More and safer water reuse in the Arab region

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19 countries: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.
1-The water challenge in the Arab region

Water resources per capita

- 1970: 1,800 m³ per capita
- 2000: 800 m³ per capita
- 2015: 600 m³ per capita
- 2020: 500 m³ per capita
Wastewater is part of the problem and part of the solution
Wastewater production grows as population, urbanization and income per capita grow

Note: Mashreq includes: Iraq, Jordan, Lebanon, Palestine, Syria and Egypt; Maghreb includes: Algeria, Libya, Mauritania, Morocco and Tunisia; GCC (Gulf Cooperation Countries) includes: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates; Least developed countries include: Sudan and Yemen
Still a long way to go in wastewater treatment to catch up with population growth

Municipal wastewater produced
21.5 km$^3$

Safely treated
60%

Source: AQUASTAT, AWC 2029, GWI, WHO 2021

Even with wastewater treatment some pollutants are poorly removed
Opportunity: resources embedded in wastewater

Water and nutrients to irrigate and fertilize more than 2.6 million hectares.
Carbon to produce methane with a caloric value to provide electricity to millions of households.
3-Indirect use of untreated wastewater is a common reality in the region.
4-Wastewater is only a waste if we decide to waste it:

The potential for resource recovery from municipal wastewater in the region is still untapped
Wastewater fate

Production

Collection

- Collected
- Not collected

Treatment

- Treated
- Not treated

Discharge and/or use

- Direct use
- Indirect use
- Loss
- Evaporated
The number of reuse project has doubled every decade since 1990

- 1990: 40 Projects, 421 Mm³
- 2000: 97 Projects, 655 Mm³
- 2010: 200 Projects, 1,249 Mm³
- 2020: 409 Projects, 2,275 Mm³

19 Countries analysed
Water reuse projects in as of 2020
# Wastewater production and fate in the region

<table>
<thead>
<tr>
<th>Loss</th>
<th>Indirect reuse</th>
<th>Direct reuse (treated)</th>
<th>Direct reuse (untreated)</th>
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<tbody>
<tr>
<td>(Sea outfall, evaporated on land, rivers...)</td>
<td>54%</td>
<td>36%</td>
<td>??</td>
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**SEWAGE-TRACK**: Spatially Explicit Wastewater Generation and Tracking model

Municipal wastewater 21.5 km$^3$

Sources: IWMI 2022, Velpuri and Mateo-Sagasta 2022 forthcoming
Wasted water
Missed opportunities
5-The region needs to:

- Recover and reuse loss wastewater
- Make indirect and informal reuse safer
Recommendations for safer water reuse

Assess health risks in informal and indirect water reuse

Mitigate health risks in informal and indirect water reuse

- Accelerate wastewater treatment to cope with wastewater production growth
- Incentivize the adoption of on-farm practices for safe water reuse
Wastewater generation

Irrigation water quality thresholds

- Wastewater treatment
- Safe Irrigation Practices

Traders

- Hygienic Handling Practices
- Safe food washing and preparation

Kitchens

- Safe food washing and preparation

Consumers

- Awareness creation to create demand for safe produce

2006 WHO Guidelines

Food safety thresholds

- Behaviour barriers
- Technology barriers
Recommendations for greater water reuse

Develop bankable projects

• Reduce costs and improve cost recovery
• Conduct CBA
• Who will pay for the costs?

Gain wider public acceptance

• Address cultural barriers and distrust, yuck factor and religious concerns
• Communication and participation
Cross-cutting recommendations

Address institutional fragmentation
- Are responsibilities and jurisdictions among national and local authorities and stakeholders clear?

Over-stringent regulations
- Prohibitive costs for treatment
- Some times ignored and therefore ineffective
Recap

1-The region faces a deep water crisis and we are not doing enough to solve it

2-Wastewater is part of the problem and part of the solution

3-Indirect use of untreated wastewater is a common reality in MENA: health risks need to be assessed and mitigated

4-Wastewater is only a waste if we decide to waste it: The potential for resource recovery from municipal wastewater in MENA is still untapped

5-The region needs to accelerate to meet SDG6 (to recover and reuse loss wastewater and make reuse safer and more productive)

6- The region needs to address the challenges that lock the potential:
High costs and lack of cost recovery, cultural barriers and distrust, institutional fragmentation, improper regulations...
Thanks!

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For more information on the outcomes of the ReWaterMENA project visit:
https://rewater-mena.iwmi.org/