

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 by short speech.

Engineer Mohamed El-Najjar, The Minister of Water and Irrigation stresses the need to adopt unified concepts for measuring water loss and to take more measures to reduce water loss.

He stressed the need to do more work and intensify efforts and procedures to reduce water loss and the need to adopt unified concepts for measuring water loss in particular. And 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 pointed to the role of the Jordanian citizen, partners, all civil society institutions and the private sector in the systematic and thoughtful work to do more actions and measures to reduce Water wastage and unifying the concepts of its calculation in water utilities according to scientific bases.

This came during its 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, 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 NRW unit from Water Authority.

Dr. Ahmed Al-Azzam, Director of UPMU, pointed out the need to unify efforts to come up with useful recommendations and results in order to reduce water losses, which will lead to enhancing the quantities of water distributed to citizens and its reflection on improving performance, providing optimal services.

Mr. Nayef Hammad, representative of the GIZ, noted that this workshop and the subsequent workshops that will follow come in light of the recommendations and results presented in the utilities performance evaluation report for the year 2019 and that the GIZ will not hesitate to continue supporting the water sector and qualifying staff (cadres).

During the workshop presentations of several working papers presented and followed with discussions between the participants and the organizers of the dialogue, 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 the Utilities Performance Monitoring Unit (UPMU) and based on the follow-up and evaluation of the performance of water utilities 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), it will hold several workshops to discuss and standardize concepts, exchange experiences, transfer knowledge, and follow and identify optimal ways to reduce technical and administrative losses from water (NRW).

The workshop has Several working papers submitted by Miyahuna, Aqaba, Yarmouk, 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 subject; projects that financed by donors and the Miyahuna strategic plan.

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, & replacement of total 44,000 customers meter.
 - 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 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 with Simulating the continuous supply in DZ 13 DMAs
 - d. Big Customers meters' replacement
 - e. Bulk Meters replacement

- **Aqaba Water Co. working paper**

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

1. Establishing NRW Unit
2. Replace Customer Meters
 - a. Replace 36,000 mechanical meter with Ultrasonic flow meter over 4 phases.
 - b. Implement AMI / AMR System
 - c. Conduct NRW Calculation Before and after the meter Replacement
 - d. Analyse 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 insure 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 expressed the strategic plan and projects to reduce the 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 meter (3,500 WM's) and detect Illegal uses.
 - c. Reduce physical losses
 - FARA1 project to provide 2 mobile units full equipped (Financed by USAID), Survey Main and Distribution water network and Establishment of 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 Irbid and Ramtha, financed by WAJ (2022-2024)
 - c. Rehabilitation and replacement of Network 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 Network in different areas of entire the company, financed by Jordan Gov.

- **NRW and FARA Projects Unit working paper**

The presentation explains the strategic plan for the NRW Unit and Project Monitoring; and to follow-up the implementation of NRW activities over all Jordan.

1. strategic plan

The unit is working currently to establish NRW reduction strategy with all related parties (Utilities, and Directorate); and will cover all needed components of NRW to ensure that the proposed strategy is feasible; meanwhile its aim to shorten the awareness, location, and repair times in order 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. Leak Detection Mobile 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 Sustainable Zone-NRW management approach implemented in YWC.

Main approach:

- NRW-Zone Identification (commercial-technical): Install metering points / bulk metering points, identify accurate zone boundaries with Improvement.
- Implementation 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 Discover 600 illegal cases.
 - Billed Amount (M3) 131%, (from 5.5 to 7.2 Mio M3)
 - Collected amounts (JOD) 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 water meters' management.

- **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: its water distributed minus water exported which is equal to water produced plus water imported.
- Pl's related to NRW: there are 6 indicators which have direct input in NRW and more than 10 indicators have indirect input related to NRW
- The formula of calculating the NRW% is: water distributed deduct water billed divided by water distributed

- **Consultant working paper which content two presentation:**

1. General approach of NRW

- The impact of negative and positive input component of NRW;
 - NRW is decrease the revenue will have decreased, increase customer demand and budget of operation decreased. on other side any decreased in NRW this will 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 of 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**

Subject to be tackled (suggestion from my side)

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