNI ratio is the highest for the utilities in Papua New Guinea.

The average staffing costs are compared with the Gross National Income (GNI) per capita and reflect the level of remuneration compared to an indicator of gross per capita income in the country.

The two PNG utilities report that their staff is paid more than 10 times the GNI per capita, while the other utilities are much lower at around 1.5 to 2.5 times the GNI per capita. This also reflects the very low level of GNI in PNG

3.5 CUSTOMER SERVICES

Figure 3.19: Meter Coverage Rate (Indicator CM1)



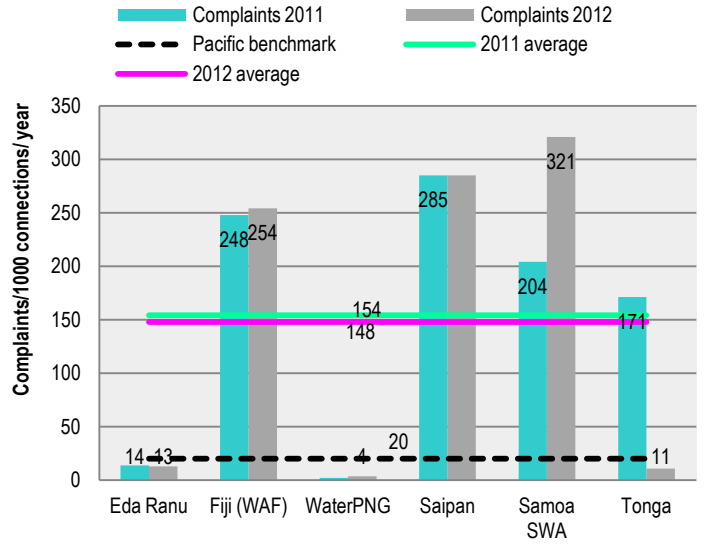
Meter Coverage

Meter coverage has improved but a percentage of water still remains unmetered.

The meter coverage rate increased considerably and has almost reached 100 per cent by all utilities.

The SWA (Samoa) improved significantly from 50 per cent to 88 per cent.

Figure 3.20: Customer Complaints per 1000 Connections (Indicator CM2)



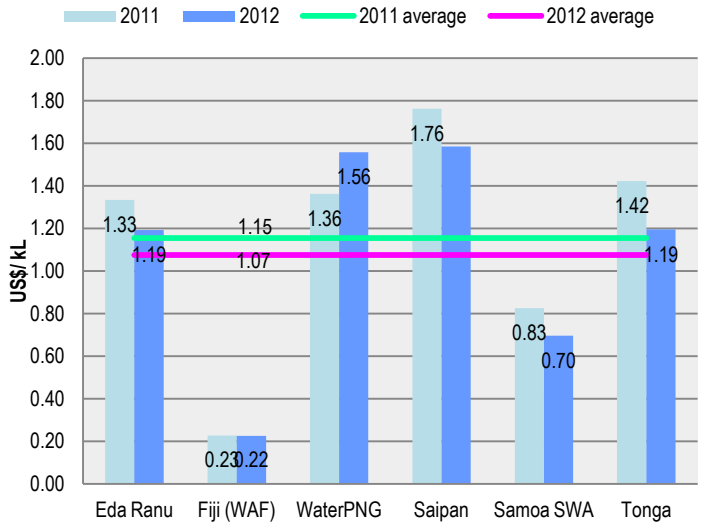
Customer Complaints

Customer complaints are very high.

The number of complaints per 1000 connections is very high in the SWA (Samoa), WAF (Fiji) and CUC (Saipan) (2011) when compared to the other large utilities.

Additionally, not all utilities are keeping record of complaints received. For example WaterPNG reported only the results of a customer survey.

Figure 3.21: Average Revenues per kL



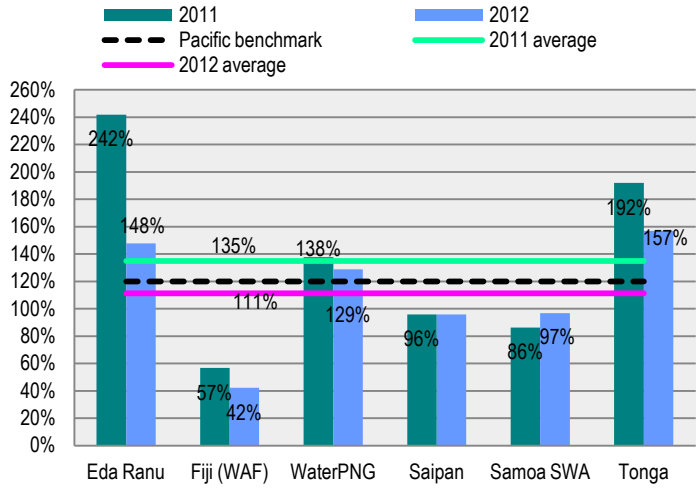
Average Revenues

There are many variations in revenue per kL.

The highest average revenue per kL is reported by WaterPNG. Very low tariffs are applied by the WAF (Fiji). Though PWWA has not defined a Pacific Benchmark, an amount in the range of US$1.00/kL to US$1.50/kL in most cases would be sufficient to recover the cost.

3.6 FINANCIAL PERFORMANCE

Figure 3.22: Operating Cost Recovery Ratio (Indicator F1)
(excluding depreciation)



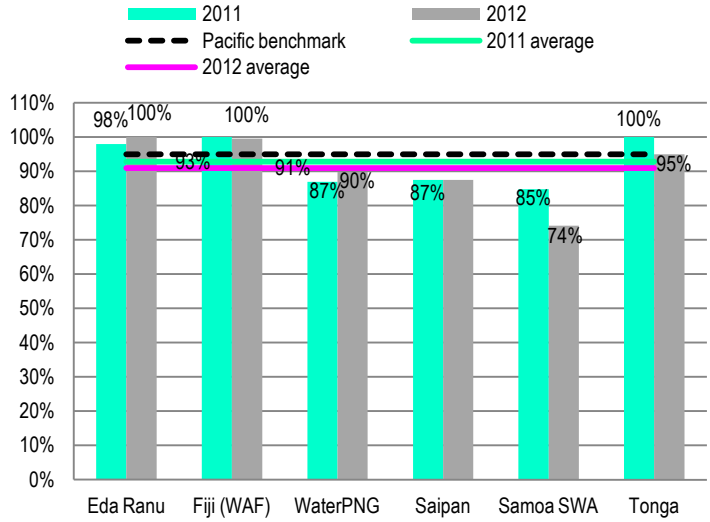
Operating Cost Recovery Ratio (OCR)

Three out of six utilities operate on a positive operating cost recovery ratio.

The overall average OCR declined from 135 per cent in 2011 to 111 per cent in 2012.

Only Eda Ranu (PNG), WaterPNG and the TWB (Tonga) operate on a positive operating cost recovery ratio. The WAF (Fiji), CUC (Saipan) and SWA (Samoa) still depend on government subsidies.

Figure 3.23: Collection Ratio – Actual Income vs. Billed Revenue (Indicator F2)



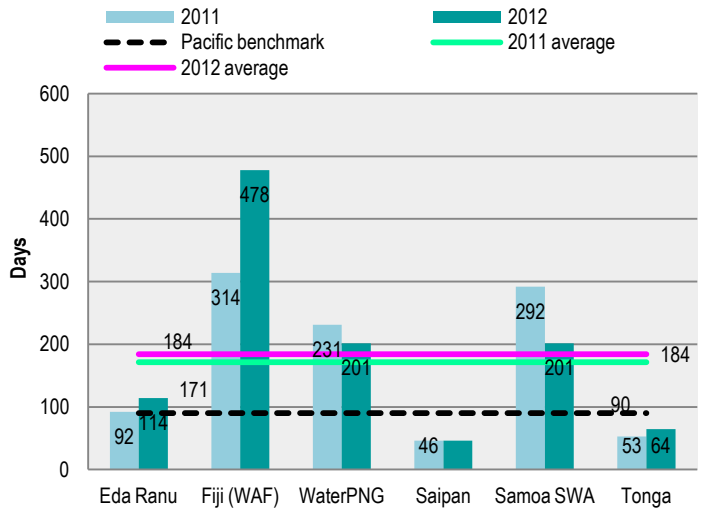
Collection Ratio

The collection ratio is high for Eda Ranu (PNG), the WAF (Fiji) and TWB (Tonga).

The average collection ratio declined from 93 per cent in 2011 to 91 per cent in 2012. A slight decrease of the average is discernible here.

Eda Ranu (PNG), the WAF (Fiji) and TWB (Tonga) are on or above the benchmark of 95 per cent, while WaterPNG (90 per cent), the CUC (Saipan - 87 per cent) and SWA (Samoa - 74 per cent) are below target.

Figure 3.24: Debtor Days (Indicator F3)



Debtor Days

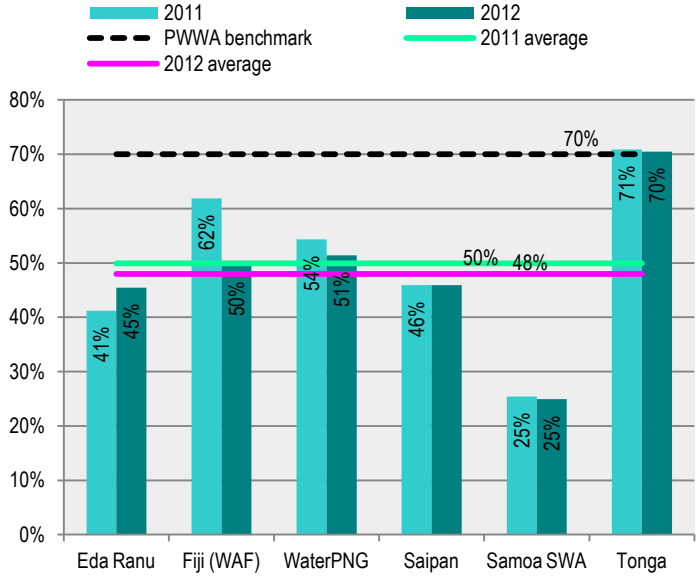
Accounts receivable vary among the utilities.

The average number of debtor days increased from 171 days in 2011 to 184 days in 2012.

The WAF (Fiji) reports the highest figure of 478 days and the lowest are reported by the TWB (Tonga - 64 days) and CUC (Saipan - 46 days).

3.7 OVERALL PERFORMANCE OF THE LARGE UTILITIES

Figure 3.25: Overall Efficiency Indicator (OEI)



Overall Efficiency Indicator

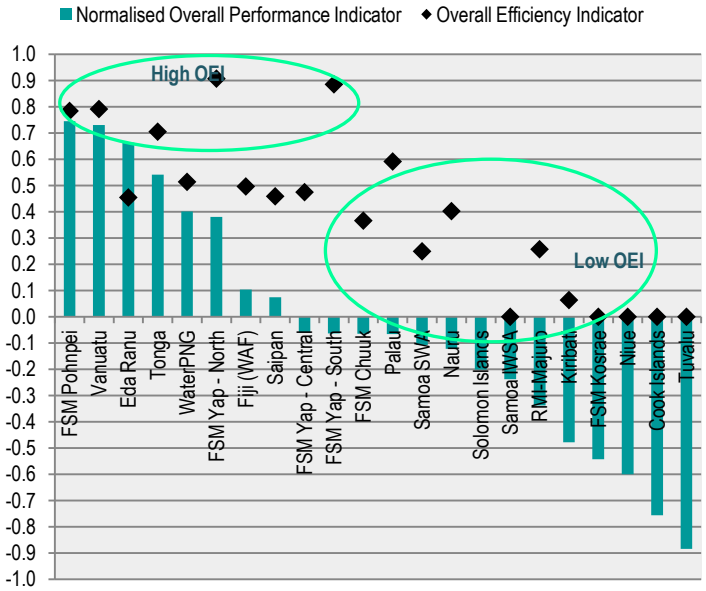
Overall efficiency increased.

The overall efficiency indicator (OEI) is essentially an overall indicator of financial performance based on the following calculation:

$$OEI = (1 - NRW)x\ Collection\ ratio.$$

This is an attempt to determine financial and billing efficiency by comparing the volume of water for which the utility collects revenue and the total volume it produces. Almost all utilities remained at the same efficiency level, except the WAF (Fiji) which decreased considerably, mostly caused by an increasing level of Non-Revenue Water. Only Eda Ranu (PNG) improved its overall efficiency indicator since last year.

Figure 3.26: Overall Performance Indicator (OPI) Normalised



Overall Performance

Overall performance of key combined indicators show Eda Ranu (PNG) has the best performance.

The OPI results show that Eda Ranu (PNG) has the best overall performance of the large utilities.

4

Benchmarking Results

Medium Utilities

This chapter presents the benchmarking results for the eight participating medium utilities, including:

- UNELCO of Vanuatu;
- Pohnpei Public Utilities Corporation (PUC) of FSM Pohnpei;
- Public Utilities Board (PUB) of Kiribati;
- the Solomon Islands Water Authority (SIWA) of Solomon Islands;
- the Nauru Utilities Corporation (NUC) of Nauru;
- Independent Water Schemes Association (IWSA) of Samoa;
- the Ministry of Infrastructure and Planning of the Cook Islands; and
- the Bureau of Public Works in Palau.

The SIWA (Solomon Islands) is the largest utility in this group with over 8,000 water connections and 6,800 sewerage connections, while the Cook Islands utility is the smallest with just over 2,000 water connections and no sewerage connections.

The IWSA (Samoa) is a newcomer in this year's benchmarking study. The other eight utilities also participated in last year's benchmarking which makes a comparison possible on performance improvement during the past year.

The institutional setting differs per utility. Palau and the Cook Islands operate as a government ministerial department while UNELCO (Vanuatu) is a 100 per cent privately operated utility. The IWSA (Samoa) is community-owned.

Each utility has unique characteristics such as size, the way it is legally operated, the supply area and the availability of water resources; and also some country characteristics such as economy, demography, geography, and topography.

Section 4.1 presents the main utility characteristics, and the performance indicators and observations follow in sections 4.2 to 4.7.

4.1 CHARACTERISTICS OF THE MEDIUM UTILITIES

Table 4.1 shows the main characteristics of the medium utilities. As with the chapter on large utilities, these details assist with the interpretation and comparison of performance indicators.

Table 4.1: Characteristics of the Medium Utilities

	Utility Characteristics	Units	Cook Islands	PUC (FSM Pohnpei)	PUB (Kiribati)	NUC (Nauru)	Palau	IWSA (Samoa)	SIWA (Solomon Islands)	UNELCO (Vanuatu)	TOTAL
1	Legal status of the utility		Government department	Not-for-profit organisation	Government statutory organisation	State owned enterprise	Government department	Community owned	State owned enterprise	Privately owned company	-
2	Services provided by the utility **W**ater/**S**ewerage/ **P**ower	W/S/P	W/S	W/S	W/S	W/S/P	W/S	W	W/S	W	-
Water											
3	Number of connections	number	2100	3521	4838	2688	4439	3708	8568	7083	36945
4	Population served	number	8400	15715	31374	10752	17990	29293	64323	30112	207959
5	Number of schemes	number	1	3	1	1	19	32	4	1	62
6	Length pipe mains (all diameters)	km	90	79	139	10	152	0	152	218	840
7	Distribution reticulated	YES/NO	YES	YES	YES	YES	YES	YES	YES	YES	-
8	Estimated % of houses with household tank	%	0	5	0	90	20	5	0	-	-
9	Water resource constraints during droughts	YES/NO	YES	NO	YES	YES	YES	YES	NO	NO	-
10	Volume water produced	ML/year	5000	2190	708	32	4974	0	9535	4268	26707
11	Drinking water quality guidelines used		WHO/NZ	USEPA	WHO	Australian	USEPA	Samoa standards	WHO	WHO standard	-
12	Drinking water safety plan in use	number	0	3	0	None	1	4	None	1	9
13	Laboratory in house by utility	YES/NO	YES	NO	NO	NO	NO	NO	YES	NO	-
14	Number of microbiological samples	number/year	0	1000	0	0	374	50	260	2633	4317
15	Number of samples for residual chlorine	number/year	0	14300	72	-	2638	-	1825	1002	19837
Sewerage											
16	Number of connections	number	250	1251	1912	-	2047	-	983	-	6443
17	Population served	number	1000	6255	13384	-	10235	-	6881	-	37755
18	Number of schemes	number	1	3	3	-	2	-	1	-	10
19	Length of sewer mains (all diameters)	km	2	19	27	-	53	-	36	-	137

	Utility Characteristics	Units	Cook Islands	PUC (FSM Pohnpei)	PUB (Kiribati)	NUC (Nauru)	Palau	IWSA (Samoa)	SIWA (Solomon Islands)	UNELCO (Vanuatu)	TOTAL
20	Volume sewage collected	ML/year	37	876	0	-	3178	-	684	-	4774
21	Sewage treatment up to primary standard	%	0	N/A	N/A	-	0	-	N/A	-	-
22	Sewage treatment up to secondary standard	%	0	N/A	0	-	0	-	N/A	-	-
23	Number of effluent samples tested	number	0	N/A	N/A	-	31	-	N/A	-	31
Operations											
24	Maintenance plan in use	YES/NO	YES	YES	YES	NO	NO	NO	YES	YES	-
25	Asset database in use	YES/NO	YES	NO	NO	NO	NO	NO	NO	YES	-
26	Meter replacement programme in use	YES/NO	YES	YES	YES	NO	NO	NO	YES	YES	-
27	Registration of leak repairs in water network	YES/NO	YES	YES	YES	NO	NO	NO	YES	YES	-
28	Registration of blockages/overflows in sewer	YES/NO	NO	YES	YES	NO	NO	NO	YES	NO	-
29	Climate change/natural disasters adopted	YES/NO	YES	YES	YES	NO	NO	YES	NO	NO	-
Customers											
30	Customer complaints	number/year	1090	151	1701	120	NO	N/A	1900	81	5043
31	Customers - charter specifying service levels and response commitment?	YES/NO	YES	YES	NO	NO	NO	NO	NO	NO	-
32	Most common complaint		Leaks	Low pressure	Leaks	Water delivery	-	N/A	-	Bills and leaks	-
Human Resources											
33	Number of staff-full time equivalent	number	13	30	42	21	105	31	101	16	359
34	Technical staff with diploma in engineering or science	number	1	5	1	1	0	0	2	1	11
35	Administrative staff with a higher business qualification	number	0	1	0	0	0	5	11	1	18

	Utility Characteristics	Units	Cook Islands	PUC (FSM Pohnpei)	PUB (Kiribati)	NUC (Nauru)	Palau	IWSA (Samoa)	SIWA (Solomon Islands)	UNELCO (Vanuatu)	TOTAL
Financial											
36	Total operating (recurrent) costs excluding depreciation	US$/yr (millions)	0.24	0.53	1.14	0.71	4.17	0.15	4.21	2.40	13.56
37	Annual depreciation	US$/yr (millions)	0.01	0.65	0.60	0.00	2.00	0.00	0.44	0.80	4.50
38	Annual Interest on loans	US$/yr (millions)	0.00	0.02	0.09	0.00	0.00	0.00	0.00	0.02	0.12
39	Total operating revenue excluding subsidies	US$/yr (millions)	0.01	1.20	0.78	0.06	1.71	0.15	3.31	3.40	10.62
40	Subsidies and grants (for operating expenses only)	US$/yr (millions)	0.20	0.02	0.49	0.65	2.46	0.06	0.00	0.00	3.88
41	Net book value of assets	US$ (millions)	0.33	10.83	8.11	N/A	N/A	0.00	1.76	32.99	54
42	Average water tariff per kL	US$/kL	0.00	0.69	4.10	2.76	0.40	0.00	0.52	0.96	-

Table of benchmarking results for medium utilities

The benchmarking results for medium utilities, including the Overall Efficiency Indicator (OEI) are shown in Table 4.2.

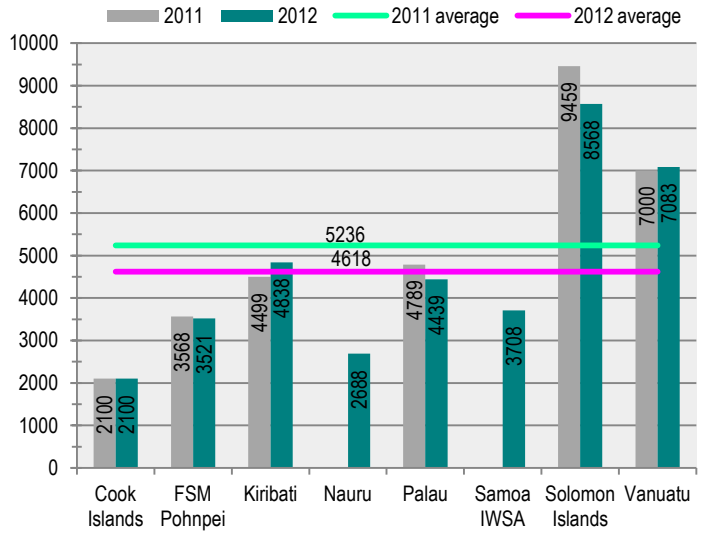
Table 4.2: Performance Indicators for Medium Utilities

No.	Indicator	Units	PWWA benchmark	Average (2012)	Median (2012)	Cook Islands	PUC (FSM Pohnpei)	PUB (Kiribati)	NUC (Nauru)	Palau	IWSA (Samoa)	SIWA (Solomon Islands)	UNELCO (Vanuatu)
KRA1 - Production													
V1	Volume of water produced - total produced from sources and treatment	kL/conn/day	**1.25**	**2.35**	**1.70**	6.52	1.70	0.40	0.03	3.07	N/A	3.05	1.65
V1b	Volume of water produced	L/capita/day	**250**	**519**	**388**	1631	382	62	8	757	N/A	406	388
V2	Volume of water sold (i.e. billed) - through meters or estimated unmetered	kL/conn/day	**1.00**	**0.99**	**1.32**	N/A	1.34	0.10	0.02	1.82	N/A	1.37	1.30
V2b	Volume of water sold (i.e. billed)	L/capita/day	**150**	**180**	**183**	0	301	16	4	448	N/A	183	306
V3	Volume of sewage produced - total	kL/conn/day	**0.75**	**1.70**	**1.91**	0.40	1.92	0.00	N/A	4.25	N/A	1.91	N/A
V3b	Volume of sewage produced	L/capita/day	**200**	**402**	**328**	100	384	N/A	N/A	851	N/A	272	N/A

No.	Indicator	Units	PWWA benchmark	Average (2012)	Median (2012)	Cook Islands	PUC (FSM Pohnpei)	PUB (Kiribati)	NUC (Nauru)	Palau	IWSA (Samoa)	SIWA (Solomon Islands)	UNELCO (Vanuatu)
KRA2 - Technical Performance													
O1	Water supply coverage	% of population	**95**	**82**	**82**	82	70	62	N/A	95	99	100	68
O2	Continuity of water supply service (hours available)	hours/day	**24**	**16.6**	**22.00**	24.0	24.0	2.0	1.0	24.0	20.0	14.0	24.0
O3b	Non-Revenue Water	% of water produced	**25**	**51**	**48**	100	21	75	48	41	N/A	55	21
O3	Non-Revenue Water	kL/conn/day	**0.3**	**1.5**	**0.4**	6.5	0.4	0.3	0.0	1.3	N/A	1.7	0.3
O3c	Non-Revenue Water	kL/km/day	**-**	**10.5**	**5.0**	NA	5.83	3.81	1.52	13.37	N/A	34.50	4.15
O4	Sewerage coverage	% of population	**80**	**41**	**49**	49	28	55	N/A	54	N/A	20	N/A
KRA3 - Health and Environment													
HE1	Drinking Water quality compliance - residual chlorine	% compliance	**100**	**71**	**83**	N/A	98	75	N/A	86	0	80	86
	Percentage of customers on treated water or % of water treated	% water produced	**100**	**76**	**89**	50	91	100	88	100	0	79	100
HE2	Drinking Water quality compliance - microbiological	% compliance	**100**	**82**	**82**	50	98	N/A	N/A	82	N/A	80	99
HE3	% of sewage produced which is treated to at least primary standard	% of sewage	**100**	**50**	**50**	N/A	100	0	N/A	100	N/A	0	N/A
KRA4 - Human Resources													
HR1	Water and sewerage business staff per 1000 connections	number of FTE/1000 connections	**8.0**	**7.9**	**7.1**	5.5	6.3	6.2	7.9	16.2	8.4	10.6	2.3
HR2	Training days	days/FTE/year	**5.0**	**1.0**	**0.9**	1.5	0.3	-	1.7	1.2	-	0.7	0.4
HR3	Average cost of staff (total labour cost / number of staff/GNI)	%	**-**	**406**	**392**	111	392	235	N/A	N/A	N/A	552	738
KRA5 - Customer Service													
CM1	Meter coverage rate for water supply customers (for all water meters)	% of customers	**100**	**47**	**49**	0	100	2	N/A	77	0	49	100
CM2	Customer complaints per 1000 connections	number/1000 conn	**20**	**167**	**122**	464	32	252	45	N/A	N/A	199	11
CM3	Affordability new connection	% GNI per person	**-**	**2.1**	**0.7**	0.2	0.7	0.6	N/A	0.1	N/A	5.1	5.9
CM4a	Affordability - average bill	% GNI per person	**-**	**2.4**	**0.7**	0.0	2.1	0.7	0.1	0.7	N/A	2.8	10.7
CM4b	Affordability - 6kL/month/connection	% GNI per person	**-**	**0.4**	**0.4**	N/A	0.4	0.5	0.1	0.8	N/A	0.3	0.3
KRA6 - Financial Sustainability													
F1	Operating cost recovery ratio (excluding depreciation)	%	**120**	**83**	**73**	5	225	68	9	41	100	79	141
F2	Collection ratio - actual cash income vs. billed revenue	%	**95**	**81**	**91**	N/A	99	25	77	100	N/A	83	100
F3	Accounts receivable	days	**90**	**235**	**261**	N/A	365	N/A	N/A	14	N/A	405	157
OV1	**Overall Efficiency Indicator ((1-NRW)*collection ratio)**	**%**	**70**	**50**	**50**	N/A	**78**	**6**	**40**	**59**	N/A	**37**	**79**

4.2 TECHNICAL PERFORMANCE

Figure 4.1: Water Connections



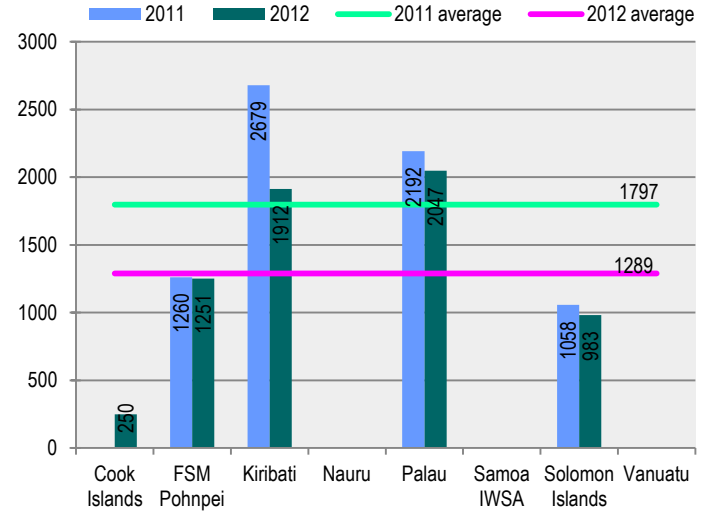
Water Connections

The number of water connections has increased with about five percent.

Compared to 2011, the number of water connections of the eight medium utilities increased on average by about five percent.

The total number of water connections of all eight utilities increased to 36,945 connections, mainly due to the additional connections of the NUC (Nauru) and IWSA (Samoa) which were not included in last year's benchmarking. Notably, the number of connections of the SIWA (Solomon Islands) decreased by almost 900.

Figure 4.2: Sewerage Connections

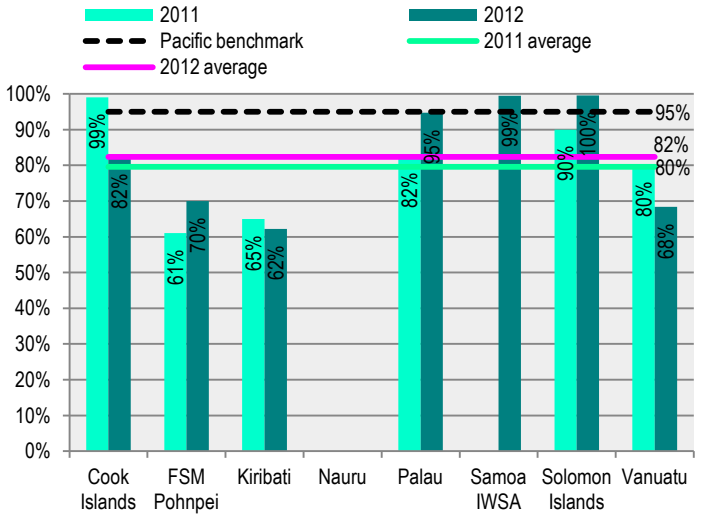


Sewerage Connections

The number of sewer connections decreased because of adjusted figures in Kiribati.

The total number of sewer connections decreased from 7,189 in 2011, to 6,443 connections in 2012. This decrease is mainly caused by a re-assessment of the data accuracy of the PUB (Kiribati), where a recent field survey among customers revealed a lower number of connections than what was reported in 2011.

Figure 4.3: Population Coverage - Water Supply (Indicator O1)



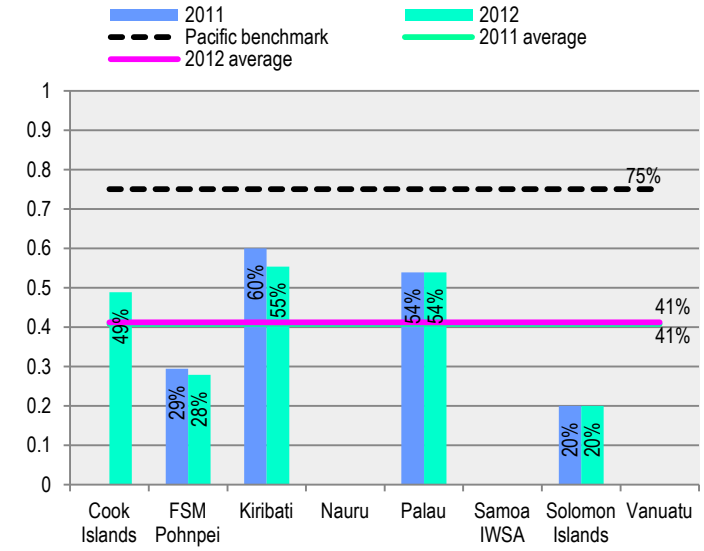
Population Coverage - Water Supply

Water supply coverage high but limited to the service area of the utility.

The population coverage for water supply within the service areas varies from 62 per cent in the PUB (Kiribati), to almost 100 per cent in the SIWA (Solomon Islands) and IWSA (Samoa).

A remarkable decrease in coverage is reported by UNELCO (Vanuatu). The decrease is due to a re-assessment of population size and occupancy rates in the service area.

Figure 4.4: Population Coverage – Sewerage (Indicator O4)



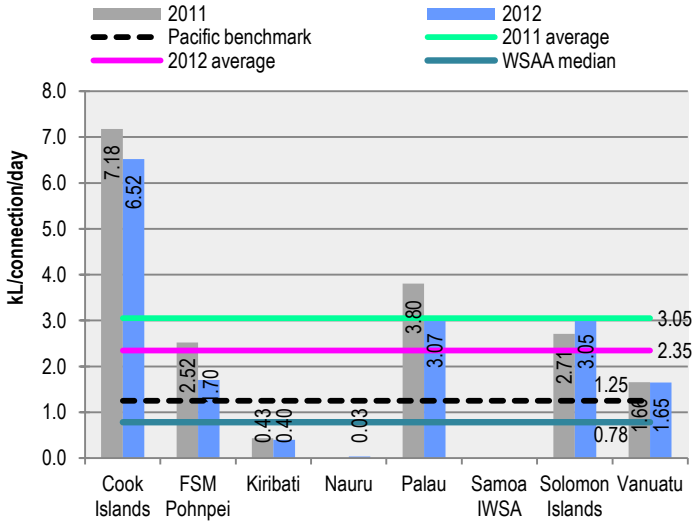
Population Coverage - Sewerage

Sewerage coverage has increased but remains below target.

None of the medium size utilities have reached the target of 75 per cent for sewerage coverage.

The increase of population coverage in the PUB (Kiribati) and Palau is attributable to a readjusting of 2011 data, rather than an expansion of connections.

Figure 4.5: Volume of Water Produced (Indicator V1)



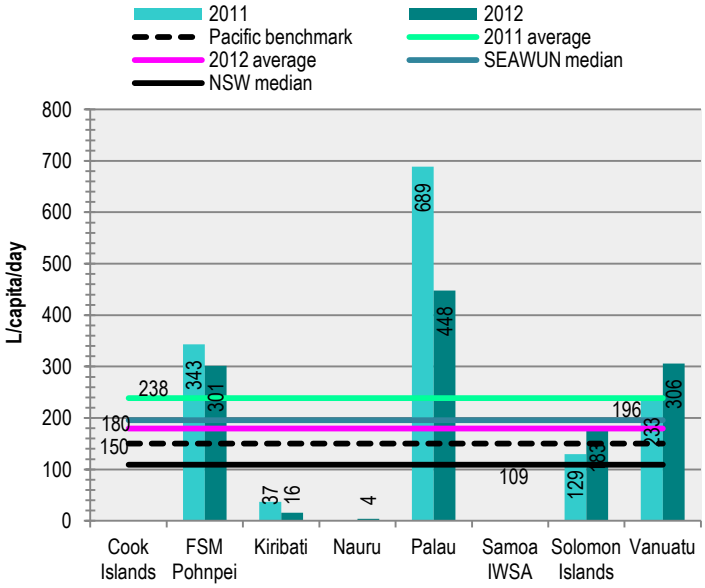
Volume of Water Produced

Volumes of water produced per connection per day are generally high and vary widely between utilities.

Water produced per connection is high for the Cook Islands, Palau and the SIWA (Solomon Islands) when compared to international benchmarks, while at the PUB (Kiribati) and NUC (Nauru); the volumes are much lower due to the scarcity of water sources and/or limited production capacity. UNELCO (Vanuatu) and the PUC (FSM Pohnpei) are approaching the Pacific Benchmark.

No data was reported by the IWSA (Samoa).

Figure 4.6: Water Consumed (L/capita/day) (Indicator V2)



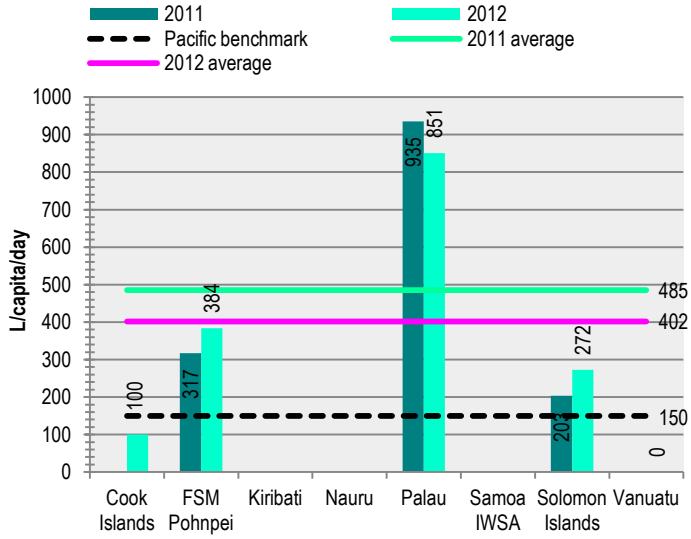
Water Consumed

Per capita water consumption has decreased.

The average per capita consumption level decreased from 238 L/capita/day in 2011, to 180 L/capita/day in 2012, with great differences between the utilities.

The decrease is mainly due to re-assessments made of the population size and occupancy rates in the service areas e.g. Palau and UNELCO (Vanuatu).

Figure 4.7: Volume of Sewage Collected (Indicator V3b)

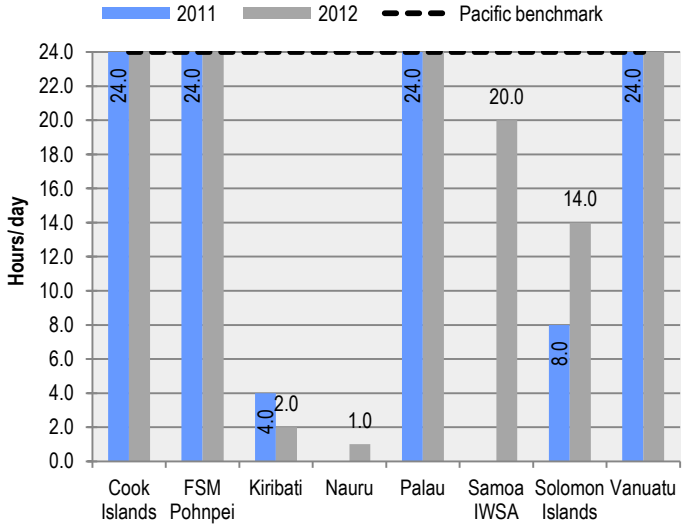


Volume of Sewage Collected

The volume of collected sewerage per capita has decreased.

The average volume of collected sewage in litres per capita decreased mainly due to re-assessments made of the population size and occupancy rates in the service areas in Palau and because of the new entry for Cook Islands.

Figure 4.8: Continuity of Water Supply (Indicator O2)



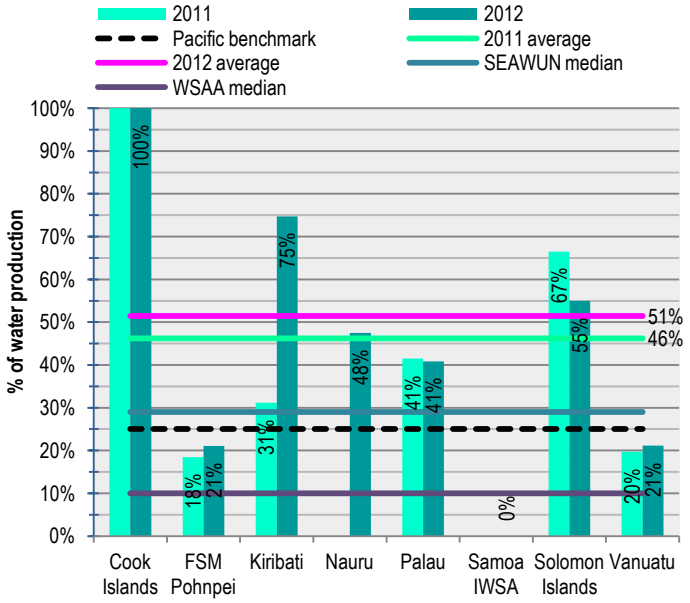
Continuity of Water Supply

Only half of the eight utilities provide continuous water supply.

Half of the eight utilities are not able to provide 24/7 continuous supply, generally because of shortages in fresh water sources and inadequate distribution systems.

The PUB (Kiribati) and NUC (Nauru) face scarcity of fresh water resources. In the case of the IWSA (Samoa) and SIWA (Solomon Islands), intermittent supply is due to a lack of developed production and/or distribution capacity.

Figure 4.9: Non-Revenue Water as % of Production (Indicator O3b)



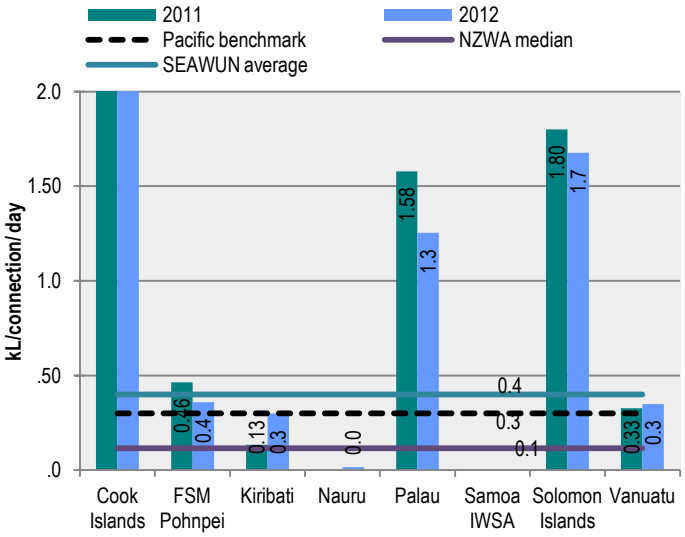
Non-Revenue Water (NRW)

NRW has improved slightly but remains a great concern.

Two utilities, the PUC (FSM Pohnpei) and UNELCO (Vanuatu), are performing better than the PWWA benchmark, all other utilities show NRW levels far above the Pacific benchmark.

The high increase reported by the PUB (Kiribati) is mainly due to a re-assessment of data. The Cook Islands provides water free of charge.

Figure 4.10: NRW per connection/day (Indicator O3)



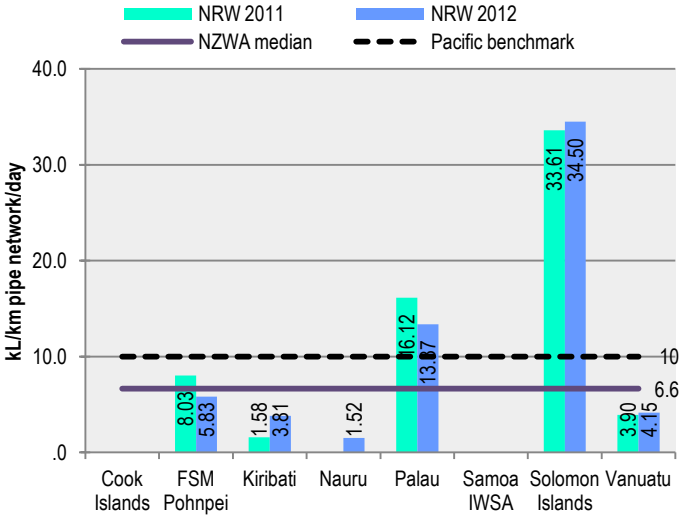
NRW per connection/day

Palau and the Cook Islands show the highest NRW per connection, per day.

In order to further analyse the characteristics of NRW, the water losses are also expressed as losses per connection.

The results indicate that apart from the Cook Islands (where water is supplied free of charge), Palau and the SIWA (Solomon Islands) show the highest NRW per connection, while the other utilities approach the Pacific benchmark of 0.3 kL/connection/day.

Figure 4.11: NRW per km of Main (Indicator O3c)



NRW per km of Main

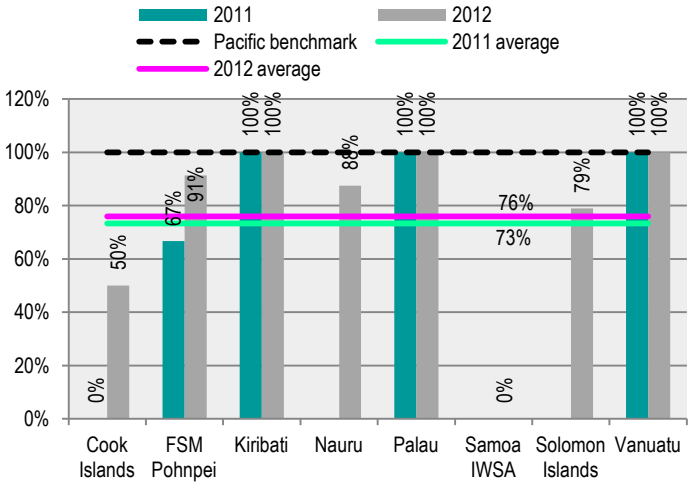
Palau and the SIWA (Solomon Islands) show the highest figures.

NRW is also expressed as volume of water losses per day per kilometre of pipe network.

Palau and the SIWA (Solomon Islands) report the highest figures.

4.3 HEALTH AND ENVIRONMENT

Figure 4.12: Treated Water as a % of Water Production (Indicator HE1a)



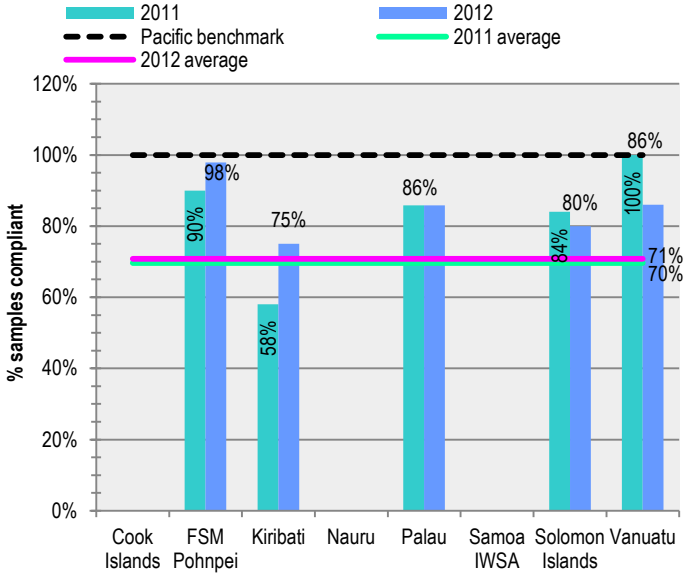
Treated Water

The average volume of treated water has increased but a high percentage still remains untreated.

Water treatment means full treatment for surface waters and at least chlorination of deep wells. The average volume of water treated compared to water produced increased from 73 per cent in 2011 to 76 per cent in 2012.

UNELCO (Vanuatu), the PUB (Kiribati) and Palau report 100 per cent treatment rates for water produced. The other utilities still need to improve their treatment facilities.

Figure 4.13: Drinking Water Quality – Residual Chlorine (Indicator HE1)

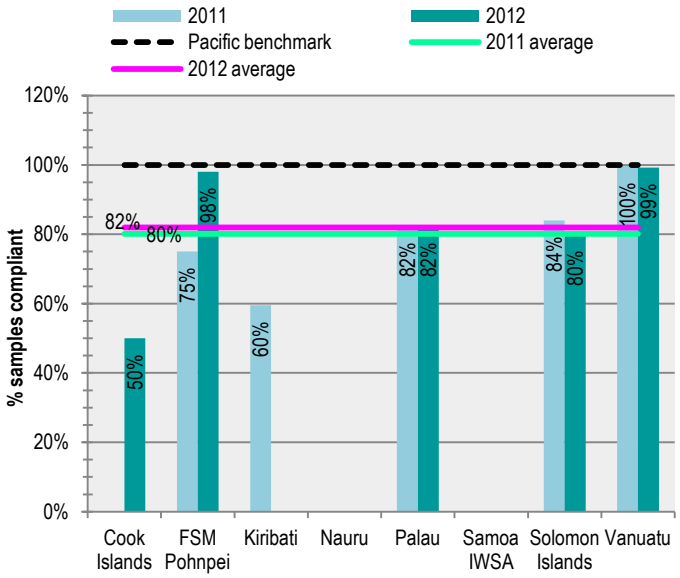


Residual Chlorine

The quality of drinking water is not compliant for residual chlorine.

Overall, the compliance of drinking water quality for residual chlorine remains the same compared to last year's benchmarking. Best results were reported by the PUC (FSM Pohnpei - 98 per cent). The PUB (Kiribati) reported a considerable improvement from 58 per cent in 2011, to 75 per cent in 2012.

Figure 4.14: Drinking Water Quality – Microbiology (Indicator HE2)

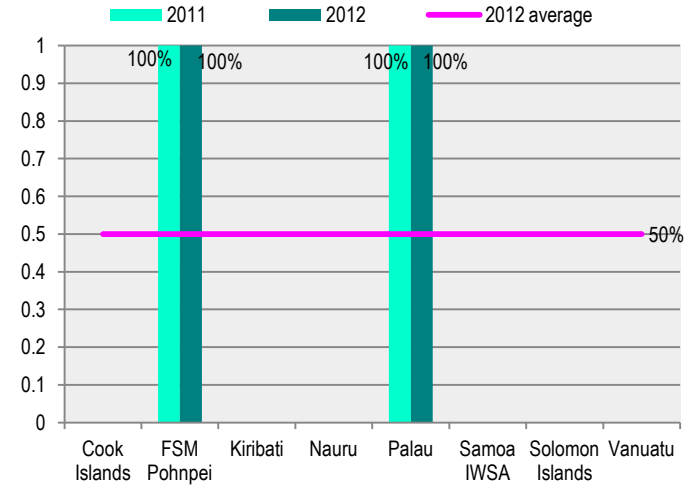


Microbiology

The majority of utilities are not compliant with the benchmark for microbiological water quality.

The best results were reported by the PUC (FSM Pohnpei) and UNELCO (Vanuatu), both at almost 100 per cent. The other medium utilities are still not achieving the Pacific benchmark.

Figure 4.15: Sewage Treatment (Indicator HE3)



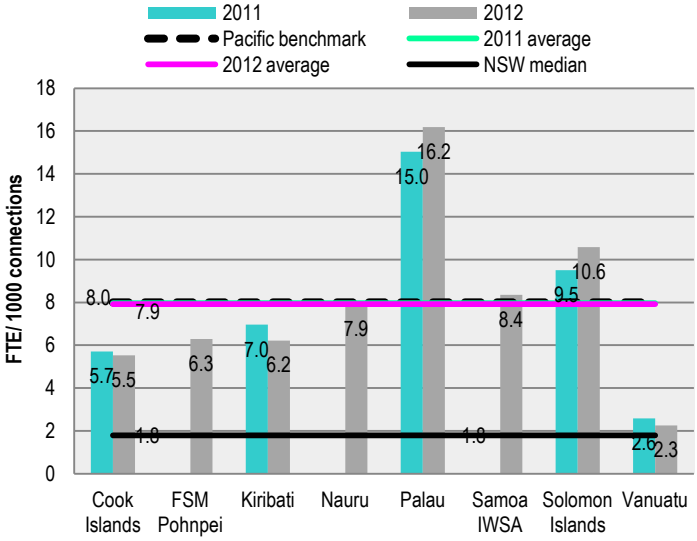
Sewage Treatment

Performance is low for wastewater treatment.

Only two out of five wastewater utilities, the PUC (FSM Pohnpei) and Palau, treat wastewater to at least primary standard. The PUB (Kiribati), NUC (Nauru) and SIWA (Solomon Islands) discharge wastewater untreated to the sea.

4.4 HUMAN RESOURCES DEVELOPMENT

Figure 4.16: Staff per 1000 Connections (Indicator HR1)



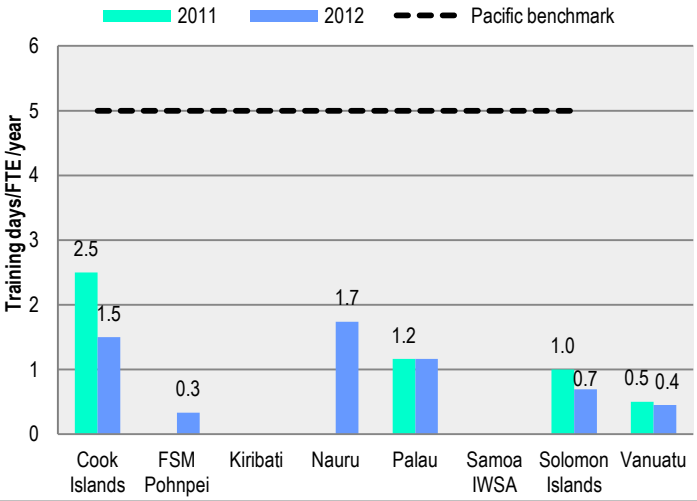
Staff per 1000 Connections

Six of the medium utilities perform well on staff utilisation.

With the exception of the SIWA (Solomon Islands) and Palau, all medium size utilities perform well on staff utilisation meeting the Pacific benchmark.

It is remarkable that the medium size utilities score better than the large size utilities (see Figure 2.17).

Figure 4.17: Training Days per Staff per Year (Indicator HR2)



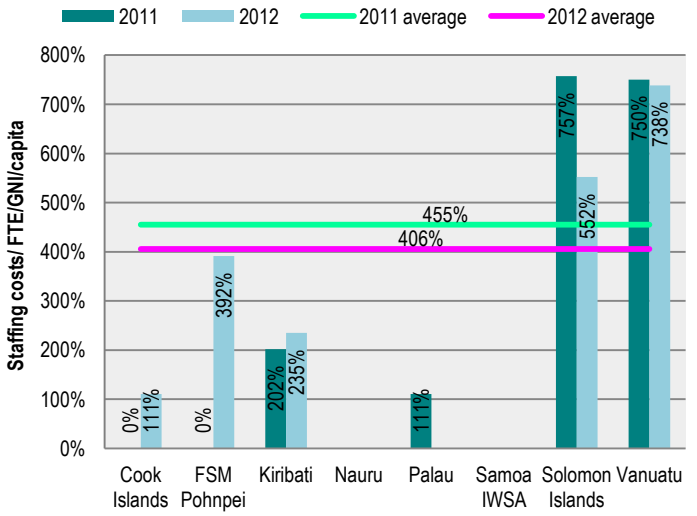
Training Days

Generally, insufficient training is provided for water utility staff.

All medium utilities remain below the Pacific Benchmark of five staff training days per year.

A common constraint in the Pacific Islands is the low qualification levels of staff. Most employees develop their skills 'on the job' and little time is allocated for training.

Figure 4.18: Average Cost of Staff/GNI Ratio (Indicator HR3)



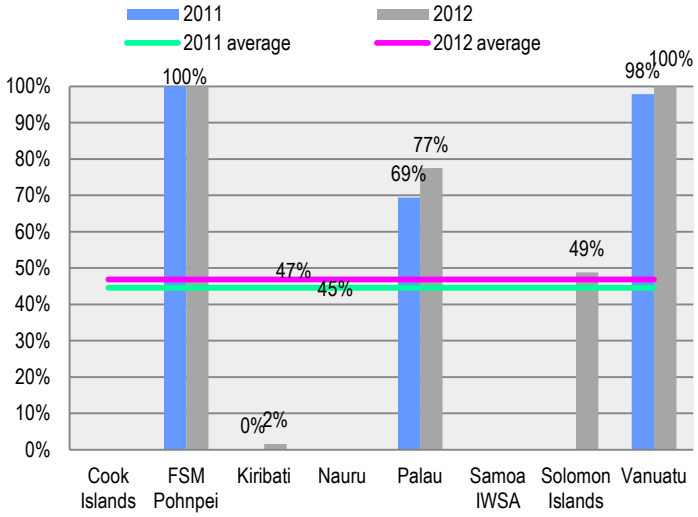
Average Cost of Staff

Staff salaries are not a limiting factor.

This indicator reflects salary costs compared to the Gross National Income (GNI) per capita. The results indicate that the SIWA (Solomon Islands) and UNELCO (Vanuatu) are spending relatively more on salaries when compared to GNI. This can be explained by the fact that the level of GNI in these countries is relatively low compared to other countries.

4.5 CUSTOMER SERVICES

Figure 4.19: Meter Coverage Rate (Indicator CM1)



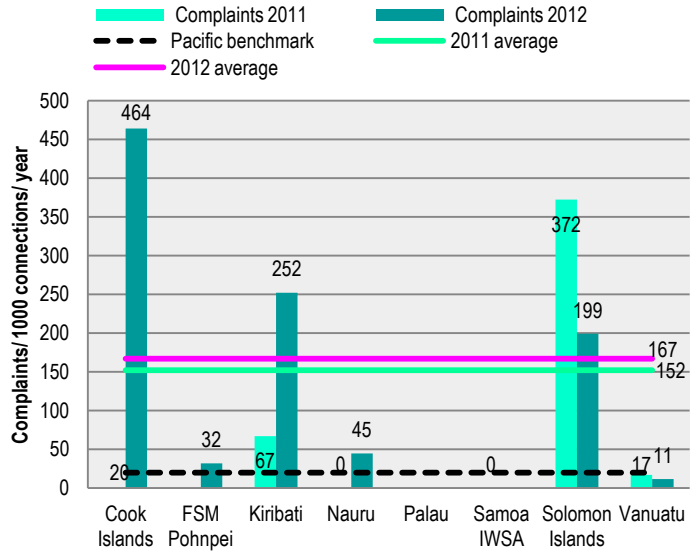
Meter Coverage

A proportion of water remains unmetered.

Both UNELCO (Vanuatu) and the PUC (FSM Pohnpei) have achieved 100 per cent metering coverage.

Palau (78 per cent), the SIWA (Solomon Islands - 49 per cent) and PUB (Kiribati - only two per cent) are partly covered, while the Cook Islands, IWSA (Samoa) and NUC (Nauru) have no metered connections.

Figure 4.20: Customer Complaints per 1000 Connections (Indicator CM2)



Customer Complaints

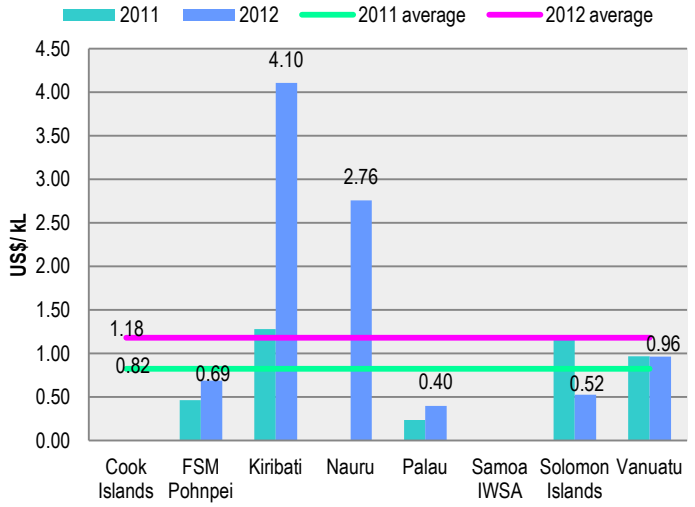
Customer complaints are very high in three out of the eight medium utilities.

The average number of reported complaints increased from 152 complaints per 1000 connections in 2011, to 167 complaints in 2012. This figure is very high and exceeds the Pacific benchmark.

The reported number of complaints is very high in the Cook Islands, PUB (Kiribati) and SIWA (Solomon Islands).

Furthermore, not all utilities have structured the recordings. Consequently, the actual number of complaints may even be higher.

Figure 4.21: Average Revenues per kL



Average Revenues

There are many variations in revenue per kL.

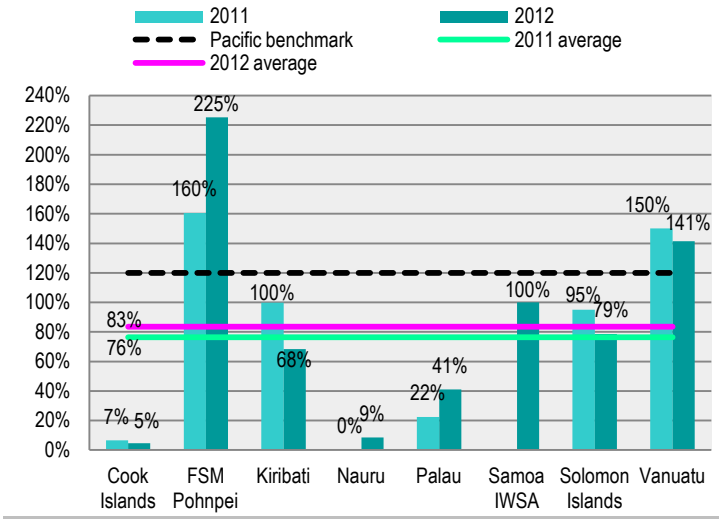
The average operating revenue increased from US$0.82/kL in 2011 to US$1.18/kL in 2012. Both the PUB (Kiribati) and NUC (Nauru) show high water charges per kL.

The NUC (Nauru) supplies water using water tankers and charges a relatively high rate per kL. The PUB (Kiribati) is forced to ration the water and charges a flat rate per month resulting in a relatively high charge per kL. No data was reported by the IWSA (Samoa).

The PUB's (Kiribati) sharp increase of revenues per kL is mainly due to adjustments of the estimated data from 2011, not because of a tariff increase.

4.6 FINANCIAL PERFORMANCE

Figure 4.22: Operating Cost Recovery Ratio (Indicator F1)
(excluding depreciation)

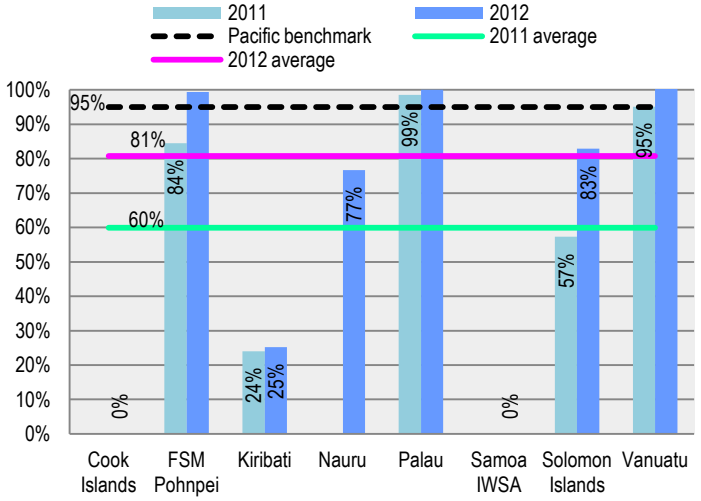


Operating Cost Recovery Ratio (OCR)

Only three out of eight utilities are able to recover their operating costs.

Only the PUC (FSM Pohnpei), IWSA (Samoa) and UNELCO (Vanuatu) operate on a positive Operating Cost Recovery Ratio. The other utilities depend on government subsidies.

Figure 4.23: Collection Ratio – Actual Income vs. Billed Revenue (Indicator F2)

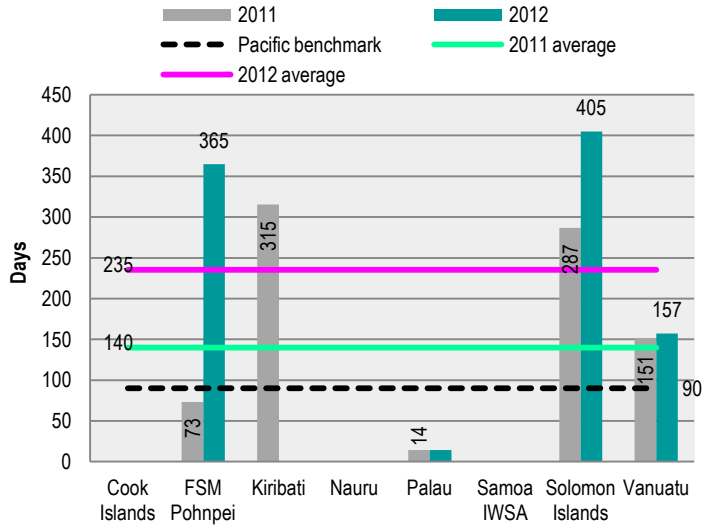


Collection Ratio

The collection ratio is high for the PUC (FSM Pohnpei) and UNELCO (Vanuatu).

The PUC (FSM Pohnpei), UNELCO (Vanuatu) and Palau reported a 100 per cent collection ratio, while all the other utilities face difficulties in collecting bills. The SIWA (Solomon Islands) reported a considerable improvement as compared to 2011.

Figure 4.24: Debtor Days (Indicator F3)



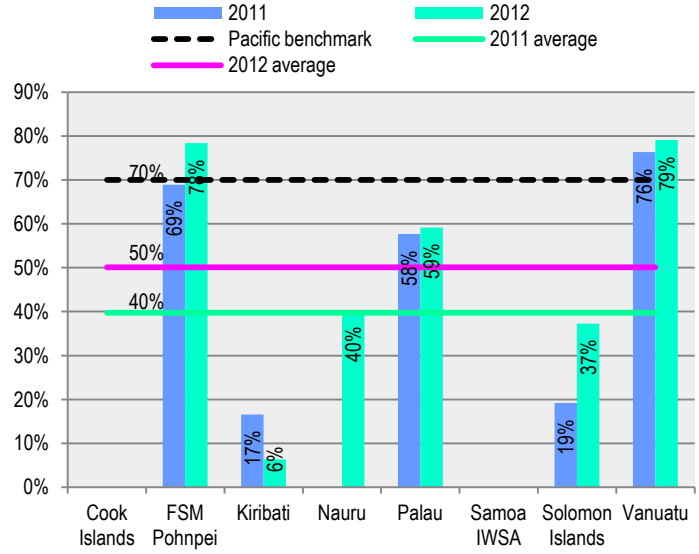
Debtor Days

The recovery period for accounts receivable is very high.

The data for 2011 and 2012 differ greatly and are mostly unverified or unsubstantiated by audited reports. Therefore, it seems inappropriate to draw comparisons and conclusions at this stage.

4.7 OVERALL PERFORMANCE OF THE MEDIUM UTILITIES

Figure 4.25: Overall Efficiency Indicator (OEI)



Overall Efficiency Indicator

Overall efficiency improved.

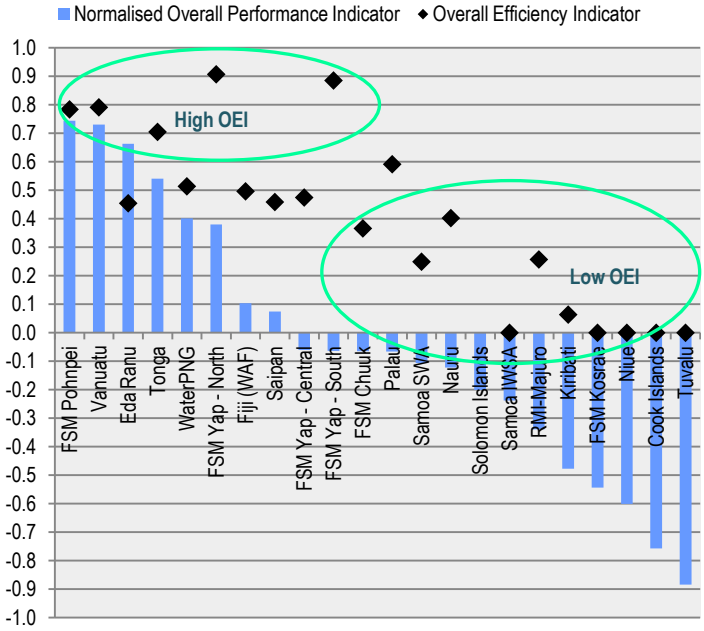
The overall efficiency indicator (OEI) is essentially an overall indicator of financial performance based on the following calculation:

$$OEI = (1 - NRW)x\ Collection\ ratio.$$

The OEI indicates the percentage of water produced that generates actual revenues for the utility.

All utilities, except the PUB (Kiribati), improved on efficiency since last year. The Cook Islands and IWSA (Samoa) do not charge water tariffs and therefore, it is not possible to calculate an OEI.

Figure 4.26: Overall Performance Indicator (OPI) Normalised



Overall Performance

Six out of eight utilities score below average.

The PUC (FSM Pohnpei) and UNELCO (Vanuatu) have the best overall performance among the medium utilities. Both also score better than the best performers of large and small utilities. All other medium utilities score below average of all PWWA utilities.

5

Benchmarking Results

Small Utilities

This chapter presents the benchmarking results for the eight participating small utilities, consisting of:

- the Water Supply Division of Niue;
- the Majuro Water and Sewer Company (MWSC) of the Marshall Islands;
- the Ministry of Works, Water and Energy of Tuvalu; and
- five utilities in the Federated States of Micronesia – Chuuk Public Utility Corporation (CPUC), the Department of Transportation and Infrastructure (FSM Kosrae), the Yap State Public Service Corporation (FSM Yap Central), the Gagil Tomil Water Authority of Yap (FSM Yap North) and the Southern Yap Water Authority (FSM Yap South).

Within the group, the MWSC (RMI Majuro) is the largest utility with over 1,100 water connections and 1,796 sewerage connections, while FSM Yap North and South are the smallest utilities with about 300 water connections and no sewerage connections.

The institutional setting of the utilities is more or less similar for all, operating as statutory government entities strongly regulated by the government, with some services outsourced to the private sector. Only Tuvalu and Niue operate as government departments.

As for FSM Yap South, Kosrae and Niue, no questionnaires were submitted this year. Therefore last year's data has been used in the results presented in the proceeding sections.

Each utility has unique characteristics such as size, the way it is legally operated, the supply area, and the availability of water resources, as well as some country characteristics such as economy, demography, geography, and topography.

Section 5.1 presents the main characteristics of each utility, while the performance indicators and observations are carefully analysed in sections 5.2 to 5.7.

5.1 CHARACTERISTICS OF THE SMALL UTILITIES

Table 5.1 shows the main characteristics of the eight small utilities. As with the two preceding results chapters, these details assist with the interpretation and comparison of performance indicators.

Table 5.1: Characteristics of the Small Utilities

	Utility Characteristics	Units	CPUC (FSM Chuuk)	FSM Kosrae	FSM Yap North	FSM Yap Central	FSM Yap South	Niue	MWSC (RMI Majuro)	Tuvalu	TOTAL
1	Legal status of the utility		Government statutory organisation	Government statutory organisation	Government statutory organisation	Not-for-profit organisation under commercial law	Government statutory organisation	Government department	State owned enterprise	Government department	-
2	Services provided by the utility **W**ater/**S**ewerage/ **P**ower	W/S/P	W/S	W/S	W	W/S	W	W	W/S	W	-
Water											
3	Number of connections	number	711	300	395	1231	289	599	1116	750	5391
4	Population served	number	5368	1600	1925	6979	900	1805	7816	15000	41393
5	Number of schemes	number	1	4	1	1	1	17	1	1	27
6	Length pipe mains (all diameters)	km	33	11	21	50	28	114	116	0	373
7	Distribution reticulated	YES/NO	YES	YES	YES	YES	YES	YES	YES	YES	-
8	Estimated % of houses with household tank	%	1	90	3	25	1	200	70	0	-
9	Water resource constraints during droughts	YES/NO	NO	NO	NO	NO	NO	-	YES	YES	-
10	Volume water produced	ML/year	844	1	106	658	64	274	648	15	2610
11	Drinking water quality guidelines used		Chuuk State	N/A	EPA	USEPA	EPA	WHO	RMI EPA	N/A	-
12	Drinking water safety plan in use	number	0	0	1	1	0	17	1	0	20
13	Laboratory in house by utility	YES/NO	NO	NO	NO	YES	NO	NO	NO	-	-
14	Number of microbiological samples	number/year	0	0	132	12	12	224	0	0	380
15	Number of samples for residual chlorine	number/year	N/A	0	20	-	0	-	N/A	0	20
Sewerage											
16	Number of connections	number	450	200	-	-	-	-	1796	-	2446
17	Population served	number	3600	1500	-	-	-	-	14370	-	19470
18	Number of schemes	number	1	5	-	1	-	-	1	-	8

	Utility Characteristics	Units	CPUC (FSM Chuuk)	FSM Kosrae	FSM Yap North	FSM Yap Central	FSM Yap South	Niue	MWSC (RMI Majuro)	Tuvalu	TOTAL
19	Length of sewer mains (all diameters)	km	25	6	-	N/A	-	-	17	-	48
20	Volume sewage collected	ML/year	276	6	-	N/A	-	-	171	-	447
21	Sewage treatment up to primary standard	%	N/A	0	-	0	-	-	0	-	-
22	Sewage treatment up to secondary standard	%	N/A	0	-	0	-	-	0	-	-
23	Number of effluent samples tested	number	N/A	0	-	-	-	-	N/A	-	-
Operations											
24	Maintenance plan in use	YES/NO	YES	NO	YES	YES	NO	NO	NO	NO	-
25	Asset database in use	YES/NO	YES	NO	NO	NO	NO	NO	NO	NO	-
26	Meter replacement programme in use	YES/NO	YES	NO	YES	YES	NO	NO	NO	NO	-
27	Registration of leak repairs in water network	YES/NO	YES	NO	YES	YES	NO	NO	YES	NO	-
28	Registration of blockages/overflows in sewer	YES/NO	YES	NO	NO	YES	NO	NO	YES	NO	-
29	Climate change/natural disasters adopted	YES/NO	YES	NO	NO	NO	NO	NO	NO	NO	-
Customers											
30	Customer complaints	number/year	72	0	5	-	0	100	1304	N/A	1482
31	Customers - charter specifying service levels and response commitment?	YES/NO	NO	NO	NO	NO	NO	YES	YES	NO	-
32	Most common complaint		Billing, metering	-	Financial, leaks and quality	Mostly water quality	-	-	No water	-	-
Human Resources											
33	Number of staff-full time equivalent	number	14	2	3	18	4	9	54	34	138
34	Technical staff with diploma in engineering or science	number	0	2	1	0	0	0	0	0	3
35	Administrative staff with a higher business qualification	number	0	0	0	3	0	0	8	0	11

Utility Characteristics		Units	CPUC (FSM Chuuk)	FSM Kosrae	FSM Yap North	FSM Yap Central	FSM Yap South	Niue	MWSC (RMI Majuro)	Tuvalu	TOTAL
Financial											
36	Total operating (recurrent) costs excluding depreciation	US$/yr (millions)	0.379	N/A	0.063	0.416	0.035	0.265	1.298	-	2
37	Annual depreciation	US$/yr (millions)	0.003	N/A	-	0.156	0.002	0.131	0.063	-	0
38	Annual interest on loans	US$/yr (millions)	0.000	N/A	-	0.088	-	-	-	-	0
39	Total operating revenue excluding subsidies	US$/yr (millions)	0.100	N/A	0.055	0.528	0.032	0.004	1.239	-	2
40	Subsidies and grants (for operating expenses only)	US$/yr (millions)	0.278	-	-	-	-	-	0.124	-	-
41	Net book value of assets	US$ (millions)	0.019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
42	Average water tariff per kL	US$/kL	0.19	N/A	0.26	0.40	0.45	0.64	1.59	N/A	-

Table of benchmarking results for small utilities

The benchmarking results for small utilities, including the Overall Efficiency Indicator (OEI) are shown in Table 5.2.

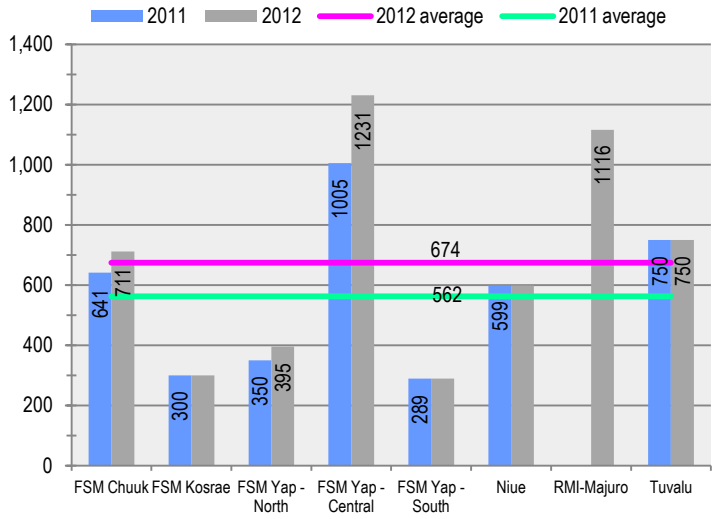
Table 5.2: Performance Indicators for Small Utilities

No.	Indicator	Units	PWWA benchmark	Average (2012)	Median (2012)	CPUC (FSM Chuuk)	FSM Kosrae	FSM Yap North	FSM Yap Central	FSM Yap South	Niue	MWSC (RMI Majuro)	Tuvalu
KRA1 - Production													
V1	Volume of water produced - total produced from sources and treatment	kL/conn/day	**1.25**	**1.12**	**0.99**	3.25	0.02	0.74	1.46	0.61	1.25	1.59	0.05
V1b	Volume of water produced	L/capita/day	**250**	**211**	**211**	431	2	151	258	196	416	227	8
V2	Volume of water sold (i.e. billed) - through meters or estimated unmetered	kL/conn/day	**1.00**	**0.62**	**0.52**	1.95	N/A	0.67	N/A	0.60	0.00	0.45	0.05
V2b	Volume of water sold (i.e. billed)	L/capita/day	**150**	**100**	**100**	258	0	137	138	195	0	64	8
V3	Volume of sewage produced - total	kL/conn/day	**0.75**	**0.97**	**0.97**	1.68	-	N/A	N/A	N/A	N/A	0.26	N/A
V3b	Volume of sewage produced	L/capita/day	**200**	**121**	**121**	210	-	N/A	N/A	N/A	N/A	33	N/A

No.	Indicator	Units	PWWA benchmark	Average (2012)	Median (2012)	CPUC (FSM Chuuk)	FSM Kosrae	FSM Yap North	FSM Yap Central	FSM Yap South	Niue	MWSC (RMI Majuro)	Tuvalu
KRA2 - Technical Performance													
O1	Water supply coverage	% of population	**95**	**78**	**86**	67	64	92	93	80	100	26	100
O2	Continuity of water supply service (hours available)	hours/day	**24**	**18.7**	**24.0**	24.0	24.0	24.0	24.0	24.0	24.0	3.5	2.0
O3b	Non-Revenue Water	% of water produced	**25**	**53**	**47**	40	100	9	47	1	100	72	N/A
O3	Non-Revenue Water	kL/conn/day	**0.3**	**0.8**	**1.1**	1.30	0.02	0.07	N/A	N/A	1.25	1.14	N/A
O3c	Non-Revenue Water	kL/km/day	**-**	**3.4**	**2.4**	10.23	N/A	0.47	N/A	0.01	2.41	4.02	N/A
O4	Sewerage coverage	% of population	**80**	**56**	**54**	45	60	N/A	70	N/A	N/A	48	N/A
KRA3 - Health and Environment													
HE1	Drinking Water quality compliance - residual chlorine	% compliance	**100**	**34**	**0**	80	0	100	90	0	0	0	0
	Percentage of customers on treated water or % of water treated	% water produced	**100**	**75**	**100**	100	0	100	100	0	100	100	100
HE2	Drinking Water quality compliance - microbiological	% compliance	**100**	**84**	**83**	N/A	N/A	76	90	70	99	N/A	N/A
HE3	% of sewage produced which is treated to at least primary standard	% of sewage	**100**	**25**	**25**	50	N/A	N/A	0	N/A	N/A	N/A	N/A
KRA4 - Human Resources													
HR1	Water and sewerage business staff per 1000 connections	number of FTE/1000 connections	**8.0**	**12.3**	**13.6**	11.6	4.0	7.6	14.9	13.8	15.0	18.5	13.3
HR2	Training days	days/FTE/year	**5.0**	**1.6**	**0.3**	7.69	0.00	0.00	0.00	-	1.11	0.56	-
HR3	Average cost of staff (total labour cost / number of staff/GNI)	%	**-**	**157**	**138**	197	N/A	171	95	106	77	297	N/A
KRA5 - Customer Service													
CM1	Meter coverage rate for water supply customers (for all water meters)	% of customers	**100**	**68**	**82**	56	83	97	80	100	8	99	20
CM2	Customer complaints per 1000 connections	number/1000 conn	**20**	**172**	**114**	62	N/A	13	N/A	N/A	167	448	N/A
CM3	Affordability new connection	% GNI per person	**-**	**1.9**	**1.4**	1.4	N/A	1.4	N/A	1.3	0.2	5.1	N/A
CM4a	Affordability - average bill	% GNI per person	**-**	**1.0**	**0.7**	0.5	N/A	0.8	1.5	0.6	0.0	2.6	N/A
CM4b	Affordability - 6kL/month/connection	% GNI per person	**-**	**0.3**	**0.3**	0.4	N/A	0.3	N/A	0.3	0.1	0.5	N/A
KRA6 - Financial Sustainability													
F1	Operating cost recovery ratio (excluding depreciation)	%	**120**	**57**	**57**	26	0	87	127	92	1	95	23
F2	Collection ratio - actual cash income vs. billed revenue	%	**95**	**82**	**89**	61	N/A	100	89	89	60	92	N/A
F3	Accounts receivable	days	**90**	**187**	**130**	134	N/A	130	40	63	N/A	570	N/A
OV1	**Overall Efficiency Indicator ((1-NRW)*collection ratio)**	**%**	**70**	**48**	**42**	**37**	N/A	**91**	**47**	**89**	**0**	**26**	N/A

5.2 TECHNICAL PERFORMANCE

Figure 5.1: Water Connections

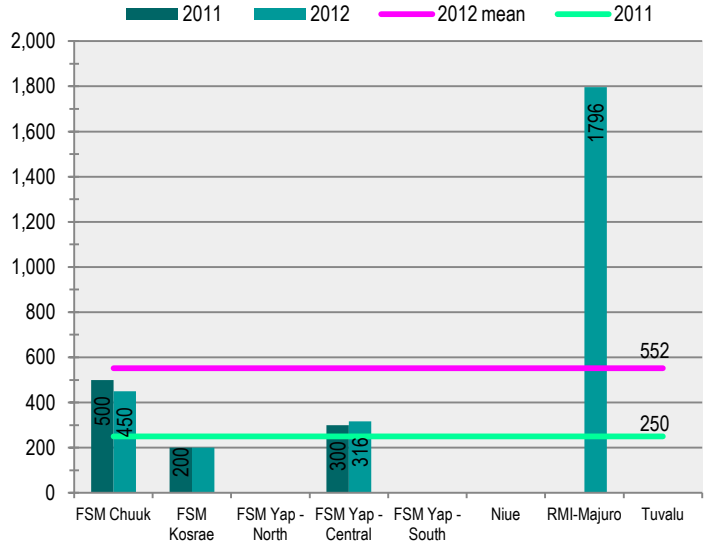


Water Connections

The number of water connections in small utilities has increased

The total number of connections of the eight small utilities increased to 5,391 connections, mainly due to the additional connections of the MWSC (RMI Majuro), which was not included in last year's benchmarking.

Figure 5.2: Sewerage Connections

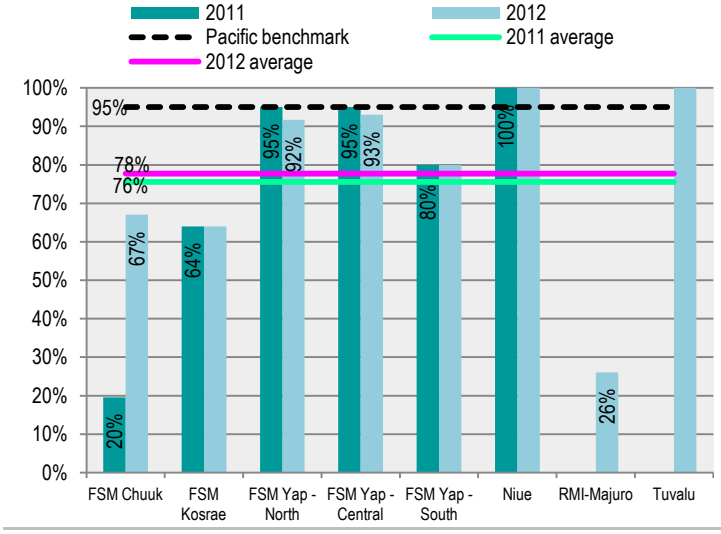


Sewerage Connections

The inclusion of the MWSC (RMI Majuro) caused an increase in the number of sewerage connections.

The number of sewer connections compared to the previous year shows a strong increase from 1,000 to 2,762. This increase is mainly accounted for by the MWSC (RMI Majuro).

Figure 5.3: Population Coverage - Water Supply (Indicator O1)

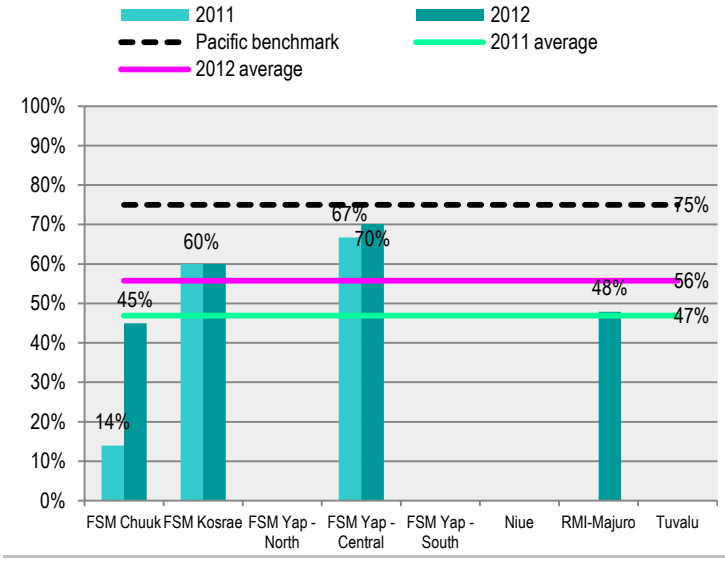


Population Coverage - Water Supply

Water supply coverage is limited to service areas.

The population coverage for water supply within the service area of the utilities varies from 26 per cent in the MWSC (RMI Majuro), to above 90 per cent (FSM Yap North, FSM Yap Central and Niue). It should be noted that these figures do not reflect the situation outside the service areas.

Figure 5.4: Population Coverage – Sewerage (Indicator O4)



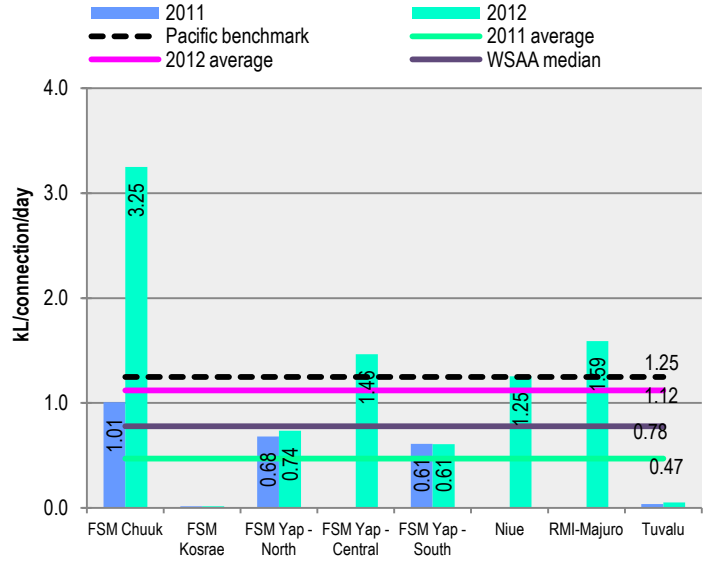
Population Coverage - Sewerage

Coverage has increased in FSM Chuuk and FSM Yap Central.

Four out of eight small utilities are managing the collection and treatment of wastewater. In the MWSC (RMI Majuro), this is based on a salt water sewerage scheme.

The strong increase of coverage at FSM Chuuk and FSM Yap Central is primarily attributable to corrections and adjustments made to the 2011 data.

Figure 5.5: Volume of Water Produced (Indicator V1)



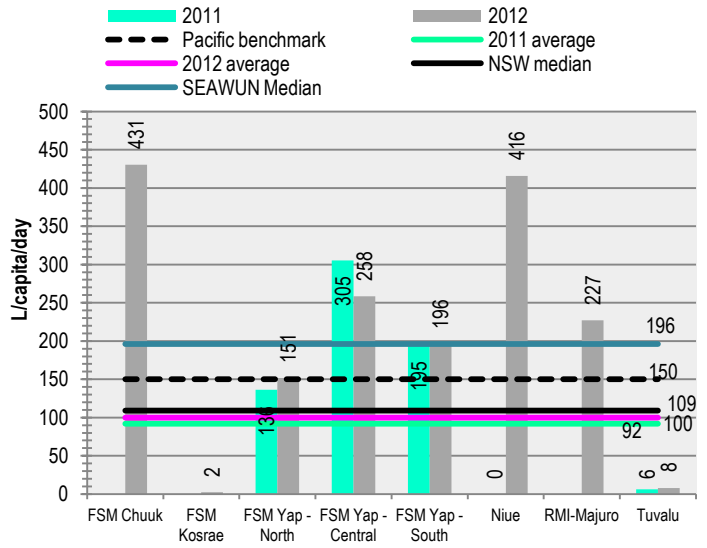
Volume of Water Produced

Except for the utility in FSM Chuuk, the volumes of water produced are not extremely high.

Water produced per connection in the small utilities is close to the Pacific benchmark. The highest production is reported by FSM Chuuk, followed by Niue, FSM Yap Central and the MWSC (RMI Majuro).

The relatively high production rate of the MWSC (RMI Majuro) is remarkable as it only supplies water for a few hours per day.

Figure 5.6: Water Consumption Levels (L/capita/day) (Indicator V2)



Water Consumption

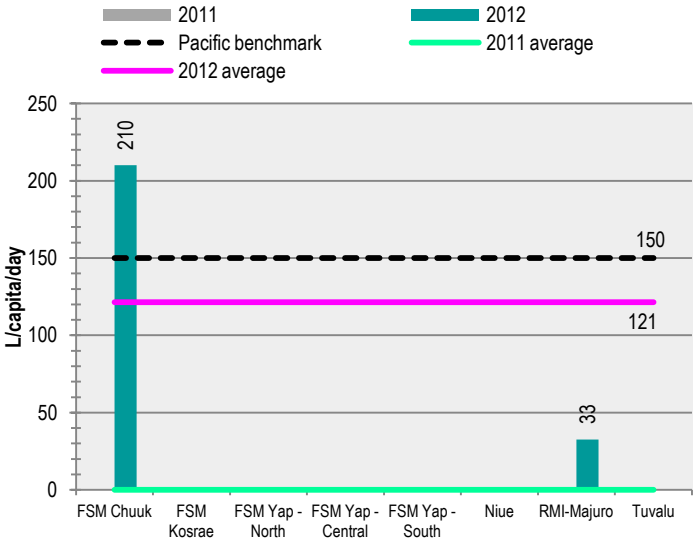
Water consumption is below the Pacific benchmark.

The average per capita consumption level increased from 92 L/capita/day in 2011 to 100 L/capita/day in 2012.

Very low figures are reported by Tuvalu and FSM Kosrae. Tuvalu has a very low consumption as the system relies on desalinated water delivered by water trucks and all houses avail of rainwater tanks.

High consumption figures are reported by FSM Chuuk, FSM Yap Central, Niue and the MWSC (RMI Majuro). FSM Yap North is on target.

Figure 5.7: Volume of Sewage Collected (Indicator V3b)

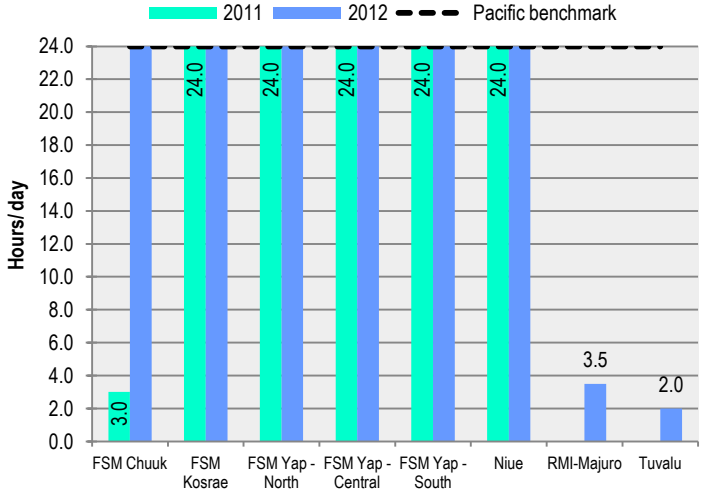


Volume of Sewage Collected

High volumes of sewage collected in CPUC (FSM Chuuk), low volumes in the MWSC (RMI Majuro).

Only the CPUC (FSM Chuuk) and the MWSC (RMI Majuro) reported this data in 2012.

Figure 5.8: Continuity of Water Supply (Indicator O2)

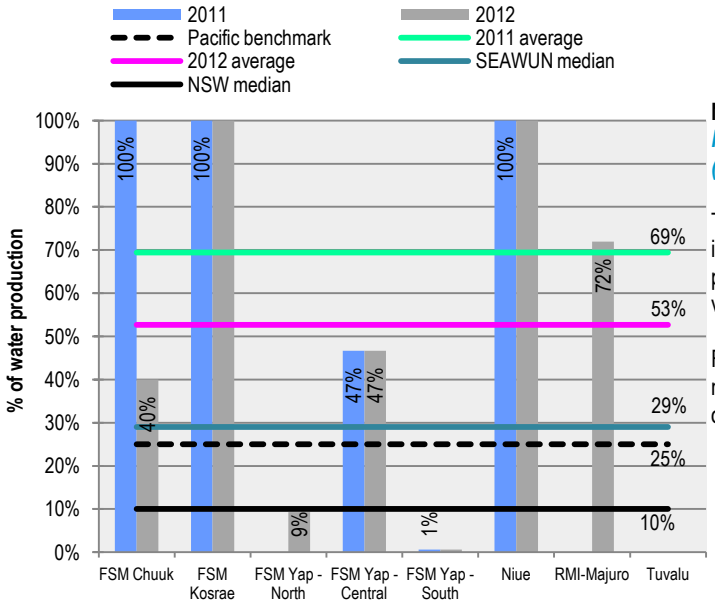


Continuity of Water Supply

Continuous supply is reported in 75 per cent of the small utilities.

Six out of the eight utilities provide continuous 24/7 supply. The MWSC (RMI Majuro) operates only a few hours per day. Tuvalu distributes water by water trucks while the majority of houses use rainwater harvesting tanks.

Figure 5.9: Non-Revenue Water as % of Production (Indicator O3b)



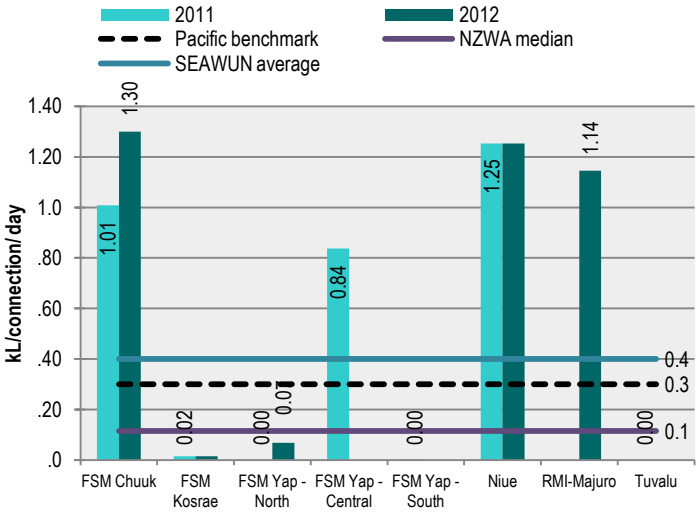
Non-Revenue Water (NRW)

NRW has been considerably reduced in the CPUC (FSM Chuuk).

The CPUC (FSM Chuuk) made a considerable improvement in NRW due to an on-going rehabilitation project, although in absolute terms the losses are still very high (see Table 5.7).

FSM Yap North is performing very well with NRW at only nine per cent. This is well under the Pacific benchmark of 25 per cent.

Figure 5.10: NRW per connection/day (Indicator O3)



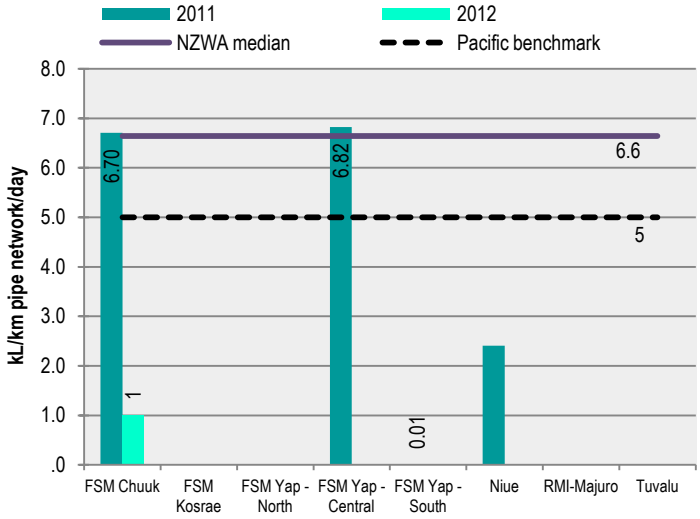
NRW per connection/day

In real terms, very high NRW figures are reported by four utilities.

In order to further analyse NRW characteristics, the water losses are expressed as volume of water losses per connection.

High figures are reported by the utilities of FSM Chuuk, FSM Yap Central, Niue, and the MWSC (RMI Majuro).

Figure 5.11: NRW per km of Main (Indicator O3c)



NRW per km of Main

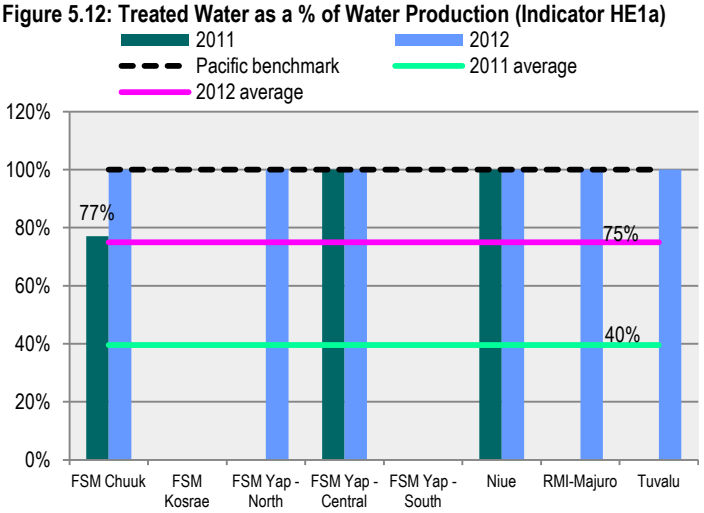
Only one utility provided data on NRW per km of main in 2012.

NRW is often also expressed as volume of water losses per kilometre of pipe network.

Except for FSM Chuuk, no data was provided this year on the length of water mains.

5.3 HEALTH AND ENVIRONMENT

Figure 5.12: Treated Water as a % of Water Production (Indicator HE1a)

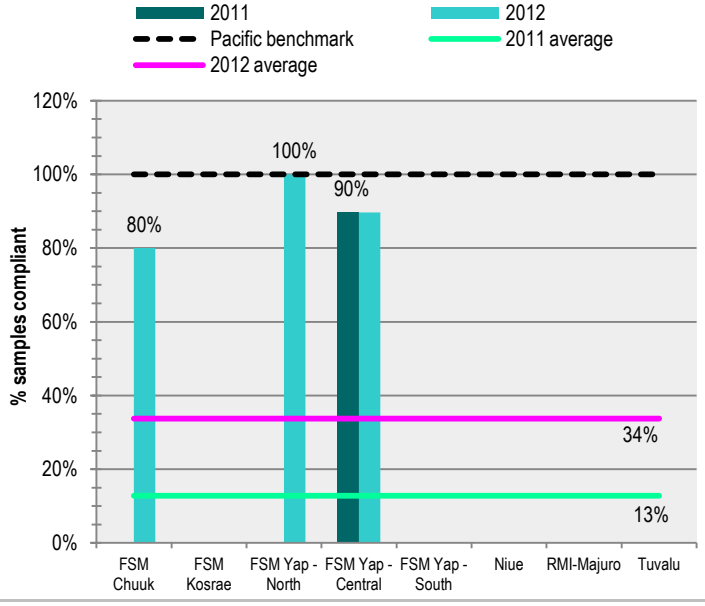


Treated Water

More than half of the small utilities report 100 per cent of supplied water is treated which is a considerable improvement as compared to 2011.

Water treatment means full treatment for surface water and at least chlorination of water from deep wells. Five out of eight utilities reported that the water supplied is 100 per cent treated.

Figure 5.13: Drinking Water Quality – Residual Chlorine (Indicator HE1)

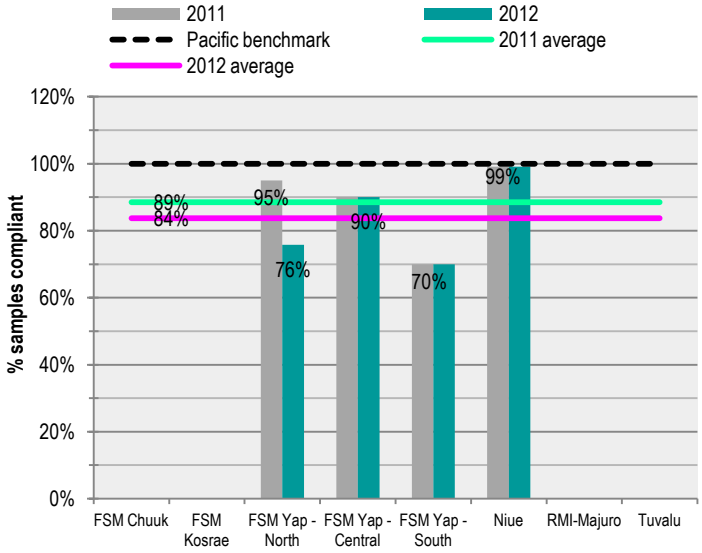


Residual Chlorine

Compliance of drinking water quality for residual chlorine remains below the Pacific benchmark.

Overall, the compliance of drinking water quality for residual chlorine improved from 13 per cent in 2011 to 34 per cent in 2012, which is still far below the Pacific benchmark. The best results are reported by the three FSM utilities on the Island of Yap.

Figure 5.14: Drinking Water Quality – Microbiology (Indicator HE2)

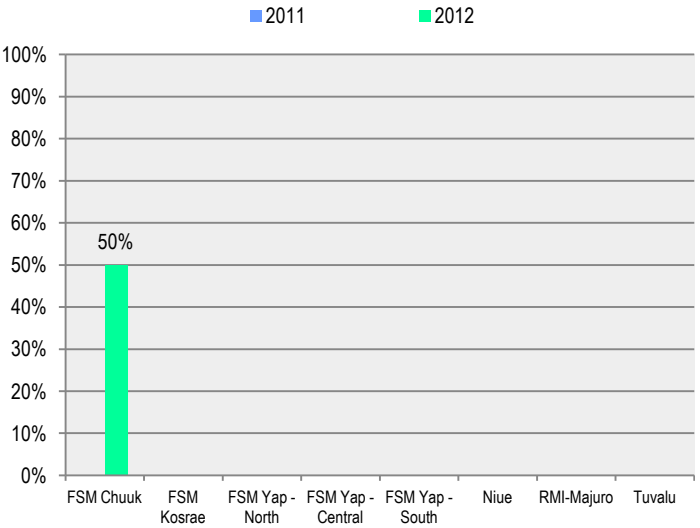


Microbiology

Only four out of eight utilities reported the results on sampling of e-coli.

Only half of the small utilities reported. The 2011 data for Niue indicated that almost 100 per cent of tested samples were compliant. The three FSM utilities on the Island of Yap reported 84 per cent compliance.

Figure 5.15: Sewage Treatment (Indicator HE3)



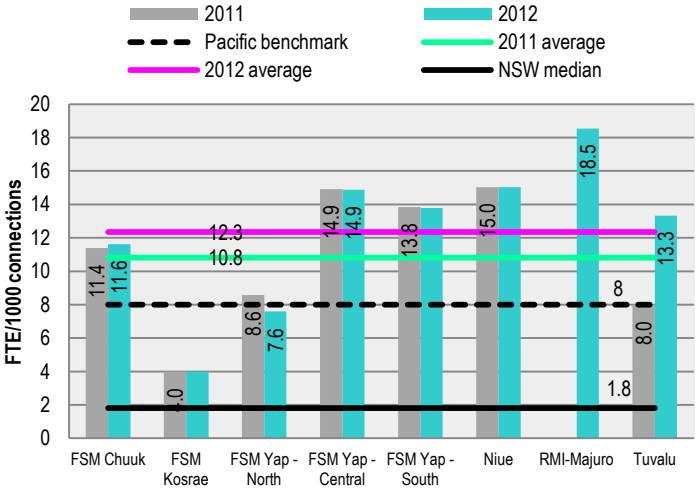
Sewage Treatment

Only one of four small utilities collecting wastewater treats it to at least primary standards.

The CPUC (FSM Chuuk) appears to be the only utility which treats wastewater to at least primary standard. Other wastewater utilities like FSM Yap Central and the MWSC (RMI Majuro) still discharge wastewater untreated to the sea.

5.4 HUMAN RESOURCES DEVELOPMENT

Figure 5.16: Staff per 1000 Connections (Indicator HR1)



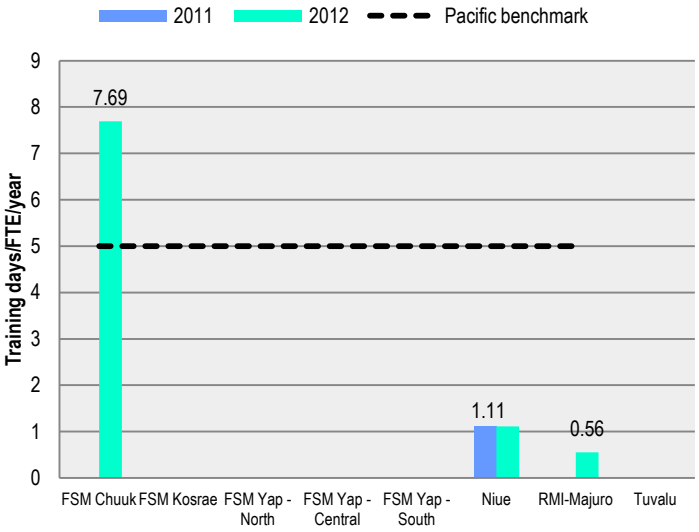
Staff per 1000 Connections

The average staff utilisation is about 50 per cent above the Pacific benchmark.

The average of the staff utilisation is 12.5 or about 50 per cent above the Pacific benchmark. Only FSM Yap North and FSM Kosrae meet the Pacific benchmark.

As the utilities are small in size, the benchmark for the staff ratio may need to be adjusted.

Figure 5.17: Training Days per Staff per Year (Indicator HR2)



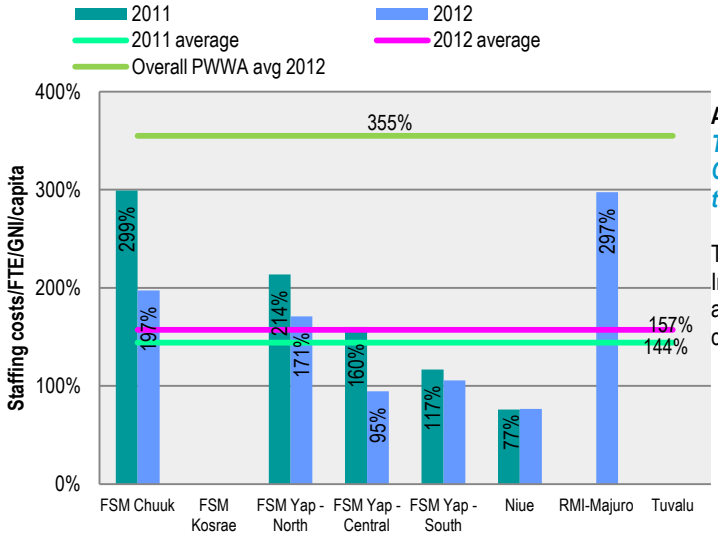
Training Days

Staff training is generally insufficient.

Only FSM Chuuk makes significant efforts to develop its staff through training. The other FSM utilities reported that no training is provided at all. All other utilities remain under the Pacific benchmark. No data was reported by Niue.

A common observation in the Pacific Islands is the low level of staff qualifications. Most of the staff develop their skills 'on the job' and little time is allocated to staff training.

Figure 5.18: Average Cost of Staff/GNI Ratio (Indicator HR3)



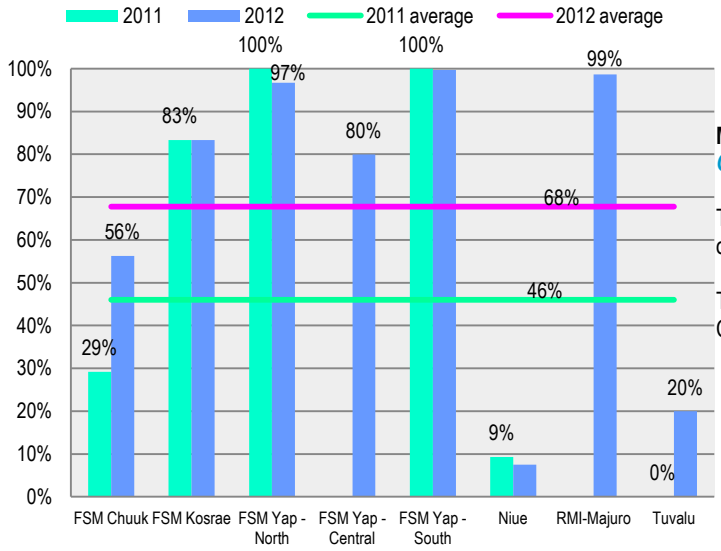
Average Cost of Staff

The average staff costs as compared to the average Gross National Income are much lower as compared to larger utilities.

The salary costs are compared with the Gross National Income (GNI) per capita. The results indicate that the average salary/GNI ratio of the small utilities is low when compared to the average ratio of all PWWA utilities.

5.5 CUSTOMER SERVICES

Figure 5.19: Meter Coverage Rate (Indicator CM1)



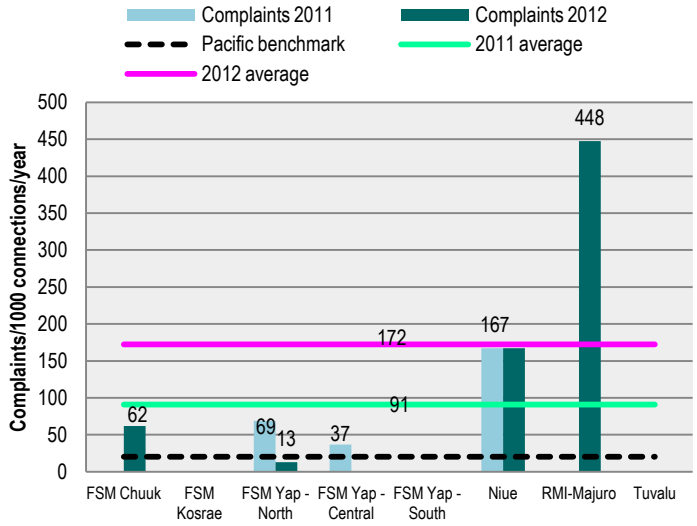
Meter Coverage

Only 68 per cent of connections are metered.

Though progressing well, 32 per cent of the connections of small utilities still remain unmetered.

The coverage of metering is progressing well at FSM Chuuk where metering commenced only last year.

Figure 5.20: Customer Complaints per 1000 Connections (Indicator CM2)



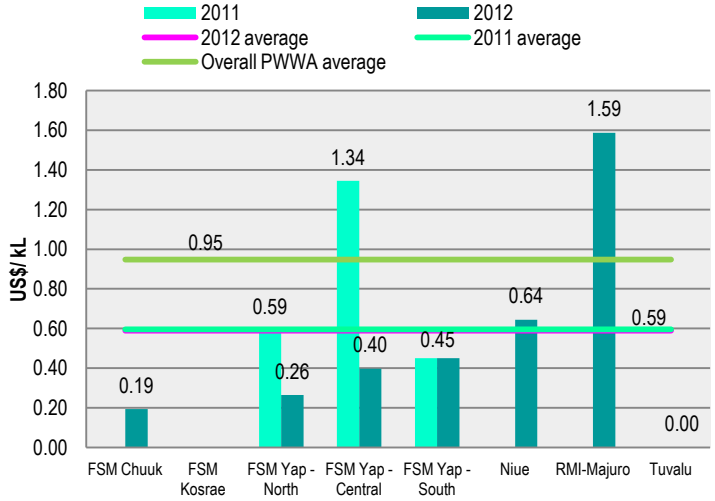
Customer Complaints

Customer complaints are high in the MWSC (RMI Majuro).

The average number of complaints per 1,000 connections increased significantly from 91 in 2011 to 172 in 2012, mainly due to the share of newcomer, the MWSC (RMI Majuro), which reported by far the largest number of complaints.

Furthermore, not all utilities have regular recordings. Consequently the actual number of complaints may possibly be much higher.

Figure 5.21: Average Revenues per kL



Average Revenues

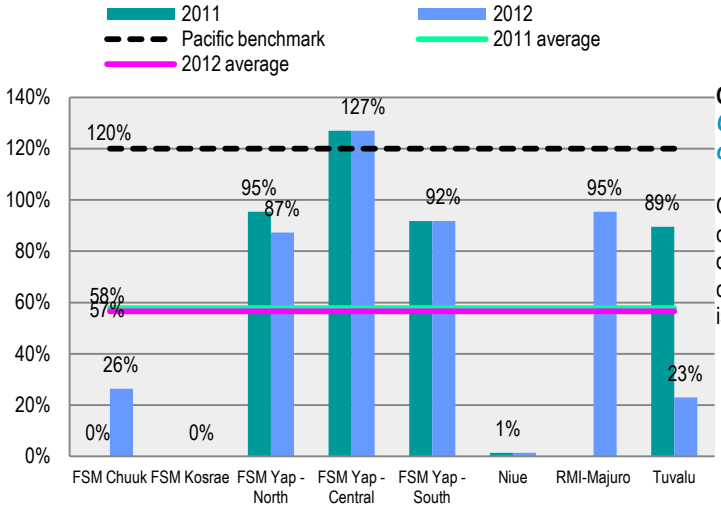
Revenues are low.

The average revenues billed by the small utilities amounts to only US$0.59/kL which is much lower than the average of all PWWA utilities.

Only the MWSC (RMI Majuro) generated higher revenues per kL.

5.6 FINANCIAL PERFORMANCE

Figure 5.22: Operating Cost Recovery Ratio (Indicator F1)
(excluding depreciation)

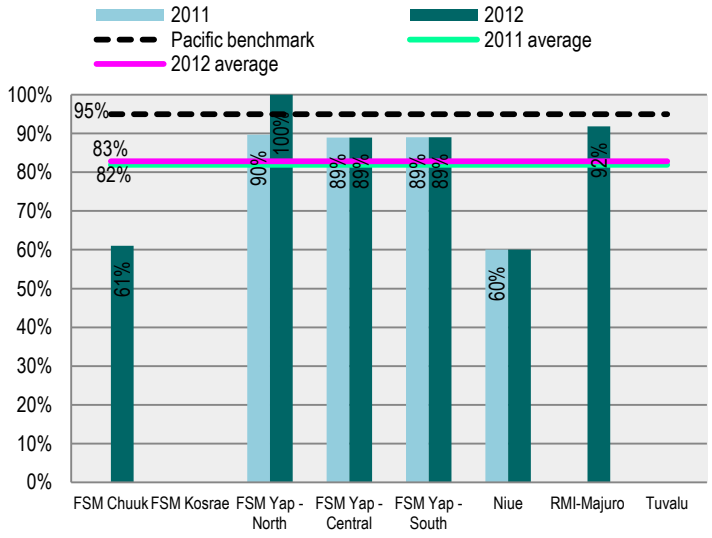


Operating Cost Recovery Ratio (OCR)

Only one utility is able to recover its operating costs.

Only FSM Yap Central operates on a positive operating cost recovery ratio (OCR) of above 100 per cent. All other utilities still depend on subsidies or are not able to cover their costs. For example, the MWSC (RMI Majuro) is not paying the electricity bills.

Figure 5.23: Collection Ratio – Actual Income vs. Billed Revenue (Indicator F2)



Collection Ratio

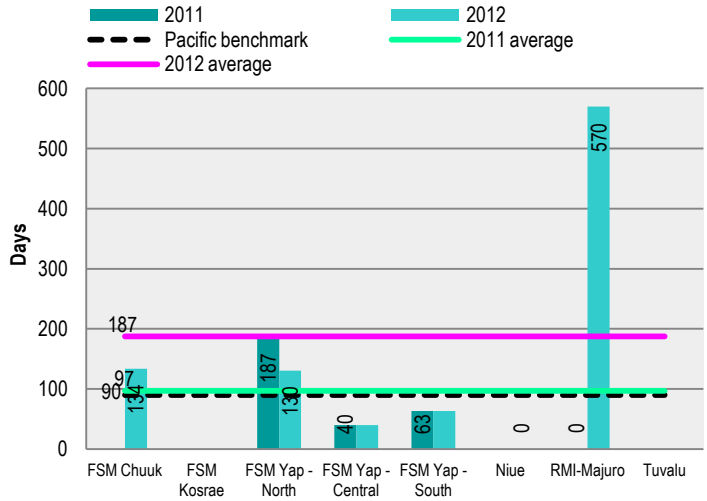
The collection ratio is below target.

All utilities perform below the target of 95 per cent, though the three FSM Yap utilities and MWSC (RMI Majuro) perform reasonably well at around 90 per cent.

In 2011, FSM Chuuk started a metering and billing programme and as a result, is well on its way to improving financial performance.

The data of Niue is based on 2011. Tuvalu is not billing for its services.

Figure 5.24: Debtor Days (Indicator F3)



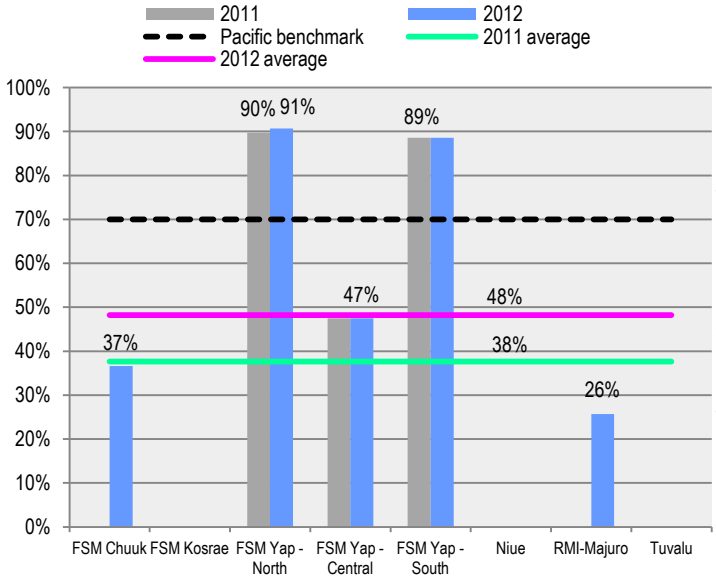
Debtor Days

The number of days needed before water bills are paid is very high in Majuro.

The highest figure of over 500 days is reported by the MWSC (RMI Majuro), which is way above the Pacific Benchmark of 90 days.

5.7 OVERALL PERFORMANCE OF THE SMALL UTILITIES

Figure 5.25: Overall Efficiency Indicator (OEI)



Overall Efficiency Indicator

Overall efficiency improved.

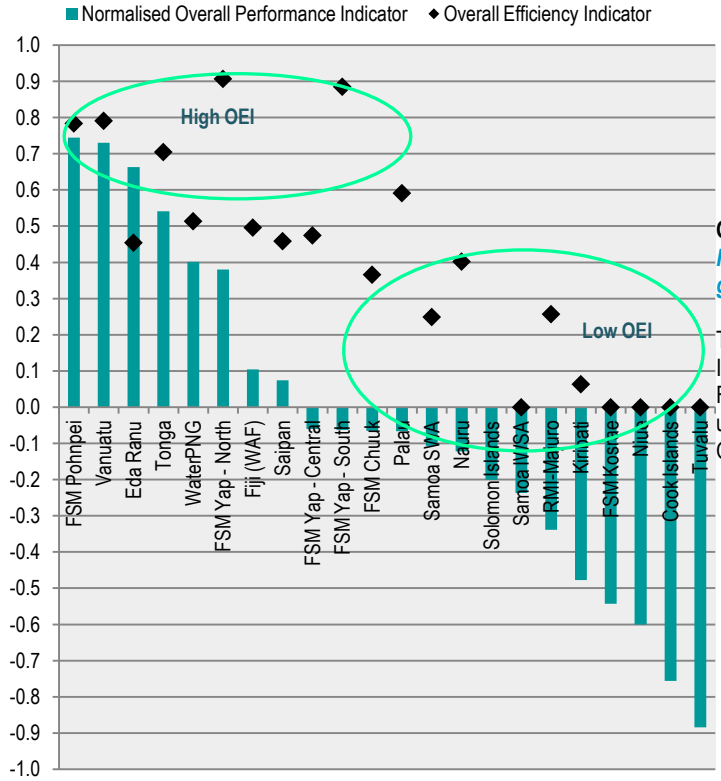
The overall efficiency indicator (OEI) is essentially an overall indicator of financial performance based on the following calculation:

$$OEI = (1 - NRW)x\ Collection\ ratio.$$

The OEI represents the percentage of water produced that actually generates revenues.

The average overall efficiency improved considerably from 38 per cent in 2011 to 48 per cent in 2012. This is mainly due to FSM Chuuk, which last year commenced a metering, billing and a leak reduction program.

Figure 5.26: Overall Performance Indicator (OPI) Normalised



Overall Performance

FSM Yap North is the best performing utility in this group.

The normalised results on the Overall Performance Indicator are illustrated in Figure 5.26 and show that FSM Yap North is the best performing of the small utilities. All other small utilities score below the average OPI of all PWWA utilities.

6

Towards Performance Improvement

Action Planning

6.1 BENCHMARKING WORKSHOP IN AUCKLAND

The 2012 Benchmarking Workshop was held in Auckland, New Zealand on 29-30 October 2012 to present the findings of the benchmarking results and to engage Pacific water utilities in analysis of their benchmarking scores and action planning.

Participants from 14 Pacific water utilities attended the workshop, as well as representatives from PIAC, PWWW, the Secretariat of the Pacific Community – Applied Geosciences and Technology Division of SPC (SPC-SOPAC), and the benchmarking consultants.

The initial part of the benchmarking workshop focused on a high level presentation of the benchmarking indicator results. The workshop participants and activities were subsequently divided into the large, medium and small utility groupings. In the group sessions, the results for each utility group were discussed in more detail. Furthermore, during the sessions utilities discussed and focused on benchmarking issues, benchmarking results, implementing benchmarking as a routine utility management tool and action planning.

The 'balanced score card' method was introduced as a guide to action planning and the group sessions were tasked with completing action plans for their individual utilities. The action plans are presented in Appendix H in this report.

The entire benchmarking workshop was interactive and the results of the group sessions were presented in the plenary sessions by the utilities themselves. A detailed report on the workshop is presented in Appendix F.

6.2 SUB-REGIONAL BENCHMARKING WORKSHOP (YAP, FSM)

A sub regional benchmarking workshop was held on 17-18 September 2012 in Yap, FSM in order to enhance the data collection of the PWWA benchmarking program. The workshop was attended by representatives of FSM Yap Central, FSM Yap North, FSM Yap South, PUC (FSM Pohnpei); and CPUC (FSM Chuuk). The objectives of the workshop were:

- to increase the awareness and understanding of the utility benchmarking participants in implementing the 2012 benchmarking project;
- to increase the quality of data inputs;

- to support the six FSM utilities with an understanding of the questionnaire and data collection process;
- to obtain a clear understanding of the overall present performances of the utilities, the current issues and utility needs for short and long improvements; and
- to share experiences and strengthen relationships between the utilities.

A short report on the Workshop is attached in Appendix G to this report.

6.3 WATER UTILITY ACTION PLANS

Based on the guidelines provided in the Auckland Workshop and the results of the draft benchmarking report, each of the water utility CEO's prepared an outline of an Action Plan with the purpose of improving performance. A summary of these Action Plans is presented in Appendix H to this report. For those utilities that prepared Action Plans, individual utility profiles were prepared that compared the results of the individual utilities to the overall benchmarking results of their peer groups. These profiles were sent to the CEO's of each utility for internal use within the organisation.

The priorities in the Action Plans outlined by the utilities for next year can be broadly summarised as follows:

- Reduce Non-Revenue Water by improving billing and implementing leak detection programs.
- Improve the quality of drinking water and laboratory standards.
- Improve continuity of water supply.
- Enhance the technical capacity of the utility staff and increase training programmes.
- Improve customer service levels.

It is expected that next year's benchmarking conference will provide an opportunity to follow up on the Action Plans outlined by the utilities. It should be noted however that some of the Actions Plans may only be realistically achieved over a two-year time frame, rather than a one-year time frame.

7

Future Benchmarking Strategy

7.1 SURVEY ON A STRATEGY FOR FUTURE BENCHMARKING

At the conclusion of the benchmarking workshop, a survey was circulated to the utilities through which they could provide comments on the future directions of the benchmarking process.

A summary of the questionnaire and the responses is provided below in Table 7.1.

Table 7.1: Future Directions Survey

No.		Question	Response	Comments
1		Would you like PWWA to continue with benchmarking of water utilities in the Pacific Region?		All utilities surveyed want the benchmarking process to continue.
	a	Yes	**100%**	
	b	No		
2		What is for you the main purpose of benchmarking: (more than one purpose is OK)		The majority of utilities selected 'management tool' at 77 per cent. However, being able to compare the benchmarking results with other water utilities and to improve the quality of information in their own utilities are also primary purposes of benchmarking.
	a	Be able to compare with other water utilities	**62%**	
	b	Improve the quality of information in my own utility	**62%**	
	c	Improve transparency about my utility's performance	46%	
	d	Be able to learn from other utilities	46%	
	e	Improve performance of my own utility	54%	
	f	Use the results as a management tool in my own utility	**77%**	
	g	Use benchmarking to convince my board/shareholders	54%	
	h	Others	8%	
3		Who is the main target group for reading the benchmarking report (more than 1 choice is possible)?		The Boards of the respective utilities is the primary target group for the benchmarking, followed by Senior Management of the utilities. A few utilities considered that the general public is also a target group for the benchmarking.
	a	Senior management of utilities	**77%**	
	b	The utility board	**92%**	
	c	The shareholder (ministries)	54%	
	d	Utility middle management and staff	54%	
	e	The general public	23%	
	f	Regional organisations	46%	
	g	Development partners	54%	

No.	Question		Response	Comments
4	How often do you want PWWA to collect benchmarking data?			Just over half of the utilities surveyed preferred data collection once a year with the other 50 per cent split between two years and twice a year.
	a	Once every two years	23%	
	b	Once per year	**54%**	
	c	Twice per year	23%	
	d	Other	0%	
5	How often do you want PWWA to publish a benchmarking report?			Once a year is the preferred option at 69 per cent for the publishing of benchmarking data.
	a	Once every two years	31%	
	b	Once per year	**69%**	
	c	Twice per year	0%	
	d	Other	0%	
6	How do you want benchmarking data to be collected?			Email was the preferred method of collection of benchmarking data.
	a	Benchmarking questionnaire sent by email	**62%**	
	b	Enter data on a PWWA website	31%	
	c	Other	8%	
7	How 'serious' do you want the benchmarking exercise to be?			The benchmarking preference in terms of how 'serious' it should be was weighted more towards it being a serious, action oriented tool for being more transparent with stakeholders.
	a	It should be "light", with a focus of exchanging information among utilities	15%	
	b	It should be more serious and action oriented	**38%**	
	c	It should become a serious tool of water utilities to become more transparent to third parties (like utility boards, shareholders, public)	**46%**	
8	Would you like PWWA to more actively monitor and follow up on benchmarking and action plans?			The majority of utilities prefer that the follow up and monitoring of action plans remain with the utilities and not PWWA.
	a	Yes, I would like PWWA to very actively monitor implementation of action plans	8%	
	b	Yes, I would like PWWA to monitor implementation of action plans once or twice a year	23%	
	c	No, I would like PWWA to collect the data and prepare the reports, but follow up and monitoring is a task of the CEO's.	**69%**	
9	How much would you be willing to pay as a maximum per annum for obtaining a high quality benchmarking report for Pacific water utilities from PWWA?			Only eight per cent of utilities believe that they should not contribute to the benchmarking report whilst 92 per cent believed that they should contribute to the benchmarking report. A relatively higher number of utilities (54 per cent) were happy to pay a maximum of US$1000, versus 23 per cent opting to pay a maximum of US$500 for the benchmarking report.
	a	US$15,000	0%	
	b	US$10,000	0%	
	c	US$7,500	0%	
	d	US$5,000	8%	
	e	US$2,500	8%	
	f	US$1,000	**54%**	
	g	US$500	23%	
	h	Nothing	8%	

In addition, the CEO's of all utilities were also asked what other suggestions they had regarding the benchmarking process. Their responses are summarised below.

- It should be used as a pre-requisite to obtain funding for utilities.
- The timing of the benchmarking was too short. Benchmarking questionnaires should be submitted to all participating utilities with sufficient time to enable data gathering.
- PWWA to coordinate detailed training of developing action plans using the balanced scorecard method.

▪ PWWA Officials/Consultants should review completed questionnaires by discussing the responses with each participating utility prior to inputting the data. This is to ensure data/information provided is correct and or relevant to each question and that there is no ambiguity, etc. It is kind of a quality check on the responses.
▪ More focus on climate change.
▪ Benchmarking is an exercise essential for data collection and data management. Benchmarking representatives for the utilities should be provided some training on the collection, organising and analysis of the data they collect from their utilities.
▪ Perhaps an area on gender balance could be incorporated.
▪ We should ensure that all data submitted by participating utilities addresses the same time periods. All performance data reported must coincide with financial year being reported.
▪ Participants should be provided with draft results as early as possible with exceptions highlighted so their causes can be investigated and corrected if applicable.
▪ Post the results of the benchmarking early on the PWWA website.
▪ Make the process easy enough to have the result communicated throughout the utility.

7.2 PWWA BENCHMARKING STRATEGY

Overview of future benchmarking strategy

The results of the benchmarking survey in section 7.1 above resulted in the formulation of the future *PWWA Benchmarking Strategy 2013 – 2017*, which has been approved by the Board of PWWA. The continuation of the benchmarking process allows PWWA to support the on-going development of efficient and sustainable water and wastewater utilities in the Pacific region. This will result in improved performance of the member utilities as senior managers and stakeholders will have access to relevant management information.

The draft benchmarking strategy has been developed for a five-year period from 2013 to 2017. By 2017, PWWA intends to be able to independently manage and sustain a robust and high quality benchmarking system. The collection and reporting of data on an annual basis will be improved over the next five years as PWWA aims to develop a web-based system for data collection. Gradual refinements to the existing benchmarking questionnaire will be implemented over the five years (where necessary) as it is important to ensure that the data is consistently maintained over this period.

"The collection and reporting of data on an annual basis will be improved over the next five years as PWWA aims to develop a web-based system for data collection."

Benchmarking workshops will continue to be held in conjunction with the PWWA annual meeting and sub-regional workshops may also be considered if efficiencies can be achieved.

Annual costs for developing and implementing the benchmarking system are estimated to be US$100,000. Utilities are prepared to contribute up to 30 per cent of the costs of the benchmarking exercise. Other stakeholders (such as development partners, regional and international organisations, NGO's etc) will be asked to pay for the data or contribute in-kind to the costs of implementing the benchmarking.

"Utilities are prepared to contribute up to 30 per cent of the costs of the benchmarking exercise. Other stakeholders...will be asked to pay for the data or contribute in-kind to the costs of implementing the benchmarking."

PWWA members consider benchmarking to be an important management tool and realise that to be successful, it needs the support of all PWWA member utilities. Based on the public status of most of its members, PWWA aims to conduct the collection and presentation of benchmarking data in an open and transparent manner. A summary of the draft benchmarking strategy is provided in Table 7.2.

Table 7.2: PWWA Draft Future Benchmarking Strategy

PWWA SUMMARY OF DRAFT FUTURE BENCHMARKING STRATEGY	
MISSION	▪ Further develop efficient, sustainable and transparent water and wastewater utilities in the Pacific region.
VISION	▪ To support improved performance and governance of its member utilities by providing relevant management information for senior managers and other stakeholders.
OBJECTIVES	▪ At the end of the five-year time period, to independently manage and implement a high quality sustainable benchmarking system as part of its regular services to its members.
STRUCTURE AND STAFFING	▪ PWWA is the lead agency. ▪ Employ part-time person(s) to undertake the annual benchmarking activity. ▪ Continue working with development partners, SPC-SOPAC and others. ▪ Benchmarking workshops held annually in conjunction with PWWA annual meeting and sub-regional workshops to be considered.
SYSTEMS	▪ Continue to further develop benchmarking based on the existing benchmarking system and process. ▪ Collection and reporting of data annually. ▪ The focus over the next five years is to improve the quality of data and to extend the system to capture more detailed and demand driven information from utilities. ▪ Web based collection of data also to be explored over the next five years.
RESOURCES	▪ Annual cost of the benchmarking exercise is about US$100,000. ▪ PWWA to contribute up to 30 per cent of these costs through utilities and PWWA itself. ▪ Other stakeholders to pay for the data or contribute in-kind to the costs of implementing the benchmarking.
STYLE AND CONFIDENTIALITY	▪ PWWA to provide benchmarking as a service to its members and to deliver the service in an efficient and cost effective manner. ▪ PWWA members consider benchmarking as an important management tool. ▪ PWWA aims to conduct the collection and presentation of data in an open and transparent manner whilst retaining the confidentiality within the association and stakeholders.

Frequency and timing of benchmarking and reporting

Benchmarking once a year is the option preferred by a majority of the utilities. The previous year's benchmarking report recommended that data collection for benchmarking be done around April to May. The consultants also recommend that this same time frame be followed for future benchmarking.

"Benchmarking once a year is the option preferred by a majority of the utilities."

Taking into account the recommendations on workshops discussed above, the following is the suggested timetable for the benchmarking process (Table 7.3):

Table 7.3: Recommended Benchmarking Timeline

April/May	June/July	August/September	October/November	December
Begin data collection	Utility follow-up and data analysis.	Sub-regional benchmarking workshops (if necessary).	Benchmarking workshop in conjunction with PWWA Annual Conference.	Final Benchmarking Report
Email and PWWA online data entry	PWWA prepares the benchmarking report, with the help of consultants.	Guam for North-West sub region. Fiji for South-East region.		Annual Benchmarking report

Benchmarking workshops

The success of the sub-regional workshop provides an opportunity for similar future benchmarking workshop models given the relative size, nature and distances of utilities within the Pacific region itself.

One of the options for the benchmarking workshop is to hold two sub-regional workshops which would be attended by the utility benchmarking officers. The sub-regions could be classified as the north-west region and the south-eastern region of the Pacific.

The sub-regional workshop held in Yap State, which brought together utilities from the FSM, was a very useful exercise and was highlighted as a more focused workshop as utilities were able to share experiences within their country.

The north-west region would comprise of utilities from FSM, Saipan, Republic of Marshall Islands (RMI) and Palau. Guam would be a more central place to hold the sub-regional conference for the north-west region as it is the airline hub for all the countries in this region.

The south-east region would comprise of utilities from the Cook Islands, Fiji, Kiribati, Nauru, Niue, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu and Vanuatu. Fiji would be one of the central places to hold the sub-regional conference for the south east region as each one of these countries has direct flights to Fiji.

The sub-regional workshops would be held one to two months prior to the annual PWWA conference and would provide more relevant and focused discussion on the benchmarking data collection, preliminary results and action planning. The primary target group at the sub-regional workshop would be the benchmarking representatives or those that have collected the benchmarking data i.e. technical managers and the finance managers, or the CEOs for the small utilities.

The annual PWWA conference will then provide the opportunity for the utility CEOs to participate in a more focused workshop on benchmarking.

Utilities willingness and ability to pay for benchmarking

The survey identified that the majority of utilities were prepared to pay for the cost of benchmarking. The amount they would be prepared to pay ranges from US$500 to US$5,000.

The cost of preparing the benchmarking report are estimated at about US$100,000, which includes the costs of data collection, data analysis, preparation of the benchmarking report, organising a one-to-two day benchmarking workshop and printing and distributing the final report. The costs may be somewhat reduced over the years following the streamlining of data collection and analysis.

"58 per cent of the utilities preferred the benchmarking data to be collected using the current process of email submission, while 31 per cent selected the entry of data into a database through the PWWA website."

It is recommended that for next year's benchmarking report, a suitable fee be levied to each of the utilities who would like to receive the complete benchmarking report. The benchmarking report fee structure may be similar to how the PWWA membership fees are arranged, that is according to size of the utility.

Collection and processing of benchmarking data

58 per cent of the utilities preferred the benchmarking data to be collected using the current process of email submission, while 31 per cent selected the entry of data into a database through the PWWA website.

Submission of data into the PWWA website would require PWWA to design a data base that can be accessed securely by utilities in order to upload benchmarking data. There are many advantages to this option as the indicators, reports and graphs can be produced almost instantaneously. Another advantage of online data

collection is that the benchmarking process can commence as soon as possible for those utilities that have completed their financial year in September, October, December or March.

Though only 31 per cent of utilities preferred this option, it should be explored further as this would provide a more efficient and cost effective platform, thus making it easier to sustain the benchmarking exercise.

Email submission of data is still the method that may continue to be used, in particular for those utilities in countries where internet access and connectivity are limited at the moment. However, the majority of countries have reasonable to very good internet connectivity and PWWA should consider this option sooner rather than later.

Other suggestions that are useful to be considered for future data collection are:

- An additional worksheet or worksheets can be included in the benchmarking questionnaire to show the benchmarking indicators automatically once the data is entered. This will provide utilities with information that can be checked for accuracy and compared to previous years. The indicators calculated on the additional worksheet will still be double checked and verified by the consultants when the completed questionnaire is submitted to PWWA.

- Benchmarking data is currently accumulated and analysed using an excel spreadsheet. Using a database such as Microsoft Access would be a more efficient manner in which to analyse and produce reports and graphs on the benchmarking indicators.

- It is recommended that a Microsoft access database be developed and tested for use in next year's benchmarking exercise. The key benefits are the efficiency of data analysis and a faster delivery of benchmarking results. Other benefits include that the data becomes easier to manage as more years of benchmarking data are collected, it would make multi-year analysis possible and individual utility reports can be produced automatically, allowing for trend analysis over multiple years.

- There will be a cost for developing this database and consideration needs to be given to who will manage the database i.e. PWWA, consultants or an outsourced entity?

- ***Online data entry via PWWA website***
  - Develop the PWWA website to allow the option of secure online data entry which would reduce the time involved in the data collection process.
  - The results can also be made available immediately online and individual utility reports cards can be downloaded immediately.
  - The option to submit questionnaires via email should still be provided to utilities if they are not comfortable with online data entry.

Improvements to the questionnaire

All the utilities commented that the current questionnaire has improved compared to that of last year and that it is a much simpler format.

Some general comments relating to the required improvements include:

"All the utilities commented that the current questionnaire has improved compared to that of last year..."

- Providing a worksheet that automatically calculates the benchmarking indicators from the data that is entered into each area.

- Selecting a clearer colour scheme so that main questions are not confused with sub-questions.

- Only some utilities submitted audited financial statements, some provided unaudited financial data and some were at a summarised level. Audited financial information should be provided, however, it is recognised that the audits for some utilities are not current. Utilities must still submit full financial statements, preferably audited.

With the modifications made to this year's questionnaire, the minor modifications discussed above can be used to revise the questionnaire for next year's benchmarking process.

Suggested timeline for future strategy

The table below presents a suggested timeline for the implementation of the future benchmarking strategy:

Table 7.4: Suggested Timeline for Future Strategy

2013	2014-2015	2016-2017
▪ Continue with the current benchmarking format ▪ Format the existing benchmarking questionnaire to include an 'indicators' worksheet ▪ Develop a Microsoft Access Database for benchmarking data analysis ▪ PWWA to introduce a charge for the benchmarking report ▪ Commence the benchmarking exercise early in 2013 – April/May ▪ Optional: conduct sub-regional workshops in Guam and Fiji ▪ Produce the Full Version of the Benchmarking Report for 2013	▪ Develop the PWWA website to accommodate online data entry and to publish benchmarking indicators reports online ▪ Trial the on-line data entry and also continue to use email questionnaires for Utilities that prefer this option ▪ Optional: conduct sub-regional workshops in Guam and Fiji ▪ Costs for the regional workshops in 2015 to be funded or partly funded by the utilities ▪ Present benchmarking data at the annual PWWA conference and produce Benchmarking Report	▪ Optional: Conduct sub-regional workshops in Guam and Fiji ▪ Full benchmarking workshop for all regions held at the annual PWWA conference ▪ Produce Full version of Benchmarking Report ▪ Review benchmarking strategy for next three years

Appendices

Appendix A: Utilities and Key Benchmarking Contacts

Country/ Region	Utility name		Role	Name of Key Contact	Email address
Cook Islands	Ministry of Infrastructure & Planning	CEO	Secretary of Ministry of Infrastructure & Planning	Ms Donye Numa	numa@oyster.net.ck
		Benchmarking Rep	Acting Director of Water Works Division	Mr Adrian Teotahi	hydro@moip.gov.ck
Papua New Guinea	National Capital District Water & Sewerage Limited trading as Eda Ranu.	CEO	CEO	Mr Billy Imar	blimar@edaranu.com.pg
		Benchmarking Rep		Dr Fifaia Matainaho	fmatainaho@edaranu.com.pg
Fiji	Water Authority of Fiji	CEO	Acting CEO	Mr Opetaia Ravai	oravai@waf.com.fj
		Benchmarking Rep		Mr Isireli Tawake	isireli.tawake@waf.com.fj
FSM Chuuk	Chuuk Public Utility Corporation	CEO	CEO	Mr Mark Waite	mwaite_cpuc@mail.fm
		Benchmarking Rep		Mr Paul Howell	howell_gkw@yahoo.com.au
FSM Kosrae	Department of Transportation & Infrastructure	CEO	CEO	Mr Weston Luckymis	weston@mail.fm
		Benchmarking Rep	Supervisor	Mr Soloman Talley	none
FSM Pohnpei	Pohnpei Public Utilities Corporation	CEO	General Manager/CEO	Mr Feliciano M. Perman	pucgm@mail.fm
		Benchmarking Rep	Assistant General Manager	Mr Robert M. Hadley	roberthadley007@gmail.com
FSM Yap North	Gagil Tomil Water Authority	CEO	CEO	Mr Manikam Razakrisnan	gtw@mail.fm
		Benchmarking Rep	As above		
FSM Yap Central	Yap State Public Service Corporation (YSPSC)	CEO	CEO	Mr Faustion Yanmog	
		Benchmarking Rep		Mr Charles Falmeyog	charlesfalmeyog@yspsc.fm
FSM Yap South	Southern Yap Water Authority	CEO	CEO	Mr John Guswel	
		Benchmarking Rep	As above		
Kiribati	Kiribati Public Utilities Board	CEO	CEO	Mr Kevin Rouatu	kevinrouatuki@gmail.com
		Benchmarking Rep	Water Engineering Manager	Mr Timona Itienang	itienangtimona@gmail.com
Nauru	Nauru Utilities Corporation	CEO	CEO	Mr Thomas Tafia	ttafia@gmail.com
		Benchmarking Rep		Mr Nixon Toremana	nixon.toremana@naurugov.nr
Samoa	Independent Water Schemes Association	CEO	President	Mr Sulutumu Sasa Milo	zultum@yahoo.com
		Benchmarking Rep	Senior Officer	Ms Morwenna Petaia	
Papua New Guinea	WaterPNG	CEO	MR. (Chief Operating Officer & Acting CE-MD)	Mr Raka Taviri	rtaviri@waterpng.com.pg
		Benchmarking Rep	Planning Manager	Mr Sibona Vavia	svavia@waterpng.com.pg

Country/ Region	Utility name		Role	Name of Key Contact	Email address
Palau	Bureau of Public Works	CEO	Director - Bureau of Public Works	Mr Techur Rengulbai	bpw@palaunet.com
		Benchmarking Rep	As above		
RMI Majuro	Majuro Water and Sewer Company (MWSC), Inc	CEO	CEO	Mr Hirobo Obeketang	hirobo74@gmail.com
		Benchmarking Rep	Operation Manager	Mr Halston W. deBrum	wq.mwsco@gmail.com
Saipan	Commonwealth Utilities Corporation	CEO	Executive Director	Mr Utu Abe Malae	abe_malae@cucgov.net
		Benchmarking Rep	Division Manager for Water & Wastewater	Mr Mariano R. Iglecias	miglecias@cucgov.net
Samoa	Samoa Water Authority	CEO	CEO	Mr Tainau Moefaauo	Moefaauo@swa.gov.ws
		Benchmarking Rep	Project Coordinator	Ms Ruth Ueselani	Ruth@swa.gov.ws
Solomon Islands	Solomon Islands Water Authority	CEO	General Manager	Mr Richard Austin	richard.austin@siwa.com.sb
		Benchmarking Rep	Technical Officer	Mr Bejimen Billy	bbilly@siwa.com.sb
Tonga	Tonga Water Board	CEO	CEO	Mr Saimone Pita Helu	twbhelu@kalianet.to
		Benchmarking Rep		Mr Pita Moala	pita.moala@gmail.com
Tuvalu	Ministry of Works, Water and Energy	CEO	Director of Works	Mr Ampelosa Tehulu	ampextehulu@yahoo.com
		Benchmarking Rep	Deputy Director of Works	Mr Uatea Maimoaga Salesa	fatukala@yahoo.com.au
Vanuatu	UNELCO GDF SUEZ	CEO	General Manager	Mr Philippe Mehrenberger	philippe.mehrenberger@unelco.com.vu
		Benchmarking Rep	Water Operation	Mr Ghislain Kaltack	ghislain.kaltack@unelco.com.vu
Niue	Water Supply Division, PWD	CEO	Director, PWD	Mr Deve Talagi	deve.talagi@mail.gov.nu
		Benchmarking Rep	Operation Adviser	Mr Clinton Chapman	clinton.chapman@mail.gov.nu

Appendix B: List of Documents Consulted

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Appendix C: Benchmarking Questionnaire and Guidance Notes

Questionnaire

PWWA BENCHMARKING PROJECT - 2012

DATA QUESTIONNAIRE CONTENTS

The data questionaire is segregated into the following sections
or the following worksheet tabs:

1 Contacts and Utility

2 Scheme and Assets

3 Volumes

4 Customers

5 Service Levels

6 Health & Environment

7 Staffing

8 Financial

9 Data Reliability

10 Utility Comments

11 Maintenance (special subject)

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SECTION 1 - UTILITY DETAILS AND CONTACTS

PRIMARY DATA (REQUIRED)		Units	Utility Response
1.1	Utility name	-	
1.2	Country	-	
1.3	Geographical region within the country (i.e. province, division, city)	-	
1.4	Name of Chief Executive Officer	-	
	CEO First Name	-	
	CEO Last Name	-	
	CEO Title	-	
1.5	CEO contact details	-	
	Mailing Address	-	
	Telephone (including country and region code)	-	
	Fax (including country and region code)	-	
	Email address	-	
1.6	Name of Benchmarking Representative	-	
	Rep First Name	-	
	Rep Last Name	-	
	Rep Title	-	
1.7	Rep contact details	-	
	Mailing Address	-	
	Telephone (including country and region code)	-	
	Fax (including country and region code)	-	
	Email address	-	
1.8	What type of water utility are you? *(PLEASE PLACE A "X" ALONGSIDE THE MOST CORRECT DESCRIPTION)*	-	
	Government department with no separate financial reporting for water & sewerage	-	
	Government department with separate financial reporting for water & sewerage	-	
	Statutory organisation following state requirements	-	
	State Owned Enterprise operating under commercial law	-	
	Jointly (Government and private) owned company operating under commercial law	-	
	Privately owned company operating under commercial law	-	
	Not-for-profit organisation (e.g. Co-operative) operating under commercial law	-	
	Community Owned Water Schemes	-	
1.9	Who has general oversight of the utility's services and prices? *(PLEASE PLACE A "X" ALONGSIDE THE MOST CORRECT DESCRIPTION)*		
	Local, regional or national government department	-	
	Independent board of stakeholders	-	
	Independent service & price regulator	-	
	Other (Describe....)	-	

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SECTION 2 - SCHEMES AND ASSETS

PRIMARY DATA (REQUIRED)

	Water supply	**Units**	**Response**	**Utility Comments**
2.1	No. of water supply schemes in total (both urban + rural) under your responsibility	No.		
2.2	Length of transport & distribution pipes (all diameters excl service connections)	km		
2.3	What best describes the types of water supply systems you operate (i.e. how was it designed to operate)? PLEASE PLACE A "X" ALONGSIDE THE MOST CORRECT DESCRIPTION			
(a)	Traditional reticulated water supply systems	-		
(b)	Constant flow system (household tanks to fill over the day to buffer peak demand)	-		
(c)	Unreticulated system (household or community tanks with water delivered/ tankered to them)	-		
2.4	Total number of property meters (i.e. domestic and non-domestic)	No.		
(a)	Number of domestic property meters (i.e. domestic)	No.		
(b)	Number of non-domestic property meters (i.e. domestic)	No.		
(c)	Number of operating property meters (i.e. not reading errors)	No.		
2.5	Estimated % of houses with household tank *(PLEASE ESTIMATE TO THE BEST EXTENT POSSIBLE)*	%		
	Sewerage			
2.6	No. of sewerage schemes - total	No.		
2.7	Total length of sewer mains (all diameters excl service connections)	km		
2.8	What best describes the types of sewerage schemes you operate (i.e. how was it designed to operate)? PLS ANSWER YES / NO			
(a)	Traditional reticulated sewerage schemes with gravity sewers, pumping stations, or rising mains	yes/no		
(b)	Common Effluent Drainage Scheme (i.e. septic tank with liquid flowing into low grade shallow gravity pipework)	yes/no		
(c)	Pressure system	yes/no		
	Water Resources			
2.9	Please provide an estimate of the type of water resources used for water production from all schemes.	% of total production		
(a)	Ground water intakes (boreholes)	%		
(b)	Spring water intakes	%		
(c)	Surface water intakes (rivers and dams)	%		
(d)	Seawater intakes (desalination)	%		
(e)	RAIN Water Harvesting	%		
	Service Area Features			
2.10	Topography of area of coverage			
(a)	Minimum elevation	m (above SL)		
(b)	Average elevation	m (above SL)		
(c)	Maximum elevation	m (above SL)		

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SECTION 3 - VOLUMES PRODUCED AND WATER RESOURCES

PRIMARY DATA (REQUIRED)

Water supply		Units	Response	Utility Comments
3.1	Total volume of water produced - total (Includes volume of water sourced from all sources or volume of water produced at treatment facilities.)	ML/annum		
3.2	Volume of water treated (please describe type of 'treatment' in the far column)	ML/annum		
3.3	Has a water audit been prepared for your utility in accordance with the IWA method? *(PLEASE ANSWER YES / NO AND PROVIDE DETAILS IN RIGHT HAND COLUMN)*	YES / NO		
3.4	Total Volume of Billed Authorised Consumption	ML/annum		
(a)	What is the volume of water billed to your customers through operating meters?	ML/annum		
(b)	What is the volume of water billed to your customers through other means - i.e. flat rates, estimated consumption, tanker supply etc	ML/annum		
3.5	Total Volume of Non Revenue Water (= result 3.1- result 3.4)	ML/annum		
	Volume of NRW as % of production (=result 3,4/result 3,1 x 100%)	%		
3.6	Unbilled authorised consumption:			
	Is all authorised consumption billed to your customers? If not, then what is the estimated volume of this metered consumption which is 'free water'? E.g the utility may for certain situations provide free water to some customers villages / communities	ML/annum		

Water Resources

3.7	What is the major water resource constraint for you? *(PLEASE SELECT THE MOST APPROPRIATE REASONS FROM THE LIST BELOW by marking an "X" and explaining in the right column)*	-	Explanatory Comments
(a)	Natural yield of the source (e.g. Low volume groundwater resources with inadequate recharge from rainfall)	-	
(b)	Existing infrastructure limitation (e.g. Capacity of pumps, capacity of dams / pipelines, power outages that limit pumping)	-	
(c)	Cost of infrastructure expansion (e.g. Cost for new dams or pumps)	-	
(d)	Land ownership and access issues (e.g. Private or village ownership of land in areas which could benefit the broader community)	-	
(e)	Source water quality issues (e.g. Saline intrusion to aquifers, sanitary issues with surface water)	-	

Sewerage

3.8	Estimated volume of sewage collected by your authority (i.e. transported in your sewerage network of pipes and pumps)	ML/annum		
3.9	Total volume of sewage treated by your authority	ML/annum		
(a)	Volume of sewage treated (to primary standard only)	ML/annum		
(b)	Volume of sewage treated (to secondary standard or above)	ML/annum		

For sewage, secondary treatment or above means anything more than screening, clarification and grease removal.

3.10	Capacity of all sewage treatment facilities	ML/day		
3.11	Typical flows during dry and wet weather			
	Typical dry weather flow in previous year	ML/day		
	Typical wet weather flow in previous year	ML/day		

SECTION 4 - CUSTOMER INFORMATION

PRIMARY DATA (REQUIRED)

Water supply

			Response	Utility Comments
4.1	Total number of direct (active) water connections	No.		
(a)	Number of residential connections	No.		
(b)	Number of non-residential connections (i.e. industrial, commercial, community, institutional, government)	No.		
(c)	Number of public standposts (total) (i.e. those currently in use - not those abandoned)	No.		
(d)	If you do not have a reticulated water network, how many 'customers' do you serve by means of supply through tank trucks?	No.		
4.2	Average population served per connection			
(a)	avg number of persons served by residential connection	person/connection		
(b)	avg number of persons served by public standpost	person/connection		
(c)	avg number of persons served by tank truck	person/connection		
4.3	Total population served with water services by the water utility	Persons	multiply 4.1 x 4.2	
(a)	Current population served with water supply - direct connection	Persons		
(b)	Current population served with water supply - within 200m of standpipe	Persons		
(c)	Current population served with a tankered supply under normal operating conditions (i.e. not emergency or back-up supply)	Persons		
4.4	Total population within jurisdiction of water utility	Persons		
4.5	Total number of service connections with functional meters (i.e. only meters that are functional) - both direct connections and standpipes	No.		

Sewerage

4.6	Total number of active sewerage connections	No.		
4.7	Total population served with sewerage services by the water utility	Persons		
4.8	Total population within jurisdiction for sewerage services of utility	Persons		

Customer Complaints

4.9	How many customer complaints did you receive in the previous financial year?	No.		
4.10	Do you have a customer charter which specifies your proposed service levels and response commitment?	Yes/No		
4.11	Is that customer charter communicated to your customers? If so, how?	-		
4.12	How do you proactively find out the views of your customers? Place a "X"	-		
	Letters, telephone calls etc from customers	-		
	Inviting customers' views through radio, TV or other publicity	-		
	Questionnaire survey	-		
	Other (please state)	-		
4.13	Are the following types of complaints recorded? (PLEASE ANSWER YES OR NO)			
	Faults / outages	Yes/No		
	Leaks	Yes/No		
	Water quality problems	Yes/No		
	Connection, billing, metering issues	Yes/No		
	Financial hardship	Yes/No		
	Other (please state)	Yes/No		
4.14	What is the most common legitimate complaint to your utility? (i.e. of those listed in question 4.13 above)	-		
4.15	Do you have a system for logging and managing customer complaints?	Yes/No		

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SECTION 5 - SERVICE LEVELS & SYSTEM PERFORMANCE

PRIMARY DATA (REQUIRED)

Water supply

		Units	Response	Utility Comments
5.1	How many customers received intermittent supply under normal operating conditions?	No. Customers		
5.2	What is the average or typical duration of supply in hours / day	Hrs/day		
5.3	What is your minimum desired water pressure at the customer's property boundary?	m		
5.4	Total number of main breaks for the previous year	No.		
5.5	Total energy usage for the water supply			
	Electricity usage (KWH)	KWH		
	Diesel (liters)	Liters		
5.6	Total energy cost for water supply	$/annum		
5.7	Energy source (please consult your energy provider) (For example, hydro power, diesel generation, wind power, solar).			
	Hydropower			
	Diesel generation			
	Natural gas (LNG)			
	Wind power			
	Solar power			
	Coal based power			

Sewerage

5.8	Do you have uncontrolled overflows from your sewer network?	yes/no		
5.9	If yes, how many times per year do you have uncontrolled overflows?	No.		
5.10	Total energy usage for sewerage			
	Electricity usage (KWH)	kWH		
	Diesel (liters)	liters		
5.11	Total energy cost for Sewerage	$/annum		
5.12	Energy source (please consult your energy provider) (For example, hydro power, diesel generation, wind power, solar). Please mark with an "X".			
	Hydropower			
	Diesel generation			
	Natural gas (LNG)			
	Wind power			
	Solar power			
	Coal based power			

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SECTION 6 - HEALTH AND ENVIRONMENT

PRIMARY DATA (REQUIRED)

Water supply		Units	Response	Utility Comments
6.1	What drinking water quality guidelines do you use?	-		
6.2	Who is your health / water quality regulator?	-		
6.3	Do you have a water quality monitoring program?	yes/no		
6.4	How many of your supply schemes have a drinking water safety plan?	No.		
6.5	How many of the Plans have been externally verified and audited?	No.		
6.6	Is drinking water quality compliance information publicly available?	yes/no		
6.7	Does your water utility own and operate its own water quality testing laboratory?	yes/no		
6.8	If yes, is your laboratory independently certified or checked for quality of results? And by who (i.e. Which organisation?)	-		
6.9	Is your water quality compliance testing done by your utility or your water quality regulator?	yes/no		
6.10	What do you believe are your most critical water quality issues? (please place a cross)			
	Raw water physical parameters - e.g. turbidity, total suspended solids, colour, salinity, total dissolved solids	-		
	Raw water chemical parameters - e.g. high iron / high manganese, nitrates	-		
	Treatment effectiveness - appropriate technology, operations	-		
	Operator skills	-		
	Cost of chemicals / energy etc	-		

Drinking Water Quality - Compliance				
6.11	Total number of microbiological indicator samples taken and tested	No./year		
6.12	Number of microbiological tests passing minimum standard required by water quality guidlines or laws in 6.11	No./year		
	% of samples compliant with microbiology requirements	%		
6.13	Total number of residual chlorine water samples taken and tested according to adopted guidelines or water quality law	No./year		
6.14	Number of residual chlorine tests passing minimum standard required by water quality guidelines or laws in 6.11	No./year		
	% of samples compliant with residual chlorine requirements	No./year		

Sewerage				
6.15	What environmental discharge guidelines do you use? (e.g. SPREP guidelines or local guidelines)	-		
6.16	Who is your environmental / effluent regulator?	-		
6.17	Do you have a sewage effluent quality monitoring program?	yes/no		

Environmental discharges - Compliance				
6.18	Total number of treated sewage samples	No.		
6.19	Number of treated sewage samples passing standard for primary treatment	No.		
	% of samples compliant with standard for primary treatment	%		
6.20	Number of treated sewage samples passing standard for secondary treatment	No.		
	% of samples compliant with standard for secondary treatment	%		

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SECTION 7 - HUMAN RESOURCE UTILISATION AND DEVELOPMENT

PRIMARY DATA (REQUIRED)

SECONDARY DATA (TO SUPPORT DATA ANALYSIS)			UTILITY COMMENTS
Staffing Numbers and Turnover			
7.1	Total number staff	No.	
(a)	How many of the above staff are working on a partime basis?	No.	
(b)	What would be the full time equivalent of those partime employees?	No.	
7.2	How many of your staff terminated their employment in the previous year (i.e. retirement, resignation, termination for poor performance)?	Persons/ year	
7.3	Of these terminated how many would you consider to be in the category of senior (in terms of responsibility) or management?	No.	
7.4	Total number of technical staff with at least a diploma in engineering or science	No.	
7.5	Total number of staff with a business qualification (e.g. Diploma or higher in accounting, commerce, economics, business, MBA)	No.	
7.6	Total number of engineering staff (i.e. with 4 year engineering degree)	No.	
7.7	Do you have a system for assessing employee satisfaction?	Yes/No	
Training			
7.8	Total number of staff training days throughout the year	days/year	
7.9	What was your (i.e.. your utility's) total training budget for the year?	$/annum	
7.10	Do you keep a training register which shows the training attended by each staff member?	Yes/No	
7.11	Do you have a training or learning and development strategy ?	Yes/No	
7.12	Do you assess the effectiveness of training delivered?	Yes/No	
7.13	What was your (i.e. your utility's) total training budget for the year?	$/annum	
(a)	Training budget for internal training (e.g. the cost of employing trainers internally)	$/annum	
(b)	Training budget for external training (i.e. to external training institutes, universities, colleges etc)	$/annum	
7.14	In addition to your own internal training budget, can you estimate what value of training was delivered by external sources of funding (e.g. under Tas, donor funded projects etc)	$/annum	
7.15	Similarly, what number of training days were provided by externally funded sources?	days/year	
7.16	What do you consider the most important training needs for your staff? Select one of the following? And specify in the right column	select using X	Please specify the type of training
(a)	technical training		
(b)	administrative		
(c)	financial		
(d)	management/governance		

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SECTION 8 - FINANCIAL

PRIMARY DATA (REQUIRED)

Financial Year and Statements		Units	Total / Overall	Utility comments
8.1	In which month does your financial year begin? (e.g. July each year or January each year or other month)?	-		
8.2	What is the currency in which your financial information is presented in this section? (e.g.: $USD, $AUD, $TOP, $NZD, $FJD etc.). Please input financial data using your own currency?	-		
8.3	Please attach your previous year's annual financial statements (preferably audited however unaudited is okay)	-		
Total Operating Cost				
8.4	Total Operating (recurrent) costs excluding depreciation	$/annum		
8.5	Of the total operating costs per question 8.4 above, please provide the following costs:	$/annum		
(a)	Energy costs (electricty and fuel/diesel costs for all assets including buildings, transport, power for water and wastewater assets)	$/annum		
(b)	Purchases of raw water	$/annum		
(c)	Chemical costs	$/annum		
(d)	Maintenance costs (Repairs, Preventative maintenance)	$/annum		
(d) (i)	If part of your maintenance costs are contracted out can you estimate or provide the total value of contracted out services?	$/annum		
(e)	Total labour costs (incl admin. & corporate/management)	$/annum		
(f)	Overhead (admin., communication, ict, advertising & corporate etc. excl labour)	$/annum		
(g)	Annual depreciation	$/annum		
(h)	If you have any external borrowings what is the cost of servicing your debt per year (i.e. how much is the annual interest expense?)	$/annum		
Total Operating Revenue				
8.6	Total operating revenue	$/annum		
(a)	Actual revenue from water sales (i.e. consumption + fixed charge)	$/annum		
(b)	Revenue from sewerage services	$/annum		
(c)	Other water related revenue (e.g. New connections, materials, sales)	$/annum		
(d)	Operating subsidies and grants (for operating expenses only) or government funding for community service expenditures.	$/annum		
Collection Rates				
8.7	Cash income (i.e.. actual revenue in the form of cash collected or receipted from billed water sales)	$/annum		
8.8	End of financial year accounts receivable (gross) balance	$/at year end		
8.9	Your provision or allowance for doubtful debts at the end of the financial year	$/at year end		
Affordability				
8.10	New connection fee (typical domestic connection fee)	$/ connection		
8.11	Average tariff per m3 (billed revenue/water consumed) - *PLEASE ATTACH SEPARATE SHEET WITH YOUR TARIFF POLICY FOR RESIDENTIAL AND NON RESIDENTIAL*			
8.12	Average annual water bill for average consumption of 6m3 per month *(PLEASE CALCULATE)*	$/annum		
Asset values				
8.13	What is the net book value (or written down value) of your total assets at financial year end (i.e.: net book value = total asset cost minus accumulated depreciation)?	$		
8.14	What is the total asset cost at financial year end (total historical cost)?	$		
8.15	What is the average age of your total assets in years?	Years		

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SECTION 9 - DATA RELIABILITY

PRIMARY DATA (REQUIRED)

		Please place a "X"	Utility Comments
9.1	How is the volume of water produced calculated or derived? (PLEASE PLACE A CROSS AGAINST THE MOST APPROPRIATE ANSWER)		
a	The quantity of water produced is computed on the basis of measurement by bulk flow meters at the outlet of the treatment plant and/or at all bulk production points, which are calibrated / verified for accuracy at least every 2 years. The volume of losses and bulk industrial consumption are periodically monitored.		
b	The quantity of water produced is estimated on the basis of measurement of period sample surveys of production flows at all bulk production points (i.e. short term monitoring, not continuous monitoring). Reliable estimates of transmission losses and industrial water consumption are available.		
c	The quantity of water produced is estimated on the basis of assumed pump capacities and efficiencies, and pump run hours.		
d	The quantity of water produced is estimated on the basis of operator judgement or turnover of reservoirs (e.g. Use 50% of the volume of a 10ML reservoir every day).		
9.2	How is the volume of water consumed calculated or derived?		
a	Metering is undertaken at all key distribution nodes (entry to DMAs) and at the consumer's end for all categories of consumers. Billing records and databases clearly reveal regular reading of meters and, therefore, the total quantum of water billed to consumers in the given time period (month/bi-monthly).		
b	The quantum of water sold is based on the metered quantity for bulk and commercial consumers. For households, ferrule size (the size of the distribution pipe outlet at the consumer end) of each consumer connection as well as the hours of supply are known, to compute the quantum of water sold.		
c	Meters are installed for a select category of consumers, such as commercial and bulk consumers. For other categories of consumers, such as domestic consumers, the number of such consumers and the average consumption per consumer are considered, to arrive at the quantum of water sold.		
d	Very few meters have been installed in the distribution system and at the consumer end. The quantity of water sold to the category of consumers to whom bills are raised is estimated on the basis of assumed average consumption in that category and the number of consumers in that category.		
9.3	How is the number of connections or customers calculated?		
a	Billing records and databases clearly identify consumers with metres (against a specific meter serial number). Billing processes reveal regular reading of meters and meter readings are the basis for charging consumers. Records on standposts are available. Databases of water connections and meters are complete and spatially referenced with a GIS database. There is a mechanism to identify faulty meters and repair meters. Processes for installation of new water connections, installation of meters and generation of water bills based on this are interlinked, and the data systems enable such continuity of data flow regarding these.		
b	Database/ records reveal the list of consumers that have meters installed in their water connections. However, there are no clear data on functioning of metres, and no linkage with the billing system that may or may not use metered quantity as the basis for billing.		
c	Meters are installed for only certain categories of consumers. It is assumed all consumers of these categories have meters installed which are functional and used as the basis for billing. Records do no reveal the exact number of connections which are metered. Water is charged on the basis of average readings for the consumer category (e.g. kL/connection/year) or on the basis of past trends in most cases.		
d	A few meters have been installed. All installed meters are assumed to be functional and used as the basis for billing water charges.		
9.4	How is the population derived?		
a	The population served is known with reasonable accuracy. Any expansion of municipal limits and other significant factors are measured and factored into the current population computation. The floating and/or seasonal population is estimated with reasonable accuracy.		
b	The population served is calculated on the basis of census figures less than 5 years old, extrapolated to current levels. Reliable estimates of the floating population are not available.		
c	The population served is calculated on the basis of past census figures more than 5 years old, extrapolated to current levels. Reliable estimates of the floating population are not available.		
9.5	Where is the financial information sourced from?		
a	Highest/preferred level In case of multi-function agencies such as municipal corporations, the of reliability (A) budget heads related to water and sanitation are clearly separated. Cost allocation standards for common costs are in place. An accrual based double entry accounting system is practiced. Accounting standards are comparable to commercial accounting standards with clear guidelines for recognition of income and expenditure. Accounting and budgeting manuals are in place and are adhered to. Financial statements have full disclosure and are audited regularly and on time.		
b	Budget heads related to water and sanitation are segregated. Key costs related to water and sanitation are identifiable, although complete segregation is not practiced (for example, electricity costs for water supply services are not segregated from overall electricity costs of the ULB). Key income and expenditure are recognised based on accrual principles. Disclosures are complete and are timely.		
c	There is no segregation of budget heads related to water supply services and sanitation from the rest of the functions of the agency. A cash-based accounting system is practiced. There are no clear systems for reporting unpaid expenditure, or revenues that are due. Disclosures and reporting are not timely. Audits have a time lag and are not regular.		

Note: These reliability grades have been adopted from the following key sources

Handbook of Service Level Benchmarking, Ministry of Urban Development Government of India

Guidelines for Audit and Review Strategic Asset Management Plan

PWWA BENCHMARKING PROJECT -2012

SECTION 10 - UTILITY COMMENTS

SECONDARY DATA (TO SUPPORT DATA ANALYSIS)

10.1	**Please list your current 5 problems/challenges to manage and operate your utility**
a	
b	
c	
d	
e	
10.2	**Please list your top 5 problems areas in the foreseeable future**
a	
b	
c	
d	
e	
10.3	**Please list the top 5 areas where you believe PWWA can assist you in addressing these problem areas**
a	
b	
c	
d	
e	

PWWA BENCHMARKING PROJECT - 2012

SECTION 11 - MAINTENANCE (SPECIAL SUBJECT)

PRIMARY DATA (REQUIRED)

Maintenance Plan & Budget		Units	Total / Overall	Utility comments
11.1	Do you have a maintenance plan in your utility?	yes/no		
11.2	What is the annual budget allocated for Maintenance?	$/annum		
11.3	How would you judge the level of maintenance of your Utility?	good/average/poor		
Preventative Maintenance				
11.4	Provide frequency of routine maintenance activities on:			
(a)	raw water intakes	frequency/annum		
(b)	pumping stations	frequency/annum		
(c)	chlorination units	frequency/annum		
(d)	reservoirs	frequency/annum		
(e)	pipelines	frequency/annum		
(f)	fire hydrants	frequency/annum		
(g)	service connections	frequency/annum		
(h)	sewer piplines	frequency/annum		
(i)	sewage treatment	frequency/annum		
11.4	Do you register number of leak repairs?	yes/no		
11.5	Do you have an up-to-date asset data base?	yes/no		
11.6	Do you have a meter replacement programme?	yes/no		
Corrective Maintenance				
11.7	Do you register number of leak repairs?	yes/no		
11.8	If yes how many repairs you have made in the past year?	no/annum		
11.9	Do you register blockages in your sewer network?	yes/no		
11.10	If yes how many repairs you have made in the past year?	no/annum		
Risk of Climate Change				
11.11	Has your utility considered the risk of climate change and natural disasters in the design and/or maintenance of your long term assets	yes/no		
11.12	Has your utility ever approached your government or a development partner for support in assessing and/or planning for the risks of climate change or disaster risk management?	yes/no		

Guidance notes to accompany data questionnaire 2012

Introduction/Instructions

This document provides guidance on how to complete the attached questionnaire. Compared to the 2011 questionnaire, we have made some revisions in line with the feedback we received from the utilities and suggested improvements by the PWWA/Consultants team. We reduced the number of questions, which appeared to be irrelevant to the utilities, combined the primary and secondary data in order to avoid confusions/doubling of the data and added a section on Maintenance as a special theme for this year.

Data questionnaire submission instructions

The questionnaire has been emailed to you as an electronic Microsoft excel file. At this stage you have three (3) options for completing it (Kindly note that OPTION A is the preferred option):

- **OPTION A** – Complete the electronic version (in Excel) and email to the PWWA Project Officer, Mrs Fiona MacKenzie (fiona@pwwa.ws), and to Mr Latu Kupa (latu@kew.com.ws) (Executive Director of the PWWA). Please send also copies to the Regional Benchmarking Consultant based in Apia, Samoa - Mr Ernest Betham (ernest.betham@gmail.com) and the International Benchmarking Consultant Mr Albert Thiadens (thiad019@planet.nl) to ensure effective data back up and prompt responses; OR
- **OPTION B** – Complete by hard copy and scan and email as per option A above.
- **OPTION C** – Complete by hard copy and fax (or mail) to Latu Kupa, the Executive Director of Pacific Water & Wastes Association at the following contact details: Fax : +685 28885 or By Mail to PWWA, PO Box 848, Apia, Samoa.

PLEASE COMPLETE THE QUESTIONNAIRE BY 20th SEPTEMBER 2012. IF YOU ARE HAVING DIFFICULTIES OR HAVE QUESTIONS, OR SIMPLY WOULD LIKE TO DISCUSS, PLEASE CONTACT ERNEST BETHAM IN THE FIRST INSTANCE AND WE WILL ENDEAVOUR TO ASSIST YOU TO COMPLETE THIS QUESTIONNAIRE WITH THE MOST ACCURATE DATA AS POSSIBLE. EMAIL: ernest.betham@gmail.com PHONE: work+(685)24337 or mobile +(685)7773501 or mobile +685(7523501). ALTERNATIVELY, CONTACT ALBERT THIADENS ON thiad019@planet.nl

PLEASE ENSURE YOU COMPLETE THE CHECKLIST ON THE FINAL PAGE AND RETURN IT WITH YOUR QUESTIONNAIRE

Contents of data questionnaire

The data questionnaire comprises 11 separate questionnaire worksheets for each category of data that is required. The categories of questions are: 1. Contacts & Utility; 2. Schemes and Assets; 3. Volumes; 4. Customers; 5. Service Levels; 6. Health & Environment; 7. Staffing; 8. Financial; 9. Data Reliability; 10. Utility Comments; and 11. Maintenance.

Reliability grades for Key Data

Worksheet Questionnaire No. 9 Data Reliability contains some indicators to assist you in assessing the reliability of the data used to complete the questionnaires. Please tick the appropriate data source for each data reliability indicator on worksheet No. 9 for each section.

Reporting Period

All data needs to be reported using a consistent reporting period for your utility. Because financial data is reported in a financial year, and much of the planning around utility operations occurs in parallel with budgeting, this benchmarking exercise will adopt a financial year as a standard reporting period. You will be asked in Section 8 (Financial) to state the start months of your financial year. When reporting all other data (e.g. volumes, water quality sampling, connections etc), please ensure you adopt this standard financial year as your reporting period.

Guidance on Sections and Key Questions

Section 1 – Utility Contact Details and Utility Information

This section should be quite self-explanatory. Please provide details of CEO and of nominated Benchmarking Contact person within your organisation. Please answer some simple questions to give an understanding of the type of water business you manage and the type of water and sewerage services you provide.

Section 2 – Schemes and Assets

In some cases you may not have the required data available. In those cases please provide estimates to the best of your knowledge. This year we left out the questions on the details of your assets as we consider that these data have not been considerably changed since last year.

Section 3 – Information on Volumes of Water and Sewage

Please answer the questions relating to water and sewage volumes to the best of your ability. These questions are amongst the most critical questions as they will form the basis of many of the performance indicator calculations. Making some attempt at answering these questions to the best of your ability and providing comments in the far right hand column will provide us with the information to calculate various indicators at a later stage. Some guidance on the most critical data is provided below:

Question 3.1 – Volume of water produced

The volume of water produced can be calculated using the following methods (in decreased order of reliability):

- Records from bulk flow meters on the outlets of water treatment plants, bores and/or reservoirs where available (depending on the reliability of the flow meters).
- Flow records through weirs/ flumes at water treatment plants.
- Sale of bulk water to your utility (from another utility).
- Bore pump run hours x flow capacity (e.g. you know the pump capacity is 10 L/s and the pump usually operates for 12 hours per day, which equates to 10 L/s x 3600 seconds/hour x 12 hours = 432,000 L or 0.43 ML/day or 158 ML/annum).
- Rate of filling of reservoirs (e.g. you know the volume of a reservoir such as 10 ML, and you know that it takes around 12 hours to fill it, that equates to 230 L/s).

Similar methods can be used for volume of treated water and volume of untreated water.

Question 3.4 – Volume of Billed Authorised Consumption

The volume of water 'consumed' (in accordance with international definitions) can be calculated using the following methods (in decreased order of reliability):

- For utilities with 100 per cent metering (e.g. WaterPNG, Eda Ranu (PNG), Tonga, ASPA) – the billed authorised consumption will be the sum of the metered volume (for operating meters) plus estimates of non-operating meter flows (e.g. errors/broken/not read).
- For utilities with partial metering – the billed authorised consumption will be the addition of:
    - Sum of metered volume (for operating meters); and
    - An estimate of all others based on unit consumption from billed meters (e.g. if typical metered household consumption is 0.5kL/day and you have 1,000 connections which are not metered or the meter is not functioning, then the billed unmetered consumption will be 0.5 kL/connection/day x 1,000 connections = 500 kL/day).
- For utilities with no or limited metering – the metered component of the billed authorised consumption will be close to zero. The larger part of this will be the billed unmetered consumption. Means of calculating this will include:
    - Adopting unit or household rates from previous donor funded studies (ADB? JICA? WB? Other?) or pilot studies.
    - Adopting the assumed household rate from your tariff policy.

Question 3.6 – Unbilled authorised consumption

Please make an estimate of any authorised consumption (i.e. the customer has authorisation from the utility to take the water) which is not billed to customers. In some countries, this is 'free water' and can include:

- Free water for villages/communities/government institutions/schools where negotiated at some time in the past.
- Other public activities such as fire fighting and training, flushing of mains and sewers (including for water quality sampling), street cleaning, watering of municipal gardens, public fountains, building water, etc.

Question 3.8 – Volume of sewage collected

Similar to Question 3.1 (Volume of water produced), there are a number of methods for calculating the flow rate of sewage collected, which include:

- Records from bulk flow meters on the inlet to sewage treatment plants outlets and obviously depends on the age and the reliability of the flow meters.
- Pump runs hours x flow capacity of major sewage pumping stations transferring flow to the STP.
- Number of sewage connections x an assumed unit loading rate.
- Ratio of sewage to household water consumption in areas where this ratio can be calculated, then applied across the board to all connections.

Question 3.9 – Volume of sewage treated (to varying standards)

Further to knowing the volume of sewage collected, it is also useful to know the volume of sewage treated to varying standards. Similar methods and reliability grades will apply to this question, however, please note the definition for primary treatment below to guide your calculation.

Typical primary sewage treatment processes may include clarification (with or without chemical treatment, to accomplish solid-liquid separation) or grease removal. Any sand filtration, disinfection, polishing steps, activated sludge processes, anaerobic + aerobic processes, biological filters and lagoons (aerated, facultative, maturation or polishing) are considered secondary processes and should be included in the category 'secondary or better'.

Question 3.10 – Capacity of sewage treatment facilities

This should relate to the rated design capacity of sewage treatment plants during typical operating conditions (not wet weather). Lower reliability grades will relate to facilities for which the capacity is not known.

Question 3.11 – Dry and wet weather flows

Similar to other volume estimates in the previous questions, flows can be calculated in a number of ways and the reliability grade should reflect this. It is likely that the reliability grade for wet weather flows will be lower due to the low frequency of such events and records.

Section 4 – Customer Information

Similar to Section 3, these questions will be critical to the benchmarking exercise and will provide a basis for many of the comparisons. Some guidance is provided below:

Question 4.1– Total Number of Connections to the network

This refers to the number of active direct water connections at year-end. All active connections should be counted – residential, non-residential, but inactive connections to vacant buildings should be excluded if possible.

Question 4.2 – Average population served per connection

In order to calculate in 4.3 the total population served by your utility we ask you to provide the average number of persons who are served by either a direct residential connection, a public stand post or a tanker supplied reservoir.

Question 4.4 – Population served by water supply

This question relates to the number of people who live within the area of the water utilities jurisdiction and actually served by the water utility. This figure can be derived in a number of ways, and it is left to your jurisdiction to adopt the method you think is most accurate for your supply area. Population under the responsibility of the utility with access to water through house connections, yard taps and public water points (either with a direct service connection or within 200m of a stand post). Any population outside the utility's area of responsibility who are served (e.g. people who come from outside to the utility's water points) should be excluded. Population figures can be derived from:

- Census data
- Statistics office
- Previous planning or demographics studies
- GIS – billing/water supply zones laid over census data

Question 4.5– Number of meters

This question relates to the total number of meters installed within the network (both those that are operating and those that are not). Active meters relate purely to the number of operational meters (i.e. those that are functional) on active properties (i.e. inactive connections to vacant buildings should be excluded if possible). Ideally, the information on the number of these meters should come from a billing database, customer database or metering database.

Questions 4.6, 4.7 and 4.8 – Connections and populations for sewerage

Similar to the previous questions on connections and populations for water, these two questions relate to sewerage and similar methods can be used to derive these numbers.

Questions 4.9 to 4.16 – About Customer Complaints

These questions are qualitative and intended to guide our understanding of your focus on customer service. Please answer them to the best of your ability.

Section 5 – Service Levels

Question 5.1 to 5.2 – Intermittent supply

Question 5.1 requires an estimate of the number of customers which receive intermittent supply under normal operating conditions. This means that we are not talking about customers who receive intermittent supply during specific failure or emergency periods.

Question 5.2 relates to the average hours of pressurised supply per day. Ideally this should be done at a water supply zone level. This should exclude hours of supply where the pressure is less than the minimum standards for pipe water supply.

Question 5.4 – Main breaks

Not all utilities will be able to report this number. The purpose is to report the number of breaks in potable and non-potable water mains, as a proportion of the total length of such mains serviced by the water utility. It is a partial indicator of customer service and the condition of the water main network. The quoted number should be the number of main breaks, bursts and leaks in all diameter water distribution and reticulation mains for the reporting period. Breaks exclude those in the property service (i.e. mains to meter connection) and weeps or seepages associated with above ground mains that can be fixed without shutting down the main.

Question 5.5 – Total Energy Usage

If possible, please state the total energy consumed by your utility for the reporting period in producing and transmitting water and collecting and treating sewage. If possible, please break this down to water and sewerage (5.12) as separate categories. Typically, this information should be available on energy bills or invoices and may be collated to an overall utility level. In some cases where your energy is not provided from electricity please indicate the amount of fuels (i.e. diesel) you have used.

Question 5.6 – Total Energy Cost

Please state the total cost of energy consumed by your utility for the reporting period in producing and transmitting water and collecting and treating sewage. If possible, please break this down to water and sewerage as separate categories. Similar as noted above, this info should be available on energy bills and may be easier to access than the energy usage figures.

Question 5.7 – Energy source

This question aims to understand the predominant energy types provided by pacific energy service providers and used by water utilities. It is unlikely that your energy bill will have this type of information; instead it is more likely to be general information available for your country. Please answer this question to the best of your ability. Typical centralised energy sources throughout the pacific may include:

- Solar power
- Hydropower

- Wind power
- Natural gas (LNG)
- Diesel-fired generation
- Bio-fuels
- Coal based power

Question 5.8 and 5.9 – Sewer Overflows

The number of overflows may be used as a partial indicator of the capacity and condition of the sewerage network, as an indication of how effectively the network is being managed and may also be used to compare customer service.

You should include the number of occurrences in the reporting year when untreated sewage spills or discharges and escapes from the sewerage system (i.e. pumping stations, pipes, maintenance holes or designed overflow structures) to the external environment, regardless of whether they are reported to an environmental regulator or not. Overflows are those caused by system faults originating in the system under the water utility's responsibility.

Section 6 – Health and Environment

This section provides a unique focus on a critical objective of water and wastewater management – to improve health and environmental outcomes. Please answer the questions relating to water and sewage volumes to the best of your ability. These questions are amongst the most critical questions as they will form the basis of many of the benchmarking calculations. Making some attempt at answering these questions to the best of your ability and providing comments in the far right hand column will provide us with the information to calculate various indicators at a later stage and to design future indicators.

Some guidance on the most critical data is provided below:

Question 6.10 in particular is your opportunity to provide feedback on your greater water quality challenges.

Questions 6.11 & 6.12 – Focus on microbiological monitoring.

The key purpose of this focus is the fact the pathogens are by far the most common and widespread health risk associated with drinking water and therefore should be our early focus. Chemical parameters will be the focus of future benchmarking exercises. What is meant by microbiological monitoring is *E. coli* or *Thermotolerant coliform* monitoring of water delivered to customers. Ideally, this should be monitoring across the network, not only at the outlet of a treatment facility.

It is recognised that *E. coli* monitoring will likely occur across a number of schemes regardless of whether treatment, in particular chlorination, occurs or not. This section will therefore be relevant to both treated and untreated schemes.

Typically, the microbiological tests undertaken will be plate counts for total or faecal coliforms. Typical targets for coliform counts should be zero per 100ml; however, in setting a target 'pass rate', your utility may make provision for sampling error and time to testing (e.g. expect 0 counts per 100ml 90 per cent of the time).

Question 6.13 and 6.14 – Water Quality Compliance – Residual Chlorine

Following on from the previous questions, Questions 6.13 and 6.14 focus on the effectiveness of the chlorination at the treatment facility and its longevity within the network. Similar to the microbiological questions, Question 6.13 requires you to state how many residual chlorine samples are required to be taken in accordance with you own sampling regime. Question 6.14 then requires you to state what the 'pass mark' is (e.g. minimum 0.2mg/l residual chlorine within the network.

Ideally, the data required should be stored in a water quality sampling and results database. Data reliability will be impacted upon by:

- Sampling only at treatment plant outlet vs. sampling at random locations throughout the network.
- Flushing of sampling points.
- Recording of results in a centralised database.
- Accreditation and independence of the laboratory where sampling is undertaken.

It is recognised that operational monitoring of residual chlorine at the WTP will be more frequent than the surveillance monitoring undertaken in the network. Please focus your answers on the surveillance monitoring undertaken by the water service provider at the WTP and throughout the network; not the monitoring undertaken by your regulator.

Question 6.15 to 6.20 – Sewerage and Environmental discharges – Compliance

Similar to the previous questions on drinking water quality compliance, these questions relate to sewage treatment compliance. The previous guidance for drinking water quality also relates to these questions.

Section 7 – Human Resource Utilisation and Development

Please answer the questions relating to human resources utilisation and development to the best of your ability. Making some attempt at answering these questions to the best of your ability and providing comments in the far right hand column will provide us with the information to calculate various indicators at a later stage and to design future indicators. It should be noted however that this is not intended to be a detailed human resources (HR) analysis. A number of other factors, including job satisfaction, training effectiveness, motivation will all influence human resource development. Some guidance on the most critical data is provided below:

Question 7.1 – Total number of staff

This question refers to the total number of staff working at the utility on water and wastewater services. Report in terms of Full Time Equivalent staff numbers (FTEs) which will include full-time staff plus long term casuals at year end (i.e. at the end of the reporting period).

Please note the following guidance when including casuals: if you have one casual worker who works an average of 20 hours per week and your standard week is 40 hours per week, then that person is a 0.5 FTE. These 'casual' FTEs should be added to the full-time staff to calculate the total FTE.

Question 7.2 and 7.3 – Staff turnover

The total of the number of employees who resign for whatever reason, or retire, plus the number of employees terminated for performance reasons. Employees lost due to Reductions in Force (RIF) will not be included in this calculation (e.g. Change in retirement age which causes large groups of people to return, corporatisation activities which make staff redundant).

Question 7.8 to 7.15– Staff Training

These questions relate to the type and amount of training provide to the utility staff as well as the identified training needs.

Section 8 – Financial

Question 8.1 – Reporting Period / Financial Year

Please state the start month of your financial year. The most recently available previous financial year information must form the basis of all your data reporting.

Question 8.3 – Financial statements

Please separately attach a copy of your financial statements from the most recent financial year completed. If your organisation has separate financial reporting, please provide the entire set of financial statements which comprises:

- Income statement, statement of financial performance or profit and loss statement
- Balance sheet or statement of financial position
- Statement of cash flows
- Notes to accounts

If your organisation does not have separate financial statements (e.g. if you are a government department), please do your best to provide a summary of the previous financial year's actual expenses and revenues.

Question 8.4 to 8.5 – Total Operating (recurrent) costs

This question is a critical question for a number of the financial indicators and therefore it is critical that the definition is well understood. This figure should include all operational expenses but exclude depreciation and financing charges (interest expense on external borrowings). It is important to understand that in this context,

that by operational we mean 'OPERATING YOUR BUSINESS', not 'OPERATING YOUR ASSETS'. The distinction is that the cost of operating your business *must include labour, overheads and indirect and/or administration costs*. These recurrent operating costs (Operations, Maintenance and Administration – OMA) should include (but not be limited to) the following:

- Water resource access charge, land charges or resource rent tax
- Purchases of raw, treated or recycled water
- Charges for bulk treatment/transfer of sewerage to other treatment utilities
- Salaries and wages (including direct operating staff, and non-direct staff including management and corporate)
- Overheads on salaries and wages
- Materials/chemicals/energy
- Other government charges which may include but not be limited to, land tax, debits tax, stamp duties and council rates.
- Indirect costs should be apportioned to water and sewerage services

Operating costs should EXCLUDE the following: (see note below)

- Depreciation
- Interest and financing costs – interest expense on external borrowings
- Any impairment write-downs of assets to recoverable amounts.
- Write-offs retired or scrapped assets.
- The written down value of assets sold

Question 8.5 asks you to provide specific cost components of the total operating (recurrent) costs such as:

- Energy
- Purchases of raw water
- Chemical costs
- Maintenance costs such as repairs, preventative maintenance etc.
- Total labour costs
- Overhead costs (administration, communication, ICT, advertising, corporate costs etc.)
- Annual depreciation
- Interest expense or interest costs on external borrowings.

Question 8.6 (a) to (d) – Total Operating Revenue

The question requires you to provide the total operating revenue and then itemise this revenue in terms of billing of water and wastewater services, other operational revenues (connection fees, well abstraction fees, and reconnection fees), subsidies and community service obligations. For subsidies and grants, please only include grants for operational costs, not capital grant components.

Question 8.7 – Cash Income

The cash income is the revenue collected for bills raised during the year i.e. what was the cash that was collected during the year from invoicing or billing of water related revenue? This should ideally exclude collection of arrears as inclusion of arrears will skew the performance reflected.

Question 8.10 to 8.12 – Affordability issues

At Question 8.10, please insert the charge for a standard new domestic connection. We will collect GNI/ GDP data from centralised sources (i.e. The World Bank) and calculate the ratio.

At Question 8.11, please attach the details of your tariff policy for residential and non-residential customers.

Section 9 – Data reliability

In order to assess the reliability of some key data for the required indicators we have included this section with a number of cross referencing questions.

Section 9 – Data reliability

In order to assess the reliability of the data for required to calculate the benchmarking indicators we have included this section with a number of cross referencing questions.

Section 10 – Utility Comments

This section gives you the opportunity to indicate the main issues and challenges to operate and manage your utility in the current and future situation. It will also allow you to indicate the services you may need from PWWA assisting you in addressing these problem areas.

Section 11 – Maintenance

As a special topic to this year's benchmarking we have included a section on Maintenance, which will allow you to indicate the present maintenance performance level of your utility as well as the company's position in view of climate change or disaster risk management.

Checklist for Data Questionnaire Completion

			Comments / areas requiring assistance
1.	Have you nominated a key contact for benchmarking in the Questionnaire in *Section 1 - Contacts and Utility* and provided contact details?	☐	
2.	Have you answered the questions in *Sections 1 through to 11* which are relevant to your business to the best of your ability? Please be sure to make notes in the column provided to clarify your answers or request assistance.	☐	
3.	Have you answered all questions in *Section 9 – Data Reliability* regarding sources of data and data reliability?	☐	
4.	Have you included a copy of your latest audited financial statements, or if no such information is available, the previous year's actual vs. budget costs and revenues?	☐	
5.	Have you completed the final *Questionnaire 10* giving a summary of the key challenges for your organisation from your own perspective?	☐	

Appendix D: Benchmarking Indicator Definitions

Refer IB-Net	PWWA No.	Indicator	Units	Definition
	KRA1 - Production			
3.2[1]	V1	Volume of water produced - total produced from sources and treatment	kL/connection/day	Total annual water supplied to the distribution system (including purchased water, if any) expressed in kL/connection/day.
	V1b	Volume of water produced – in litres per capita per day	L/capita/day	
4.2[2]	V2	Volume of water sold (i.e. billed) - through meters or estimated unmetered	kL/connection/day	Total annual water sold (both metered and unmetered) expressed in kL/connection/day.
	V2b	Volume of water sold per capita	L/capita/day	
	V3	Volume of sewage produced - total	kL/connection/day	Total annual sewage collected (treated and untreated) expressed in kL/connection/day.
	V3b	Volume of sewage produced – per capital	L/capita/day	
	KRA2 - Technical Performance			
1.1	O1	Water supply coverage	% of population	Population with access to water services (either with direct service connection or within reach of a public water point) as a percentage of the total population under utility's nominal responsibility.
15.1	O2	Continuity of water supply service (hours available)	hours/day	Average hours of service per day for water supply, under normal operating conditions.
6.3	O3	Non-Revenue Water (kL/connection/day)	kL/connection/day	The difference between the volume of water produced and the volume of water for which customers are actually billed (i.e. annual figures for V1 minus V2).
	O3b	Non-Revenue Water (% of water produced)	% of water produced/supplied to network	
	O3c	Non-Revenue Water (kL/km/day)	kL per km of mains per day	
2.1	O4	Sewerage coverage	% of population	Population with sewerage services (direct service connection) as a percentage of the total population under utility's notional responsibility.
	KRA3 - Health and Environment			
15.4	HE1	Drinking Water quality compliance - residual chlorine	% compliance	The percentage of samples tested for residual chlorine that passes the relevant standard. Chlorination is generally applied to safeguard the water quality in the distribution network. Utilities are required to monitor the residual chlorine within the network.
	HE1a	Percentage of customers on treated water	% treated	The percentage of water produced what is treated, which means full treatment of surface water and at least chlorination of water produced from boreholes.
-	HE2	Drinking Water quality compliance - microbiological	% compliance	The percentage of samples tested for E. coli that passes the relevant standard. Most countries apply the EPA World Health Organization standards.
17.1	HE3	% of sewage produced which is treated to at least primary standard	% of sewage	Proportion of collected sewage that receives at least primary treatment, i.e. involving settlement with the intention of removing solids, but not biological treatment. Both lagoon and mechanical treatment can be included, where appropriate.
	KRA4 - Human Resources			

[1] IB-Net uses m^3/connection/month, although this unit can be easily converted to kL/connection/day. The unit adopted of kL/connection/day is considered more tangible to most utility operators.
[2] Similar to the footnote above, IB-Net uses m^3/connection/month and calls this indicator 'water consumption', although it is the same indicator. Water sold is a more accurate indicator name than water consumed.

Refer IB-Net	PWWA No.	Indicator	Units	Definition
12.2	HR1	Water and sewerage business staff/ 1000 connections	number of FTE/1000 conn	Total number of full time equivalent staff expressed as per thousand connections.
	HR2	Training days (no days/year)	days/FTE/year	Total number of training days (both internal and externally provided) per full time equivalent staff member per year.
	HR3	Average cost of staff (total labour cost / no of staff/GNI)	$/FTE/GNI PPP	Total labour cost divided by number of full time equivalent staff, a percentage of Gross National Income (based on Purchasing Power Parity (PPP)) per capita.
	KRA5 - Customer Service			
7.1	CM1	Meter coverage rate for water supply customers (for all water meters)	% of customers	Total number of connections with operating meter/ total number of connections, expressed in percentage
16.1[3]	CM2	Customer complaints / 1000 connections	number/1000 conn	Total number of complaints received (regardless of whether they were addressed) per 1,000 connections.
	CM3	Affordability - new connection	% GNI PPP per capita	Affordability of a typical new residential connection (size to be agreed) as a percentage of Gross National Income (based on Purchasing Power Parity (PPP)) per capita.
19.2[4]	CM4	Affordability – average bill	% GNI PPP per capita	Affordability of an average annual water bill per person (excluding wastewater) as a percentage of Gross National Income (based on Purchasing Power Parity (PPP)) per capita.
	CM4b	Affordability – 6kL/month/connection	% GNI PPP per capita	Affordability of 6kL monthly water bill per person (excluding wastewater) as a percentage of Gross National Income (based on Purchasing Power Parity (PPP)) per capita.
	KRA6 - Financial Sustainability			
24.1[5]	F1	Operating cost recovery ratio (excluding depreciation)	%	The operating cost recovery ratio is defined as the ratio between operating costs (excluding depreciation and debt servicing) and the operating revenues excluding subsidies from water & sewerage sales.
23.2	F2	Collection ratio - actual cash income vs. billed revenue	%	Cash income / Billed revenue as a %
23.1	F3	Accounts receivable (debtor days)	days	(Year-end accounts receivable/Total annual operating revenues) * 365
	OV1	**Overall Efficiency Indicator**	**%**	**(1-NRW) x Collection Ratio.** The Pacific Benchmark is set at 70% based on approximately 95% collection ratio and 25% Non-Revenue Water
	OV2	**Overall Performance Indicator**	**%**	For each key result area (KRA) the normalised scoring of the indicators are calculated to an average score per KRA. Subsequently these KRA scores are then normalised to calculate the combined overall score.

[3] IB-Net uses total number of complaints per year expressed as a percentage of the total number of connections. Where number of connections are known this can be easily converted. Complaints per 1,000 connections are a measure more readily used in the water sector in developed countries.

[4] IB-Net uses the affordability of monthly water bill for a household consuming 6m^3 of water per month (Section 8.6 clarifies the reason for adopting an average bill instead of 6m^3/month).

[5] Depreciation is excluded due to the inconsistencies in approaches and accuracy of calculated depreciation.

Appendix E: Benchmarking Examples throughout the World

List of other benchmarking initiatives for comparison:

Country/ Region	Org.	Year	Doc. Type	Document Name
Australia	NSW	2012	Report	State of New South Wales 2010-11 NSW Benchmarking Report
	WSAA	2009-10	Reports	National Performance Report 2009-10 Definitions Handbook
			Reports	National Performance Report 2009-10
			Data	National Performance Report 2009-10 data
	QLD Gov	2008-09	Data	Comparative information QLD local government 2008-09
New Zealand	Water NZ	2009-10	Report	National Performance Review Report 2009-10
Europe	EBC	2011	Report	European Benchmarking Co-operation 2011 Water & Wastewater Benchmark - Learning from International Best Practices
Netherlands		2009	Report	Reflections on Performance 2009
USA	AWWA	2010	Report	2010 Water and Wastewater Rate Survey
South East Asia	ADB	2004	Report	SEAWUN Benchmarking Report 2003
Pacific	ADB/ Castalia	2005	Report	Enhancing Effective Regulation of Water and Energy Infrastructure and Utility Services (Small Island Countries Component) - Interim Pacific Report
	ADB	2005	Report	Performance Benchmarking for Pacific Power and Water Utilities
	PWWA	2010	Data	PWWA preliminary benchmarking
Africa	WSP / WOP	2009	Report	Water Operator's Partnership - Africa Utility Performance Assessment
Worldwide	World Bank	ongoing	Data on internet	IB-NET is a benchmarking tool developed by the World Bank Water and Sanitation Program.

There are numerous water utility benchmarking activities throughout the world which have been undertaken as one-off and ongoing programs. The findings of this benchmarking initiative have been compared with the range of indicators available in the studies listed in the table above, where deemed appropriate for each indicator. PWWA benchmarks have been set by PWWA based on the 2011 benchmarking results and reflect targeted values for the indicators concerned and may be adapted by PWWA from time to time.

Comparisons within the Pacific water utilities are complemented by evaluations against results from previous initiatives from within the Pacific and with other jurisdictions for various purposes. For example, comparisons against Australian and New Zealand utilities could illustrate best practice for larger water and wastewater utilities, comparisons with other small island states or developing country utilities will also provide best practice comparisons. This might offer an interim target for water and wastewater utilities.

Appendix F: Report, Program and List of Participants of the Auckland Benchmarking Workshop

The 2012 Benchmarking Workshop was held on the 29th and 30th of October 2012 in Auckland to present the findings of the benchmarking results and to engage Pacific water utilities in the analysis of their benchmarking scores and action planning.

Participants from 14 Pacific Water Utilities attended the workshop including representatives from PRIF, PWWA, SOPAC and the benchmarking consultants. The benchmarking workshop was conducted and led by the International Specialist and supported by the Regional Specialist.

The initial part of the benchmarking workshop focused on a high level presentation of the results of the benchmarking indicators. After that, the workshop participants were divided into groups representing large, medium and small utilities. In the Group Sessions the results for each utility were discussed in more detail. Furthermore, the utilities discussed and focussed on benchmarking issues, benchmarking results, on implementing benchmarking as a routine management tool of the utility and action planning.

Short presentations were made by the Pohnpei Utility Corporation and the Solomon Islands Water Authority on their respective experiences on maintenance in Pohnpei and action planning in the Solomon Islands.

PIAC provided a presentation of the 'balanced score card' as a management tool to design and structure action planning and the group sessions were tasked with completing action plans for their individual utilities.

The benchmarking workshop was very interactive and the results of the group sessions were presented and discussed in the plenary sessions by the utilities.

A. *Group Sessions Results Day 1 – Discussions on the Benchmarking Process*

Specific questions on the benchmarking process, outcomes and improvements were discussed at the group sessions and presented in the plenary sessions. The summary of these discussions are provided below.

1. **How did your utility experience the use of the questionnaire and provide comments on the benchmarking process for 2012.**
   All of the utilities commented on the fact that the current benchmarking questionnaire was much simpler to complete and that it was tailored to the extent that the smaller utilities could also complete the questionnaire.

   The Sub-Regional Workshop held in Yap State of the Federated States of Micronesia was a very positive outcome and was greatly appreciated by the participants. Owing to the distance of travel, the sub-regional workshop provided a more focused meeting and discussion platform for the utilities of the FSM region. Some utilities commented that they would like increased emphasis on climate change in the questionnaire given its effects on water.

   The Tongan and Samoan utilities, who are completing the questionnaire for the second time, reported an improvement in their information management process as a result of the need to gather data for the benchmarking. Some of the utilities suggested that the benchmarking data be shared at the national level in their respective countries as it would support the identification/achievement of MDGs (Millennium Development Goals).

2. **Describe any improvements in the benchmarking results over the prior year.**
   Some utilities have reported improvements in their benchmarking results which is due in part to infrastructure improvement development programs that had been on-going during the first benchmarking study in the previous year.

   The Gagil Tomil Water Authority (northern utility) in Yap State of the Federated States of Micronesia has achieved a 100 per cent compliance rate with their chlorine and microbiological testing.

The Tongan and Samoa utilities reported improved Non-Revenue Water losses in the current benchmarking program due to active leak detection programs.

3. What are the key challenges for your utilities?

A common challenge across all the utilities was to continue the management and improvement of Non-Revenue Water through improved leak detection and billing efficiencies.

Water quality and asset management is a major concern as well due to funding limitations and this is coupled with the need for governments to provide Community Service Obligation funding to utilities in order to effectively carry out their programs and provide water.

Recruiting and retaining qualified and technical staff is a major challenge for all the utilities as experienced and knowledgeable personnel is essential to conducting and improving water operations.

Some of the smaller utilities commented that establishing their billing and collection system is difficult for them due to limited knowledge in the finance area as well as a lack of funding. In addition, smaller utilities commented that more comprehensive contingency/disaster management/risk management plans need to be developed and that there should be opportunities for adopting twinning arrangements and learning from other utilities.

Water shortage was a common problem for all the utilities as they continue to experience this issue given that the effects of climate change are more pronounced in the smaller states.

4. What actions have you taken to improve your benchmarking results since the previous year?

A summary of actions taken this year by some of the utilities to improve on their benchmarking is as follows:

- The CPUC (FSM Chuuk) has installed meters for approximately 50 per cent of the population and it is now in a position to improve billing and collection. The CPUC (FSM Chuuk) has also increased production by 90 per cent by rehabilitating well and water treatment plants. This should lead to increased water available for sale to consumers.
- The IWSA (Samoa) introduced rock gravel filtration at the intakes & storage tanks to filter water, developed/implemented five water safety plans, improved network upgrade through the use of PE pipes.
- The NUC (Nauru) established a new policy on revenue collection; meters were installed at the desalination plant, and developed a new corporate plan to improve management/operation system.
- The PUB (Kiribati) prepared an urgent recovery and action plan that is currently under implementation; however results are only expected over time.
- The Cook Islands made minimal progress; will receive financial assistance from the Government of China (PRC) and the New Zealand Government to improve/upgrade water network.
- The PUC (FSM Pohnpei) upgraded its meter service, improved leak detection on NRW, introduced a sodium hydrochloride generator, installed production meters to measure leaks, increased security at water shed areas (access roads) and introduced sewage overflow.
- The SIWA (Solomon Islands) improved the reliability of pumping equipment, water quality, customer care, financial sustainability, a NRW taskforce and network hydraulics.

5. Describe how you would use benchmarking as a management tool to monitor and evaluate the performance of your utility.

Utilities all expressed similar comments in this area in that benchmarking would be used to primarily evaluate and assess performance of their utilities and management. All utilities also agreed that the benchmarking results across the region would also identify areas where they can improve by using the experiences of other utilities in the region.

6. Clarify or discuss the Top 5 priorities.

There are no surprises in the responses to this particular question as controlling and addressing Non-Revenue Water was a significant priority. Improving water quality was also a priority as well as treatment of waste water.

In smaller island states the source of water was a major concern, including the age of the water network assets.

Asset management is also a priority in most of the water utilities as they try to maintain their assets through preventative maintenance rather than reactive maintenance. Funding a comprehensive asset maintenance program is also a challenge in many utilities. Other important priorities relate to the training of employees. Some utilities are also focussing on improving their customer service relations and are trying to improving their customer satisfaction levels.

7. What opportunities do you see for cooperation among the utilities in the region?

A very useful exchange of ideas around the different chlorination practices or water treatment practices of the utilities was well received and this is one area where utilities see the benefit of cooperation among the members.

Twinning arrangements are one of the major topics that were discussed in areas of staff secondments to create opportunities to learn and share experiences. However, problems raised in this area relate to funding arrangements for the secondment opportunities.

Some of the utilities in the north western part of the region suggested that there are opportunities for bulk purchasing of inventory supplies or the opportunities to make inventory available in times of emergencies.

8. What support do you require from PWWA in view of benchmarking/performance improvement?

The focus of the comments in this question was on the 'facilitation' role that PWWA can provide in terms of donor interaction and twinning arrangements among the utilities.

One utility also expressed a desire for PWWA to actively monitor the action improvement plans for the utilities (as a result of the benchmarking exercise) so that it encourages utilities to address the needs in a timely manner. Following on from this, they would also like to see PWWA provide assistance in promoting operational and technical expertise.

Some utilities would like to see PWWA develop to a point where it provides resource and technical material in much the same way other professional associations provide for their members.

Pictures from the Auckland Benchmarking Workshop.

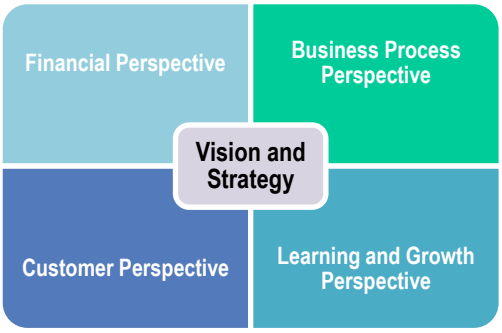
B. *Group Sessions Results Day 2 – Balanced Score Card and Action Planning*

The second day of the workshop focussed on using the 'balanced score card' (BSC) approach to action planning.

The BSC method is a strategic approach to managing the performance of an organisation. It provides a framework for organisational strategies, vision and mission to be implemented, monitored and the performance measured.

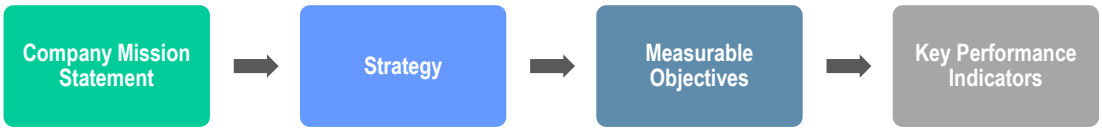
Before implementing the BSC method the organisations' mission and strategic plan/vision must first be determined and translated into four critical success factors (or perspectives):

a. ***Finance –*** the financial status of the organisation, grow revenue, reduce costs and improve collections.
b. ***Customer –*** customer satisfaction level.
c. ***Business process –*** how the organisation is currently structured and operating, new technologies, operational excellence.
d. ***Learning and Growth –*** the level of expertise of their employees, staff performance appraisal and development programs.



Objectives and performance measures for each of the four critical success factors are defined in line with the organisations vision/mission and strategic objectives. Targets and indicators for the performance measures are developed in order to track the progress on the performance measures or objectives.

The following illustration shows a process that an organisation may experience from mission/vision statement to key performance indicators. Everyone in the organisation sees the decisions they make in the context of the 'big picture' and every decision is aligned with the goals and strategy.



An important step is to assign responsibility for collecting the data and reporting (i.e. SMART Actions) to ensure that the performance targets and indicators are achieved.

The BSC method provides the basis for developing detailed action plans and also business plans by using the measureable objectives which are aligned to the overall strategy and vision to achieve the key performance indicators or targets. Organisations develop plans or 'actions' in order to achieve the key performance indicators and accomplish the organisational strategy and vision.

An example of the balanced score card for the large group of utilities that was presented at the Auckland workshop is provided in Table F.1 below:

Table F.1: Balanced Score Card Approach

BUSINESS PERSPEC-TIVE	WATER UTILITY BBIC OBJECTIVES	2012 TARGETS AND MEASURES	KEY PERFORMANCE INDICATORS (KPIs)	SMART ACTIONS
CUSTOMERS (Samoa)	To improve responsiveness to our customers. Increase treated water supply coverage.	Reduce customer complaints. To increase treated water supply coverage.	Resolve 70 per cent of customer complaints within three working days for water supply. Resolve 95 per cent of customer complaints within 24 hours for wastewater customer. To increase treated water supply coverage by five per cent in FY 2012-2013.	Categorising complaints to types of complaints and logging complaints for reporting to CEO fortnightly. CEO to monitor levels of customer complaints and those served every month. Effective implementation of capital projects at Vailele and Aleisa. Construction of WTPs.
FINANCE (Fiji)	Improve financial performance.	To increase operating cost recovery ratio by five per cent.	Reduce operating cost. Reduce NRW.	CEO to monitor water loss problems.
BUSINESS PROCESSES (Tonga)	Reduction energy consumption (electricity and diesel). Improve asset management.	To reduce energy cost by 1.5 per cent. Increase from 30-60 per cent data register on GIS system.	Shifting from diesel to power (ongoing project). Continuous monitoring of assets.	Monitoring by CEO on the monthly basis. To be monitored by the CEO.
LEARN AND GROWTH (PNG)	Improve the performance of staff.	Perform annual performance evaluation meetings to all staff.	Provide training to staff from 0.5 to one training day per person.	To be monitored by CEO.

Table F.3: List of Participants Workshop in Auckland 29th - 30th October 2012

No.	Title	First Name	Last Name	Organisation	Job Title
1	Mr	Opetaia	Ravai	Water Authority Fiji	CEO
2	Mr	Ta'inau	Titimaea	Samoa Water Authority	General Manager
3	Mr	Ruth	Ueselani	Samoa Water Authority	Sector Coordination Unit
4	Mr	Richard	Austin	Solomon Islands Water	General Manager
5	Mr	Benjamin	Bulao	Solomon Islands Water	NRW Task Force Leader
6	Mr	Saimone	Helu	Tonga Water Board	CEO
7	Mr	Pita	Moala	Tonga Water Board	
8	Mr	Sulutumu	Milo	Independent Water Scheme Samoa	President
9	Mr	Philippe	Mehrenberger	UNELCO - Vanuatu	CEO
10	Mr	Ghislain	Kaltack	UNELCO - Vanuatu	
11	Mr	Raka	Taviri	Water PNG	Chief Oper. Officer & Acting CE-MD
12	Mr	Tokaata	Niata	Kiribati Public Utility Corporation	Board of Directors
13	Mr	Kevin	Rouatu	Kiribati Public Utility Corporation	CEO
14	Ms	Donye	Numa	MOIP Cook Islands	CEO
15	Mr	Paul	Howell	Chuuk Public Utilities Corporation	Water/Wastewater Manager
16	Mr	Halston	deBrum	Majuro Water and Sewer Compnay	Operations Manager
17	Mr	Bradley	Henry	Pohnpei Utility Coprporation	AGM Water/Sewer
18	Mr	Ampelosa	Tehulu	Public Works-Tuvalu	CEO
19	Mr	Tom	Tafia	Nauru Utility Authority	CEO
20	Ms	Frances	Brown	Water Sector Co-ordination Unit MNRE	Water Sector Co-ordinator
21	Mr	Latu	Kupa	Pacific Water and Wastes Association Secretariat	Executive Director
22	Mrs	Kisa	Kupa	Pacific Water and Wastes Association Secretariat	
23	Ms	Laumua	Leavai	Ministry of Womens, Community and Social Dev	
24	Mr	Ernest	Betham	PWWA consultant	Consultant
25	Mr	Albert	Thiadens	PWWA consultant team leader	Consultant Team Leader
26	Mr	Kamal	Khatri	SOPAC	Program Officer
27	Mr	Jan	Overbeek	Pacific Infrastructure Advisory Center (PIAC)	Deputy Manager
28	Ms	Cori	Alejandrino-Yap	Pacific Infrastructure Advisory Center (PIAC)	Research Officer

Table F.4: Program PWWA Benchmarking Workshop Auckland 29th-30th October 2012

Day 1	Start time	End time	Details	By
29 Oct	8:30:00	9:00:00	Registration	
	9:00:00	9:15:00	Welcome and recall last year benchmarking 2011	Chairman
	9:15:00	10:15:00	Overall performance 2012	Consultants
	10:15:00	10:30:00	The Pohnpei experience on Maintenance	Bradley
	10:30:00	10:45:00	Morning tea	
	10:45:00	12:30:00	Paralel session Benchmark results per size of Utility	
			- Presentation benchmark KRA results by PWWA	CEOs
			- Individual presentation by utility 10 minutes each	
			Group 1 (small Utilities)	E. Betham
			Group 2 (medium Utiities)	Latu Kupa
			Group 3 (large Utilities)	A.Thiadens
	12:30:00	13:30:00	LUNCH	
	13:30:00	14:15:00	Plenary Session: Presentation results group sessions	
	14:15:00	15:30:00	Paralel sessions continued	
			- Benefits benchmarking: relevance to usual business	
			- Top 5 priority areas Performance Improvement	
			- Opportunities for cooperation/partnerships	
			Group 1 (small Utilities)	E. Betham
			Group 2 (medium Utiities)	Latu Kupa
			Group 3 (large Utilities)	A.Thiadens
	15:30:00	15:45:00	Afternoon tea	
	15:45:00	16:45:00	Plenary Session: Presentation results group sessions	AT/EB/Latu
	16:45:00	17:15:00	Performance Improvement Plan & Balanced Score Card	J. Overbeek
	17:15:00	17:30:00	Wrap-up first day	AT/EB
	19:00:00	21:00:00	Dinner with Workshop Participants	

Day 2	Start time	End time	Details	By
30 Oct	8:00:00	9:00:00	Board Meeting	
	9:00:00	9:15:00	PWWA - key messages	Latu
	9:15:00	9:30:00	Action Planning & BBIC in Solomon Islands	R. Austin
	9:30:00	10:30:00	Group session - Perf.Improvem./Action Planning	
			- Benchmarking as management tool	
			- Benchmarking becomes usual business	
			Group 1 (small Utilities)	E. Betham
			Group 2 (medium Utiities)	Latu Kupa
			Group 3 (large Utilities)	A.Thiadens
	10:30:00	10:45:00	Morning tea	
	10:45:00	11:45:00	Group session - Perf.Improvem./Action Planning continued	
			- Balance Score Card exercise	
			Group 1 (small Utilities)	E. Betham
			Group 2 (medium Utiities)	Latu Kupa
			Group 3 (large Utilities)	A.Thiadens
	11:45:00	12:10:00	Plenary session Follow Up Action Planning	AT/EB
	12:10:00	12:20:00	Workshop Evaluation	AT/EB
	12:20:00	12:30:00	Workshop Closure	Chairman
	12:20:00	13:30:00	LUNCH	
	13:30:00	17:00:00	Site Visit	

Appendix G: Sub-Regional Benchmarking Workshop in Yap, FSM

A sub regional benchmarking workshop was held on the 17th-18th of September 2012 in Yap in order to enhance the data collection of the PWWA benchmarking program. The workshop was attended by representatives of FSM Yap Central, FSM Yap North, FSM Yap South, the PUC (FSM Pohnpei), and CPUC (FSM Chuuk). The objectives of the workshop were:

- To increase the awareness and understanding of the utility benchmarking participants in implementing the 2012-benchmarking project.
- To increase the quality of data inputs.
- To support to the six FSM utilities with an understanding of the questionnaire and data collection process.
- To obtain a clear understanding of the overall utility present performances, the current issues and the utility needs for short and long improvements.
- To share experiences and strengthen relationship between the utilities.

Outline of the workshop

- Introduction and reflection on last year's benchmarking results.
- Clarification and guidance on the 2012 questionnaire.
- Sharing of initial benchmarking results among the participating utilities.
- Presentation of the maintenance experiences in FSM Pohnpei.
- Presentation of the hydraulic management programme in FSM Chuuk by the CPUC.
- A field visit to the drinking water and wastewater facilities of FSM Yap Central and FSM Yap North.
- Session on defining the key issues to be addressed on performance improvement of the six utilities.

Key findings

The workshop participants evaluated the workshop and established the following findings:

- Valuable exchange of experiences on:
  - maintenance practices;
  - treatment (chlorination) practices;
  - billing;
  - customer complaints; and
  - water quality control and the role of the EPA.
- Better and more practical understanding of benchmarking questionnaire sheets.
- Better understanding of PWWA's facilitating role and the type of support it can provide.
- Better understanding of the performance indicators.
- Operating issues are comparable.
- Water tariff rates: great differences (between US$1-4/1000 gallons).

At the end of the workshop the participants came up with the following suggestions for future benchmarking and cooperation in the sub-region:

- Organise annual benchmarking sub-regional workshops and also involve other countries in the region such as RMI, Palau, Saipan, Guam and Nauru.
- Guam would be a suggested meeting point.
- Convert the benchmarking indicators into US units such as gallons/miles etc.
- Create partnerships between the utilities (South-South WOP's).
- Initiate a sub-regional staff exchange program.
- Set up water thematic groups using social media.
- Use multi-user GIS software throughout FSM.

- Training on asset management, GIS, hydraulic management e.g. Epanet.
- Exchange experiences of management tools (software) for operating & management e.g. billing systems, customer service models etc.

Pictures of the 2012 Sub-Regional Workshop

Appendix H: Water Utility Action Plans

In addition to the action planning that was discussed at the workshop in Auckland, each utility also completed an action plan that focussed on the top three priority areas. A summary of these action plans is provided below. Based on the priorities outlined by the utilities they can be broadly categorised into the following:

- Improve Non-Revenue Water by improving billing and leak detection.
- Improve quality of drinking water and laboratory standards.
- Improve continuity of water supply.
- Improve the technical capacity of the local staff and increase training programmes.
- Improve customer service levels.

It is expected that next year's benchmarking conference will provide an opportunity to follow up on the action plans outlined by the utilities above. It should be noted, however, that some of the actions plans may only be realistically achieved over a two-year time frame rather than over a year.

1. IWSA (Samoa)

PRIORITY 1	Quality of Water
Objective	To have sustainable water resources.
Measure	Water flow meters.
Target	Improve infrastructure.
PRIORITY 2	Quality of Water
Objective	To have safe drinking water.
Measure	Water quality tests.
Target	Implement DWSP and enforce.
PRIORITY 3	Sanitation
Objective	To find what the current sanitation situation is.
Measure	Sanitation survey.
Target	To complete sanitation survey.

2. CPUC (FSM Chuuk)

PRIORITY 1	Set up quality monitoring standard operating procedures.
PRIORITY 2	Complete water network set-up and NRW investigation completion.
PRIORITY 3	Complete I&I (sewer maintenance).
Objective	Establish laboratory and accreditation.

3. WaterPNG

PRIORITY 1	NRW
Objective	Lower (improve) NRW level to economical level /3-5 per cent per annum/ 15 per cent by 2016.
Measure	3-5 per cent per annum.
Target	15 per cent by 2016.
PRIORITY 2	Human resource
Objective	Highly skilled workforce/two staff trained in NRW reduction per year/ every centre (branch) to have capable staff by year 2017 in water loss.
Measure	Two staff trained in NRW reduction per year.
Target	Every centre (branch) to have capable staff by year 2017 in water loss.
PRIORITY 3	Asset Management
Objective	Replace ageing water and sewerage assets/ replacement programme based on condition assessment/ by 2030.
Measure	Replacement programme based on condition assessment.
Target	By 2030.

4. Samoa Water Authority

PRIORITY 1	Improve NRW
Objective	Non-Revenue Water – L/c/d measure improvement trend reduction as % of water loss per month/ for SWA – the EU target for NRW FY 12-13 is to reduce to NRW to 2,350 L/c/d.
Measure	Non-Revenue Water – L/c/d measure improvement trend reduction as % of water loss per month/ for SWA – the EU target for NRW FY 12-13 is to reduce to NRW to 2,350 L/c/d.
Target	The EU target for NRW FY 12-13 is to reduce to NRW to 2,350 L/c/d.
PRIORITY 2	Water Quality Compliance
Objective	Improve water quality compliance/ compliance of water quality samples to Samoa National Drinking standards/ for SWA, water quality compliance target according to SNDWS for FY 2012-2013 is 66 per cent.
Measure	Compliance of water quality samples to Samoa National Drinking standards.
Target	Water quality compliance target according to SNDWS for FY 2012-2013 is 66 per cent.
PRIORITY 3	Water supply coverage
Objective	Water supply coverage to increase and improve water supply/ % of all households within SWA service areas with access to reliable, clean and affordable WS / the EU target for water supply coverage for FY2012-2013 is 82 per cent of all households in Samoa.
Measure	% of all households within SWA service areas with access to reliable, clean and affordable WS.
Target	The EU target for water supply coverage for FY2012-2013 is 82 per cent of all households in Samoa.

5. Nauru Utilities Corporation

PRIORITY 1	Asset Management & Auditing
Objective	Evaluate current status of NUC water department assets and estimate costs/ inspect all assets and estimate depreciating costs/ determine conditional assessment of all assets/ enable asset replacement plans to be prepared/ enable accurate budgeting for maintenance purposes. Submission to cabinet for approval and donor funding.
Measure	Inspect all assets and estimate depreciating costs/ determine conditional assessment of all assets.
Target	Enable asset replacement plans to be prepared/ enable accurate budgeting for maintenance purposes/ submission to cabinet for approval and donor funding.
PRIORITY 2	Metering of bulk storage tanks
Objective	To determine NRW and other losses that will assist water management/ install meters to measure water produced and delivered/ record all data and put into database/ to determine NRW and address losses/ improve billing requirements.
Measure	Install meters to measure water produced and delivered/ record all data and put into database.
Target	To determine NRW and address losses/ improve billing requirements.
PRIORITY 3	Data base
Objective	To create a data base on daily basis/ collect and record data on daily basis/ create data based to accurately record data/ effective water management/ improve budgeting of water operational costs. Accessible to other governments for planning purposes.
Measure	Collect and record data on daily basis/ create data based to accurately record data.
Target	Effective water management/ improve budgeting of water operational costs/ accessible to other governments for planning purposes.

6. Solomon Islands Water Authority

PRIORITY 1	Continuity of water supply
Objective	To achieve an improved continuity of supply/ hours/day or average hours/day/connection/ 18 hours per day by 31/12/2013.
Measure	Hours/day or average hours/day/connection.
Target	18 hours per day by 31/12/2013.
PRIORITY 2	NRW
Objective	To achieve a reduction in the percentage of Non-Revenue Water/ expressed as a % of water produced/ 40 per cent by 31/12/2013.
Measure	Expressed as a % of water produced.
Target	40 per cent by 31/12/2013.
PRIORITY 3	Drinking water compliance
Objective	To achieve an improvement in the safety of potable water supplied/ % compliance/ more than 95 per cent by 31/12/2013.
Measure	% compliance.
Target	More than 95 per cent by 31/12/2013.

7. Majuro Water and Sewer Company

PRIORITY 1	Reduce NRW
Objective	Reduce NRW/ leak detection unit/ install bulk meters/ decrease NRW by 20 per cent a year.
Measure	Leak detection unit/ install bulk meters.
Target	Decrease NRW by 20 per cent a year.
PRIORITY 2	Improve financial performance
Objective	Cover expenses to break even/ reduce expenses, reduce NRW and increase revenue/ become financially solvent.
Measure	Reduce expenses, reduce NRW and increase revenue.
Target	Become financially solvent.
PRIORITY 3	Improve customer services
Objective	Increase services/ decrease customer complaints/ increase water duration hours/ decrease customer complaints by 50 per cent.
Measure	Decrease customer complaints/ increase water duration hours.
Target	Decrease customer complaints by 50 per cent.

8. Water Authority of Fiji

PRIORITY 1	Maximise utilisation of supplied water
Objective	Reduction of NRW/ produced water vs. billed consumption/ five percent per annum.
Measure	Produced water vs. billed consumption.
Target	Five percent per annum.
PRIORITY 2	Improve effluent quality in STPs/ Upgrade STPs/ BOD, TSS/ Meet best practice standards
Objective	Upgrade STPs.
Measure	BOD, TSS.
Target	Meet best practice standards.
PRIORITY 3	Reduce energy bill/ Improve efficiency of pumps/ Previous energy bill compared to current energy bill/10 per cent per annum
Objective	Improve efficiency of pumps.
Measure	Previous energy bill compared to current energy bill.
Target	10 per cent per annum.

9. Pohnpei Utility Corporation

PRIORITY 1	Improve customer satisfaction
Objective	Improve customer satisfaction/ reduce customer complaints by 20 per cent/ Customer Service Manager.
Measure	Reduce customer complaints by 20 per cent.
Target	Customer Service Manager.
PRIORITY 2	Improve quality of water to customer
Objective	Improve quality of water to customer/ reduce non-compliance by 50 per cent compared to the previous year/ Treatment Plant Manager.
Measure	Reduce non-compliance by 50 per cent compared to the previous year.
Target	Treatment Plant Manager.
PRIORITY 3	Improve Non-Revenue Water
Objective	Reduce NRW by 10 per cent of 2012 results/ reduce number of flat rate meter readings by 50 per cent/ Manager water division.
Measure	Reduce number of flat rate meter readings by 50 per cent.
Target	Manager water division.

10. Tonga Water Board

PRIORITY 1	Mandating the development and implementation of asset management plan
Objective	Strengthen policy environment for delivery of urban services/ level of maintenance and timely replacement of assets/ time bound.
Measure	Level of maintenance and timely replacement of assets.
Target	Time bound.
PRIORITY 2	Managing water loss and demand
Objective	To reduce NRW from current level, estimated at about 26 per cent to less than 25 per cent/ distribution and consumption (water sales)/ no. of leaks at reasonable levels and meter replacement per months/ NRW less than 25 per cent and increase in revenues.
Measure	Distribution and consumption (water sales)/ N=no. of leaks at reasonable levels and meter replacement per months.
Target	NRW less than 25 per cent and increase in revenues.
PRIORITY 3	Risk management in respect of sustainable urban water management/ to build local capability in the Tonga Water Board allowing it to ensure effective, environmentally, friendly and socially acceptable water management at reasonable cost/ methodology assessment/ to be determined by the results of the methodology assessment
Objective	To build local capability in the Tonga Water Board allowing it to ensure effective, environmentally, friendly and socially acceptable water management at reasonable cost.
Measure	Methodology assessment.
Target	To be determined by the results of the methodology assessment.

11. Kiribati Public Utilities Board

PRIORITY 1	**The current rate of NRW has reached 80 per cent at end of 2011 due to high leakage level in both the transmission main pipe and the reticulation pipes coupled with high water wastage volume occurred at households open connections as well as non-payment of water charges by customers due to poor service level.**
Objective	To carryout leak detection programs within the transmission main pipe, reticulation pipelines, and at households plumbing systems as well as to improve current water charges collection.
Measure	Quantify actual leakage rate as well as actual wastage rate within the whole system. Develop program to locate and fix leaking pipes and set up public education and awareness programs for water conservation measures within areas confirmed to have a high wastage rate. Improve current collection method whereby all PUB services are merged in one account and to disconnect electricity when the account is not cleared, regardless of either water or electricity is not cleared.
Target	To reduce NRW from 80 per cent to 50 – 40 per cent at end of 2013. To reduce leakage level from 50 per cent to 35 per cent of production.
PRIORITY 2	**Response time to attend customer needs/ complaints in terms of new connections, regarding connection of services as well as complaints related water and sewerage problems has been declined / unreliable during the past years which has resulted in a poor public image of PUB. This is due to absence of a systematic approach and lack of resources required to timely attend to these customers' needs/complaints.**
Objective	To develop a systematic approach and to provide appropriate resources required to address the issue of prolonged/delayed response time to attend complaints from PUB customers.
Measure	Provision of a 24/7 hotline telephone system with duty officers readily available to look into the nature of complaints, establish a response repair team comprised of qualified technicians, provide available transport for on call/duty officers/staff; and set a response time to various type of complaints.
Target	Reduce backlog in customers complaints/ attend complaints based on a response time set on customer response time charter/ improve public image of PUB and improve service reliability etc.
PRIORITY 3	**Lack of training and upgrading courses to existing staff members has affected the performance of individual staff in term of up-grade their knowledge and skills on their job up to the required international standard of good workmanship , skills etc.**
Objective	To train and upgrade skills/knowledge of individual staff so that they can perform/handle jobs up to the good standard of workmanship, to rectify and solve technical problems in a professionally manner etc.
Measure	To sign a training partnership with a recognised international or local training institution and to develop training plans to gap train and up skilling of existing staff.
Target	75 per cent of existing staff obtained a recognized water operation qualification to an Australian standard; 75 per cent of existing staff complete OHS training, 75 per cent of middle management staff to complete a Leadership and management training program.