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Real Time and Online Water Monitoring: A Tool for Good Governance in Water Sector in Jordan

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Governance, water quality and water security connections

- It is well known that good water governance is necessary to achieve water security.
- TAP in Governance: Transparency, Accountability & Participation
- The issue of water security—defined as an acceptable level of water-related risks to humans and ecosystems, coupled with the availability of water of **sufficient quantity and quality** to support livelihoods, national security, human health and ecosystem services.



Water quality and SDGs

- The 2030 Agenda and Sustainable Development Goals (SDGs) bring water quality issues to the forefront of international action by setting Goal 6 specifically aiming to “ensure availability and sustainable management of water and sanitation for all” to respond to the pressing challenges posed by water quality issues.
- Water quality is addressed also under other SDGs such as the goals on health, poverty reduction, ecosystems and sustainable consumption and production, recognizing the links between water quality and the key environmental, socioeconomic and development issues (Goals 1, 3, 12, 15 and Targets 1.4, 3.3, 3.9, 12.4, 15.1).
- The clear focus on water quality in the SDGs demonstrates growing attention on the urgent need to improve water quality worldwide.

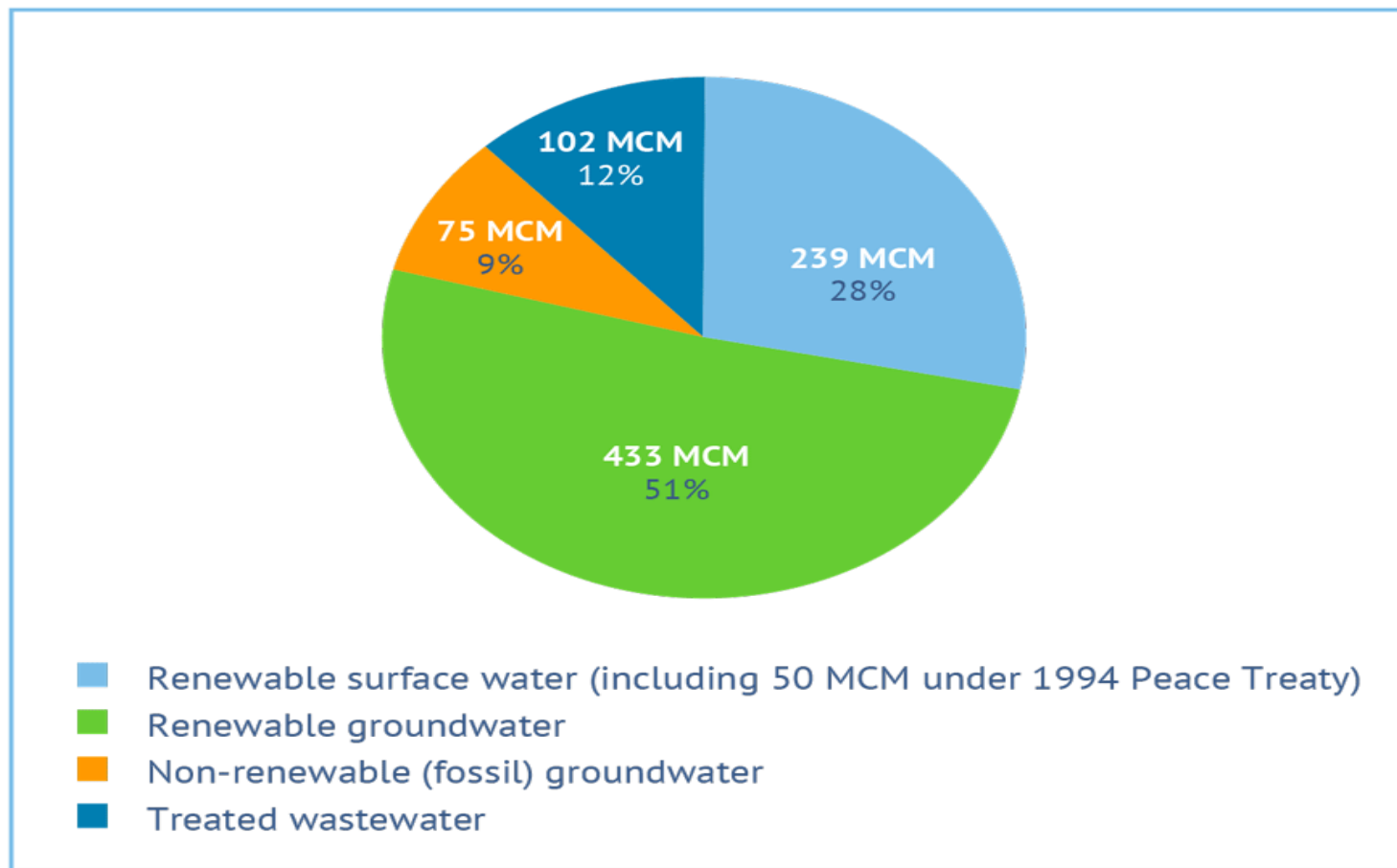


Jordan Water Issues

- Jordan is one of the most water-scarce countries in the world.
- The country's renewable water supply currently meets around two-thirds of the population's water demands, with groundwater being used twice as quickly as it can be replenished.
- Population growth and the influx of refugees from regional conflicts put additional strain on an already stressed water supply.
- Climate change will exacerbate the problem. Jordan's water security is critical to the country's long-term political and economic stability.



Jordan water resources (2019)



Jordan Water Issues Cont.

Water Availability:

- ☐ sufficiency and continuous supply
- ✓ 98% linked to public water supply systems
- ✓ average of two days supply per week

☐ Water Quality:

- ✓ Groundwater of high salinity
- ✓ Surface water is not adequate for drinking

☐ Physical accessibility

- ✓ most reliable water resources are far from residential centers
- ✓ 100% of urban and 87% of rural population have access to piped water



Cont.

☐ Economic accessibility / affordability

- ✓ Water supply is still subsidized by the government
- ✓ Water prices still affordable by the poor
- ✓ Water prices for bottled water and tanked water is 810 times more than piped water



WQ Monitoring



Reason for WQ Monitoring



Water Quality Monitoring Systems

1. Routine Systems
2. Real Time Systems



Why Real Time Monitoring Systems

No one can deny the importance of a proper monitoring system for the effective management .

- While the traditional way of monitoring involves the use of reports, it does have certain limitations. Reports are only capable of showing what has already happened, and by the time you analyze, identify trends, and predict any instance of failure, it may be too late to make the right fix.
- This critical gap between the time to report and time to take action can cost you a lot of money. Real-time monitoring helps fill this gap by giving you real-time data, alerts, and notifications so you can take the timely discourse to deal with any issue.



Environment Monitoring and Research Central Unit (EMARCU)

Established by the Higher Council for Science
& Technology (HCST) and operated by the
Royal Scientific Society (RSS) since 2003

Real-Time Monitoring System (RTMS)
instrument and installation are funded by Japan
International Cooperation Agency (JICA)

RTMS operation and maintenance are funded
by 4 Ministries (MOE, MWI, MOA, MOH)

Its mission is to collect and make available
water quality data from a real-time monitoring
system (RTMS)

Its ultimate objective is public health and
environmental protection and sustainability.



The Long-term Goals of EMARCU

Collect and make available water quality data on the major surface water resources in Jordan

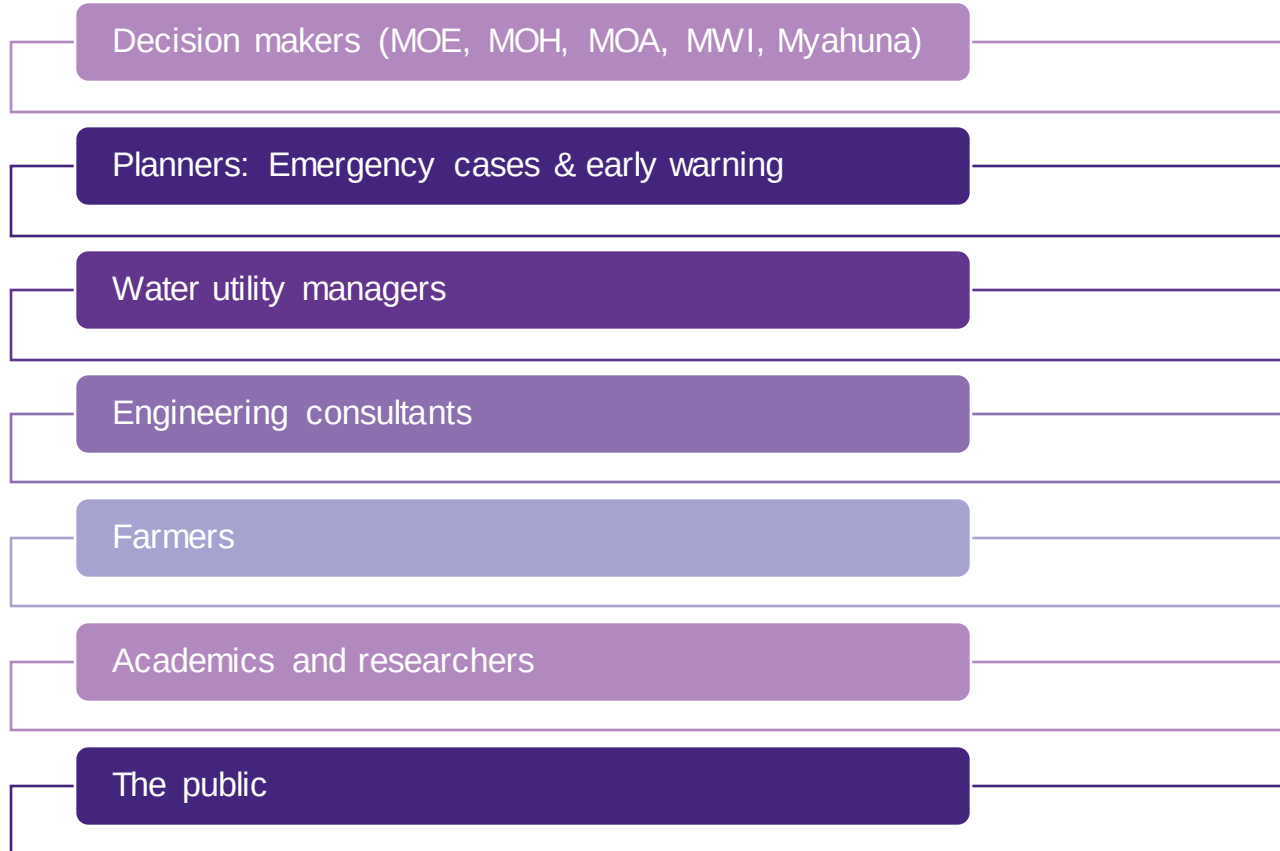
Provide a data collection platform for national water quality

The data will be integrated in the National Water Information System(NWIS)for water quality in Jordan

Help improve decision making in the water and environment sectors through Real-time data provision and system modelling



Potential System Users



EMARCU Accreditation

EMARCU has been Accredited by **UKAS**, we are the first online system to be accredited in the Middle East.

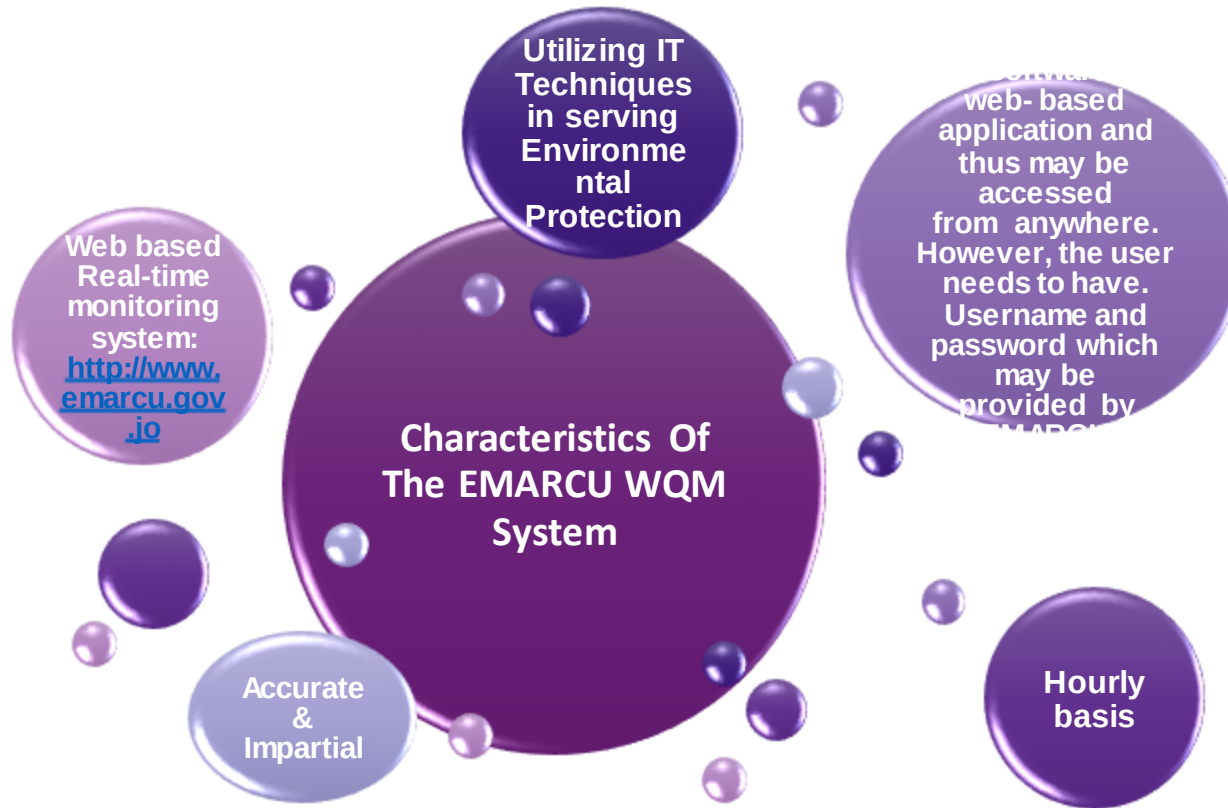


EMARCU Results

EMARCU results were used in national reports like:
Environment of state Environment indicators and National
Information System.



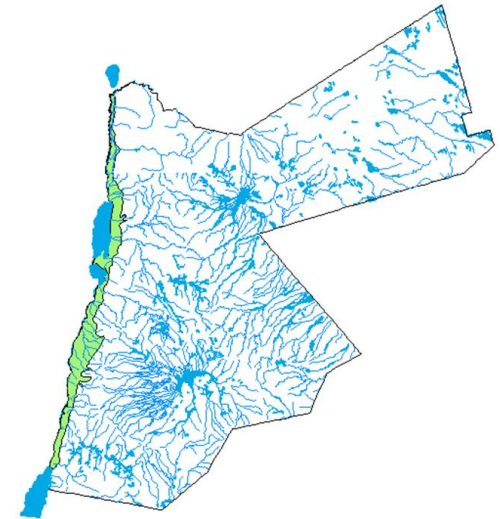
Characteristics of the EMARCU WQM System



The Real-time Monitoring System (RTMS)

Thirteen fully-automated monitoring stations are located on:

Jordan River	2 Stations
Yarmouk River	1 Station
King Abdullah Canal	6 Stations
Zarqa River	4 Stations (3 Stations through the path of water from Kherbat Assamra to the King Talal Reservoir inlet and 1 Station at the outlet of KTR)



Monitoring Stations



Monitoring Parameters

Three sets of physiochemical water analysis equipment for:

- Temperature, pH, EC, Turbidity, DO
- COD
- In 2020 Nitrate is added for Zai station
- We are working to add TOC



Telemetry System (emarcu.gov.jo).





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Thank you

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