Ministry of Water & Irrigation
وزارة المياه والري

Ministry of Water and Irrigation
Utilities Performance Monitoring Unit (UPMU)

Jordan Water Utilities Monitoring Report 2020

Aqaba Wastewater treatment plant

Jordan Water Utilities Monitoring Report 2020

Imprint
Publication supported by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

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Abbreviations

AW	Aqaba Water Company
BMZ	German Federal Ministry for Economic Cooperation and Development
CMMS	Computerized Maintenance Management System
COVID-19	Corona Virus Disease of 2019
GIZ	German International Cooperation
H.E.	His Excellency
Hrs.	Hours
IT	Information Technology
JOD	Jordanian Dinar
KfW	Kreditanstalt fur wiederaufbau banking group
JVA	Jordan Valley Authority
Km	Kilometer
KPI	Key Performance Indicator
KWH	Kilo-Watt Hour
Lcd	Liter per capita per day
M	Million
m3	Cubic Meter
MCM	Million Cubic Meter
MoU	Memorandum of Understanding
MWI	Ministry of Water and Irrigation
No.	Number
NRW	Non-Revenue Water
NSPI	National Strategy Performance Indicator
O&M	Operation and Maintenance
PIs	Performance Indicators
PSP	Private Sector Participation
Req.	Request
Sub.	Subscribers
UPMU	Utilities Performance Monitoring Unit
W&WW	Water and Wastewater
WAJ	Water Authority of Jordan
WWTPs	Wastewater Treatment Plants
YWC	Yarmouk Water Company

Jordan Water Utilities Monitoring Report - 2020

Opening speech

It is my pleasure to present to you the Annual Performance Monitoring report for the year 2020, as prepared by the Utilities Performance Monitoring Unit (UPMU). It is hoped that annual reports such as this will help the Water Utilities to raise their performance, improve water sector services for the Jordanian population, and assist other developmental sectors with their water needs.

Water Utilities cover operation and maintenance in 9 of the Kingdom's 12 governorates, and are thus important for ensuring a smooth delivery of water and wastewater service to the citizens of Jordan. The Water Utilities are responsible for ensuring that this vital service, which is essential to developmental activities in the country, is offered in the most efficient and effective manner, and continues to be closely monitored and assessed.

Performance monitoring is very important and critical for building better performing Utilities. It helps them to determine how efficiently their operations and activities are being conducted, and to assess the productivity of management and employees. It also enables the Utilities to evaluate their results against a set of Performance Indicators and targets.

This performance report focuses on monitoring the quality of services provided by the Water Utilities and their level of operational performance towards that end. The monitoring covers the key areas that are needed to assess and analyze the status quo of the Utilities in four major sections: water and wastewater operations, customer services, finance, and human resources.

It proposes a set of recommendations that reflect and highlight current areas of strength and zooms in on areas where there is room for improvement that should be reflected in an implementation plan that ensures a roadmap for improving performance to enable them to provide the highest possible level of service.

While the UPMU is a part of the water sector, it offers an independent view on the performance of the Water Utilities owned by the Water Authority of Jordan (WAJ) and aims to regulate the relationship between the two. A positive relationship between the Utilities, WAJ, and the UPMU is essential for the water sector to be successful and achieve its goals.

The UPMU's efforts over the past two years, and the cooperative and supportive culture developed by the Water Utilities and WAJ, are highly appreciated, and I hope that this relationship continues to grow to tackle the challenges facing the water sector in securing the scarce water resources that the kingdom needs.

We extend our gratitude for the financial support provided by the KfW to the UPMU over the past years and into the future. We are also grateful to the GIZ for their continued and sustainable technical support in setting up the UPMU, in cooperation with the water sector.

In conclusion, the annual performance report 2020 will create a new momentum in the water sector to do business differently and more efficiently; to be better prepared; and to add value to the national development.

Eng. Mohammad Al Najjar
Minister of Water and Irrigation

Vision

UPMU Vision

Enhancing the capabilities of Jordanian Water Utilities to provide the best services to customers in an effective and efficient manner.

Mission

UPMU Mission

Monitoring the Jordanian Water Utilities' performance against an agreed set of indicators, setting performance targets to evaluate and compare performance, and recommending incentives and penalties accordingly, while taking into consideration the need to enhance the Utilities' financial sustainability.

Foreword

This performance monitoring report for the year 2020 was prepared by the Utilities Performance Monitoring Unit (UPMU), which was established under the Ministry of Water and Irrigation and linked to H.E. the Minister. The report is based on data and information provided by Miyahuna, Aqaba (AW), and Yarmouk (YWC) Water Utilities.

Monitoring Performance is very important, and indeed critical for building better performing utilities. It makes it possible to measure how efficiently they are conducting their operations and activities and assess the productivity of both management and employees. It also enables the UPMU to measure the Utilities' performance against a set of Performance Indicators (PIs), which will help with the following:

1. Assessing performance against PI's and performance targets.
2. Setting performance targets for certain indicators.
3. Assessing the achievement of national policy targets and the sector's overall development.
4. Conducting workshops and round table discussions to exchange experiences.
5. Creating transparency and accountability within the sector and individual Utilities through public reporting.

These results can help the MWI/ WAJ to improve the Utilities' overall performance and reach its goals and ensure continued provision of high-quality water and wastewater services.

For this report, the UPMU/ GIZ team conducted a continuous review to check the reliability and credibility of data collected for various activities, in cooperation with the three Water Utilities.

This Second annual report shows the performance of Miyahuna, AW and YWC Water Utilities for the year 2020, and is comprised of four sections: Operations, Customer Service, Finance, and Human Resources. Performance is assessed against 10 KPIs and 33 lower-level PIs, along with 11 National Strategy Indicators (NSPI). The results are used to assess the Utilities' performance and their adherence to the Ministry of Water and Irrigation's strategic goal of improving and sustaining high quality water and wastewater services.

The first monitoring report from 2019 included several recommendations, many of which were accepted and have led to improvement actions in the Utilities.
In addition to the above activities, the UPMU:

- Conducted a Workshop for WAJ and the three Utilities to present and discuss the 2019 report and discuss the Memorandum of Understanding (MoU)[1].
- Presented the current situation to the YWC Board of Directors, together with a set of recommendations for further action.
- With support of GIZ, conducted the first round-table workshop on NRW and will later conduct a second workshop to help the Utilities find appropriate solutions for and unify the concept of calculating water loss. Additional roundtables will be conducted on other topics in the future.

The MWI/ UPMU greatly appreciates the KfW's continuous financial support for maintaining achievements and improving the performance of Jordan's Water Utilities.

Dr. Ahmad AlAzzam.
UPMU Director

[1] *See annex V Memorandum of Understanding (MoU)*

1 Chapter

Description of UPMU

1- Description of UPMU

The UPMU was established in accordance with WAJ Law No. 18 and its amendments in Article (10) to enhance the principles of transparency and good governance in the water sector and improve the legal and contractual relationship between the Ministry of Water and Irrigation (MWI), WAJ, and the Water Utilities.

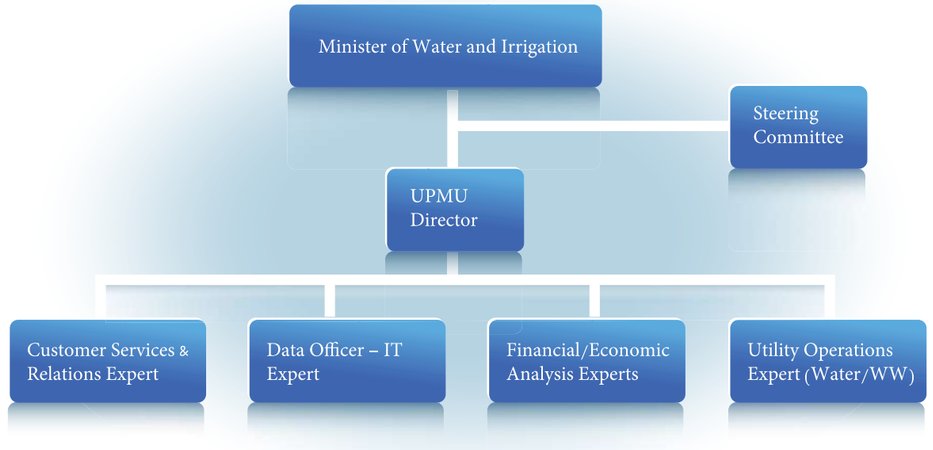
To meet these objectives, the UPMU performs the following tasks:

1- Monitoring the Utilities' performance and issuing performance reports.
2- Setting and developing performance indicators, baselines, and mechanisms for calculating and using them as a basis for comparing and evaluating the Utilities' performances.
3- Developing and reviewing the necessary documentation for establishing the Utilities and developing their tasks/duties (i.e. Development and Delegation Agreements (Assignment Agreements)).
4- Issuing the basis and general evidence which describe the frameworks for developing internal working guidelines and procedures, such as Business planning and Customer service guidelines as regulatory standards.
5- Reviewing, approving, and accrediting company business plans and setting targets, in cooperation with the Utilities and in accordance with water policies.

A steering committee has been established to supervise the UPMU, chaired by H.E the Minister of Water and Irrigation and with the following members:

1. H.E. Secretary General of WAJ
2. H.E. Secretary General of MWI
3. H.E. Secretary General of JVA
4. Director of Legal Affairs in MWI
5. Assistant Secretary General for Financial Affairs – WAJ
6. Donors Representative
7. King Abdullah II Centre of Excellence Representative

The figure below shows the UPMU's approved organizational structure:



The Figure 1: UPMU organization structure

The figure below shows UPMU's regulation cycle:

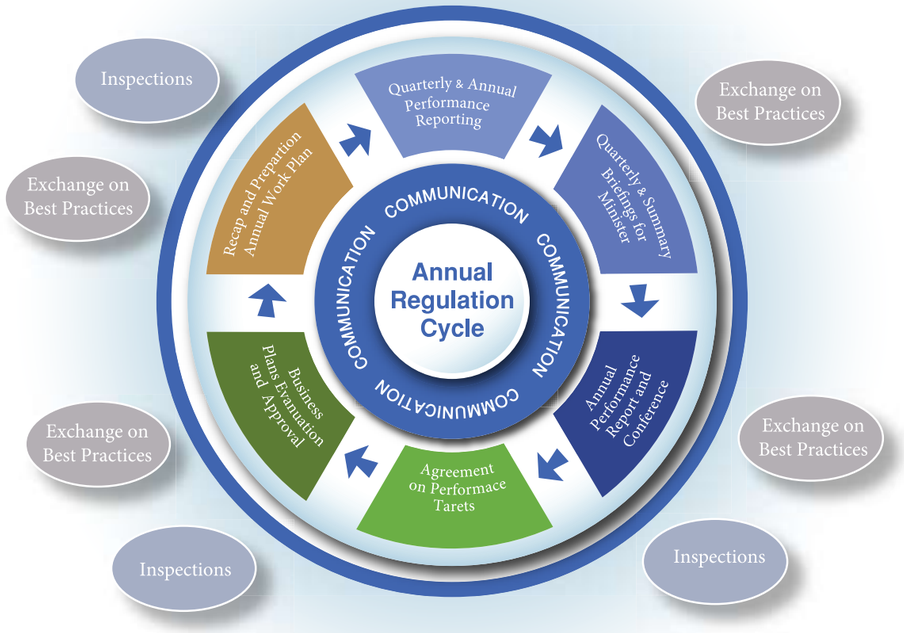
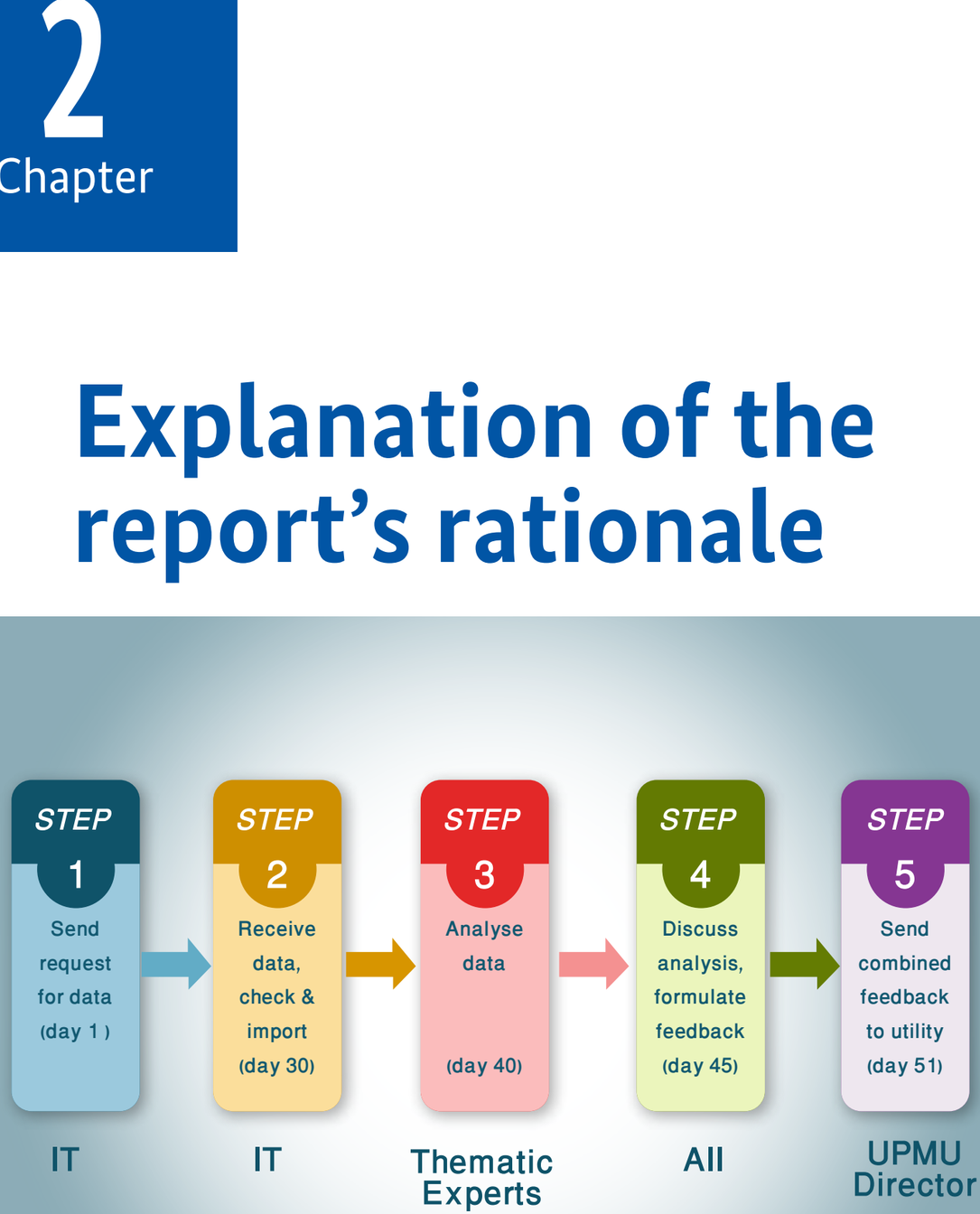


Figure 2: UPMU regulation cycle

2
Chapter

Explanation of the report's rationale



Data collection in UPMU

2- Explanation of the report's rationale

2.1 Objective of the report

This second annual report is based on data from 2020. It builds on the monitoring and reporting framework which UPMU introduced in its first annual report in 2019.
This second annual report will:

- Establish baseline data for the performance of Jordan's Water Utilities.
- Define areas where UPMU experts should continue to inspect. and, where necessary, investigate the Utilities performance
- Evaluate the Utilities' operations, showing what they are doing well and highlighting where they are facing challenges in performing their mandate.
- Provide a single, consolidated source of information on Jordan's Water Utilities for policy makers and stakeholders.
- Establish the UPMU's role as a mediator through which representatives from different Utilities can meet and exchange their approaches to issues of shared concern.
- Contribute to transparency and accountability, while revealing the challenges and offering pathways for improvement.

2.2 How data was collected and analyzed

With GIZ's support, the UPMU updated the variables and indicators which were developed earlier. Data for year 2020 was collected and performance analysed to meet the UPMU and Utilities' tasks and goals in the most efficient and effective manner.

A single Excel spreadsheet was produced to unify data collection. This tool automatically imports data from all Utilities into a single file which calculates all indicators automatically and consolidates data from all Utilities into one master sheet, making it easier to analyse trends and make comparisons between Utilities.

The UPMU expects the reporting procedures to evolve and improve over time as monitoring and analysis capacity increases, and adjustments are potentially made to policies and strategies in the sector. The reporting Utilities will also be able to internally assess their performance against the defined indicators, improving transparency and ensuring that they are not surprised by the results and conclusions in future UPMU reports.

The UPMU supported the Utilities in completing the new Excel spreadsheets within the reporting deadline by clarifying the variables involved and providing training on using the new system. This ensured the accuracy of data and helped to ensure that the Utilities' staff can make best use of the results.

Nevertheless, there were a number of challenges in compiling and verifying the data which required close cooperation and a strong working relationship between the UPMU and the Utilities' employees to explain the data sets and their sources, translate terminology, and ensure ownership of the end results. This was especially true in Miyahuna, where data from three governorates (Amman, Zarqa and Madaba) was merged into one sheet. The UPMU expects data collection for year 2021 to go more smoothly and quickly.

Different levels of process automation and digitalization within the Utilities meant that some data were readily available whilst others had to be manually gathered and compiled through spreadsheets. Other technical issues that emerged included operational, financial and commercial bottlenecks, differing time scales between the two processes, and billing data not matching financial data (e.g., annual revenue).

Once data had been collected and verified, the monitoring tool consolidated the three Utility sheets into a master sheet. UPMU experts then examined the numbers and information outputs, analysing and correlating various sets of indicators and grouping them to allow for a better overview of the issues that the report raised. They also went back to the Utilities to verify and clarify certain results to ensure that they had a full understanding the outputs before producing the final analysis.

The outputs were then discussed and cross-checked internally among different categories to provide a more comprehensive overview of the performance and comparison of related indicators. Figures and tables were produced to support the report's conclusions, with comments and recommendations to help stakeholders understand various outcomes.

This second annual report will be published and shared with senior management and stakeholders to identify and prioritize areas where improvements and interventions are necessary.

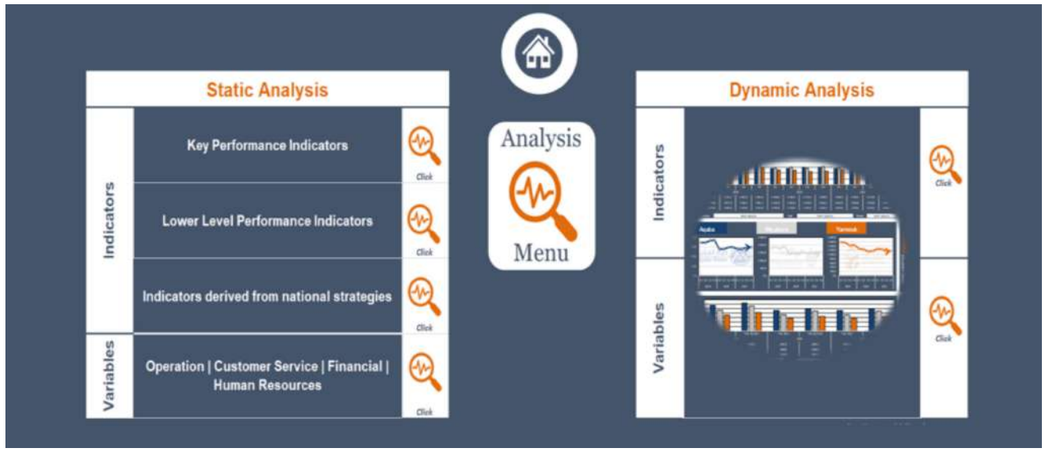


Figure 3: Master sheet

The UPMU report analysed and assessed all 10 KPIs and 23 of the 33 lower-level PIs, along with 9 of the 11 National Strategy Indicators (NSPI)

3
Chapter

Performance Indicators

Wadi Alarab project inauguration

3- Performance Indicators [2]

3.1 Operational Performance

The first group of indicators, which look at operational performance, is divided into six sections:

a. The first section addresses water quality assurance.

b. The second section is concerned with increasing the use of technology to improve energy efficiency.

c. The third section focuses on aspects that have a direct influence on making operations more efficient and cost effective.

d. The fourth section looks at bulk metering, which can give a better understanding of the percentage of Non-Revenue-Water (NRW).

e. The fifth section uses four different indicators to analyse water losses, which includes both real losses and apparent losses.

f. Last section consists of two PIs that represent actual water losses in the network and describes the volume of water supplied by the Utilities per capita.

Ser.	Section	PI Name	PI Level	Unit	No. of Variables
1	Quality Assurance & Control	Microbiological water quality compliance	KPI	%	2
2		Water quality tests performed	PI	% of req. tests	2
3		Physical-chemical water quality compliance	PI	%	2
4		Effluent quality compliance	NSPI	%	2
5	Energy Efficiency	Average unit energy consumption	PI	KWh/m^3	4
6		Renewable energy utilization	NSPI	%	5
7		Power consumption monitoring	NSPI	%	2
8	Response Time & Repair Efficiency	Speed of repair of failures	PI	% of bursts	4
9		Preventive maintenance of pumps	NSPI	%	2
10		Corrective maintenance of pumps	NSPI	%	2
11		Sizing of pumps	NSPI	%	2
12	Bulk metering	Operational well and reservoir meters	NSPI	%	2
13		Calibration of well and reservoir meters	NSPI	%	2
14		Metering of import and export points	NSPI	%	4
15	Water Losses	Non-Revenue Water	KPI	% of system input	2
16		Water loss per subscriber	PI	m^3/subscriber/day	4
17		Water losses per mains length	PI	m^3/km/day	3
18		Water losses per connection per day	PI	m^3/connection/day	4
19	Network Efficiency	Inefficiency of use of water resources	PI	%	5
20		Water resources use per capita/day	PI	lcd	4

Table 1: Operation sections and indicators

[2] *See annex III PIs calculation*

3.2 Customer Service Performance

The second group of indicators looks at service reliability, complaints, and the responsiveness of service providers, as well as commercial & customer processes.

Ser.	Section	PI Name	PI Level	Unit	No. of Variables
1	Supply Mode & Efficiency	Continuity of supply	KPI	% of time	1
2		Subscribers receiving continuous supply	PI	%	2
3		Water consumption per capita (residential subscribers)	KPI	Liters/capita/day (lcd)	2
4	Commercial & Customer Processes	New connection efficiency	KPI	% of requests	2
5		Percentage of inactive subscribers	PI	%	2
6		Subscriber meter replacement ratio	PI	%	2
7		Meter reading ratio	PI	%	2
8	Customer Relationship & satisfaction	"No Water" complaints	KPI	No. of com-plaints/1000 active subscribers	2
9		Billing complaints	PI	No. of complaints/1000 active subscribers	2

Table 2: Customer service sections and indicators

3.3 Financial performance

While the main aim of the water sector is to provide high quality water and wastewater services, achieving financial sustainability is both a vital target and a major, critical challenge for Jordan's Water Utilities for the following reasons:

- High levels of Non-Revenue-Water
- Strict limitations on raising water tariffs
- High energy costs and increasing electricity tariffs
- Insufficient funding to support infrastructure improvement and maintain daily operations to meet increases in demand for water and wastewater services

Therefore, taking the above constraints and challenges into account, the Water Utilities must work in a transparent, accountable, economic, and efficient manner to improve their financial performance. If the Utilities are not allowed to raise tariffs, the government must fulfil its promises to provide subsidies. Incentives should also be offered to motivate the Utilities to improve their performance and ensure continuous development.

Ser.	Section	PI Name	PI Level	Unit	No. of Variables
1	Financial Efficiency (Liquidity)	Collection Efficiency (Customers)	KPI	%	4
2		Collection ratio	PI	%	2
3		Electricity costs as percentage of total O&M costs	PI	%	2
4		Delay in accounts receivable	PI	month	4
5		Operating cost coverage ratio (collection)	PI	%	2
6	Financial Sustainability (Profitability)	Operating cost coverage ratio (revenues)	KPI	%	2
7		Operating cost coverage ratio (billing)	PI	%	2
8	Unit Profitability-JOD/m^3	Average water and wastewater revenue for billed consumption	PI	JOD/m^3	11
9		Unit operating cost water and wastewater services	PI	JOD/m^3	2

Table 3: Financial sections and indicators

3.4 Human Resources performance

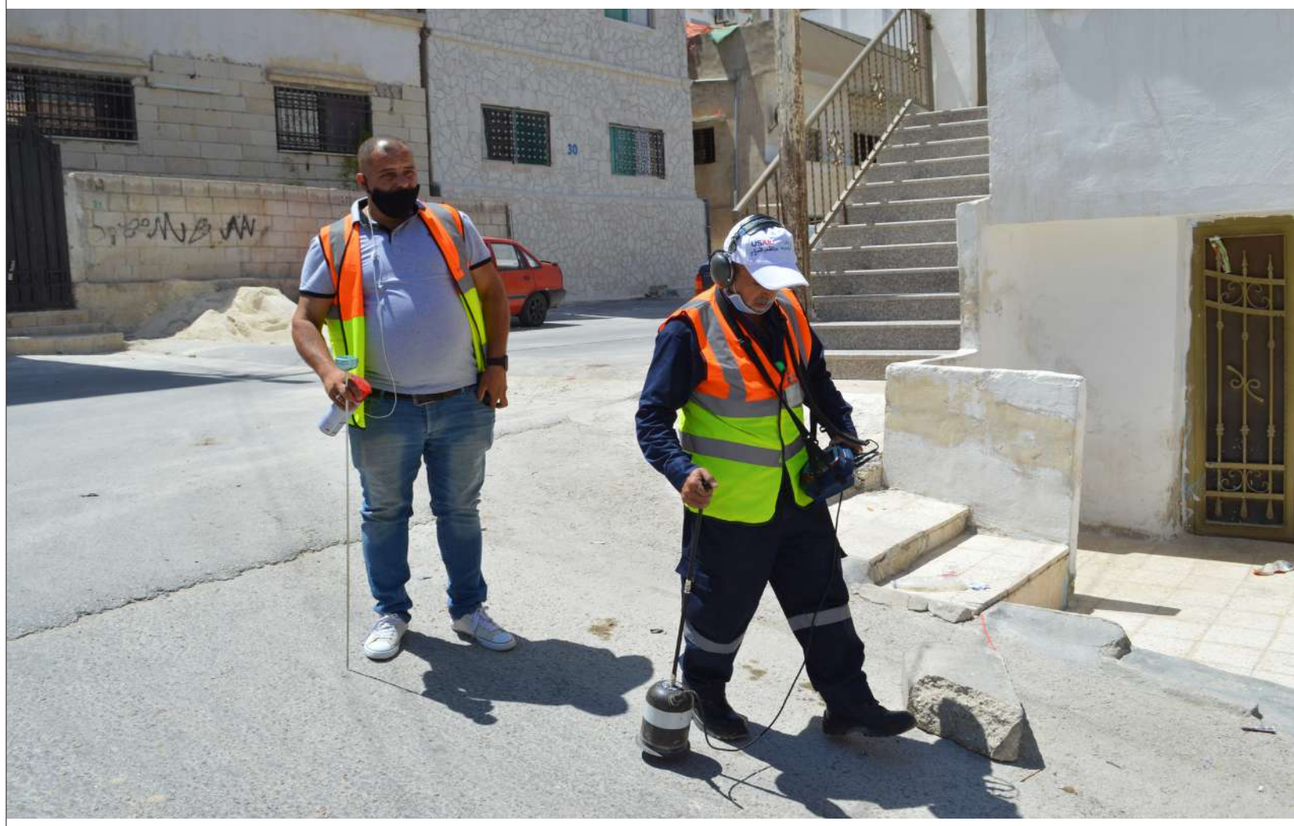
The last group analyses employees' efficiency, capability, and capacity building measures.

Ser.	Section	PI Name	PI Level	Unit	No. of Variables
1	Staff Utilization & Efficiency	Employees per 1000 subscribers Water & Wastewater (W&WW)	KPI	No/1000 subscribers	3
2		Employees per 1000 subscribers W	PI	No/1000 subscribers	2
3		Training per employee	KPI	Hr/employee	2
4		Percentage of staff trained	PI	%	2

Table 4: Human Resources section and indicators

4 Chapter

Water Utilities' Performance in 2020



Leak detection in Miyahuna

4- Water Utilities' Performance in 2020

4.1 Utilities key data-2020

The table below shows key data for the three Water Utilities:

	Area[3] [km²]	Water subscribers	Sewage subscribers	Employees	Water distributed [MCM]	Authorized consumption [MCM]	Amount billed in period[4] [Mio JOD]	Estimated water service coverage [%]	Estimated Wastewater coverage [%]
Miyahuna	13,286	970,718	765,449	2,287	313.671	170.697	161.609	98	77.5
AW	6,905	44,508	38,098	354	28.697	18.092	16.988	100	90.5
YWC	28,990	361,752	174,355	1,407	106.513	54.077	38.264	96	46.3

Table 5: Utilities key data 2020

4.2 Operational performance

4.2.1 Quality Assurance & Control

Ser.		PI Name	Unit	Miyahuna	AW	YWC
1	Quality Assurance & Control	Microbiological water quality compliance	%	99.7	100	100
2		Water quality tests performed	% of req. tests	100	100	100
3		Physical-chemical water quality compliance	%	99.9	100	100
4		Effluent quality compliance	%	99.3	100	87.5

Table 6: Quality Assurance & Control at the end of 2020

[3] *See annex I: Map of Jordan showing the Utilities'*
[4] *Amount billed in period includes water and wastewater as well as other billing.*

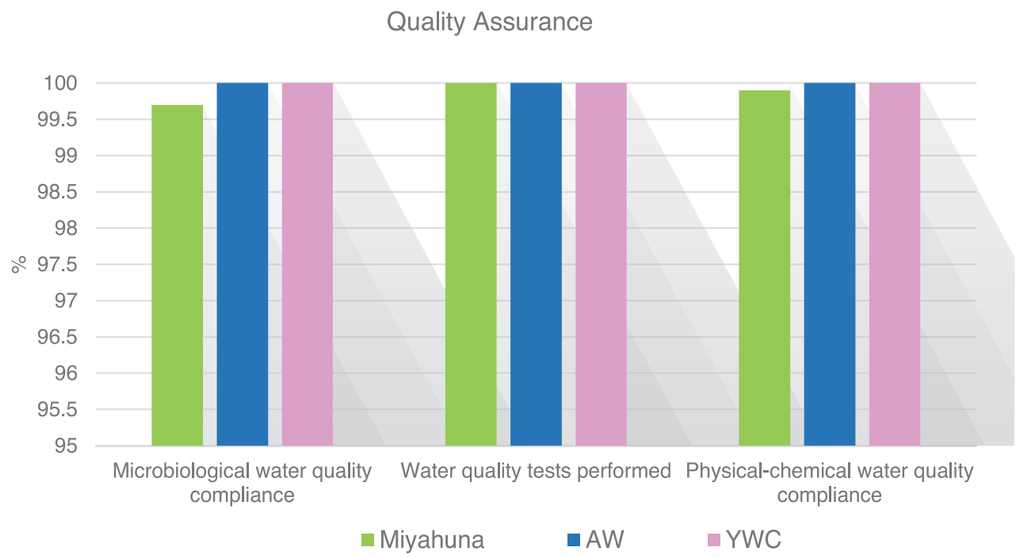


Figure 4: Quality Assurance

- Water quality remains very high for the year 2020, with microbiological water quality compliance for the three Utilities rated as excellent. Assessments of the procedures for monitoring and responding to cases of non-compliance will form part of the inspections protocol that the UPMU will develop and implement.

- The three Utilities are also rated asexcellent for water quality tests peformed and physical- chemical water quality compliance.
- While both Miyahuna and AW are above the Jordanian minimum acceptable threshold of 95% for effluent quality compliance, YWC is below the threshold with 87%, which is a drop of 4% from 2019's figure of 91%.
- The YWC should seek other options for improving the efficiency of Wastewater Treatment Plants (WWTPs).

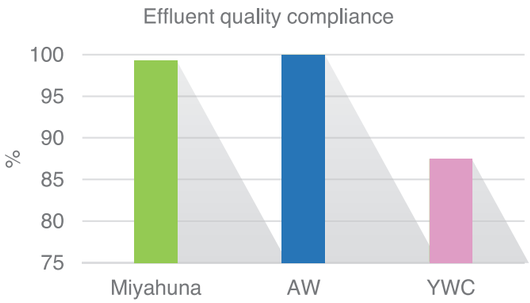


Figure 5: Effluent quality compliance

4.2.2 Energy Efficiency

Ser.		PI Name	Unit	Miyahuna	AW	YWC
5	Energy Efficiency	Average unit energy consumption	KWh/m^3	3	1	3.2
6		Renewable energy utilization	%	0	0	0
7		Power consumption monitoring	%	43.1	100	95

Table 7: Energy Efficiency at the end of 2020

- The stark difference in average unitenergy consumption is caused by Jordan's geography and the Utilities' modes of operation. Miyahuna in particular is pumping most of its produced water from 400 meters below sea level to more than 1,000 meters above sea level, and YWC is partly pumping from the Jordan valley as well, in addition to the fact that the mode of operation in YWC is direct pumping in the network. Whereas AW's water is supplied by gravity from the mountains overlooking Aqaba.

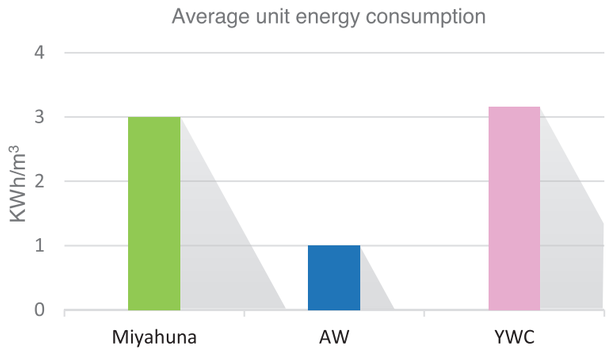


Figure 6: Average unit energy consumption

- None of the three Utilities are producing renewable energy, which would represent a cost saving.
- The Utilities could all achieve financial savings by continuously monitoring pump consumption.
- Since Zarqa does not monitor the power consumption of pumps, Miyahuna should focus on monitoring in the Zarqa governorate.

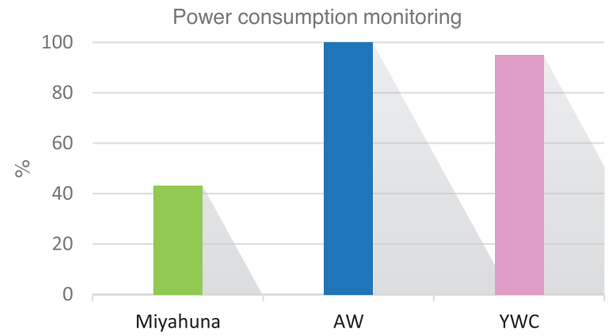


Figure 7: Power consumption monitoring

4.2.3 Response Time & Repair Efficiency

Ser.		PI Name	Unit	Miyahuna	AW	YWC
8	Response Time & Repair Efficiency	Speed of repair of failures of network	% of bursts	95.9	100	94.7
9		Preventive maintenance of pumps	%	97.3	100	31.9
10		Corrective maintenance of pumps	%	21.3	51.4	79.5
11		Sizing of pumps (Percentage of pumps running at the right curve)	%	80.1	100	29.2

Table 8: Response Time & Repair Efficiency at the end of 2020

- The three Utilities are performing well in responding to network failures within target times. The UPMU needs the inspection report that prepared by WAJ/ Crisis Management and Control Directorate before it can properly investigate the reality and credibility of variables for this indicator.

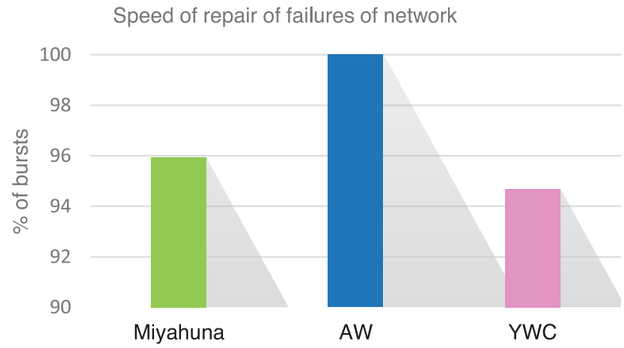


Figure 8: Speed of repair of failures of network

- Miyahuna is implementing a program of preventive pump maintenance for most of its pumps.

  As mentioned in the 2019 report, AW implemented preventive maintenance for all their pumps as per the computer maintnance management system (CMMS). While YWC did not carry out any preventive maintenance for their pumps in 2019, they showed an improvement in2020. YWC needs to implement CMMS.

- Preventive maintenance is perquisite for reducing the level of corrective maintenance per pump.
- Pump sizing directly impacts optimal energy consumption, and its effect on electricity expenses

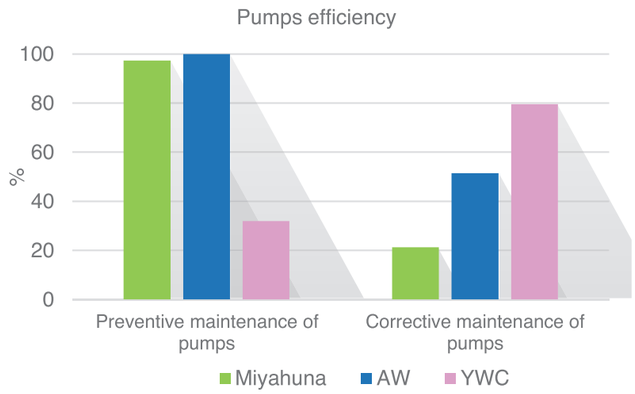


Figure 9: Pumps efficiency

(KWh/m3) will be analysed in the financial efficiency subchapter.

- YWC needs to replace its current inefficient gravity pumps with variable speed pumps.

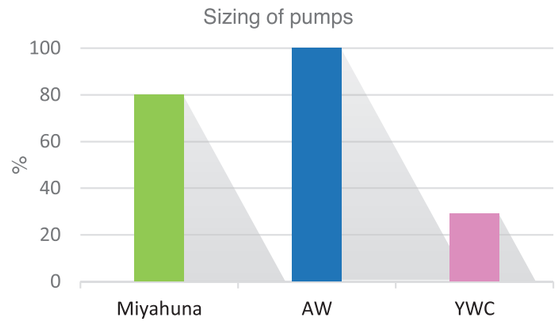


Figure 10: Sizing of pumps

4.2.4 Bulk metering

Ser.		PI Name	Unit	Miyahuna	AW	YWC
12	Bulk Metering	Operational well and reservoir meters	%	89.9	57.6	86.4
13		Calibration of well and reservoir meters	%	35.7	100	100
14		Metering of import and export points	%	100	100	83.3

Table 9: Bulk Metering at the end of 2020

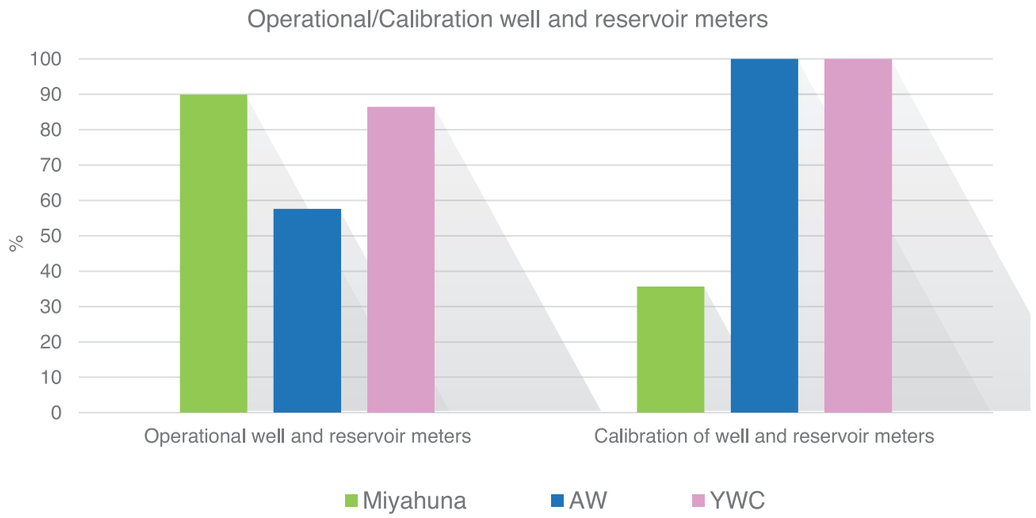


Figure 11: Well and reservoir meters

- All the Utilities need to pay more attention to having all their production and supply points metered and calibrated on a permanent basis.
- The calibration of bulk water meters for wells, reservoirs, and import/export points is a fundamental prerequisite for reliable NRW calculations. Miyahuna in particular should pay more attention to this issue.
- All export/import points in Miyahuna and AW are metered. YWC only meters 83% of its import and export points, and must implement procedures to ensure that they reach 100%.
- The UPMU will verify the calibration of wells and reservoir meters for the Utilities in the next report.

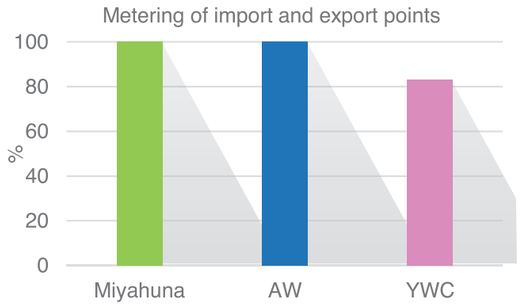


Figure 12: Metering of import and export points

4.2.5 Water Losses

Ser.		PI Name	Unit	Miyahuna	AW	YWC
15	Water Loss	Non-Revenue Water	% of system input	46.1	37.0	49.5
16		Water loss per subscriber	m^3/subscriber/day	0.4	0.65	0.4
17		Water loss per mains length	m^3/km/day	25.46	27.54	12.38
18		Water loss per connection per day	m^3/connection/day	1.16	1.4	0.65

Table 10: Water Loss at the end of 2020

- Percentage of NRW has increased in Miyahuna and YWC since 2019, more efforts are needed to reduce this percentage.
- Water losses remain high, according to international standards. This is of particular concern for a water-scarce country such as Jordan.

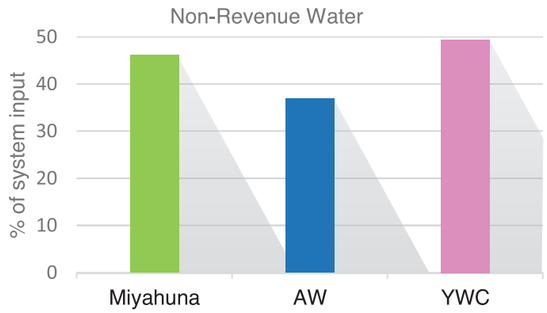


Figure 13: Non-Revenue Water

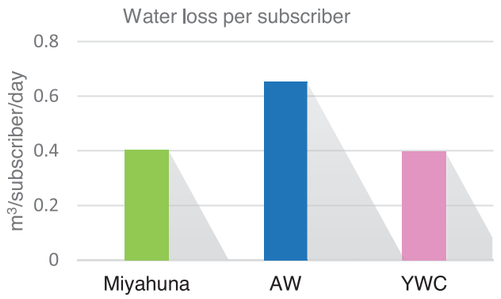


Figure 14: Water loss per subscriber

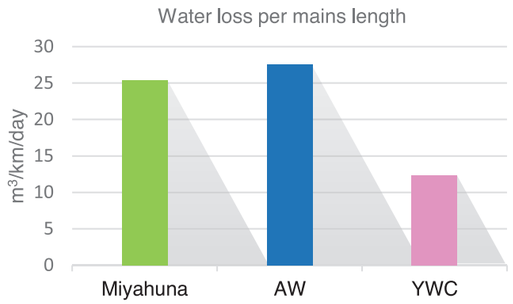


Figure 15: Water loss per mains length

- The other three indicators are easy to understand and have been widely used, and it is important to look at variations in the different indicators related to water loss, i.e., losses per subscriber, km of network, and connection.
- During June 2021, the UPMU conducted the first session on the NRW round table[5].
  The second session will be conducted in October-November 2021 with the Utilities, WAJ, GIZ, and various experts to unify the concept of NRW and exchange experiences.

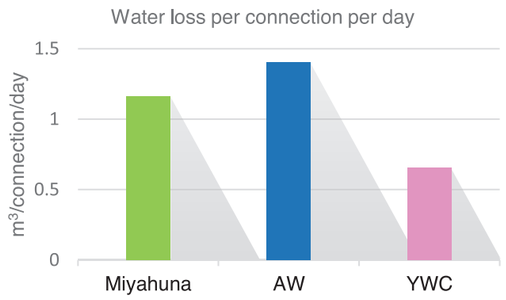


Figure 16: Water loss per connection per day

[5] *Annex IV UPMU 1st NRW roundtable discussion report*

4.2.6 Network Efficiency

Ser.	Cluster	PI Name	Unit	Miyahuna	AW	YWC
19	Network Efficiency	Inefficiency of use of water resources	% of use of water resources	19.8	18.5	24.4
20		Water resources use per capita/ day	lcd	125.4	369.1	97.4

Table 11: Network Efficiency at the end of 2020

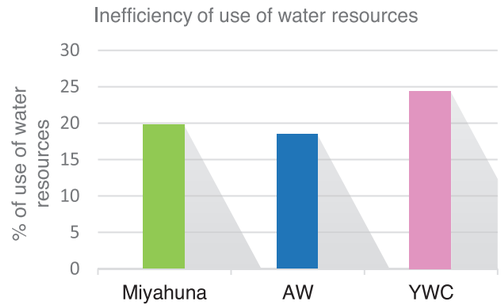


Figure 17: Inefficiency of use of water resources

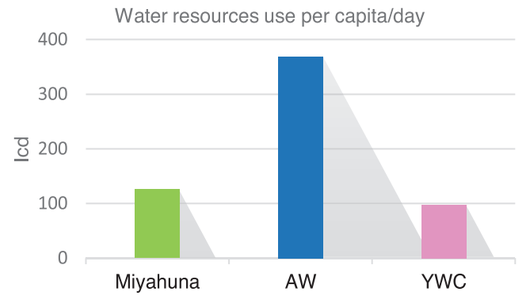


Figure 18: Water resources use per capita/day

- The inefficiency of water resource usage is calculated by multiplying NRW volumes by an estimated real losses ratio. The Utilities currently estimate this ratio at about 50%, and the UPMU will use results from the second round-table discussion to develop a better understanding for estimating.
- Per-capita consumption of water resources is by far the highest for AW, due to the influence of commercial and industrial customers.

4.3 Customer service performance

4.3.1 Supply Mode & Efficiency

Ser.		PI Name	Unit	Miyahuna	AW	YWC
1	Supply Mode & Efficiency	Continuity of supply	% of time	21.3	100	5.4
2		Subscribers receiving continuous supply	%	3.2	93.3	0
3		Water consumption per capita (residential subscribers)	Liters/capita/ day (lcd)	54.1	76.4	45.6

Table 12: Supply Mode & Efficiency at the end of 2020

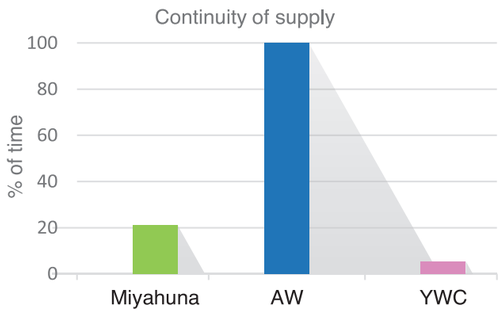


Figure 19: Continuity of supply

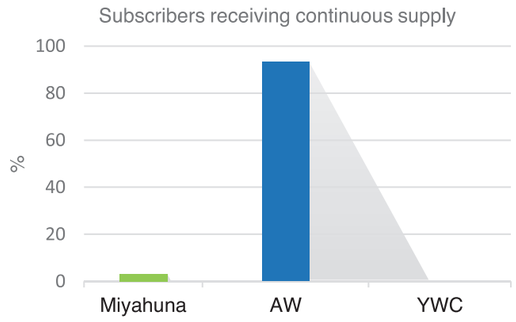


Figure 20: Subscribers receiving continuous supply

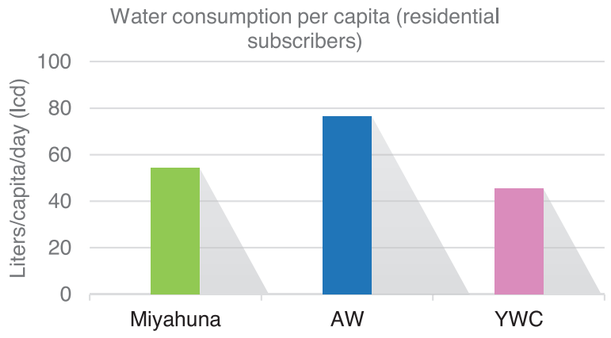


Figure 21: Water consumption per capita (residential subscribers)

- UPMU reports on the percentage of time that subscribers receive water. For AW, as expected with continuous supply, the system is pressured 168 Hrs. per week, Miyahuna almost 36 Hrs., and YWC 9 Hrs.
- While a significant number of subscribers receive a continuous supply in Aqaba, the percentage for other utilities is low and shows no signs of improvement.
- The water consumption for residential subscribers showed a decline in litres per capita per day in 2020 compared to 2019, due to change in the average family size per subscription as calculated based on the water services coverage per utility.

4.3.2 Commercial & Customer Processes

Ser.		PI Name	Unit	Miyahuna	AW	YWC
4	Commercial & Customer Processes	New connection efficiency	% of requests	83.5	100.0	87.7
5		Percentage of inactive subscribers	%	9.5	6.7	13.4
6		Subscriber meter replacement ratio	%	2.4	43.4	2.6
7		Meter reading ratio	%	103.4*	97.6	97.9

Table 13: Commercial & Customer Processes at the end of 2020

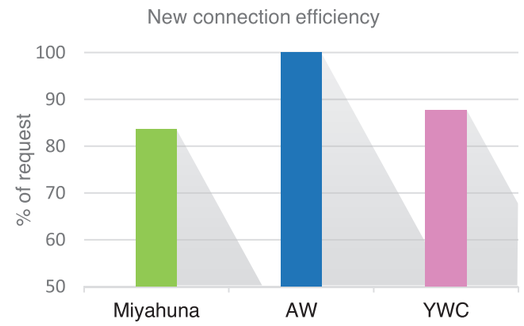


Figure 22: New connection efficiency

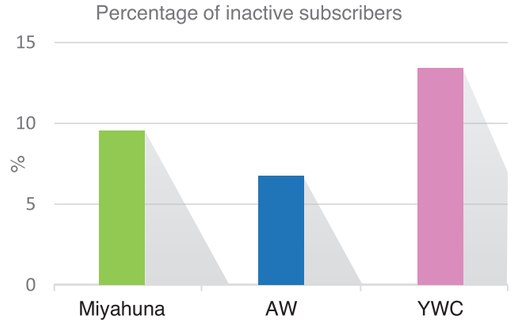


Figure 23: Percentage of inactive subscribers

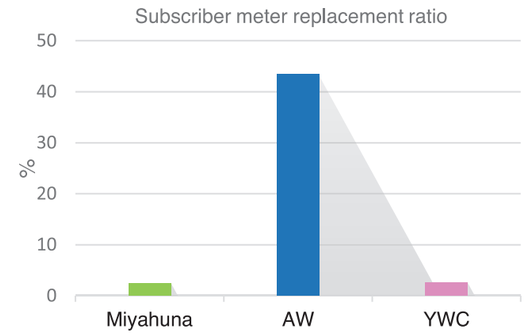


Figure 24: Subscriber meter replacement ratio

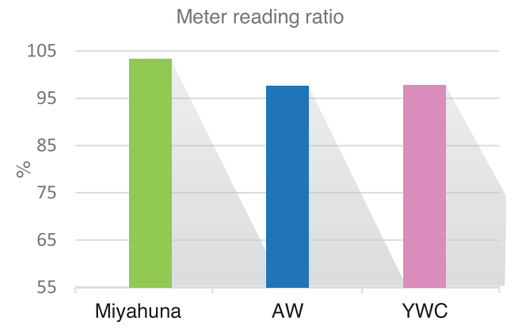


Figure 25: Meter reading ratio

- AW has the highest level of service efficiency for new type 1 & 2 connections at 100% within target time. Miyahuna declined from 87.5% in 2019 to 83.5% in 2020 due to merging with the Zarqa and Madaba Water governorates, while YWC's new connection efficiency increased from 85% in 2019 to almost 88% in 2020. However, YWC complied with the UPMU's recommendations to compile the manual registers and spreadsheets from its 10 regional operating units to manage the documentation for new connections.
- The percentage of inactive subscribers for the three Utilities increased in 2020 due to COVID-19 and lock down. The notable increase in AW's figures from 3.4% in 2019 to 6.7% in 2020 was due to the fact that 2019's figures did not include customers from Disi village.
- The three Utilities have been engaged in replacing water meters. AW has the highest rate of meter replacement because it has started replacing mechanical meters with smart meters, which have proved more efficient and reliable than mechanical meters in continuous supply systems.
- The meter reading ratios for the three Utilities are high, and exceeded 100% in. Miyahuna due to:
  - Issuing monthly water bills for big customers rather than quarterly.
  - Bills issued in the third quarter are high to recover the interruption of issuing bills in the first and second quarters during lock down.

4.3.3 Customer Relationship & Satisfaction

Ser.		PI Name	Unit	Miyahuna	AW	YWC
8	Customer Relationship & Satisfaction	No. of complaints/1000 active subscribers	No. of complaints/1000 active subscribers	298.1	57.1	287.2
9		Billing complaints	No. of complaints/1000 active	19.4	24.1	18.3

Table 14: Customer Relationship & Satisfaction at the end of 2020

- The annual percentage of "no water" coplaints during 2020 are quite substantial for Miyahuna and YWC at 29.8% and 28.7% respectively.
  AW, which has a continuous water supply, reduced the annual percentage of "no water" complaints from 7% in 2019 to 5.7% in 2020. This was because there was more water available for residential customers since non-residential customers (hotels) were at minimum consumption during lock down.

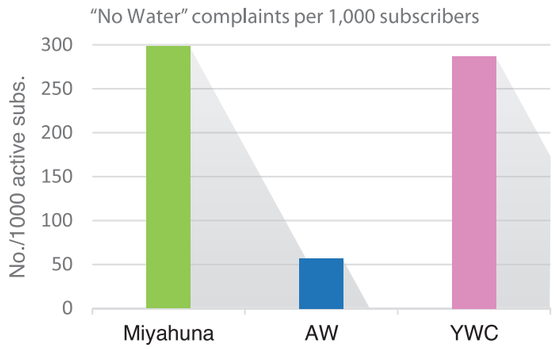


Figure 26: "No Water" complaints per 1000 subscribers

The UPMU recommends minimising the repetition of no water complaints, and the Utilities are trying hard to comply with this requirement.

- The percentage of billing complaints remains low and acceptable. The substantial increase in Miyahuna is due to merging Zarqa and Madaba governorates. The percentage of billing complaints decreased for both AW and YWC, which indicates improved performance.

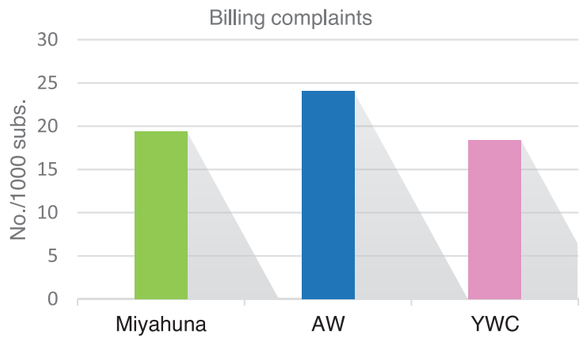


Figure 27: Billing complaints

4.4 Financial performance

4.4.1 Financial Efficiency

Ser.		PI Name	Unit	Miyahuna	AW	YWC
1	Financial Efficiency (Liquidity)	Collection Efficiency (Customers)	%	87.9	88.9	72.0
2		Collection ratio	%	86.1	84.2	84.4
3		Electricity costs as percentage of total O&M costs	%	51.6	19.4	51.5
4		Delay in accounts receivable	months	7.75	8.1	17.6
5		Operating cost coverage ratio (Collection)	%	77.1	71.6	45.8

Table 15: Financial Efficiency at the end of 2020

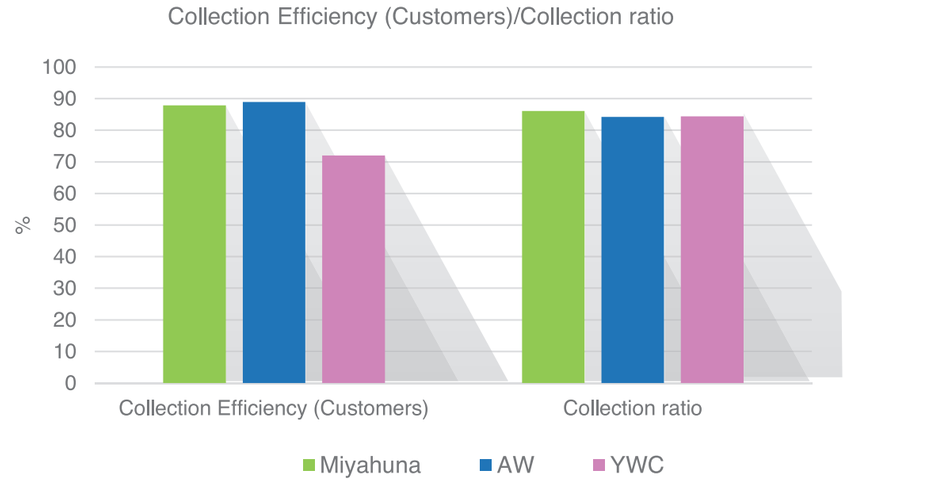


Figure 28: Collection Efficiency (Customers)/Collection ratio

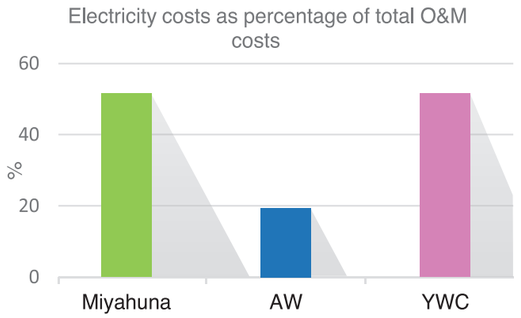


Figure 29: Electricity costs as percentage of total O&M costs

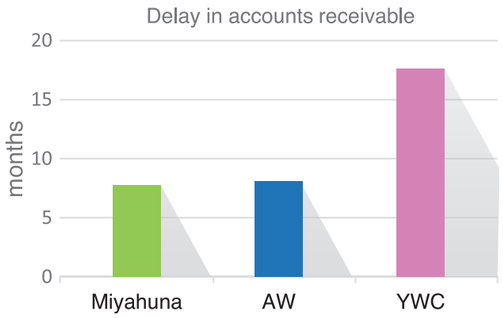


Figure 30: Delay in accounts receivable

- Collection Efficiency and collection ratio measures the Utilities' ability to cover issued billings from collection processes. Liquidity is considered a strong indicator for assessing the Utilities' collection performance. Collection efficiency for all three Utilities declined between 2019 and 2020 (Miyahuna from 99.3% to 87.9%, AW from 98.7% to 88.9%, and YWC from 75.7% to 72%), due to the following:

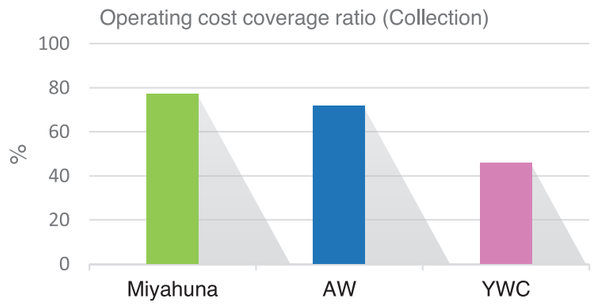


Figure 31: Operating cost coverage ratio (Collection)

  - The lock down that took place during quarters I and II of 2020 due to COVID-19
  - The implementation of Defence Laws which prevented the Utilities from disconnecting water supplies for non-performing customers
  - Reductions in the size of the work force of between 25% and 50% due to the COVID-19 pandemic, which affected daily operational performance

The UPMU advised AW to segregate collection of billing from other collections in their accounting and billing system.
While the collection ratio for Miyahuna and AW declined during 2020, this indicator improved for the YWC from 73.7% in 2019 to 84.4% in 2020. As figures for YWC are neither final nor verified by the external auditor, the UPMU cannot verify this indicator.

- Electricity costs as a percentage of total O&M costs measures the segment size of electricity cost to total O&M cost.
  Although electricity consumption (KW/h) has increased in 2020, electricity costs were reduced for all the Utilities[6] for the following reasons:
    - The electricity Tariff was reduced
    - Electricity bills were exempted from fuel differences during 2020
- There were delays in the time frame for accounts receivable measures (Collecting Period) for the Utilities to collect outstanding receivable balances (Measure of liquidity)[7].
  The formula used in 2019 included Total Accounts Receivable (Accounts Receivable from Billing & Other Receivables) / Billing on a monthly basis. This was updated in 2020 to Accounts Receivable from Billing (excluding other receivables) / Billing on a monthly basis to reflect the water and wastewater sales.

  The ageing of receivables decreased in Miyahuna from 8.65 months during 2019 to 7.75 months during 2020 due to the implementation of a new formula where receivables from billing only is calculated net of other receivables, and improvements in collection.
  The delay in Accounts receivable for AW and the YWC increased from 6.24 and 14.36 months respectively during 2019 to 8.1 and 17.63 months between 2019 and 2020. This was caused by reductions in collections due to the negative impact of COVID-19, which increased accounts receivable and thus negatively affected the Utilities' liquidity.

[6] *See annex II List of indicators- 2019/2020*
[7] *Utilities' ability to settle their short-term financial obligations*

- The operating cost coverage ratio (collection) measures the ability of collection to cover O&M costs (Measure of Liquidity).

  In Miyahuna, the ratio declined during 2020 due to increases in the cost of O&M.

  The ratio in AW declined during 2020 due to increases in the cost of O&M caused by increases in water purchases and end of service provision.

  The ratio for YWC improved slightly during 2020.

4.4.2 Financial Sustainability (Profitability)

Ser.		PI Name	Unit	Miyahuna	AW	YWC
6	Financial Sustainability (Profitability)	Operating cost coverage ratio (revenues)	%	90.1	122.0	58.3
7		Operating cost coverage ratio (billing)	%	89.5	85.1	54.3

Table 16: Financial Sustainability (Profitability) at the end of 2020

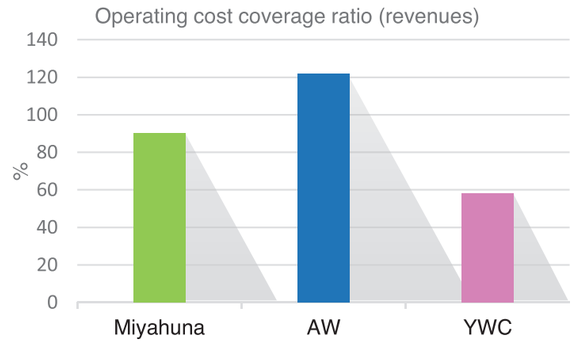


Figure 32: Operating cost coverage ratio (revenues)

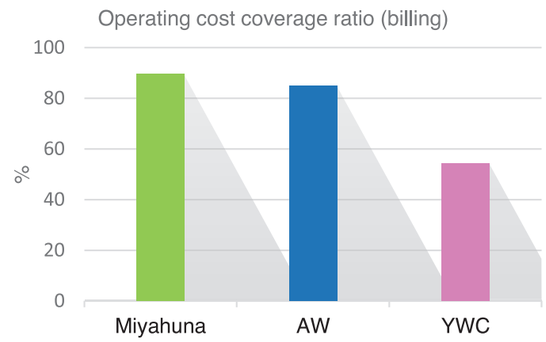


Figure 33: Operating cost coverage ratio (billing)

- Operating cost coverage ratio (revenues) measures the ability of revenue to cover the cost of operations and maintenance.

  The Operating Cost coverage ratio (Revenue) for Miyahuna declined from 94.4% during 2019 (Miyahuna-Amman) to 90.1% during 2020 due to increases in the cost of O&M and the merging of Zarqa and Madaba governorates.
  The indicator for AW declined from 124.7% during 2019 to 122% during 2020 due to an increase in "end of service indemnity provision," as per the Jordanian labour law.
  The indicator increased slightly for YWC from 56.3% during 2019 to 58.3% during 2020. This has not yet been audited by an external auditor.

(Measure of Profitability). The ratio for Miyahuna (Billing) increased slightly during 2020, and declined in AW and YWC.

4.4.3 Profitability Unit

Ser.		PI Name	Unit	Miyahuna	AW	YWC
8	Unit Profitability-JOD/m^3	Average water and wastewater revenue for billed consumption	JOD/m^3	0.83	0.89	0.72
9		Unit operating cost water and wastewater services	JOD/m^3	1.06	1.1	1.3

Table 17: Unit Profitability at the end of 2020

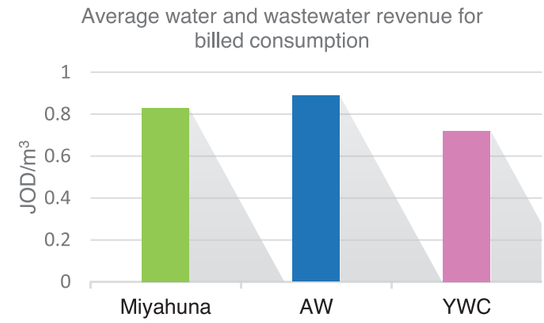


Figure 34: Average water and wastewater revenue for billed consumption

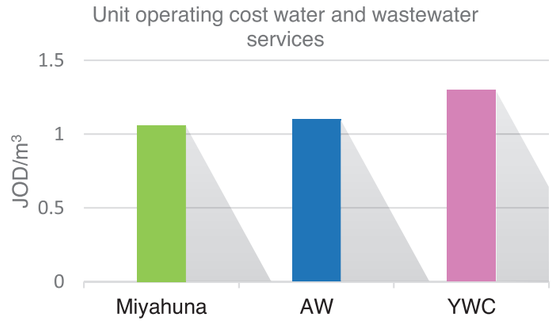


Figure 35: Unit operating cost water and wastewater services

- Average water and wastewater revenue for billed consumption measures Revenue per cubic meter. The Utilities' Revenue per cubic meter has increased during 2020 since the UPMU has modified the formula for this indicator to include the following revenues in addition to water sales: billing for illegal usage, billing from tanker sales, residential wastewater services, and non-residential wastewater services.

- Unit operating cost of water and wastewater services measures Cost per cubic meter. The UPMU has modified the formula for this indicator to include wastewater operating costs (excluding water Capital Cost), in addition to water operating costs. Miyahuna and AW's operating costs increased during 2020, but decreased for YWC.

Note: YWC does not segregate water cost from Wastewater cost.

4.5 Human Resources performance

4.5.1 Staff Utilization & Efficiency

Ser.		PI Name	Unit	Miyahuna	AW	YWC
1	Staff Utilization & Efficiency	Employees per 1000 subscribers (W&WW)	No/1000 subscribers	1.3	4.3	2.6
2		Employees per 1000 subscribers W	No/1000 subscribers	2.4	8.0	3.9
3		Training per employee	Hour/ Employee	2.2	14.1	0.7
4		Percentage of staff trained	%	10.9	41.5	6.9

Table 18: Staff Utilization & Efficiency at the end of 2020

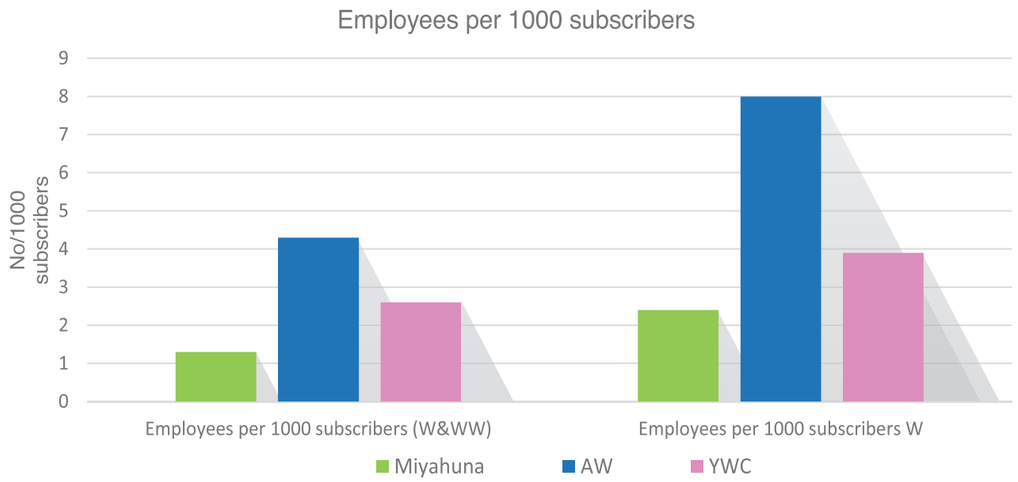


Figure 36: Employees per 1000 subscribers

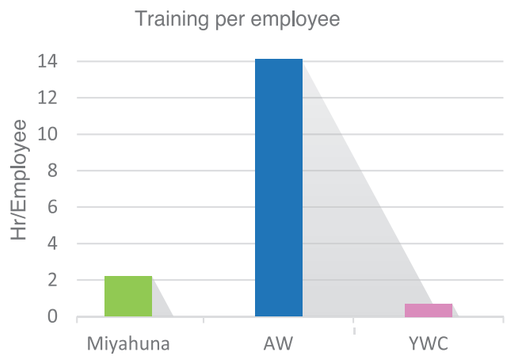


Figure 37: Training per employee

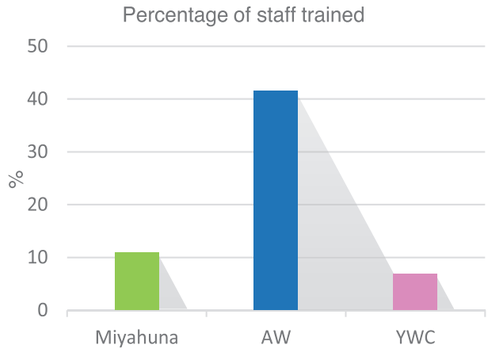


Figure 38: Percentage of staff trained

- Staff efficiency, expressed in employees per 1,000 subscribers, is acceptable for the three Utilities.
- Training per employee showed a significant reduction due to the impact of COVID-19. AW performed better than the other Utilities.
- Figure 38 shows that YWC has the lowest percentage of staff trained.

4.6 Effect of merging Zarqa and Madaba governorates to Miyahuna

At the beginning of 2020, Zarqa and Madaba governorates merged with Miyahuna-Amman to form one Utility. This led to major changes in some performance indicators, as shown in the table below:

Ser.	PI Name	Unit	Amman	Zarqa	Madaba	Miyahuna
1	Non-Revenue Water	% of system input	40.6	56.0	41.8	46.1
2	Collection Efficiency (Customers)	%	89.4	85.6	65.5	87.9
3	Water consumption per capita (residential subscribers)	L/c/d	58.0	41.3	63.3	54.1
4	"No water" complaints per 1000 subscribers	No. of complaints/1000 active subscribers	269.7	433.2	180.8	298.1
5	Meter reading ratio	%	107.4	90.2	89.8	103.4
6	Delay in accounts receivable	months	5.8	16.6	18.9	7.11

Table 19: List of Indicators for Miyahuna governorates at the end of 2020

- As shown in the figure 39 NRW% for Miyahuna-Amman (standalone) increased from 38.7% in 2019 to 40.6%. furthermore, to 46.1% when merge with Zarqa and Madaba took place.

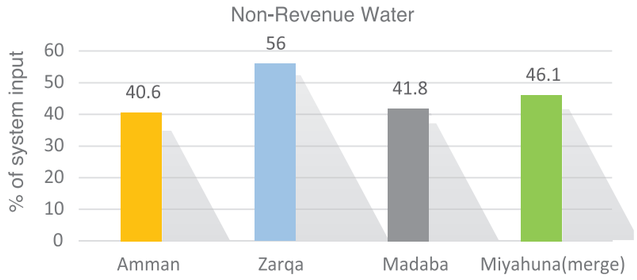


Figure 39: Non-Revenue water for Miyahuna governorates

- The collection efficiency for Miyahuna -Amman (standalone) declined from 89.4% to 87.9% when merged with Zarqa and Madaba. This is considered a negative indicator for Miyahuna liquidity.

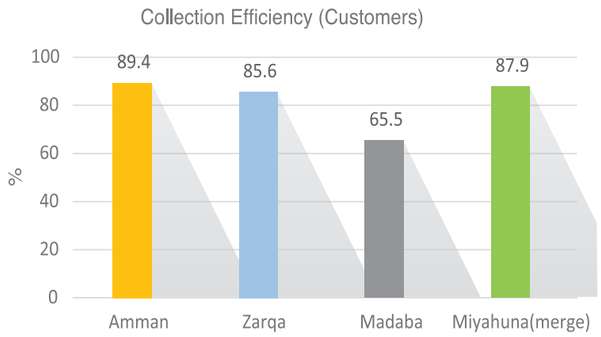


Figure 40: Collection Efficiency(Customers) for Miyahuna governorates

- As shown in figure 41, Zarqa has the lowest water consumption per capita, which affected Miyahuna's overall consumption per capita.

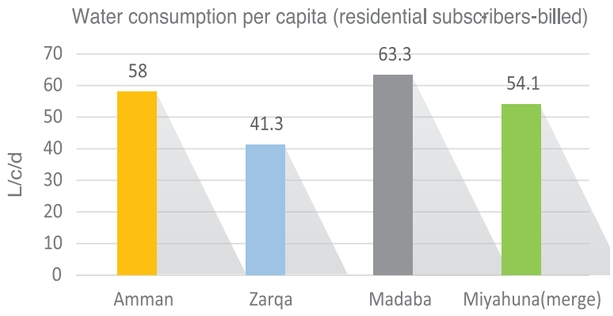


Figure 41: Water consumption per capita (residential subscribers-billed) for Miyahuna governorates

- As mentioned above, the merger with Zarqa increased the number of Miyahuna's water complaints

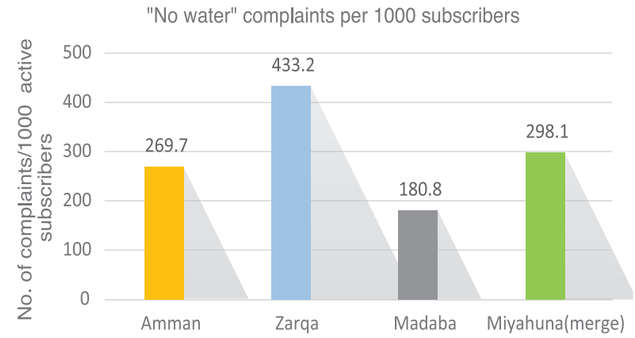


Figure 42: "No water" complaints per 1000 subscribers for Miyahuna governorates

- Zarqa and Madaba must put more effort into improving their meter reading ratio.

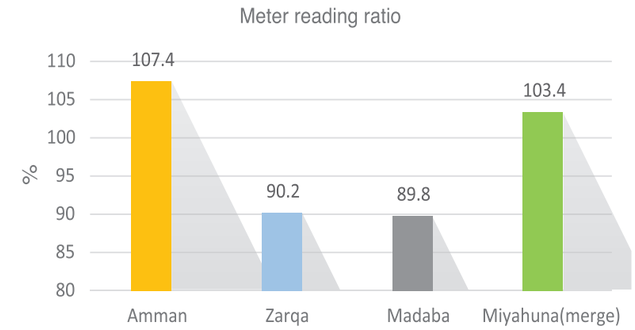


Figure 43: Meter reading ratio for Miyahuna governorates

- The merger of Zarqa and Madaba led to an increase in the collection period.

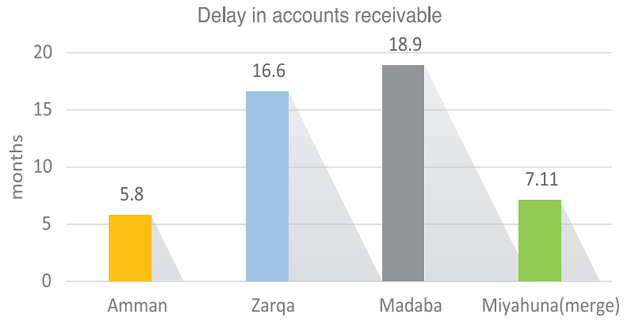


Figure 44: Delay in accounts receivable for Miyahuna governorates

4.7 Recommendations from the analyses to Utilities

1. The Utilities should create their own data banks to gather information on all activities. This should collect, update, and analyse data to obtain accurate and reliable information that can assist in decision making and furnish stakeholders with the data they need.
2. The Utilities should revise and update their existing emergency response plans to ensure that they are capable of meeting any unforeseen challenges and of mitigating risks, such as water shortages during the summer season.
3. The Utilities should empower their internal auditing units by developing a skilful and dedicated staff with the necessary authority to carry out their duties effectively.
4. The Utilities are recommended to enhance public awareness and create communication channels with local communities that target all segments of society, and should apply penalties to customers who waste water resources.
5. The YWC should seek better options for improving performance in wastewater treatment plants (WWTPs) efficiency.
6. The YWC should change its mode of operations. Replacing existing pumps with variable speed pumps might be an option.
7. The YWC is advised to conduct hydraulic analyses for its water distribution network to convert the system from direct pumping to distribution by gravity.
8. Reiterate the importance of installing CMMS in YWC.
9. The Utilities should improve monitoring power consumption to keep it within an acceptable range.
10. The Utilities are advised to search for effective, cost saving sources of renewable energy.
11. The UPMU recommends that the Utilities promote private sector participation (PSP) in their business activities.
12. The Utilities are advised to increase collection to reflect positively on their collection efficiency.
13. AW is advised to segregate collection of billing from other collections in their accounting and billing system.
14. YWC should segregate water operations expenses from wastewater operations expenses.
15. To enhance collection, the Utilities should implement the Public Funds law (Amiri Law) and follow up effectively on collection procedures.
16. The YWC's finance department is advised to have a clear structure and specify job descriptions for staff members to enhance the internal control environment and financial reporting.
17. The Utilities are advised to intensify their training programs to improve staff skills.

5 Chapter

Thematic/strategic deep dives

Awareness of use of water in YWC

5- Thematic/strategic deep dives

This chapter provides an analysis and outlook that goes beyond individual indicators on topics that the UPMU sees as strategically relevant to the sector.

5.1 Financial challenges

Some of the financial challenges facing the Water Utilities include:

- High electricity costs
- Inability to cover O&M costs due to low water tariffs
- High levels of NRW
- Low collection efficiency

- High Electricity costs:

Despite a slight reduction in tariffs, electricity costs still represent the highest segment of O&M costs, which has a negative impact on financial performance as shown in the table below:

Description	Miyahuna[8]			AW			YWC		
	Amount JOD '000								
Year	2018	2019	2020	2018	2019	2020	2018	2019	2020
Electricity Expenses	80,518	85,329	77,063	3,915	4,345	3,874	39,649	42,624	36,304
O&M Expenses	134,922	144,514	145,995	17,392	17,685	19,956	71,553	76,899	70,445
%of Electricity from O&M	**60%**	**59%**	**52%**	**23%**	**25%**	**19.4%**	**55%**	**55%**	**51.5%**

Table 20: Utilities' O&M and Electricity Expenses 2018-2020

Recommendations:

- The Water Utilities are strongly advised to conduct studies on energy efficiency measures to reduce electricity consumption, and to search for alternative sources of renewable energy.
- The Water Sector management should open communication channels with the EMRC (Energy and Mineral Resources Commission) to discuss a favourable tariff for electricity consumption, since the current tariff places such a substantial financial burden on operating expenses.

- Low Water Tariff:

Despite restructuring water tariffs in 2020, the Water Utilities remain unable to cover their operating costs.

Recommendations:

- Decision makers should gradually restructure the water tariff to cover O&M costs and reduce dependency on governmental subsidies.
- The Utilities should monitor and control operational and maintenance expenditures.
- Management should properly implement budgeting and financial planning since budgeting is seen as a key tool for the Utilities to monitor and control expenditures and forecast future financial performance.

[8] *Data for Miyahuna-Amman only*

- High levels of Non-Revenue Water:

The Utilities should increase their efforts to reduce NRW, which will lead to:

- Decreased O&M costs
- Increased revenue generation from billing
- Increased availability of water for customers

- Collection Efficiency:

Improving collection efficiency is an excellent way for the Water Utilities to improve liquidity. This could be achieved through:

- Putting practical incentive plans in place to motivate members of the collection teams to meet their set targets
- Implementing the Public Funds law (Amiri Law)
- Outsourcing through PSP to improve:
  - Collection of aged outstanding receivables
  - Collection from illegal sewerage connections, added floors, and annual sewerage agreements

5.2 Financial Statement Analysis

5.2.1 Miyahuna-Amman

Other Receivables:

- Jordan Post Office:

The Jordan Post Office's balance has increased by 34% over the course of the year from JOD 538,609 in 2019 to JOD 719,272 in 2020. It is recommended that the existing collection agreement is followed up and reviewed.

- Receivables of Water and Wastewater Subscribers[9] :

The merger of the Zarqa and Madaba governorates led to the receivable balance increase by 74% from JOD 41.57 M in 2019 to JOD 72.35 M in 2020.This increase has a negative effect on the Utilities' financial performance and liquidity.

- Electricity Payables[10] :

The electricity payable balance has increased by 93% from JOD 31.94 M in 2019 to JOD 61.80 M in 2020.

- Sewage Tax 3%:

The balance of sewage Tax has increased from JOD 22.90 M in 2019 to JOD 24.46 M in 2020. This balance represents the amount vested by the Municipalities towards Miyahuna.

5.2.2 Miyahuna-Zarqa

- Collections represents 73% of total revenue earned during 2020.
- The classification of accounts by the external auditor for the audited financial year 2020 differ from year 2019 classification (Comparative Issue).

[9] *Data 2020 represents the merge of Amman, Zarqa and Madaba*
[10] *Data 2020 represents the merge*

- The Zarqa Water Utility supplies YWC with water. The outstanding unsettled receivable balance as of 2020 is JOD 2.28 M.
- Other receivables – Sewage Tax 3%:
  This account represents the receipt of 3% wastewater Tax from the Zarqa and Rusaifeh municipalities, which at the end of 2020 reached JOD 6.6 M.
- The balance of Trade Receivables – (Subscriptions) has increased to JOD 19.8 M during 2020. Collection procedures need to be improved.
- The electricity payable balance has increased to JOD 9.8 M in 2020.

5.2.3 Miyahuna-Madaba

- Collections represent 66% of total revenue earned during 2020.
- The classification of accounts by the external auditor for the audited Financials year 2020 differ from year 2019 classification (Comparative Issue).

5.2.4 AW Financial Statement Analysis

- Trade receivables / Customer Subscribers' balance has increased by JOD 2.60 M during 2020 compared to 2019.
- A provision for end of service indemnities of JOD 2.1 M was accounted for in 2020.

5.2.5 YWC Financial Statement Analysis

The YWC financial statement had not been finalised or verified by the external auditor by the date the UPMU report was issued, so further analyses could not be performed.

5.3 Internal audit

Internal audits provide independent assurance that an organization's risk management, governance, and internal control processes are operating effectively.

Although there are skilful staff in this field, the Utilities still lack sufficient resources for the internal audit unit to perform activities regularly and adequately.

The UPMU and GIZ will invite relevant staff from the Utilities, external experts, and other stakeholders to exchange their knowledge, and to define what the Utilities need to do to reach the best international practice in this area.

Figure 45: Elements of a compliance program [11]

[11] *Data 2020 represents the merge of Amman, Zarqa and Madaba*

6 Chapter

Performance targets (Benchmarking)

Command and control center in WAJ

6- Performance targets (Benchmarking)

Benchmarking is a key regulatory tool for assessing and improving performance by allowing the Utilities to compare their results against similar entities and their own historical trends.
Performance targets are set to:

- Turn the objectives of the Utilities' business plans into specific goals that are connected to fixed time frames
- Bring the Utilities closer to international goals
- Promote and measure competition between the Utilities
- Trigger an overall improvement in the sector performance

6.1 Performance Analysis

Data used for performance benchmarking is obtained and verified through the consolidated sheet used by the UPMU, who selected AW as the first Utility to be tested against an agreed number of indicators for the year 2019/2020. Miyahuna and the YWC will be considered in future reports. The UPMU and AW considered the following aspects while setting the first batch of performance targets:

- Performance targets should only be for priority areas
- Performance targets should measure real, achievable progress
- The consequences of not meeting performance targets

UPMU staff held several discussions with AW employees to classify indicators into five categories as shown in table 20 below.

Nom.	Colour	Group name	Description
1		Performance target should be set	Same target for all Utilities or group of Utilities
2		Performance target could be set	Requires an assessment of individual Utilities, e.g., consideration of investment requirements beyond the Utilities' capacity, current status of infrastructure, other external factors (e.g., topography)
3		Performance target may not be advisable	Strong dependency on external factors (e.g., investment, policy)
4		No performance target	Compliance is a legal requirement as targets set by laws and regulators cannot allow laws to be breached
5		Performance target for the sector	As an alternative to setting the green category, it might make sense to set sector targets that are aiming more at signalling to policy makers that more needs to be done in and for the sector to make it sustainable (e.g., NRW, cost recovery)

Table 21:Main components of indicators used in Benchmarking

6.2 Benchmarking PIs

In the first batch of performance targets for AW (benchmarking), 13 out of 53 indicators were selected and defined, and the following targets set for the years 2020-2025:

No.	Color	PI's	Unit	AW/2019	AW/2020	Trend	Target 2020	Benchmark
1		New connection efficiency	%	100	100	→	100	achieved
2		Collection Efficiency (Customers)	%	94.8	88.85	↓	84	achieved
3		Non-Revenue Water[12]	%	36.2	36.95	→	39	achieved
4		Employees per 1000 subscribers (W&WW)	No/1000 subscribers	4.5	4.29	↑	5	achieved
5		Training per employee	Hour/ Employee	26.7	14.05	↓	25	Not achieved
6		Water consumption per capita (billed residential subscribers)	lcd	79.5	76.42	↓	80	Not achieved
7		Operating cost coverage ratio (revenue)	%	124.8	122.04	↓	95	achieved
8		Delay in accounts receivable	month	6	8.10	↓	7	Not achieved
9		Electricity costs as percentage of total O&M costs	%	23.9	19.41	↑	20	achieved
10		Preventive maintenance of pumps	%	2.8	100	↑	100	achieved
11		Operational well and reservoir meters	%	57.6	57.58	→	55	achieved
12		Metering of import and export points	%	100	100	→	100	achieved
13		Wastewater coverage	%	86.2	90.48	↑	87	achieved

Table 22: List of indicators used in Benchmarking

This will be considered as a first generation of targets and benchmarks, and will be developed over time. UPMU staff will work closely with Miyahuna and YWC after completing this report to set their targets for years the next five years against data from year 2020 (base year), and work with AW to revise the targets for 2021 – 2025.

[12] *This indicator mixed components II and V in table 21*

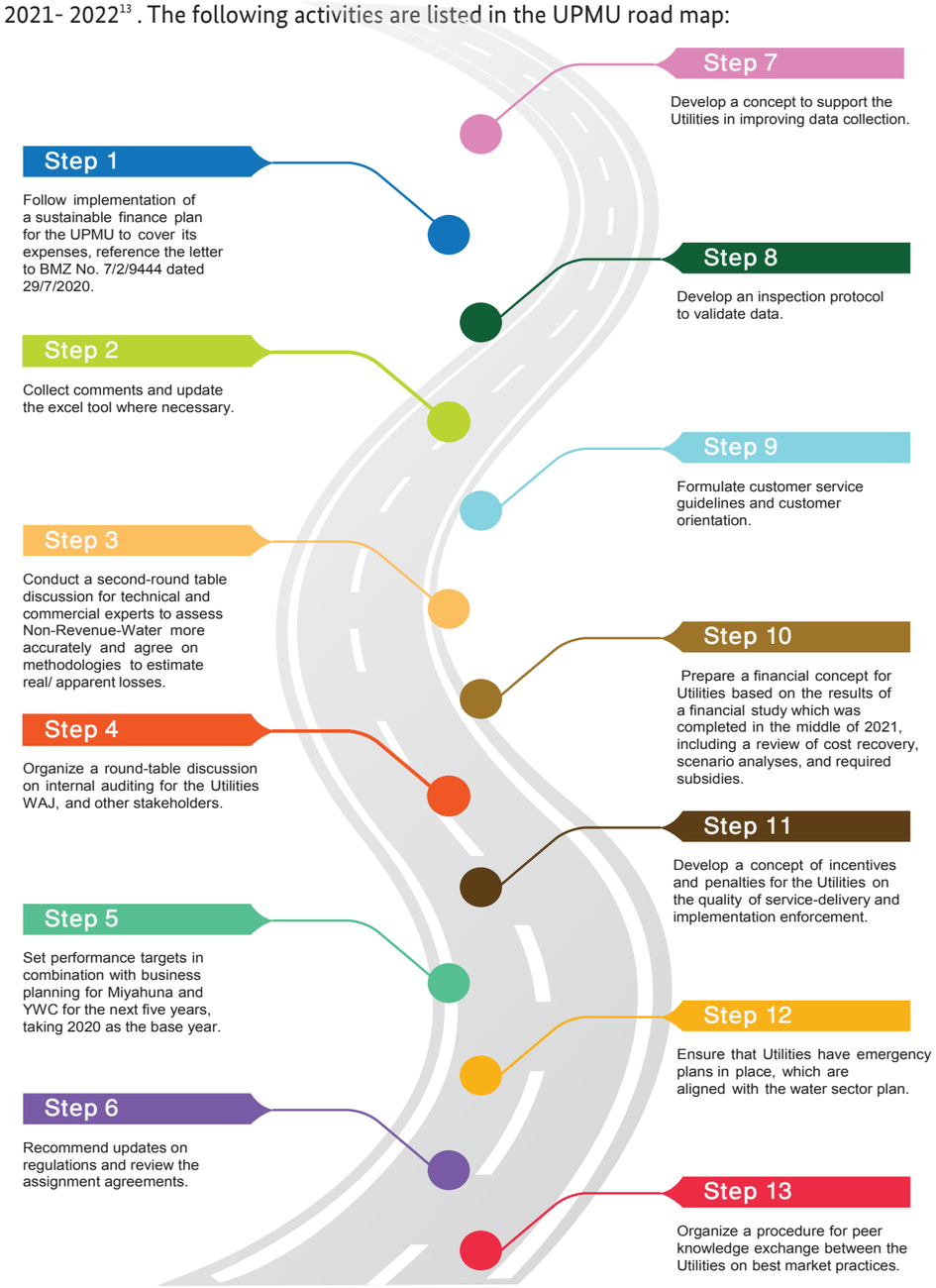
7
Chapter

What's next for the UPMU

Illegal use in YWC water network

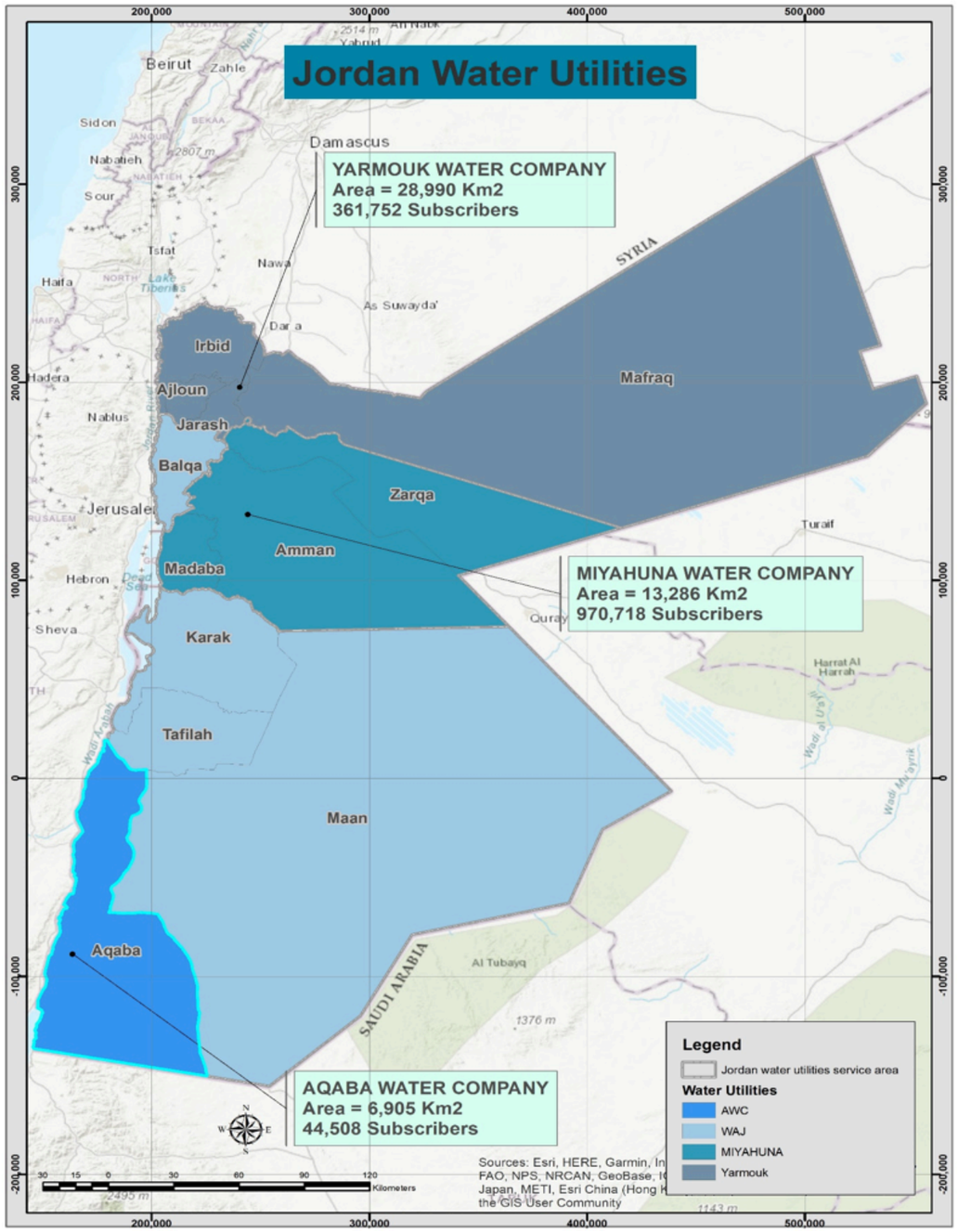
7- What's next for the UPMU

The UPMU's core activities and responsibilities are now specified after finalizing the operational plan for 2021- 2022[13] . The following activities are listed in the UPMU road map:



[13] *See annex VI UPMU Operational Plan 2021-2022*

Annex I Map of Jordan showing the Utilities' service areas



Annex II List of indicators used in reports for years 2019/2020

Ser.	Sections	PI Name	Unit	Miyahuna [14]		AW		YWC	
				2019	2020	2019	2020	2019	2020
Operations									
1	Quality Assurance & Control	Microbiological water quality compliance	%	99.9	99.7	100	100	100	100
2		Water quality tests performed	% of req. tests	100	100	100	100	100	100
3		Physical-chemical water quality compliance	%	99.8	99.9	100	100	100	100
4		Effluent quality compliance	%	99.4	99.3	100	100	91.1	87.5
5	Energy Efficiency	Average unit energy consumption	KWh/m^3	3.4	3	1.0	1	3.3	3.2
6		Renewable energy utilization	%	0.0	0	0.0	0	0.2	0
7		Power consumption monitoring	%	61.9	43.1	0.0	100	49.4	95
8	Response Time & Repair Efficiency	Speed of repair of failures of network	% of bursts	96.6	95.9	100.0	100	100.0	94.7
9		Preventive maintenance of pumps	%	100.0	97.3	2.8	100	0.0	31.9
10		Corrective maintenance of pumps	%	60.9	21.3	NA	51.4	225.0	79.5
11		Sizing of pumps	%	87.9	80.1	0.0	100	50.0	29.2
12	Bulk Metering	Operational well and reservoir meters	%	100.0	89.9	57.6	57.6	32.9	86.4
13		Calibration of well and reservoir meters	%	0.0	35.7	0.0	100	0.0	100
14		Metering of import and export points	%	100.0	100	100.0	100	83.3	83.3
15	Water Loss	Non-Revenue Water	% of system input	38.7	46.1	36.2	37.0	46.1	49.5
16		Water loss per subscriber	m^3/subscriber/day	0.35	0.4	0.61	0.65	0.36	0.4
17		Water loss per mains length	m^3/km/day	25.5	25.46	25.5	27.54	11.6	12.38
18		Water loss per connection per day	m3/connection/day	1.25	1.16	0.62	1.4	0.58	0.65
19	Network Efficiency	Inefficiency of use of water resources	% of use of water resources	12.5	19.8	18.1	18.5	20.9	24.4
20		Water resources use per capita/ day	lcd	142.8	125.4	404.2	369.1	112.9	97.4

[14] *2019 Miyahuna Indicators for Amman only*

Customer service									
21	Supply Mode & Efficiency	Continuity of supply	% of time	21.3	21.3	100	100	5.4	5.4
22		Water consumption per capita (residential subscribers)	Liters/capita/day (lcd)	64.8	54.1	79.5	76.4	56.7	45.6
23		Subscribers receiving continuous supply	%	0.9	3.2	96.6	93.3	0.0	0
24	Commercial & Customer Processes	New connection efficiency	% of requests	87.5	83.5	100	100.0	85.4	87.7
25		Percentage of inactive subscribers	%	9.4	9.5	3.4	6.7	12.7	13.4
26		Subscriber meter replacement ratio	%	5.8	2.4	3.7	43.4	12.7	2.6
27		Meter reading ratio	%	99.5	103.4	93.8	97.6	102.1	97.9
28	Customer Relationship & Satisfaction	"No Water" complaints per 1,000 subscribers	No. of complaints/1000 active subscribers	211.3	298.1	70.8	57.1	243.2	287.2
29		Billing complaints	No. of complaints/1000 active subscribers	16.8	19.4	33.3	24.1	25.2	18.3
Financial									
30	Financial Efficiency (Liquidity)	Collection Efficiency (Customers)	%	99.3	87.9	94.8	88.9	75.7	72.0
31		Collection ratio	%	95.5	86.1	94.8	84.2	73.7	84.4
32		Electricity costs as percentage of total O&M costs	%	60.1	51.6	23.9	19.4	54.9	51.5
33		Delay in accounts receivable	months	8.6	7.75	6.0	8.1	14.4	17.6
34		Operating cost coverage ratio (Collection)	%	90.5	77.1	84.7	71.6	44.9	45.8
35	Financial Sustainability (Profitability	Operating cost coverage ratio (revenues)	%	94.4	90.1	124.8	122.0	56.3	58.3
36		Operating cost coverage ratio (billing)	%	94.7	89.5	89.4	85.1	60.9	54.3
37	Unit Profitability-JOD/m3	Average water and wastewater revenue for billed consumption	JOD/m^3	0.677	0.83	0.630	0.89	0.663	0.72
38		Unit operating cost water and wastewater services[15]	JOD/m^3	0.76	1.06	1.09	1.1	1.61	1.3
Human Resources									
39	Staff Utilization & Efficiency	Employees per 1000 subscribers (W&WW)	No/1000 subscribers	1.2	1.3	4.5	4.3	2.9	2.6
40		Employees per 1000 subscribers W	No/1000 subscribers	2.16	2.4	8.26	8.0	4.15	3.9
41		Training per employee	Hour/Employee	11.9	2.2	26.7	14.1	1.8	0.7
42		Percentage of staff trained	%	43.1	10.9	110.0	41.5	14.2	6.9

[15] *Indicator for 2019 cover operating cost for water only*

Annex III Calculation of indicators used in this report

Indicator Name	Definition	Formula
"No water" complaints per 1000 subscribers	Number of "no water" complaints per 1000 active subscribers during reporting period	=Complaints of "No Water Supply" / (Active subscribers*1000)
Average unit energy consumption	Electricity consumption per m^3 supplied	=Electricity consumption / (Water produced + Imported treated water - Exported treated water)
Average water and wastewater revenue for billed consumption	Water and wastewater sales revenue from residential and non-residential subscribers (exported water excluded) per m^3 of authorized consumption	= (Residential water sales (amount) + Non-residential water sales (amount) + Billing for illegal usage + Reductions in billing +Billing for tanker sales + Billing for residential wastewater + Billing for non-residential wastewater) / (Residential billed volume + Non-residential billed volume + Volume billed for illegal usage + Volume provided through tankers)
Billing complaints	Average number of billing complaints and queries per 1.000 water subscribers during reporting period	=Billing complaints / Total water subscribers
Calibration of well and reservoir meters	Percentage of calibrated well and reservoir meters	=Number of reservoir meters calibrated / Number of reservoir meters that require calibration
Collection Efficiency (Customers)	Percentage of revenues collected from residential and non-residential customers during period	= (Collected amount from bills of residential & non-residential customers + collected amounts of sewerage charges from private tankers sales + collected amounts from annual sewerage. agreement) / (Amount Billed in Period - billed amount for exported water - Other Billing)*100
Collection ratio	Percentage of revenues collected from billed amounts during reporting period including exported water and other billing	=Total collection / Amount billed in period * 100
Continuity of supply	Percentage of hours when the (intermittent supply) system is pressurized	=Number of hours per week that the system is pressurized / (7*24) * 100
Corrective maintenance of pumps	Percentage of pumps fixed by corrective maintenance	=Production and distribution pumps corrective maintenance / Production and distribution pumps * 100
Delay in accounts receivable	Accounts receivable at reporting date compared to revenues during reporting period	=Total accounts receivable / (Amount billed in period / 12)
Effluent quality compliance	Percentage compliance of effluent quality test results with standards	=Compliant effluent quality tests / Wastewater effluent tests conducted * 100
Electricity costs as percentage of total O&M costs	Electricity costs as percentage of total Operation and Maintenance	=Total electricity costs / Total operation and maintenance costs water and wastewater services * 100
Employees per 1000 subscribers(W&WW)	Number of full time equivalent employees per 1000 water subscribers and wastewater subscribers	=Total number of employees / ((Total water subscribers + Total sewer subscribers) /1000))
Employees per 1000 subscribers W	Number of full-time equivalent employees per 1000 water subscribers	=Total number of water employees / ((Total water subscribers /1000)
Inefficiency of use of water resources	Real losses during the assessment period / System input volume during the assessment period *100	=(Water produced + Imported treated water - Exported treated water - Billed consumption) / (Water produced + Imported treated water - Exported treated water) * 100) * (Real water losses/100)
Meter reading ratio	Percentage of active customers whose meter has been read during reporting period	=Customer meters read / Active subscribers *100
Metering of import and export points	Percentage of metered import and export points	=(Number of metered import points + Number of metered export points) / (Number of import points + Number of export points) * 100
Microbiological water quality compliance	Percentage of the total number of microbiological tests of treated water performed that comply with the applicable standards.	=(Compliant microbiological tests/Microbiological water quality tests performed) * 100
New connection efficiency	Percentage of connections installed within the specified target time	=New water connections type 1 and type 2 within a target time / New water connections type 1 and type 2 requested * 100
Non-Revenue Water	Percentage of system input volume not being billed	=(Water distributed - Billed authorized consumption) / (Water distributed) * 100

Operating cost coverage ratio (billing)	Total billing compared to total operation and maintenance costs	=Amount billed in period / Total operation and maintenance costs water and wastewater services * 100
Operating cost coverage ratio (collection)	Total collection compared to total operation and maintenance costs	=Total collection / Total operation and maintenance costs water and wastewater services * 100
Operating cost coverage ratio (revenues)	Total revenues compared to total operation and maintenance costs	=Total revenues / Total operation and maintenance costs water and wastewater services * 100
Operational well and reservoir meters	Percentage of wells and reservoirs with operational meters	=Number of operational reservoir meters / Number of metered reservoirs
Percentage of inactive subscribers	Percentage of subscribers inactive at the time of reporting	=(Total water subscribers - Active subscribers) / Total water subscribers * 100
Percentage of staff trained	Percentage of staff trained during reporting period	=Total number of staff that participated in internal or external training / Total number of employees (full-time equivalent) * 100
Physical-chemical water quality compliance	Percentage of the total number of physical-chemical tests of treated water performed that comply with the applicable standards.	=Compliant physical-chemical tests / Physical-chemical water quality tests performed * 100
Power consumption monitoring	Percentage of pumps monitored for power consumption	= Production and distribution pumps monitored / Production and distribution pumps * 100
Preventive maintenance of pumps	Percentage of pumps covered by preventive maintenance	=Production and distribution pumps preventive maintenance / Production and distribution pumps * 100
Renewable energy utilization	Percentage of renewable energy used	=((Photovoltaic energy produced + Hydro power produced + Wind energy produced + Biogas energy produced) / Electricity consumption) * 100
Sizing of pumps	Percentage of pumps running at the right sizing	=Production and distribution pumps sizing / Production and distribution pumps * 100
Speed of repair of failures	Percentage of network and water service connection failures repaired within target time	=(Network failures repaired in target time) + (Service connection failures repaired in target time) / (Network failures + Water service connection failures) * 100
Subscriber meter replacement ratio	Percentage of subscriber meters replaced during reporting period	=Subscriber meters replaced during reporting period / Subscriber meters * 100
Subscribers receiving continuous supply	Percentage of subscribers receiving 24 hours supply 7 days per week except for interruptions due to major maintenance or repair interventions	=Subscribers receiving continuous supply / Total water subscribers * 100
Training per employee	Number of training hours per employee during reporting period	=Total number of training hours in reporting period / Total number of employees
Unit operating cost water and wastewater services	Operating costs of water and wastewater services per m^3 authorized consumption	Total operation, maintenance and administration costs water and wastewater services / Authorized consumption
Water consumption per capita (residential subscribers)	Average daily water consumption per capita	quarterly = Residential billed volume*1000/90/Population supplied (water) annually = Residential billed volume*1000/365/Population supplied (water)
Water loss per subscriber	Total (apparent and real) losses, expressed in terms of annual volume of supplied water lost per subscriber per day	=(Water supplied -(Authorized consumption-Exported water)) / Total water subscribers) * 1000 / 365
Water losses per connection per day	Total real losses, expressed in terms of annual volume of supplied water lost per connection per day	=((Water supplied -(Authorized Consumption-Exported water)))*Real losses / Total connections * 1000 / 365
Water losses per mains length	Total (apparent and real) losses, expressed in terms of annual volume of distributed water lost per mains length.	=(Water distributed -Authorized consumption) / Length of water network) / 365
Water quality tests performed	Percentage of treated water tests required by applicable standards that are carried out.	=Water quality tests performed / Water quality tests required * 100
Water resources use per capita/day	Average daily volume of water supplied per capita	=(Water produced + Imported treated water - Exported treated water) / (Resident population) * 1000 / 365

Annex IV UPMU 1st NRW roundtable discussion report

Technical Report

Non-Revenue Water Round Table Discussion
Utility Performance Monitoring Unit (UPMU)
First Roundtable Session
June 21st 2021
Amman Rotana Hotel

Abbreviation

MWI	Ministry of Water & Irrigation
WAJ	Water Authority of Jordan
NRW	Non-Revenue Water
IWA	International Water Association
AMR	Automatic Meter Reading
UPMU	Utility Performance Monitoring Unit
GIZ	German International Cooperation
USAID	US Agency for International Development
FARA	Fixed Amount Reimbursement Agreement
AMI	Automatic Meter Infrastructure
ERP	Enterprise Resources Planning
DMA	District Meter Area
DZ	District Zone
PPPC	Public Private Sector Participation Contract
AW	Aqaba Water
KfW	Kreditanstalt fur wiederaufbau banking group
ILI	Infrastructure Leakage Index

First NRW Round Table Discussion 21.06.2021

H.E the minister addressed the workshop with a short speech.

Engineer Mohamed El-Najjar, The Minister of Water and Irrigation, stressed the need to do more work and intensify efforts and procedures to reduce water loss, particularly the need to adopt unified concepts for measuring water loss, and pointed out that Jordan is considered one of the poorest countries in the world in terms of water and is experiencing exceptional conditions this summer.

Eng. Al-Najjar highlighted the role of Jordanian citizens, partners, all civil society institutions, and the private sector in the systematic and thoughtful work to take more actions and measures to reduce Water wastage and unify the concepts of its calculation in Water Utilities according to a scientific basis.

These comments came during H.E. the minister's sponsorship and opening of the workshop that was held on Monday, 21st June 2021 at Amman Rotana Hotel under the title "Water Loss, Finding Appropriate Solutions and Unifying the Concepts of Calculating Loss in Water Facilities", which was organized by the Utilities Performance Monitoring Unit (UPMU) in coordination with the German Agency for International Cooperation (GIZ), in the presence of His Excellency the Secretary General of the Water Authority, Eng. Ahmed Alimat, The CEO of Miyahuna, the Director General of the Aqaba Water Company, and a number of specialists and experts in water loss management and customer services in companies and the Head of the NRW unit at the Water Authority.

Dr. Ahmad Al-Azzam, Director of the UPMU, pointed out the need to unify efforts to come up with useful recommendations and results to reduce water losses, which will lead to enhancing the quantities of water distributed to the citizens of Jordan. He also reflected on the need to improve performance and provide optimal services.

Mr. Nayef Hammad, representing the GIZ, noted that this and subsequent workshops are the result of the recommendations and results presented in the Utilities' performance evaluation report for 2019, and that the GIZ will not hesitate to continue supporting the water sector and qualifying staff (cadres).

Several working papers were presented during the workshop, followed by discussions between the participants and the dialogue organizers, engineers Waleed Sukkar and Zeyad Shawagfeh, through which the participants exchanged knowledge and experiences in the areas of water loss reduction (NRW). It is mentioned that, based on the follow-up and evaluation of the Water Utilities' performance and motivating them to make more efforts to develop their performance and in implementation of Recommendation No. (9) contained in Performance evaluation for 2019 and in cooperation with the (GIZ), the Utilities Performance Monitoring Unit (UPMU) will hold several workshops to discuss and standardize concepts, exchange experiences, transfer knowledge, and follow and identify optimal ways of reducing technical and administrative losses from water (NRW).

Several working papers were submitted to the workshop by Miyahuna, Aqaba, Yarmouk, the NRW and FARA project unit-WAJ, GIZ, and the consultant. All presentations will be attached as a part of the report.

Miyahuna working paper.

The presentation discussed two main subjects; projects that are financed by donors and the strategic plan for Miyahuna.

1. Projects financed by USAID
    a. FARA Phase I-Distribution Zones. Includes 86 DMAs & 157,034 Customers
    b. FARA Phase II-Distribution Zones. Includes 116 DMAs & 169,632Customers
    c. FARA 07; Bulk meter replacement 10,000, & the replacement of 44,000 customer meters.
    d. Phase II FARA 07; IT Infrastructure Upgrade
2. Strategic Plan
    a. DMA Management, Monitoring and Controlling / Data Acquisitions, Network Rehabilitation Programs
    b. Reduce Commercial Losses
    c. Capacity Building
    d. Private Sector Participation to reduce NRW
3. Main project components Amman, Zarqa and Madaba.
    a. Establish smart platform for Metering, Monitoring and Controlling in Miyahuna, integrating the AMI, SCADA, and ERP systems
    b. Improve Metering, Monitoring, and Operation for the Primary Water Supply System in Amman and Parts of Zarqa and Madaba
    c. Smart operation for secondary water supply system in Khilda Distribution Zone (DZ13) in Amman, improve metering, monitoring, and operation for tertiary water supply system in selected DMAs inside DZ 13, simulating the continuous supply in DZ 13 DMAs
    d. Replacement of Big Customers' meters
    e. Replacement of Bulk Meters

Aqaba Water Co. working paper

The presentation clarified the strategic plan to reduce NRW from 36% in 2019 to 24% by 2024 through the following measures

1. Establishing NRW Unit
2. Replacing Customer Meters
    a. Replace 36,000 mechanical meters with Ultrasonic flow meters over 4 phases
    b. Implement an AMI / AMR System
    c. Conduct NRW Calculations before and after the meter Replacement
    d. Analyze the Results and calculate the impact on NRW %

3. SCADA Upgrade Project
    a. NRW calculation over the Entire water system from Disi Well Field to the DMZ.
    b. Using HART protocol to ensure high accurate flow and Totalizers Readings
    c. Cover all AW company sites (Total 111 sites)
    d. Integrate with AMI, Noise loggers, Pressure Management system, & ERP system
    e. Energy Efficiency Management System with Power Monitoring system
4. Public Private Sector Participation Contract (PPPC)
    a. Cross Connection, Illegal Connection, and Leak Detection Survey
    b. Noise Loggers and Leak Detection Equipment's supply
    c. AW staff Training

Yarmouk working paper

The presentation detailed the strategic plan and projects to reduce NRW from 49.5% to 40%.

1. Strategic Plan;
    a. Establishing NRW Unit to cover all Yarmouk Water Company
    b. Reduce commercial losses
        • Improve customer water meter reading, install smart meters (3,500 WM's), and detect Illegal usage
    c. Reduce physical losses
        • FARA1 project to provide 2 full equipped mobile units (Financed by USAID), Survey Main and Distribution water network, and Establish DMAs
2. Projects to reduce NRW;
    a. Rehabilitation and replacement of Network, financed by KfW, AFD, EU (2021-2023)
    b. Rehabilitation and replacement of Network at Irbid and Ramtha, financed by WAJ (2022-2024)
    c. Rehabilitation and replacement of Network at Irbid and Ajloun, financed by USAID (2021-2023)
    d. HC replacement at Hwarah and Sareeh, financed by JICA (2021-2022)
    e. Rehabilitation and replacement of the Network in different areas of the entire company, financed by the Jordanian Government.

NRW and FARA Projects Unit working paper

The presentation explains the strategic plan for the NRW Unit and Project Monitoring and following-up on the implementation of NRW activities across the whole of Jordan.

1. Strategic plan
   The unit is currently working to establish NRW reduction strategy with all related parties

(Utilities, Directorates). This will cover all necessary components of NRW to ensure that the proposed strategy is feasible. Meanwhile, its aim is to shorten the time taken to identify, locate and repair leaking infrastructure to minimize water losses, and to be integrated in the day-to-day business processes.

2. NRW Reduction and FARA projects unit- Main projects;
   - NRW Phase II- Associate FARA 4 USAID. The project activities are divided into four main parts ($15,500,000):
     a. Restructuring, Rehabilitation, Residential Water Meters, and Pressure Management of Ain Al-Basha
     b. Mobile Leak Detection Workshops
     c. Shoubak Pump Station (Najel)
   - FARA NRW - Phase III: $ 152,000,000: September 1, 2020 to August 31, 2026
   - KFW with amount approximately 50-60 million Euros
   - IFC with approximate financing amount up to 60 $ million

GIZ working paper (Mafraq pilot project)

The main Goal of the presentation is NRW reduction through implementing a Sustainable Zone-NRW management approach in the YWC.

Main approach:

- NRW-Zone Identification (commercial-technical): Install metering points / bulk metering points, identify accurate zone boundaries with Improvement.
- Implementation of the YWC-GIZ-Framework contract: replacement of water network and damaged water meters
- Knowledge transfer and Sustainability of Zone-NRW management installed approach:

Activities and Achievements:

- MAFRAQ Pilot Project:
  - Registration of 3500 customers, Replacement of 1600 water meters, and Discovery of 600 illegal cases.
  - Billed Amount (M3) increased by 31%, (from 5.5 to 7.2 Mio M3)
  - Collected amounts (JOD) increased by 100%, (from 1.9 to 3.8 Mio JOD)
- Yarqa Pilot Project at Balqa WA: reduction of NRW from 60.3% to 34.7% by management of water meters

UPMU working paper

The presentation elaborates the UPMU Variables and Indicators related to-Non-Revenue Water.

- The main objective is standardizing the definition of water supplied as water distributed minus water exported, which is equal to water produced plus water imported.
- PI's related to NRW: there are 6 indicators which have a direct input on NRW and more than 10 indicators that have indirect inputs related to NRW
- The formula for calculating the NRW% is: water distributed minus water billed divided by water distributed

Consultant working paper, containing two presentations:

1. General approach towards NRW
   - The impact of negative and positive input components on NRW;
   - Increased NRW decreases the revenue, increases customer demand and budget for operation decreased. On the other side any decreased in NRW this will have positive impact on the revenue, the budget of operation and more investment on NRW reduction.
   - IWA Water Balance Calculation and the UPMU WB structure
2. Technical Approach towards NRW (Case Study by Japanese Consultant -Miyahuna/Amman)
   - Four pilot areas were selected (Jofeh, Suewileh, Jubieha, and Tareq)
   - NRW management through DMA
   - Reduction of Commercial losses, Detection of defective customer meters, Replacement, and Rotated meter's accuracy test
   - Reduction of Physical losses by Leak Detection Approach

Recommendation for second round table discussion

Subjects to be tackled

1. Percentage of NRW (Commercial & physical losses)
2. Minimum Night Flow
3. Pressure Management
4. ILI calculation
5. Utilities Contribution (Case Studies to be Provided)
6. The NRW strategies in the Utilities Business Plans (BP's)
7. Any other related issues

Annex V Memorandum of Understanding (MoU)

Memorandum of Understandig (MoU)

مذكرة تفـاهـم

Between:

بين:

Water Authority of Jordan (WAJ),
Secretary General,
Shmeisani, PO.Box: 5012, 11181Amman, Jordan

سلطة المياه الاردنية (WAJ)
الأمين العام ،
الشميساني ، ص.ب: 5012 ، 11181 عمان ، الأردن

And
Aqaba Water Company,
General Manager,
Aqaba, Jordan

و
شركه مياه العقبه(AWC)
المدير العام
العقبه, الاردن

And
Jordan Water Company Miyahuna
Chief Executive Officer,
Amman, Jordan

و
شركه مياهنا(Miyahuna)
الرئيس التنفيذي
عمان , الاردن

And
Yarmouk Water Company
General Manager,
Irbid, Jordan

و
شركه مياه اليرموك (YWC)
المدير العام
اربد , الاردن

The Partners hereinafter collectively referred to as "the Partners" on implementing a joint Human Resource Development Concept WHEREAS

ويشار الى أطراف المذكرة اعلاه فيما يلي باسم "الشركاء في تنفيذ مفهوم تنمية الموارد البشرية المشترك"

Water Authority of Jordan WAJ (Partner) is a governmental organization which provides all of its service recipients in the Hashemite Kingdom of Jordan with drinking water according to Jordanian quality standards at optimized cost, manage available water resources efficiently, protect them from pollution, distribute water fairly, search for new sources, apply legislations to prevent waste and misuse, provide sanitation services, re-use treated water effectively in accordance with approved specifications, and focus on earning the trust of its customers and its employees.

سلطة المياه الاردنية (WAJ) هي مؤسسة حكوميه توفر مياه الشرب لجميع المستفيدين من الخدمة في المملكة الأردنية الهاشمية وفقا لمعايير الجودة الأردنية وبالتكلفة الأفضل، وتعمل على إدارة الموارد المائية المتاحة بكفاءة و تعمل على حمايتها من التلوث ، و تقوم بتوزيع المياه بشكل عادل والبحث عن مصادر مائية جديدة. وكذلك تحرص على تطبيق التشريعات لمنع الهدر وسوء الاستخدام ، و تعمل على توفير خدمات الصرف الصحي وإعادة استخدام المياه المعالجة بشكل فعال بما يتوافق مع المواصفات المعتمدة، وسلطة المياه دائمة التركيز على كسب ثقة عملائها وموظفيها.

Aqaba Water Company (Partner) was established to increase the operational efficiency of the water and wastewater sectors in the Aqaba Special Economic Zone in particular and the Governorate of Aqaba in general, in order to cope with the increasing demand for water and sewerage services and to improve the services provided to the public, which reflects positively on the investment climate and provides the suitable environment for all investment sectors. Aqaba Water Company is a national limited liability company 85% owned by the Water Authority and 15% is owned by the Aqaba Development Corporation -Special Economic Zone Authority

شركة مياه العقبة (شريك) تم انشائها لزيادة الكفاءة التشغيلية لقطاعي المياه والمياه العادمة في منطقة العقبة الاقتصادية الخاصة على وجه الخصوص ومحافظة العقبة بشكل عام ، من أجل مواجهة الطلب المتزايد على خدمات المياه والصرف الصحي وإلى تحسين الخدمات المقدمة للجمهور ، والتي تنعكس بشكل إيجابي على مناخ الاستثمار وتوفر البيئة المناسبة لجميع قطاعات الاستثمار . شركة مياه العقبة هي شركة وطنية ذات مسؤولية محدودة مملوكة لسلطه المياه بنسبه 85% و مملوكه بنسبه 15% لشركه تطوير العقبه - سلطه منطقه العقبه الاقتصاديه الخاصه الخاصه.

Jordan Water Company - Miyahuna (Partner) is a limited liability company owned by the Water Authority, responsible for managing, operating and providing water and sanitation services in the governorates of: Amman, Zarqa, Madaba, Mahes and Fuheis from Balqa governorate

شركة مياه الاردن - مياهنا (الشريك) تعتبر شركه ذات مسؤليه محدوده مملوكه بالكامل لسلطه المياه ، مسؤله عن اداره وتشغيل و تقديم خدمات المياه و الصرف الصحي في محافظات: العاصمه عمان ، الزرقاء ، مادبا و لواء ماحص و الفحيص من محافظه البلقاء .

Yarmouk Water Company (Partner) is a limited liability company wholly owned by the Jordan Water Authority. It started in 2011 working on the operation and maintenance of drinking water production and distribution systems, which depend mainly on groundwater, in addition to a set of different springs and water sources in addition to the collection and purification of wastewater in Northern Governorates of Jordan (Irbid, Jerash, Ajloun and Mafraq).

شركة مياه اليرموك (شريك) هي شركة ذات مسؤولية محدودة مملوكة بالكامل من قبل سلطة المياه الأردنية .بدأت في عام 2011 العمل على تشغيل وصيانة انظمة إنتاج وتوزيع مياه الشرب ، والتي تعتمد بشكل أساسي على المياه الجوفية ، بالإضافة إلى مجموعة من الينابيع ومصادر المياه المختلفة بالإضافة إلى جمع وتنقية مياه الصرف الصحي في المحافظات الشمالية في الأردن (اربد وجرش وعجلون والمفرق)

Utilities Performance Monitoring Unit (UPMU) – is a unit established in Minister of water and Irrigation/ WAJ to act as an implementation support and coordination entity where needed among the above mentioned companies.

وحدة مراقبة أداء الشركات (UPMU) هي وحدة انشئت في وزارة المياه و الري / سلطة المياه لتقوم بدور التنسيق والدعم لشركات المياه اعلاه اينما استدعت الحاجه لذلك.

NOW, THEREFORE, the Partners have come to the following understanding:

الان و بناء على ذلك ، فقد توصل الشركاء إلى التفاهمات التالية :

1. Purpose

1. الغرض:

Improve the cooperation and coordination among the partners aiming at improving the overall performance and the integration of agreed modes of management and operation through:

- Implementing a joint Human Resource Development (HRD) Concept
- Exchange of knowledge, experiences as well as strengthening capacities on individual and institutional level

تحسين التعاون والتنسيق فيما بين الشركاء بهدف تحسين الاداء الكلي للشركاء وتطبيق طرق الادارة والتشغيل المتفق عليها من خلال:

- تنفيذ مفهوم تنمية الموارد البشرية المشترك.
- تبادل المعرفه والخبرات وتعزيز القدرات على المستوى الفردي والمؤسسي .

2. Areas of Collaboration

2. مجالات التعاون:

Partners intend to cooperate according to the needs of work and within the frameworks between all parties in the following areas including but not limited to:

- On-boarding of new employees
- Job shadowing
- Mentoring
- Knowledge management
- Alignment of a competency framework
- Identification of common trainings
- HRD activities to support gender diversity

ينوي الشركاء التعاون في المجالات التالية وحسب حاجه العمل و ضمن اطر يتم وضعها بين جميع الاطراف بما في ذلك (على سبيل المثال لا الحصر)

- تهيئة الموظفين الجدد
- الملازمة الوظيفية.
- التوجيه الوظيفي.
- إدارة المعرفة.
- تأطير الكفايات.
- تحديد التدريبات المشتركة.
- أنشطة تنمية الموارد البشرية لدعم التنوع بين الجنسين.

UPMU in coordination with the partners will organize exchange of experiences according to the needs of work and between all parties in the following areas including but not limited to:

- Management of water losses.
- IT systems and tools for all purposes.
- Energy efficiency and renewable energy.
- Financial and accounting management.

ستقوم وحدة مراقبة أداء الشركات بالتنسيق مع الشركاء بتنظيم تبادل الخبرات في المجالات التالية وحسب حاجه العمل وبين الشركاء بما في ذلك (على سبيل المثال لا الحصر):

- إدارة فاقد المياه.
- الأدوات والأنظمه التكنولوجيه لجميع الاغراض.
- ترشيد الطاقه والطاقه المتجدده.
- الإدارة المالية والمحاسبيه.

3. Joint Activities

3. الأنشطة المشتركة:

To achieve the objectives of the cooperation, the Partners intend to implement the following joint activities:

لتحقيق أهداف التعاون ، يعتزم الشركاء تنفيذ الأنشطة المشتركة التالية:

a) Cooperation in the area of onboarding of new employees
The aim of an onboarding process is to give new employees across a company the same coherent information and create a sense of belonging to the company.

أ) التعاون في مجال تهيئة الموظفين الجدد:
الهدف من العملية الداخلية هو منح الموظفين الجدد عبر الشركة نفس المعلومات وخلق شعور بالانتماء إلى الشركة.

b) Knowledge Management
The intended outcome of this activity is an active interregional exchange of staff of different levels in the sector, to identify synergies within water related topics as well as staff motivation.

ب) إدارة المعرفة:
والنتيجة المقصودة لهذا النشاط هي تبادل المعرفه بين الموظفين من مختلف المستويات في هذا القطاع ، لتحديد أوجه التعاون في المواضيع المتعلقة بالمياه بالإضافة إلى تحفيز الموظفين.

c) Job shadowing
Job shadowing could be conducted in the same water company or between water companies, e.g. someone from YWC could shadow someone from Miyahuna in the area of training in order to learn from them.

ج) الملازمة:
يمكن إجراء الملازمة في الوظائف في شركات المياه نفسها او بين عامه الشركاء على سبيل المثال يمكن لشخص من شركه اليرموك أن يلازم شخصا من شركه مياهنا في مجال التدريب من أجل التعلم منه.

d) **Mentoring**
To learn from WAJ experience in setting mentoring matrix.

د) التوجيه:
الاستفادة من تجربة سلطة المياه في اعداد مصفوفة التوجيه.

e) Alignment of a competency matrix for common framework based on what already exists.

هـ) تبادل مصفوفة الكفايات بين الشركاء للتوصل إلى إطار مشترك يستند إلى ما هو موجود بالفعل.

f) Participation and presentation of results and impacts at international conferences: The intended outcome of this activity is an active interregional exchange of knowledge and staff motivation.

و) المشاركة وعرض النتائج والتأثيرات في المؤتمرات الدولية:
والنتيجة المقصودة لهذا النشاط هي التبادل النشط للمعرفة وتحفيز الموظفين.

4. Modalities of the Collaboration

- WAJ will act as a facilitator for the implementation of the joint activities.
- Utilities Performance Monitoring Unit (UPMU) will coordinate activities as per its mandate.;
- UPMU will organize an annual event to review the year's activity and planning for the next year
- All partners jointly will support the implementation of the activities by: leading, participating, coordinating or provision of logistics

4.1 Partners will appoint a coordinator who will be responsible for ensuring the smooth preparation of the joint activities and keeping alive the flow of communication between the Partners:

- For **WAJ** (main coordinator)
Director of Training and Capacity Building Directorate

- For **Aqaba**
Director of Human Resources and Training

- For **Miyahuna LLC Water Company**:
Head of the Learning and Development Division - under the supervision of the Director of the Human Resources Department

- For **Yarmouk**:
Human Resources Manager

4.2. The Partners will share information and meet regularly in order to consult on the progress of the Cooperation:
Once, every quarter of a year face to face or by video conference

4. نطاق التعاون :

- ستقوم سلطة المياه بدور الميسر لعمليات تطبيق الأنشطه المشركه.
- ستقوم وحدة مراقبة أداء الشركات بتنسيق النشاطات ذات العلاقه بمهامها .
- ستقوم وحدة مراقبة أداء الشركات بتنظيم إجتماع سنوي لمراجعه أعمال السنه وللتخطيط للسنه التاليه.
- الشركاء مجتمعين سيدعمون تطبيق النشاطات المذكوره من خلال دور القياده
- أو المشاركه أو التنسيق أو توفير الدعم اللوجستي.
-

4.1 **سيقوم الشركاء بتعيين منسق** يكون مسؤولا" عن ضمان الإعداد السلس للأنشطة المشتركة والحفاظ على تدفق الاتصالات بين الشركاء:

- **لسلطه المياه (منسقا اساسيا)**
مدير مديرية التدريب وبناء القدرات.

- **لشركه مياه العقبه :**
مدير الموارد البشريه و التدريب.

- **لمياهنا :**
رئيس شعبه التعلم و التطوير - باشراف مدير اداره الموارد البشريه.

- **لشركه مياه اليرموك :**
مدير الموارد البشرية.

2.4 **سيتبادل الشركاء المعلومات ويلتقون بانتظام من أجل التشاور حول تقديم التعاون :**
مرة واحدة ، كل ثلاثة اشهر من خلال اجتماعات مباشره أو عن طريق مؤتمرات الفيديو.

5. **Term**
This MoU becomes operative on the date of signature and runs for three years.

6. **Non-binding Nature**

Nothing in this MoU shall be understood or construed as a binding right or obligation of the Partners or as obligating the undersigning Partners hereto to finally conclude any agreement. In particular, this MoU in no way restricts either Partner from pursuing similar activities on its own or from participating in similar activities with other public or private agencies, organizations, and individuals and shall not provide exclusivity between the Partners in the scope of any cooperation, does not endorse a specific entity, does not create any rights in any person, and does not create any obligations for any third party.

This MoU is drawn up in four originals.

5. مدة سريان مذكرة التفاهم:
تعتبر مذكرة التفاهم هذه سارية المفعول منذ تاريخ توقيع الشركاء عليها وتستمر لمدة ثلاث سنوات.

6. اطار العمل:

لا يوجد في مذكرة التفاهم هذه ما يُفهم أو يُفسر على أنه حق أو التزام ملزم من جانب الشركاء أو يُلزم الشركاء الموقعين عليها أدناه بإبرام أي اتفاق في النهاية. و على وجه الخصوص ، لا تقيد مذكرة التفاهم هذه بأي حال من الأحوال الشريك من متابعة أنشطة مماثلة من تلقاء نفسه أو من المشاركة في أنشطة مماثلة مع الوكالات والمؤسسات والأفراد العامة أو الخاصة الأخرى، وكذلك لا توفر أي حصرية بين الشركاء في نطاق أي تعاون ، ولا تويد كيانًا محددًا ، ولا تنشئ أي حقوق في أي شخص ، ولا تنشئ أي التزامات تجاه أي طرف ثالث.

وضعت مذكرة التفاهم هذه في أربع نسخ أصلية.

الموقعين:

المهندس أحمد علي عليمات	**المهندس خالد العبيدين**
أمين عام سلطة المياه وزارة المياه والري	المدير العام شركة مياه العقبة
المهندس محمد الكوران	**المهندس منتصر المومني**
الرئيس التنفيذي شركة مياه الاردن – مياهنا	المدير العام شركة مياه اليرموك

عمان، الأردن تاريخ 16 /12/ 2020

Annex VI UPMU Operational Plan 2021-2022

UPMU Workplan June 2021 - May 2022

	Task	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
1	Quarterly and Annual Performance Reporting						
1.1	Send request for data to utilities					Director; IT-Expert	light blue= quarterly; dark blue= annual reporting
1.2	Receive data, check file and import					IT-Expert	
1.3	Analyze data					IT ", Economic ", Technical Expert	
1.4	Discuss analysis and formulate feedback					all	
1.5	Send agreed upon feedback to utilities					Director	
2	Quarterly briefings for Minister	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
2.1	Summarize performance, progress, findings					Director	
3	Annual Performance Report and Conference	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
3.1	Kick-off session					all	
3.2	1st interim meeting				1 day	all	
3.3	2nd interim meeting		4.4, 4.5		2-3 days	all	
3.4	Final meeting				0,5 days	all	
3.5	Report finalization					Communication ",Economic ", Technical Expert	
3.6	Report editing and printing						
3.7	Conference (incl. invitation and preparation)				1 day	Director, Communication Expert	
4	Agreement on Performance Targets	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
4.1	Request for audited accounts, subsidies and KPI					Director; IT-Expert	
4.2	Receive and check data					IT-Expert	
4.3	Analyze data, subsidies and proposed KPI					Economic ", Technical Expert	
4.4	Internal meeting			3.3		all	Company 1: Internal meeting; Meeting with company in Amman; Company 2; Internal meeting; Meeting with company in Amman; Company 3; Internal meeting; Meeting with company in Amman;
4.5	Meetings with utilities on KPI etc.					Economic ", Technical Expert	
4.6	Request for additional data					Director; Economic ", Technical Expert	
4.7	Receive and check data					Economic ", Technical Expert	
4.8	Discuss analysis, determine KPI and feedback			5.1		all	Company 1: Internal discussion; Give feedback; Company 2: Internal discussion; Give feedback; Company 3: Internal discussion; Give feedback;
4.9	Send feedback incl. Business Plan requirements					Director	
4.10	Inform Minister					Director	
5	Business Plan (BP) evaluation and approval	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
5.1	Receive updated BPs		4.9			IT-Expert	
5.2	Analyze BP incl. KPI					Economic ", Technical Expert	
5.3	Internal meeting on analysis per utility					all	Company 1: Internal meeting; Meeting with company in Amman; Company 2; Internal meeting; Meeting with company in Amman; Company 3; Internal meeting;
5.4	Meeting with each utility on BP with reference to KPIs					Economic ", Technical Expert	
5.5	Internal meeting on analysis per utility			7.1		all	Company 1: Internal meeting; Determinations; Company 2: Internal meeting; Determinations; Company 3: Internal meeting; Determinations
5.6	Request changes, Approval of updated BPs			6.1		Director, Economic ", Technical Expert	
5.7	Inform Minister incl. implications for tariff/subsidies					Director	
6	Inspections	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
6.1	Assign responsibility for inspections for the year		5.6			Director	
6.2	Provide 7 day notice					Director	grey= Yarmouk, Yellow= Aqaba, brown= Milyahuna
6.3	Carry out inspection incl. utility de-briefing					Economic ", Technical Expert	
6.4	Internal de-briefing					all	
6.5	Write inspection report, incl. required actions					Economic ", Technical Expert, Communication Expert	
6.6	Share inspection report with utility					Director, Economic ", Technical Expert	
6.7	Follow-up on actions					Director	
7	Exchange on best practices	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
7.1	Identify 4 priority topics for utility exchange		5.5 meetings			all	
7.3	Prepare agenda and send invitations (4x)					Responsible person(s)	
7.4	Conduct 1-day exchange					Responsible person(s) (min. 2)	
7.5	Document key findings for Annual Report					One of the two responsible persons	
8	Communication	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
8.1	Formulate annual communication plan for upcoming year					Communication Expert	
8.2	Discuss and decide on annual communication plan for upcoming year	9.2			1 day	all	
9	Recap and Preparation Annual Work Plan	Together with..	Starts after..	Input for...	Duration	Responsible	Remarks
9.1	Prepare agenda and assign inputs to be prepared					Communication Expert	
9.2	1-day meeting	8.1			1 day	all	

Utilities Performance Monitoring Unit (UPMU) Team

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