Ministry of Water & Irrigation
وزارة المياه والري

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

Jordan Water Utilities Monitoring Report 2019 Q1, Q2, Q3

April 2020

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1. Foreword

This performance monitoring report was prepared by the new "Utilities Performance Monitoring Unit" (UPMU), which was established under the Ministry of Water and Irrigation and is linked to H.E. the Minister. Unless otherwise stated, the report is based on data and information provided by the water utilities, Miyahuna-Amman, Aqaba and Yarmouk.

Monitoring is extremely important for building strong utilities since it helps to determine how efficiently operations and activities are being conducted, and how productively management and employees are working. Monitoring and analysis will enable the utilities to evaluate results against a set of Key Performance Indicators (KPIs). The water sector high level management can then use these results to steer the utilities towards improving their overall performance, reaching their goals, and ensuring the continued provision of high-quality water and wastewater services.

The report shows the performance of the Miyahuna-Amman, Aqaba and Yarmouk water utilities for the first three quarters of 2019, and is comprised of four sections; "Operations, Customer Service, Financial and Human Resources." Performance is assessed against the 8 KPIs listed below and relevant PIs and strategy indicators, and the results are used to measure how well the utilities are adhering to the Strategic Goals of the Ministry of Water and Irrigation to improve and sustain high quality water and wastewater services:

1. Microbiological water quality compliance.
2. Continuity of supply.
3. New connection efficiency.
4. Water service complaints per subscriber.
5. Water consumption per capita (residential subscribers).
6. Non-Revenue Water.
7. Employees per 1000 subscribers.
8. Training per employee.

The UPMU's first task when it took over the monitoring role from its predecessor, the Program Management Unit (PMU), was to review and update the KPIs, PIs and Strategic level PIs. Collection procedures then needed to be updated to provide the necessary data in the new formats to satisfy the updates. Unfortunately, it was not possible to fully validate the data collected for this report due to the current COVID 19 crisis, and we cannot guarantee the completeness, accuracy or reliability of the data and information which it contains.

UPMU conducted review and assessment in accordance with the Key Performance Indicators for Water and Wastewater services, Customer Services, financial and Human Resources Indicators for 2019, which were developed by the UPMU in cooperation with the three water utilities and submitted to the H. E. the Minister of Water and Irrigation on 02/03/2020. Our responsibilities under those standards are to establish facts based on these data, and to review them through the UPMU audit process. We believe that our review and evaluation establish a reasonable basis for the findings contained herein.

2. Description of UPMU

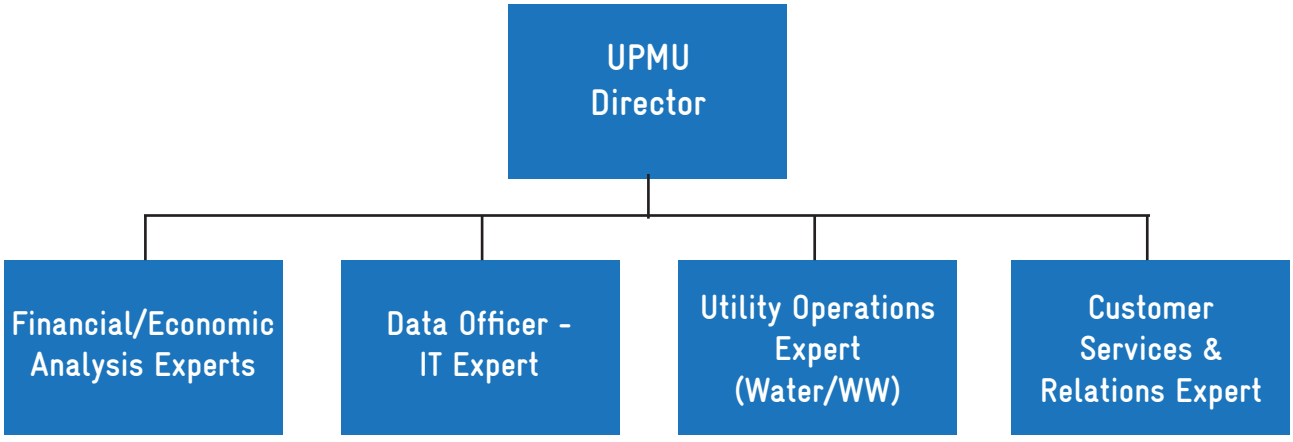
Current status of operationalization, envisaged mandate

The Water Authority of Jordan (WAJ) has, in accordance with Article (10) of the 1988 WAJ Law No. 18 and its amendments, and as part of its mandate to institutionalize the water sector according to the principles of transparency and good governance and improve the legal and contractual relationship between the Ministry of Water and Irrigation (MWI), the WAJ and the utilities which it fully or partially owns, established a "Utilities Performance Monitoring Unit" (UPMU), and amended its organization structure to link the unit with the Minister of Water and Irrigation. The tasks and responsibilities of the UPMU are as follows:

1. Monitor the performance of the utilities and issue performance reports
2. Set and develop KPI baselines and mechanisms for their calculation, compare and evaluate the utilities' performances on their basis.
3. Develop and review the necessary documentation to establish the utilities and develop their tasks/duties (Development and delegation agreements, Establishment Contracts and Internal Bylaws).
4. Issue the basis and general evidence which describe the frameworks for developing internal working guidelines and procedures, such as staff and financial guidelines.
5. Review and accredit (approve) company business plans and set targets in cooperation with the utilities and in accordance with the water policies.

The decision also includes establishing a steering committee to supervise the UPMU, chaired by H.E the Minister of Water and Irrigation, with the following members:

a. H.E. Secretary General of WAJ
b. H.E. Secretary General of MWI
c. H.E. Secretary General of JVA
d. Director of Legal Affairs in MWI
e. Assistant Secretary General for Financial Affairs – WAJ
f. Donors Representative
g. King Abdullah II Centre of Excellence Representative



UPMU Structure - March 2020

3. Explanation of the rationale/objectives of the quarterly report

This short report, which covers the first three quarters of the 2019 fiscal year, introduces the UPMU's new monitoring and reporting framework and establishes baseline data on the performance of Jordanian utilities. The report evaluates the utilities' operations, showing where they are doing well and where they face challenges in performing their mandate in the different fields.

Since this is the first time that the new monitoring approach has collected comprehensive data, the report also represents a learning process for all stakeholders involved. Experience from regulators in other countries of introducing new monitoring procedures which require new data and the calculation of a new set of indicators suggests that the utilities and the UPMU will need time and regular feedback to establish routines and a common understanding of the data and its interpretation. This report is based on numerous feedback loops, but data verification was challenged and limited by the ongoing COVID 19 crisis. It is expected that future reports will benefit from increased data availability and accuracy.

The report also instructs experts from the UPMU to regularly inspect and, where necessary, investigate the utilities. This function will be carried out immediately after restrictions due to COVID 19 are lifted and staff can return to normal working conditions and will become a regular and routine exercise under the UPMU's regulatory mandate. Inspections and investigations will serve different purposes. Firstly, inspections should ensure that correct data are delivered, which will require UPMU staff to perform spot checks. Secondly, a combination of inspections and strong working relationship with the utilities' employees will help to identify examples of Best Practice which might be worth sharing between the different water utilities. The UPMU will then act as a moderator, helping utilities to share their experiences of delivering certain tasks. However, these investigations will never involve the UPMU telling utilities how to solve technical problems. The UPMU will only set output targets; responsibility for achieving Key Performance Indicator Targets will remain with the utilities.

The first report will also be a tool to help the UPMU and the utilities to improve the delivery time and quality. Miyahuna-Madaba and Zarkaa, who are excluded from this report, will be included once data are complete and merged with Miyahuna-Amman as one entity.

4. Short description of the monitoring tool, its key functionalities and the process of its development

In order to meet the UPMU's tasks and goals in the most efficient and effective manner, UPMU and GIZ project staff implemented methodologies to identify key phases that could be used to update the variables and indicators (Key Performance Indicators, Lower Level Performance Indicators, and Strategy Indicators).

An Excel tool was produced which can import and consolidate data from all the utilities in one file. This enables the UPMU to automatically calculate all indicators, compare performances, and monitor performance trends. It also allows the reporting utilities to internally assess their performance against the defined indicators. This improves transparency and ensures that the utilities are not surprised by the results and conclusions that the UPMU reports.

5. Performance Indicators[1]

The UPMU has defined the 10 most relevant Key Performance Indicators (KPI) for assessing and comparing the utilities' overall performance. 8 of these KPIs are monitored and reported in the Quarterly and Annual Performance Reports, while 2 are only monitored annually and are reported in the Annual Performance Report.

The UPMU has also tentatively defined 27 Lower Level Performance Indicators, of which 13 are calculated on both a quarterly and annual basis, and 14 are only calculated annually. Both their number and their formulas might still change once the first reporting cycle with annual data is completed. The UPMU will use these indicators for a more in-depth analysis of the utilities' operational, customer service and financial performance. Only selected indicators will be included in the Quarterly and Annual Performance Reports.

In addition to the KPIs and the Lower Level Indicators, most of which are common international indicators for the water sector, the UPMU has also developed a set of 11 indicators to monitor progress in the implementation of the National Water Strategy 2016 – 2025 and related policies. While the National Water Strategy also addresses water issues beyond the performance of water utilities, and therefore requires other means of monitoring and reporting, the UPMU strives to assist the government in monitoring those strategic objectives which are tied to the performance and sustainability of water service provision, including e.g. the areas of energy efficiency and the use of renewable energy, as well as increased metering and other measures aiming at curbing water losses.

Since most of the Strategy Indicators require the utilities to submit data they have not previously reported, the UPMU will engage with them to ensure that relevant data is being collected, reported, and adequately understood. The UPMU will continue to evaluate the indicators in future reporting cycles and consider adjustments where necessary. It is expected that the first Annual Performance Report will include a higher number of Strategy Indicators than this initial report, which is based on quarterly data.

[1] See Annex I

6. Performance of water utilities during Quarters I, II and III 2019

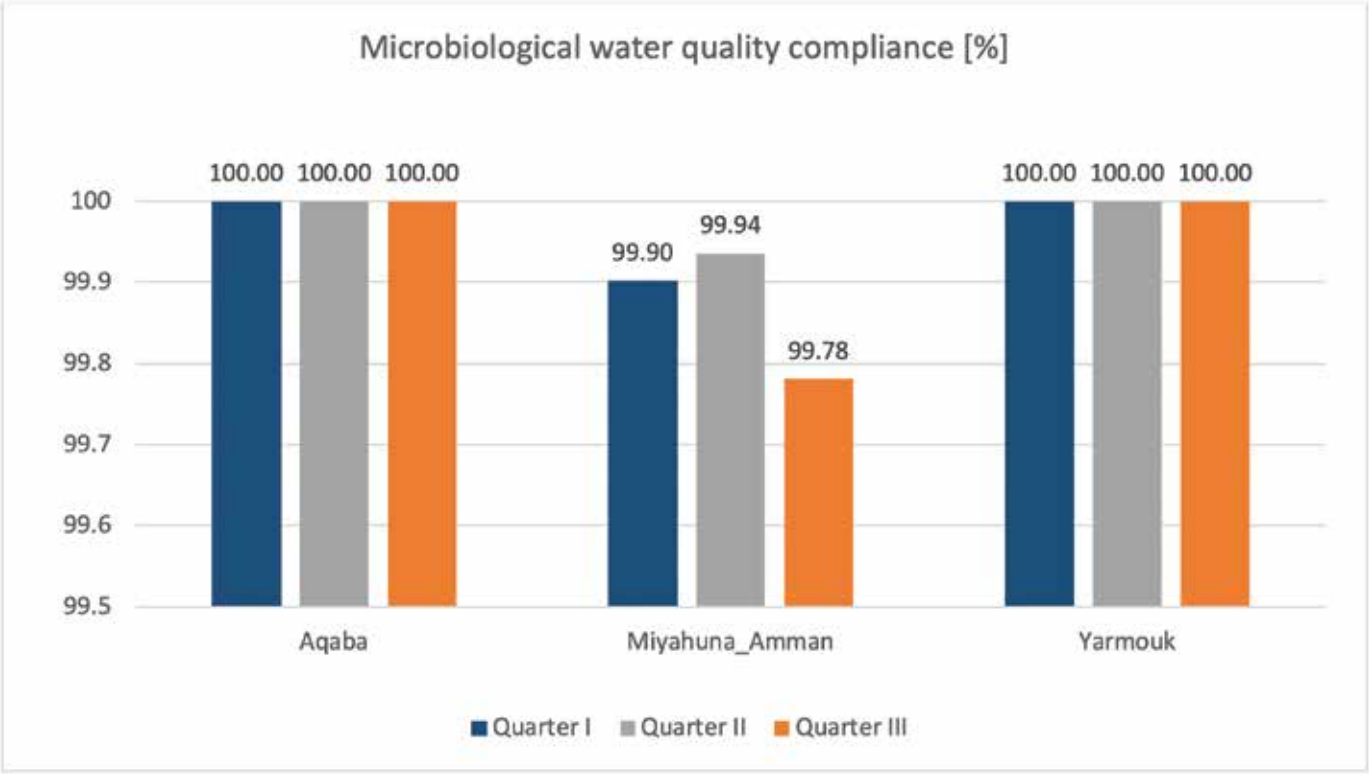
6.1 Comparison of the size of utilities, Quarter III 2019

	Total water subscribers	Total sewer subscribers	Total number of employees	Water distributed [m³]	Authorized consumption [m³]	Total billing for water [JOD]
Aqaba[2]	43,226	37,247	334	7,832,581	4,752,247	4,676,796.9
Miyahuna Amman	664,313	538,797	1,525	67,446,290	43,200,369	26,820,125.6
Yarmouk	351,009	146,361	1,521	27,060,478	14,312,391	13,971,296.0

Table 1

6.2 Service quality

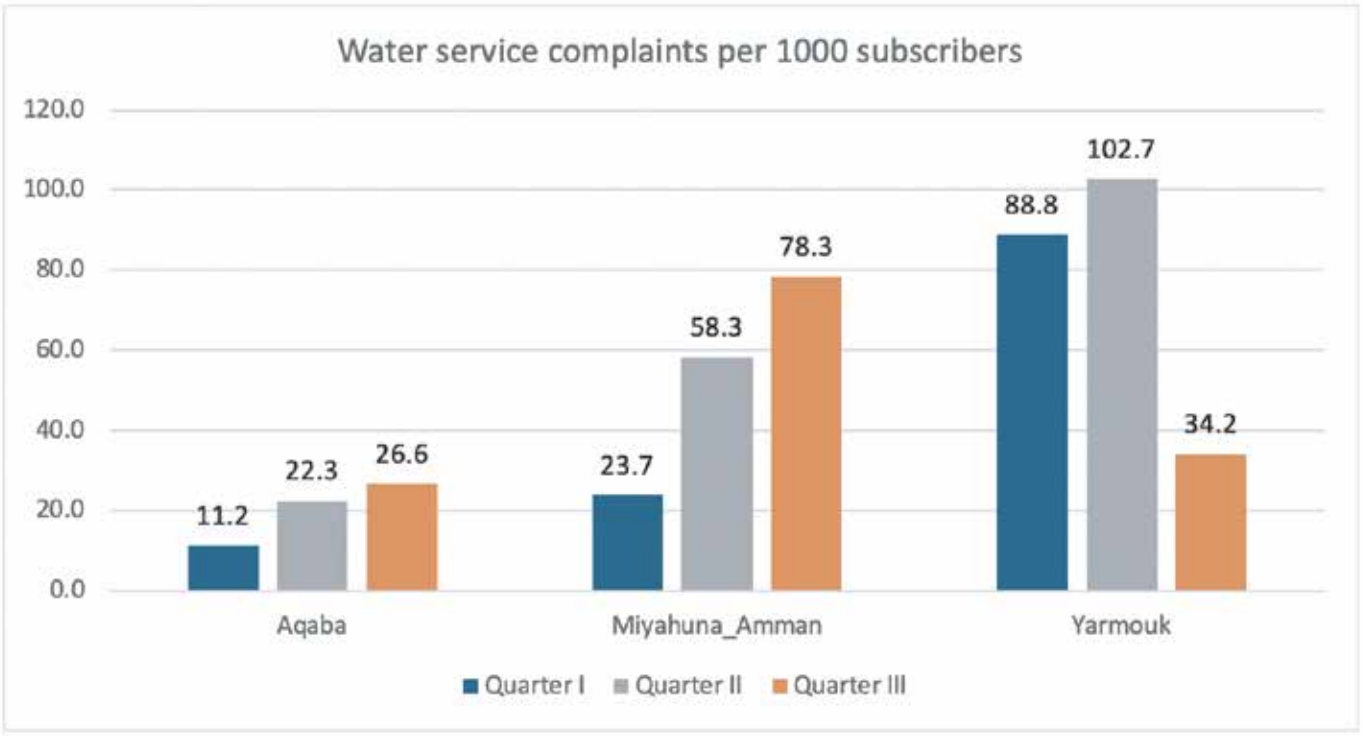
This first group of indicators looks at aspects that describe the quality of service experienced by the customers of individual utilities. The indicators address the water quality, service reliability, complaints and responsiveness of the service providers.



The microbiological water quality compliance of the three utilities is rated as excellent with minor deviation in compliance cases in Miyahuna-Amman. Assessments of the procedures for monitoring and responding to cases of non-compliance will form part of the inspections protocol that the UPMU is yet to develop and implement.

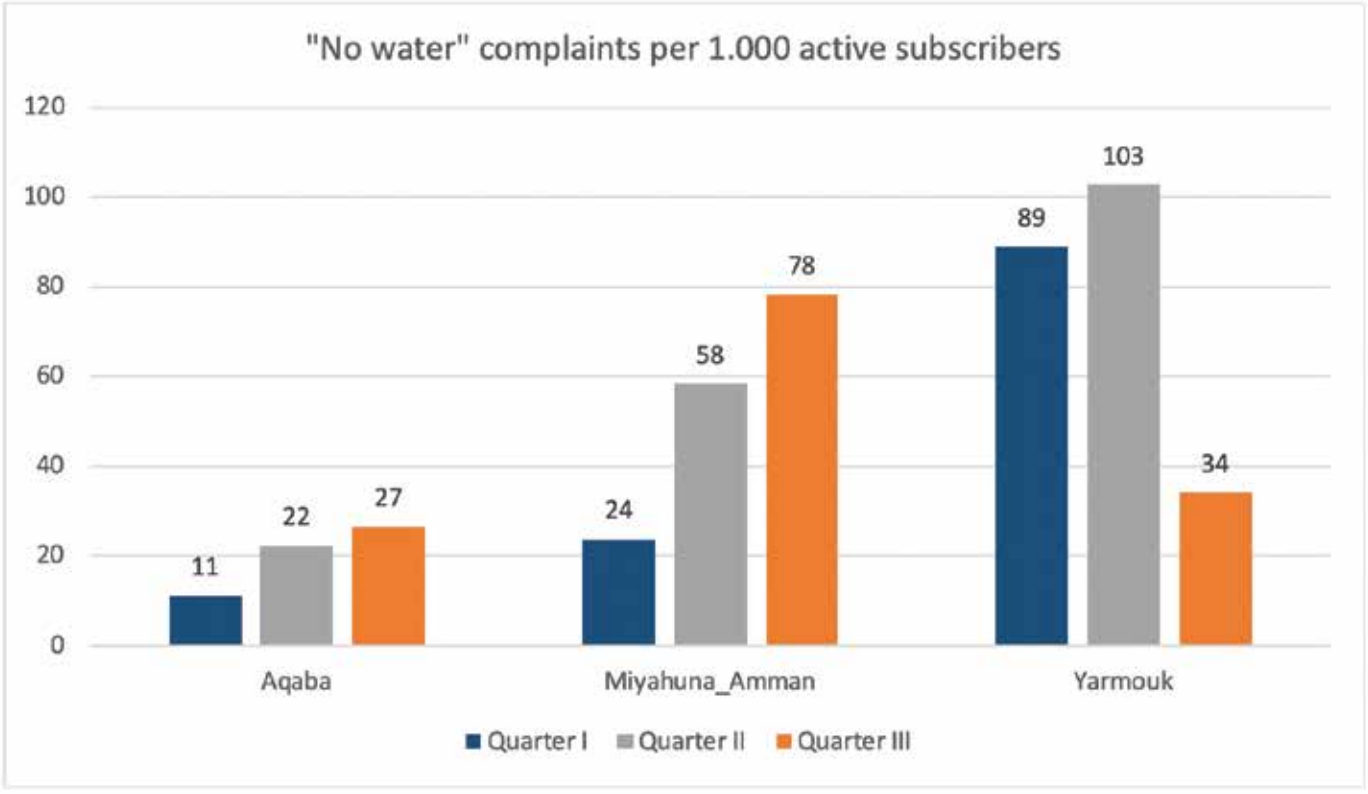
[2]The authorized consumption data for Aqaba was obtained through a phone conversation and not included in the data sent electronically.

When designing the performance reporting protocols for the UPMU, it was initially decided to continue with some of the indicators that were already being used. This included an indicator of the total number of water service complaints per 1,000 subscribers, as shown in the following chart.

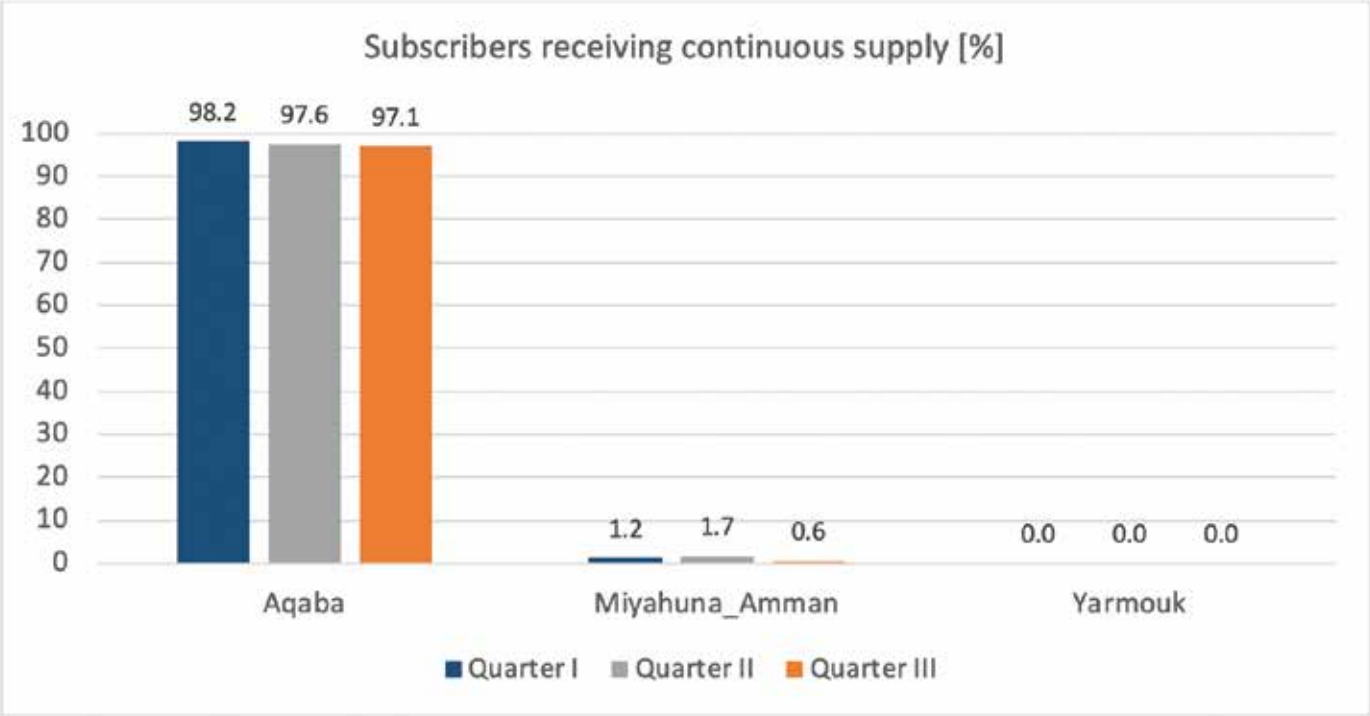


However, the UPMU could not use this indicator as a basis for developing adequate regulatory interventions since it does not show whether the complaints were related to water quality or provision of water, and gives no indication as to what might have caused the significant fluctuations in complaints between the quarters.

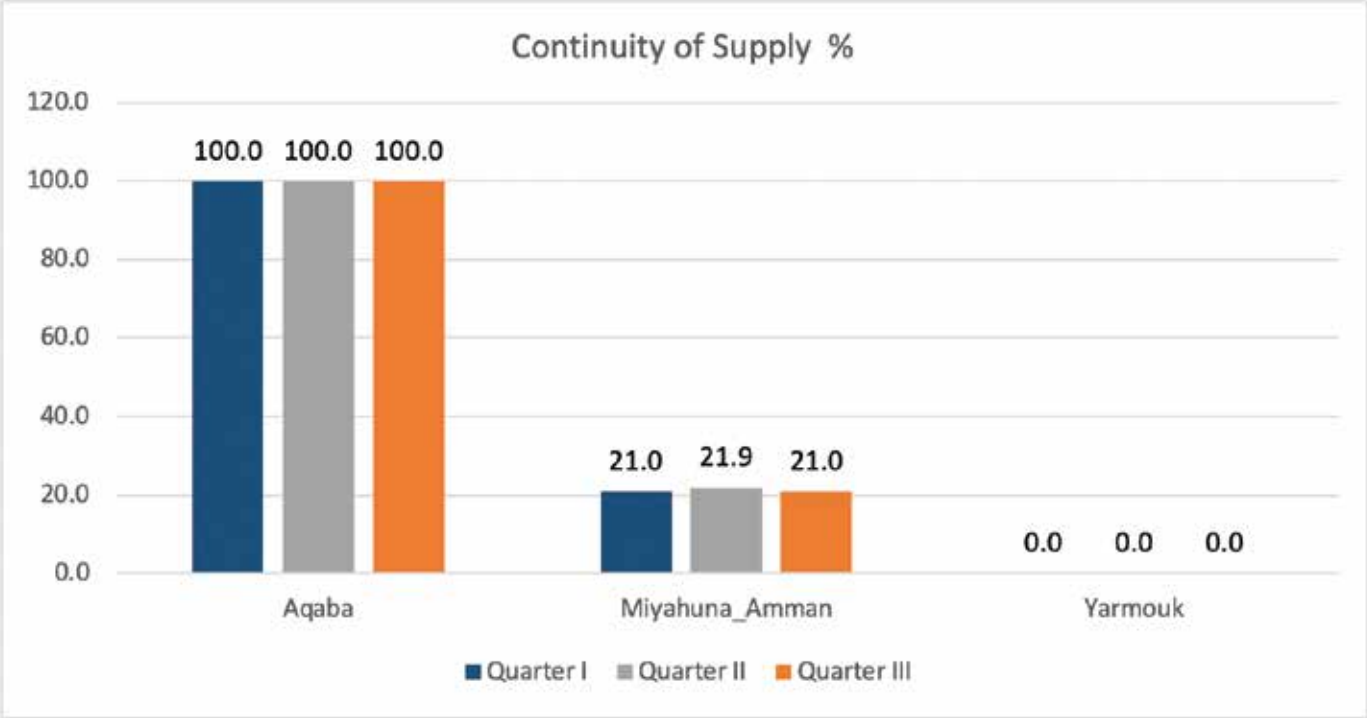
Additional data analysis revealed that in Miyahuna-Amman, for example, approximately 99% of complaints in Quarter I related to lack of water, while only 1 % were related to water quality. Since this indicates that water quality is not a major concern, the UPMU has changed this KPI to only reflect “no water” complaints.



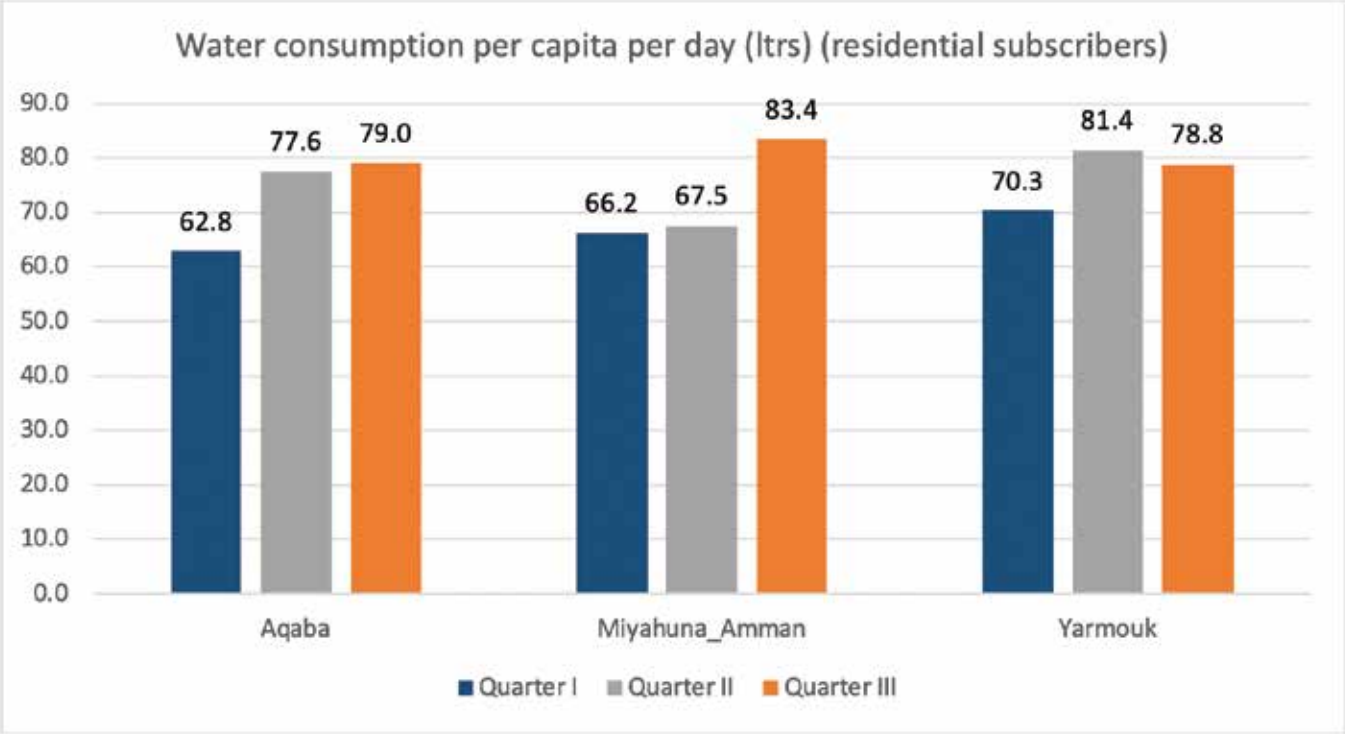
Previous PMU reports showed the percentage of subscribers who received a continuous supply, but this new KPI indicator of "no water" complaints per 1,000 subscribers better reflects the concerns of the three utilities' customers, namely lack of water, with seasonal differences, and the reliability and continuity of supply.



The indicator for the percentage of subscribers receiving a continuous supply is of limited regulatory use. 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 UPMU will therefore report on the percentage of time that subscribers are receiving water as a better means of monitoring the status quo and observing improvements and shortfalls in supply.



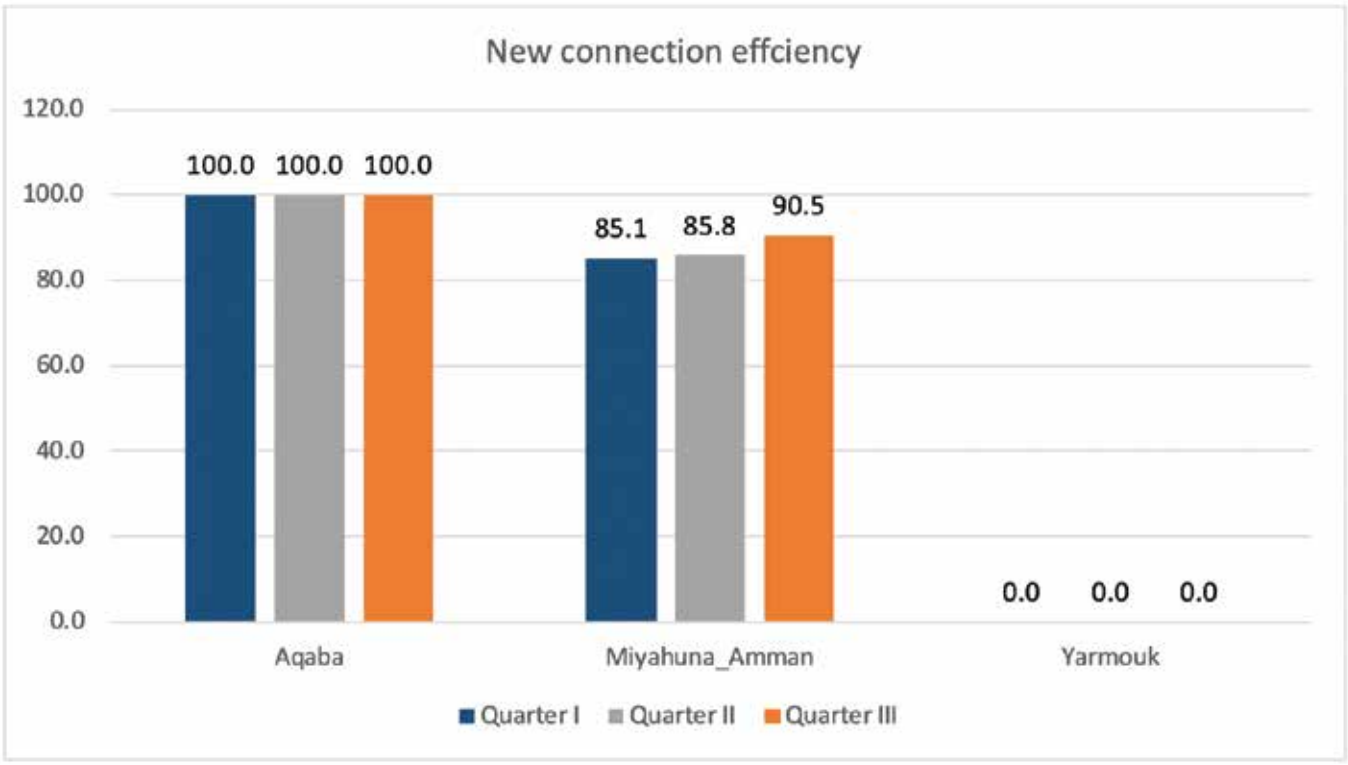
The continuity of supply KPI suggests that the utilities are reporting on their water supply schedule, but this is not always a true reflection of the situation on the ground, as shown by the increase in "no water" complaints for all utilities over the summer period. The UPMU and the utilities will discuss ways of more accurately reporting the actual average hours per week that customers receive water from the network.



The water consumption per capita per day indicator shows that average daily consumption ranged from 63 litres in Aqaba during Quarter I to 83 litres in Miyahuna-Amman during Quarter III. Consumption was lowest for all utilities during Quarter I, and highest for all (except Yarmouk) during Quarter III. Based on the data reported, seasonal fluctuations of water demand are significant. Aqaba and Miyahuna-Amman experienced over 20% higher consumption in Quarter III than Quarter I.[3]

Continuity of supply, or in this case the supply schedule, does not appear to have significant impact on average per capita water consumption. Interestingly, however, the largest numbers of "no water" complaints occur during the period of highest average water consumption. This could be an indication of inequitable water distribution during summer, i.e. excessively high consumption by some subscribers, leaving others with insufficient supply of water.

[3]The data in this chart for Aqaba will require further assessment in future reporting. Aqaba initially reported very high volumes of unbilled authorized consumption, which was adjusted by the UPMU after telephone consultations with the Aqaba utility. The adjusted figures are, however, based on estimates, and accurate numbers will only be available after the COVID-19 crisis.



According to the data provided, Aqaba managed to install all new connections (types 1 and 2) within the specified target time. At the time of reporting, Yarmouk was unable to provide data for this indicator. The UPMU and the Miyahuna–Amman and Yarmouk utilities will discuss how to improve their performance and customer response, and what lessons could potentially be learned from Aqaba.

Outcome "service quality":

- Investigating inequalities in distribution during the summer, where high consumption by some subscribers might leave others with insufficient water supplies.
- Since water quality is not a major concern, the UPMU has changed this KPI to only reflect "no water" complaints.

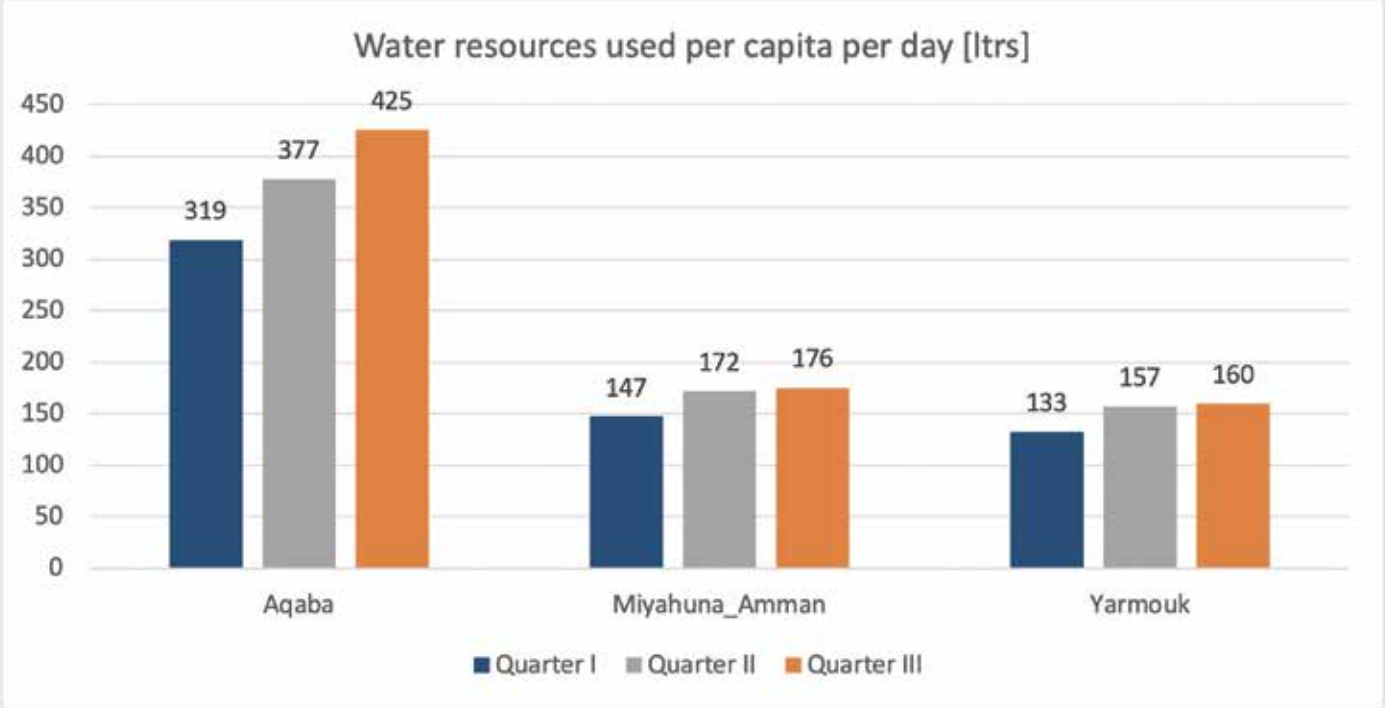
6.3 Water Resources Efficiency

This chapter on water resources efficiency provides an overview on the volumes of water produced, distributed and lost by the utilities in the supply process.

6.3.1 Water production in the three utilities

Name	Unit	Aqaba			Miyahuna - Amman			Yarmouk		
		Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Water produced	1000 m³	4,551	5,278	5,502	31,477	37,670	39,410	21,278	24,671	25,133
Imported treated water	1000 m³	1,212	1,607	2,330	22,686	27,149	28,036	795	1,589	1,927
Water distributed (=Water produced + Water Imported)	1000 m³	5,763	6,884	7,832	54,164	64,819	67,446	22,073	26,260	27,060
Exported treated water	1000 m³	0	0	0	9,525	12,112	12,794	210	220	217
Water supplied to subscribers (=Water distributed - Water exported)	1000 m³	5,763	6,884	7,832	44,638	52,707	54,653	21,863	26,040	26,843

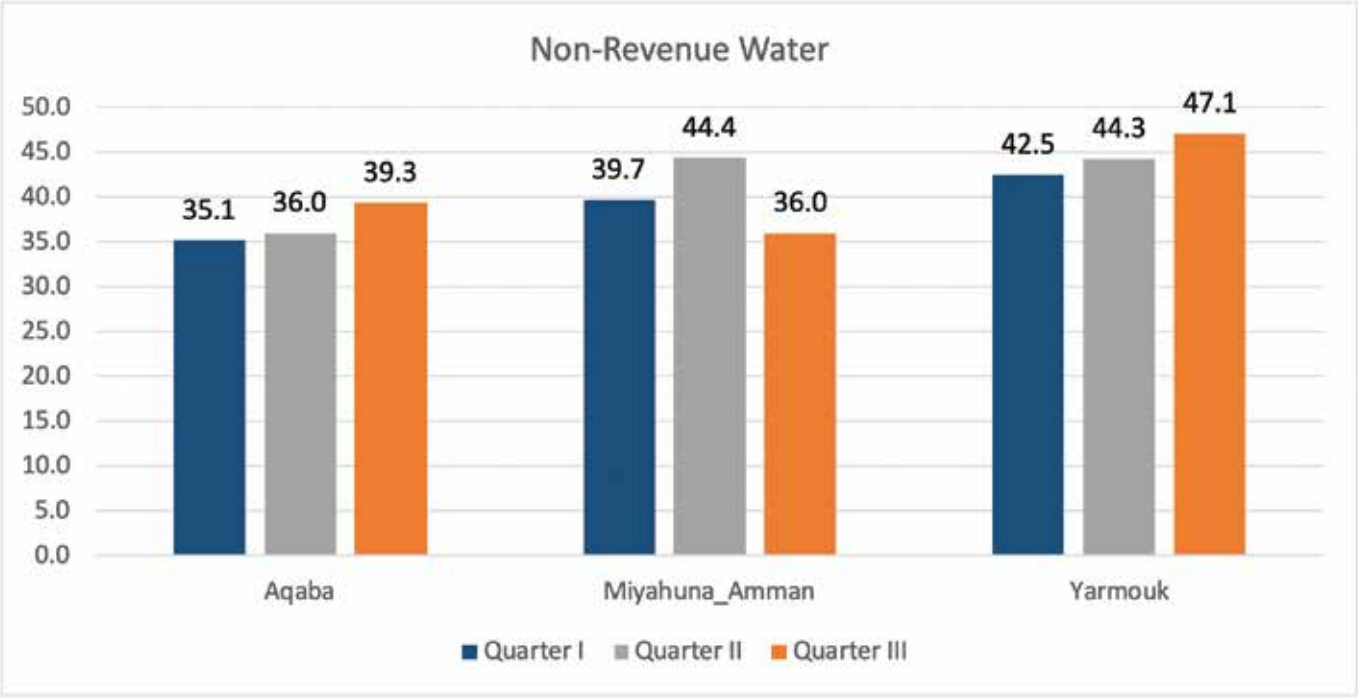
Table 2



The overview on water resources use per capita describes the volume of water supplied by the utilities per resident in their service area. The seasonal trends are similar for all utilities, with volumes being significantly higher in summer. The chart also shows the significant impact of commercial consumers in Aqaba, leading to per capita use of water resources being more than twice as high as in Miyahuna-Amman or Yarmouk.

When assessing water resources efficiency, and particularly water losses, it is important to look at different indicators to get a more comprehensive understanding. Water losses in Jordan remain high, and are well above international benchmarks for all utilities.
The most common indicator in this context is Non-Revenue-Water (NRW), which describes the difference between the volume of water a utility could have potentially sold versus the volume that it actually sells. The difference can be caused by several factors, such as water lost through leakage, administrative losses (e.g. through faulty meters) or water theft, and water that is legally obtained for free and not billed for, e.g. for firefighting. NRW can be looked at as either the percentage of overall water available, or as the volume per subscriber or per km of network.
If the UPMU's monitoring only looked at the percentage of the total volume that is not billed for, the analysis could be distorted. For instance, selling water to residential subscribers through an extensive supply network might result in a higher percentage of real water losses than exporting water though a bulk line. A higher share of water exports could therefore lead to a comparatively lower percentage of NRW, painting an overly optimistic picture of the prevailing situation. Utilities with a high density of connections might be expected to have lower losses per subscriber than those with lower connection densities.

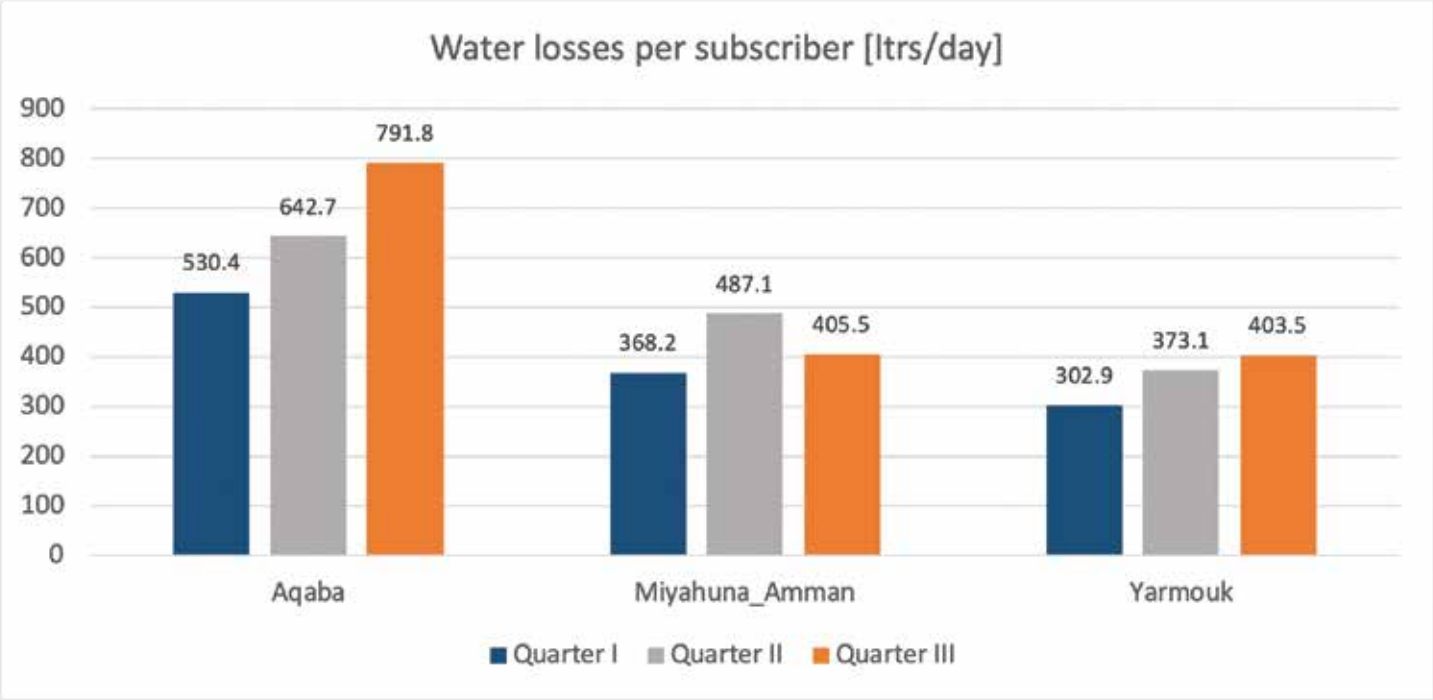
Therefore, to gain a better understanding of NRW and to potentially guide utilities toward the most effective measures, the UPMU is initially using three different indicators to assess NRW in particular and overall water loss in general.



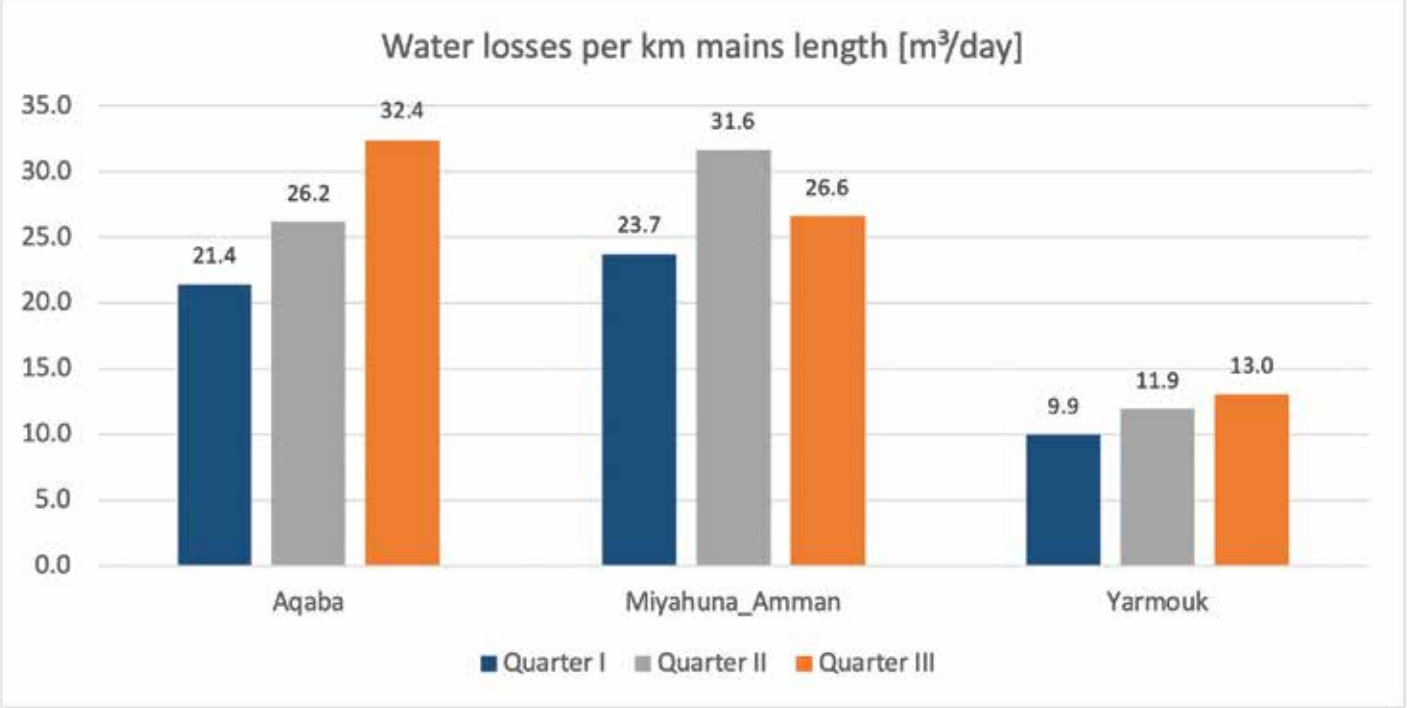
The significant drop in NRW in Miyahuna-Amman during Quarter III was caused by a sharp, 20% increase in billed volume from approx. 36,1 to 43,2 million m³, while the distributed volume only increased by 4 % from 64,8 to 67,4 million m³. For Aqaba and Yarmouk, NRW increased consistently on a quarterly basis, in line with the increased volume of water distributed. Water losses remain high according to international standards, with NRW values above 35% for all utilities during all quarters. This is of particular concern for a water-scarce country like Jordan.

	Aqaba			Miyahuna - Amman			Yarmouk		
	Q1	Q2	Q3	Q1	Q1	Q3	Q1	Q2	Q3
Length of water network [km]	1,052	1,052	1,055	10,045	10,091	10,172	10,481	10,881	10,881
Connections per km	19.2	19.2	19.3	20.2	20.3	20.5	20.3	19.6	19.7
Subscribers per km	40.3	40.7	41.0	64.5	64.9	65.6	32.8	31.8	32.3
Subscribers per connection	2.1	2.1	2.1	3.2	3.2	3.2	1.6	1.6	1.6

Table 3



While Yarmouk showed the poorest average performance in NRW based on water distributed (i.e. including the volume of water exported, although this only forms a significant share of the water balance for Miyahuna-Amman), the calculation of NRW based on water supplied and per subscriber paints a different picture. Yarmouk shows the best performance for the water losses per subscriber indicator, although numbers are still high. Comparing data for Miyahuna-Amman with the previous indicator shows the impact of the volume of water exported, for which this indicator assumes the losses to be zero. The losses per subscriber in Aqaba result from industrial customers causing a comparatively high consumption per subscriber.

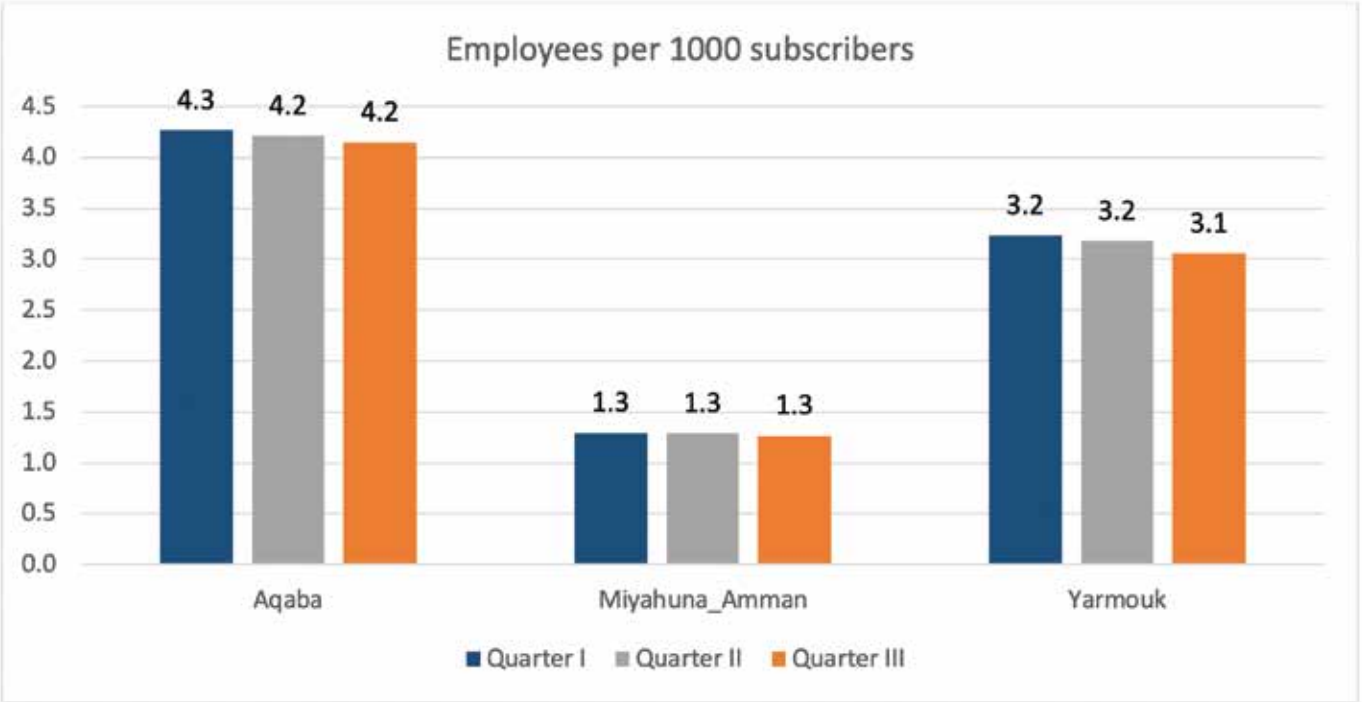


Similarly, the indicator for water losses per km of mains length is based on the volume of water distributed (including exported water). Yarmouk, with its vastly expanded service area, has comparatively low apparent and real losses per km of mains compared to Miyahuna-Amman and Aqaba.

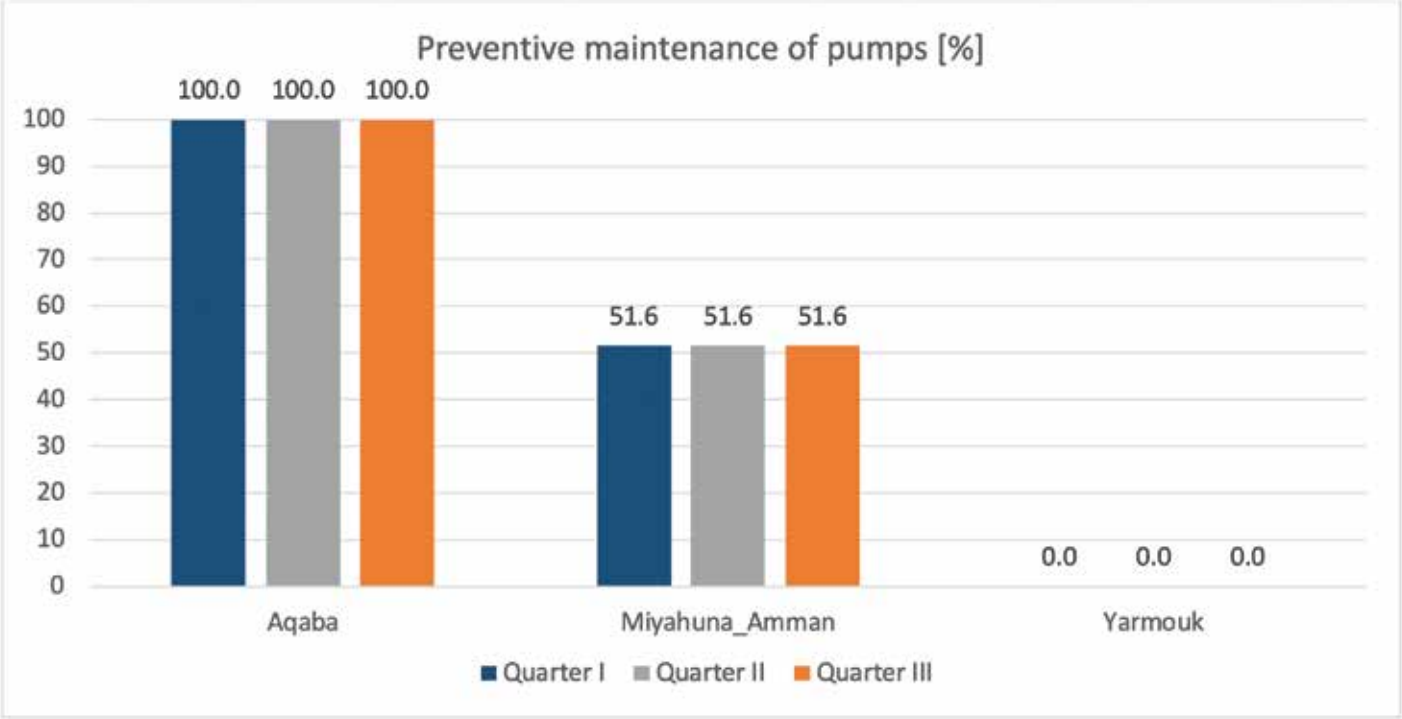
Outcome "water resources efficiency":

- Work with the utilities to assess Non-Revenue-Water more accurately using the three related indicators and agreeing on methodologies to estimate real/technical losses which, according to international standards, are high for a water-scarce country.
- Assess the utilities' compliance with supply schedules.

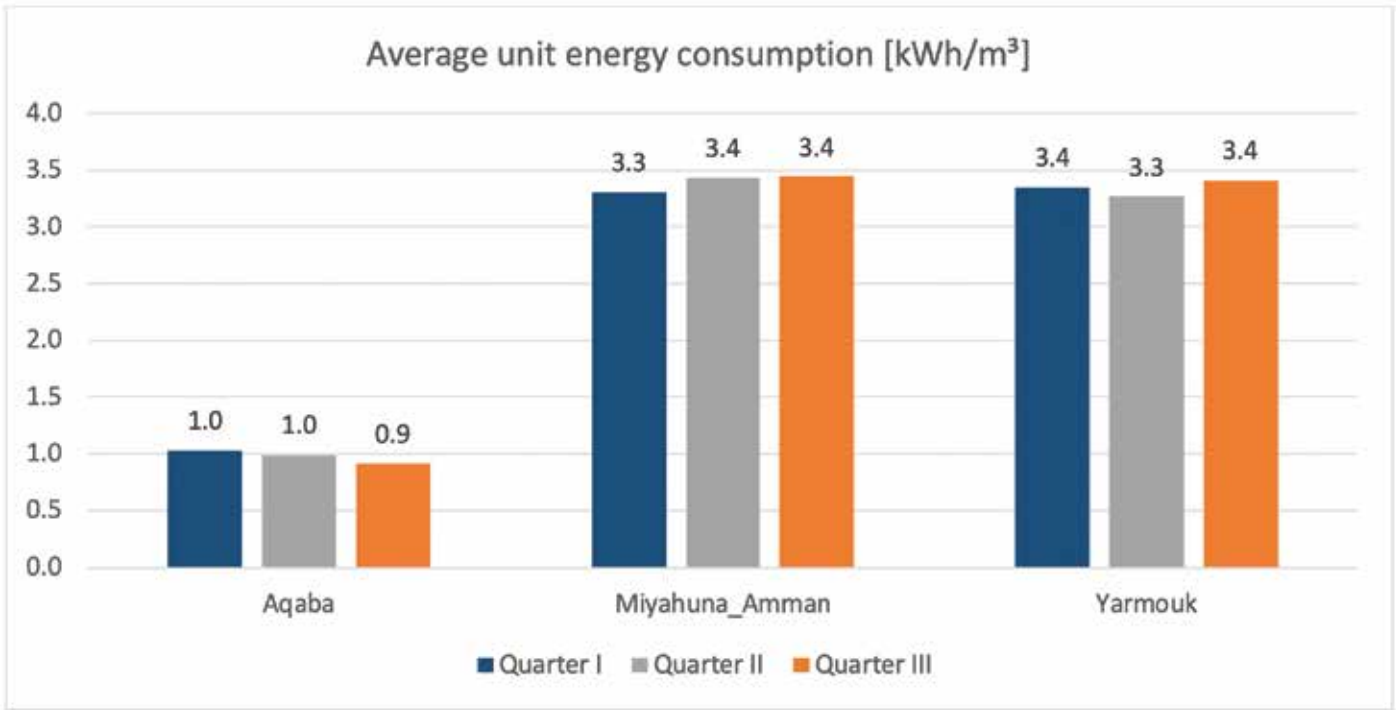
6.4 Operational Efficiency



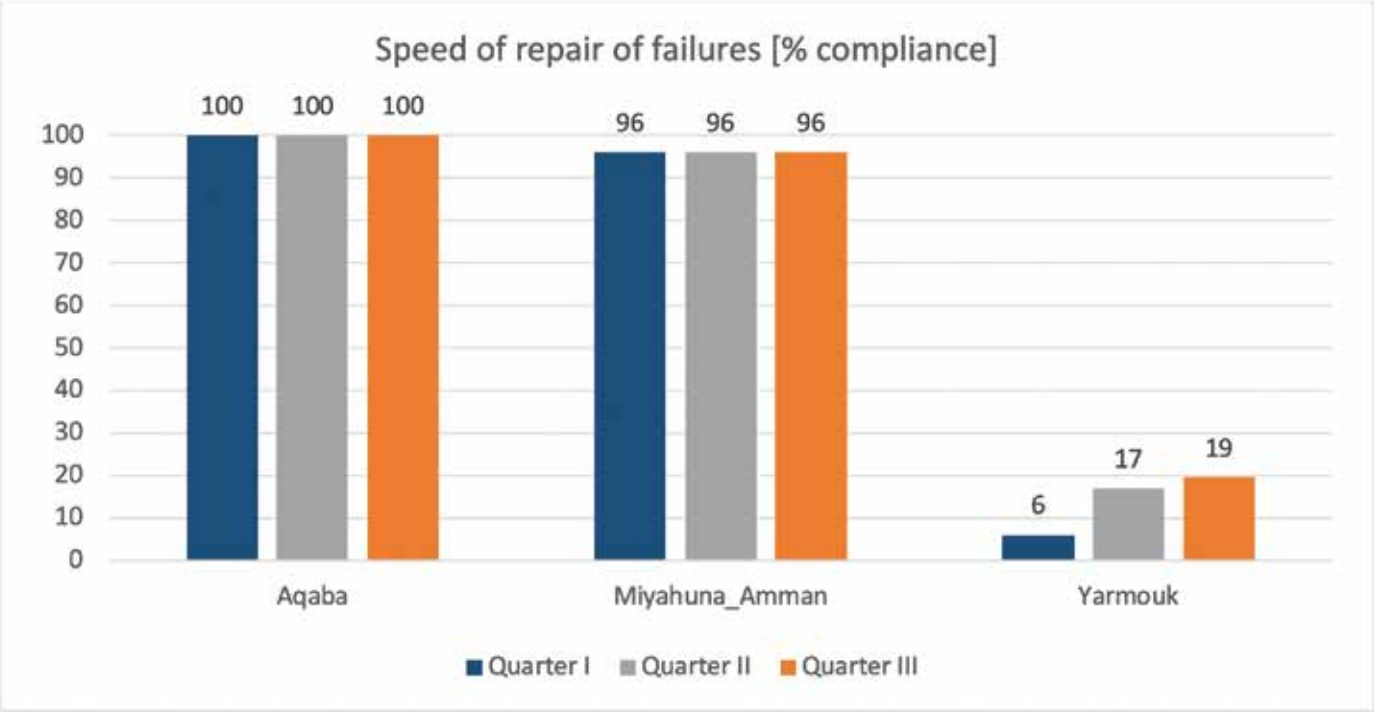
Compared to international benchmarks, staff efficiency expressed in employees per 1,000 subscribers is generally good in Jordan. Economies of scale will normally result in larger utilities needing less staff per 1,000 subscribers and this appears to be true for Jordan's utilities except for Yarmouk, which compared to the size of its customer base appears to be less efficient than the other utilities. Although the size and relatively low density of the service area partly justifies the higher rate of staff per connection, the utility still suffers from overstaffing, and the UPMU and the Yarmouk management must work together to formulate a plan for reducing the number of staff per 1,000 connections.



The preventive maintenance of pumps indicator is derived from the National Water Strategy 2016-2025 and water policies. The data indicates that Miyahuna-Amman and particularly Yarmouk, which does not have a preventive maintenance plan, need to do more to maintain their assets. Saving costs on carrying out preventive maintenance not only threatens the reliability of the operation, it also increases costs in the long run. The UPMU will include this as part of its future inspections protocol, and consider it in the development of regulatory tools.



Given Jordan's geography it is not surprising that the average unit energy consumption indicator shows huge differences between the utilities. This indicator is a good example of why comparisons between utilities cannot be based on numbers alone; they also require an understanding of the conditions under which the utilities are operating. Amman and Yarmouk incur high electricity consumption due to their geographies, but the data also shows that they should be especially able to benefit from measures to improve energy efficiency.



The data for the speed of repair of failures (% compliance) indicator shows two entirely different realities. While Aqaba and Miyahuna-Amman[4] are performing well in responding to failures in a timely fashion, the same cannot be said for Yarmouk. This indicator needs more elaboration on the variables and the reality on the ground. UPMU staff must coordinate and cooperate with the national call centre to collect more accurate and detailed data for the next reports.

[4] The data for Amman was obtained through a phone conversation and not included in the data sent electronically.

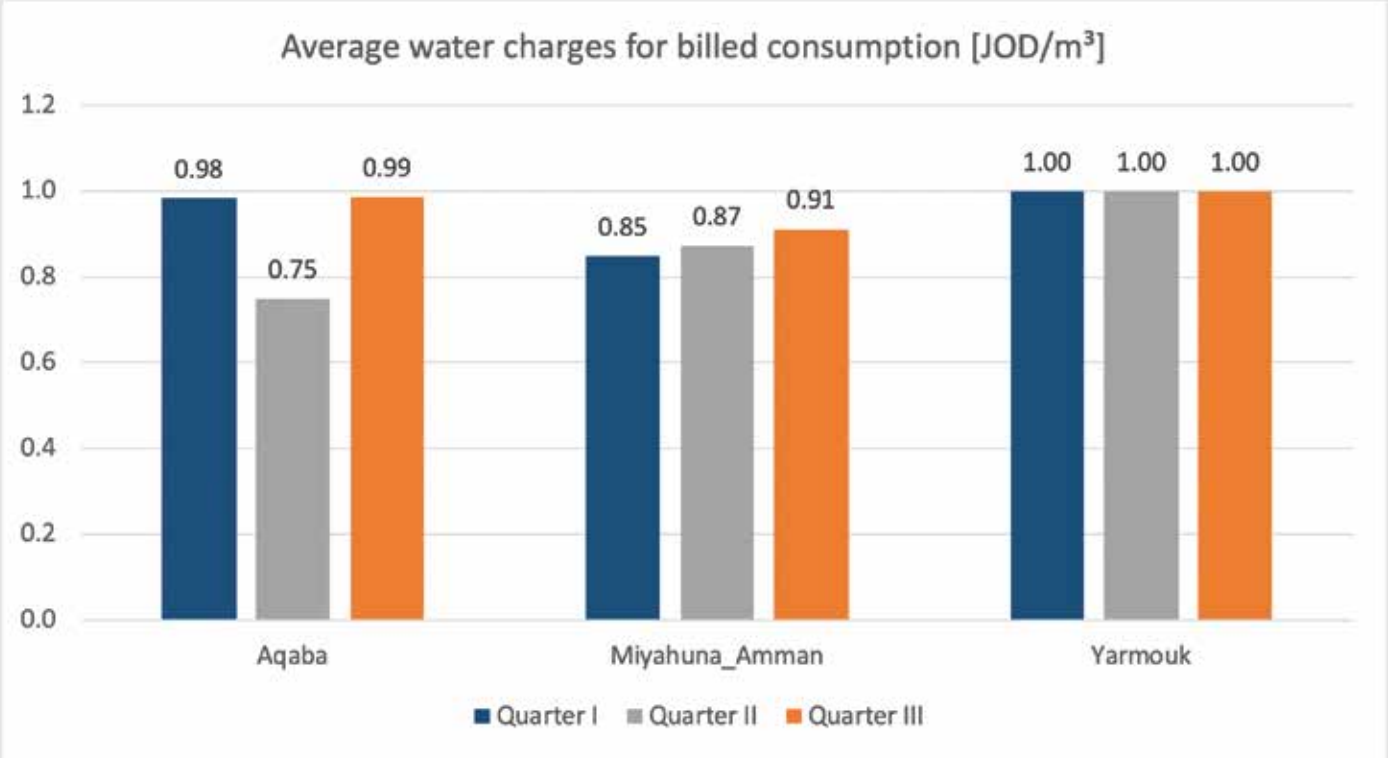
Constantly improving the level of training per employee as a means of increasing staff capacity has been identified as a key priority for the water sector. While specific training needs are dependent on each utility's individual work force, it might be difficult to justify the huge difference between Aqaba and Yarmouk in training provided per employee. The UPMU will follow up on this issue with the Yarmouk management team to ascertain if they are investing enough in improving staff capacity.

Outcome "operational efficiency":

- Request that utilities develop and implement preventive maintenance programs to maintain their assets.
- Promote measures that could add benefit by improving energy efficiency.
- Request that utilities monitor and record the speed of repairs and set target times for each utility.
- Require utilities to develop and implement suitable staff development and training plans.

6.5 Financial Performance

The UPMU has developed several indicators to assess the utilities' financial performances. Data for some of these indicators is only available on an annual basis while for others, such as collection efficiency, the International Water Association explicitly recommends that evaluation periods should be at least 12 months, even when data is available on a quarterly basis. The UPMU will continuously scrutinize the data submitted by each utility for these indicators on a quarterly basis and address any concerns on poor performance or negative trends, while not necessarily including them for comparison in the Quarterly Report.



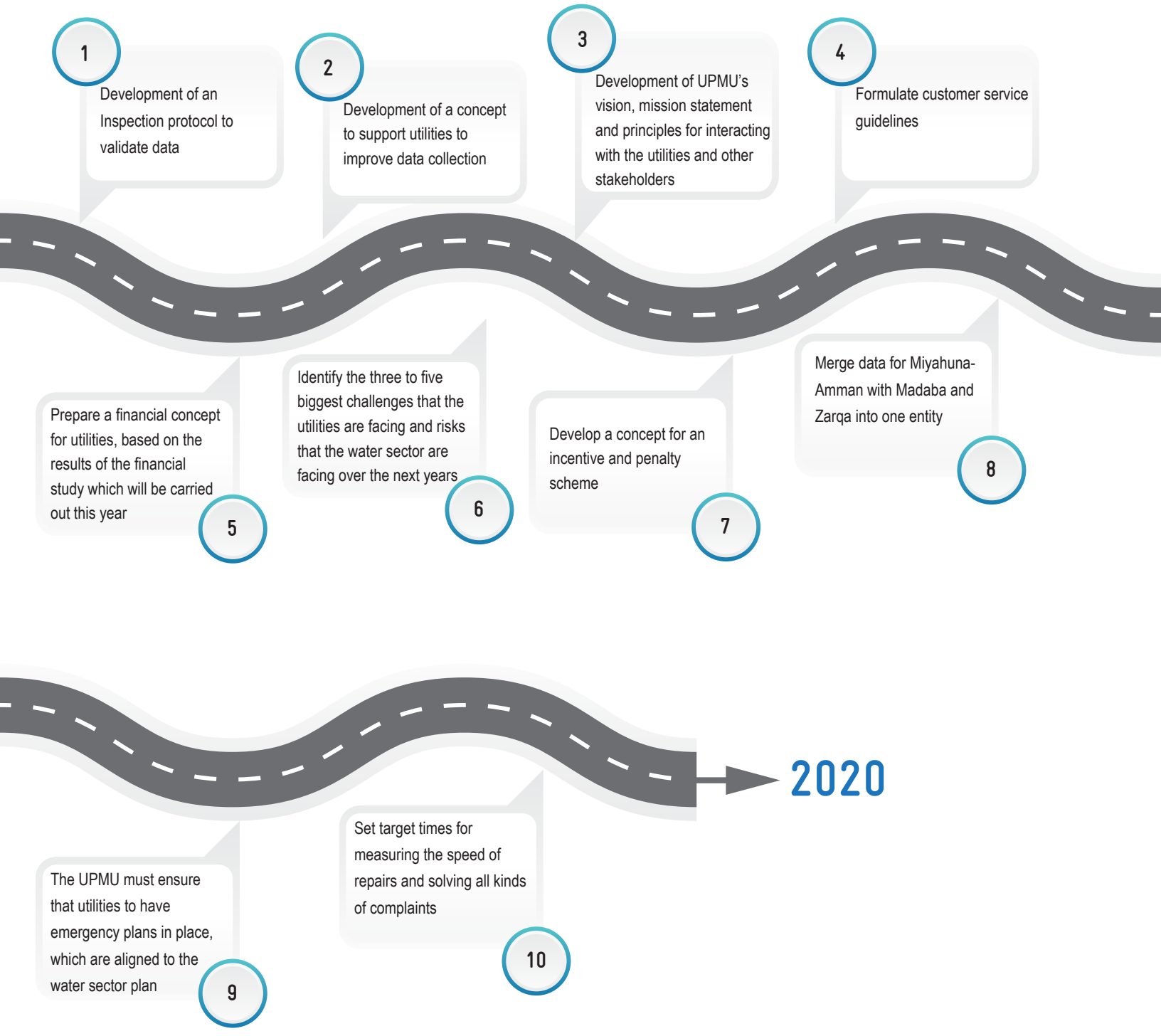
The average amount that a utility charges per m³ of water sold is important for the financial viability of its operation. Ideally, it should be higher than the average cost of supplying each m³ of water sold. While the costs of service provision will be analysed in the Annual Report, the above chart shows that average charges per m³ in Miyahuna-Amman increased significantly between Quarter I and Quarter III, in line with the increase in average consumption per subscriber. This is an expected impact of the increasing block tariff. However, the same cannot be observed for Yarmouk, and this will require further analysis once the UPMU can visit the utility. Similarly, the steep decline in average water charges in Aqaba in Quarter II reflects the drop in billed volumes from JOD 3,7 million to JOD 3,2 million, according to the data provide by the utility. This data needs to be reviewed once the UPMU can operate in the field after the COVID-19 restrictions.

Outcome "financial performance efficiency":

- This will be dealt with in the year 2019 report "Annual Report", based on complete and audited data

7. Road Map

The core activities and responsibilities of the UPMU are now specified, and can be finalized during the UPMU's kick-off workshop, once the team is complete. The following activities are listed in the UPMU road map for the year 2020:



Annex I – List of Indicators

Indicator name	Unit	Category	Aqaba			Miyahuna_Amman			Yarmouk		
			Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Microbiological water quality compliance	%	Key Performance Indicators	100	100	100	99.9	99.9	99.8	100	100	100
Continuity of supply	% of time	Key Performance Indicators	100	100	100	21	21.9	21	0	0	0
New connection efficiency	% of requests	Key Performance Indicators	100	100	100	85.1	85.8	90.5	0	0	0
Water service complaints per subscriber	Complaints/1000 active subscribers/year	Key Performance Indicators	11.2	22.3	26.6	23.7	58.3	78.3	88.8	103	34.2
Water consumption per capita (residential subscribers)	L/cap/d	Key Performance Indicators	62.8	77.6	79	66.2	67.5	83.4	70.3	81.4	78.8
Non-Revenue Water	% of system input	Key Performance Indicators	35.1	36	39.3	39.7	44.4	36	42.5	44.3	47.1
Collection ratio	%	Key Performance Indicators	87.9	89.2	92.5	82.1	68.9	77.7	17.5	27.6	35
Operating cost coverage ratio	%	Key Performance Indicators	71.7	57	84.4	0	0	0	20.6	42.7	52.2
Employees per 1000 subscribers	No/ 1000 subscribers	Key Performance Indicators	4.3	4.2	4.2	1.3	1.3	1.3	3.2	3.2	3.1
Training per employee	h/ employee	Key Performance Indicators	5.9	6.2	8.5	2.1	3.4	3.5	1.8	1.2	0.4
Subscribers receiving continuous supply	%	Lower Level Performance Indicators	98.2	97.6	97.1	1.2	1.7	0.6	0	0	0

			Aqaba			Miyahuan_Amman			Yarmouk		
Indicator name	Unit	Category	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Billing complaints	No./1.000 subscribers	Lower Level Performance Indicators	4.9	3.5	9.2	3.5	3.1	6.7	0	0	0
Percentage of inactive subscribers	%	Lower Level Performance Indicators	1.8	2.4	2.9	0	0.4	0.8	13.9	12.4	12.8
Water quality tests performed	% of required tests	Lower Level Performance Indicators	100	100	100	100	100	100	100	100	100
Physical-chemical water quality compliance	%	Lower Level Performance Indicators	100	100	100	99.9	99.9	99.9	100	100	100
Water resources used per capita/day	L/ cap/d	Lower Level Performance Indicators	319	377	425	147	172	176	133	157	160
Speed of repair of failures	% of bursts	Lower Level Performance Indicators	100	100	100	96	96	96	6	17	19.4
Metering ratio	%	Lower Level Performance Indicators	100	100	100	110	110	109	0.8	0.8	1
Subscriber meter replacement ratio	%	Lower Level Performance Indicators	1.2	0.7	0.7	3	1.3	0.7	428	513	27
Water loss per subscriber	litres/subscriber/day	Lower Level Performance Indicators	530	643	792	368	487	406	303	373	404
Water losses per mains length	m^3/km/day	Lower Level Performance Indicators	21.4	26.2	32.4	23.7	31.6	26.6	9.9	11.9	13
Percentage of water treated in wastewater treatment plants	%	Lower Level Performance Indicators	40.9	38.3	38.9	93.9	93.8	73.3	43.2	38.8	39.3
Meter reading ratio	%	Lower Level Performance Indicators	92.3	93.7	95	103	103	104	105	103	102
Electricity costs as percentage of total O&M costs	%	Lower Level Performance Indicators	23.6	23.4	27.6	0	0	0	30.6	74	76.8

Indicator name	Unit	Category	Aqaba			Miyahuan_Amman			Yarmouk		
			Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Average unit energy consumption	kWh/m³	Lower Level Performance Indicators	1	1	0.9	3.3	3.4	3.4	3.4	3.3	3.4
Average water charges for billed consumption	JOD/m³	Lower Level Performance Indicators	1	0.7	1	0.8	0.9	0.9	1	1	1
Percentage of staff trained	%	Lower Level Performance Indicators	21	22.9	37.1	5.7	14	15	12.4	7.6	4.5
Preventive maintenance of pumps	%	Indicators derived from national strategies	100	100	100	51.6	51.6	51.6	0	0	0
Corrective maintenance of pumps	%	Indicators derived from national strategies	0	0	0	44.2	44.2	44.2	54.9	56.4	57.9
Sizing of pumps	%	Indicators derived from national strategies	0	0	0	100	100	100	50.1	50	50
Operational well and reservoir meters	%	Indicators derived from national strategies	57.6	57.6	57.6	0	0	0	76.5	83.1	86.3
Metering of import and export points	%	Indicators derived from national strategies	100	10	100	100	100	100	83.3	83.3	83.3
Effluent quality compliance	%	Indicators derived from national strategies	100	100	100	99.3	99.3	99.4	90.1	94.9	90

Annex II - Calculation of indicators used in this report:

Microbiological water quality compliance
Percentage of the total number of microbiological tests of treated water performed that comply with the applicable standards.

Formula: (Compliant microbiological tests/Microbiological water quality tests performed) * 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

Formula: Subscribers receiving continuous supply / Total water subscribers * 100

Continuity of supply
Percentage of hours when the (intermittent supply) system is pressurised

Formula: Number of hours per week that the system is pressurized / (7*24) * 100

Water consumption per capita (residential subscribers)
Average daily water consumption per capita

Formula: quarterly = Residential billed volume*1000/90/Population supplied (water)

Water service complaints per subscriber
Number of quality of service (water quality, "no water") complaints per 1000 active subscribers per year

Formula: (Water Quality Complaints + Complaints of “No Water Supply”) / (Active subscribers*1000)

“No water” complaints per subscriber
Number of “no water” complaints per 1000 active subscribers per year

Formula: (Complaints of “No Water Supply”) / (Active subscribers*1000)

New connection efficiency
Percentage of connections installed within the specified target time

Formula: New type 1 and 2 water connections within a target time / New type 1 and 2 water connections requested * 100

Water resources used per capita per day
Average daily volume of water supplied per capita

Formula: (Water produced + Imported treated water - Exported treated water) / (Resident population) * 1000 / 90

Non-Revenue Water
Percentage of distributed water volume not being billed

Formula: (Water distributed - Billed authorized consumption) / (Water distributed) * 100

Water losses per subscriber
Total (apparent and real) losses, expressed in terms of annual volume of supplied water lost per subscriber

Formula: (Water supplied - (Authorized consumption - Exported water)) / Total water subscribers * 1000 / 90

Water losses per km of mains length
Total (apparent and real) losses, expressed in terms of annual volume of distributed water lost per mains length.

Formula: (Water distributed - Authorized consumption) / Length of water network / 90

Employees per 1000 subscribers
Number of full-time equivalent employees per 1000 water subscribers and wastewater subscribers

Formula: Total number of employees / ((Total water subscribers + Total sewer subscribers) /1000)

Preventive maintenance of pumps
Percentage of pumps covered by preventive maintenance

Formula: Production and distribution pumps receiving preventive maintenance / Production and distribution pumps * 100

Average unit energy consumption
Electricity consumption per m^3 supplied

Formula: Electricity consumption / (Water produced + Imported treated water - Exported treated water)

Speed of repair of failures

Percentage of network and water service connection failures repaired within the target time = (Network failures repaired in target time) + (Service connection failures repaired in target time) / (Network failures + Water service connection failures) * 100

Training per employee

Number of training hours per employee during reporting period

Formula: Total number of training hours in reporting period / Total number of employees

Collection ratio

Percentage of revenues collected from billed amounts during reporting period

Formula: (Total collection from water sales - Collection for past periods + Total collection from wastewater services - Collection for past periods) / Amount billed in period * 100

Average water charges for billed consumption

Water sales revenue from residential and non-residential subscribers (exported water excluded) per m^3 of authorised consumption

Formula: (Residential water sales (amount) + Non-residential water sales (amount)) / (Residential billed volume + Non-residential billed volume)