Municipal Water Security in Bahrain: Stakeholder Analysis and Scenario Projections

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Presentation outline

- Introduction
- Salient Attributes in Bahrain Water Sector
- Water Security Concept (Narrow vs. Broad)
- Prevailing Definition (Short Term Water Provision)
- Methodology
- Results and Findings
- Discussion and Conclusion
Introduction

- Bahrain is SIDS
- Bahrain experiences high climatic variability (typical of arid regions)
- Lack of surface water (River or lake)
Introduction cont’s

Bahrain in 1940

Bahrain in 2015
Salient Attributes in Bahrain Water Sector

- Desalination has emerged to be the main source for municipal water.
- Demand for municipal water has grown drastically over the year.
  - Urbanization
  - Increase in population
- Consumption rate has grown to unprecedented level.
- The sector is facing financial and water rationing has started for a year now.
- Non-revenue water is another issue.
- Wastewater reuse does not feed into the municipal water supply.

Data source: EWA Published stats
Water Security Concept

Narrow and Specific

• Securing Water Infrastructure
• Emergency Response
• Storage Capacity
• Flood/Hurricane Prevention

Broad and Integrated

• Supply and Demand Management
• Resilience and Adaptive
• Institutional and Capacity Building
• Acknowledging Nexus
Prevailing Definition (Short Term Water Provision)

• There is a systematic shift towards Water Emergency
  • On ground and underground storages
  • Attributed to security reasons
  • Attainment of water security could only be achieved within the country

• Enough quantities of fresh water to meet normal demand
Methodology

- Interdisciplinary approach
- Engaging stakeholders to view their prospects of secure municipal water
- Stakeholders
  - Upstream *(MoEW, EWA, Parliament...etc)*
  - Affiliated *(S&T NGOs, Environment and social NGOs, Water Resource Council, academics and media ...etc)*
  - Downstream *(Consumers in the domestic sector)*
- Scenario building using WEAP package
Interviews, Focus-groups and Media Discourse Analysis

- Interviews and focus groups were the main source of information.

- Several media release around water sector were gathered, coded and analysed.

- Data gathered about challenges around the municipal water Stakeholders.
WEAP package (policy evaluation tool)

- The corresponding views of the stakeholders were translated into dynamic model scenarios
- which therefore were used for the integrated simulation of the water management system
WEAP package (policy evaluation tool)

WRM system Dynamic Model Development
Results and Findings

Stakeholder Analysis

- Challenges faced by the sector:
  - arid condition of Bahrain (*Majority respondent and media releases*)
  - non-revenue water plague associated with leakage in the distribution network (*practitioners and academics*)
  - unsustainable utilisation of shared groundwater
  - Climate change
## Prominent themes & suggested scenario options

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Proposed By</th>
<th>Tools / Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business As Usual (BAU)</td>
<td>Consumers</td>
<td>Maintain population growth, consumption rate</td>
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<td></td>
<td></td>
<td>Increase desalination capacity by building more plants</td>
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<tr>
<td>Capacity expansion and reducing groundwater abstraction</td>
<td>Public Authorities (EWA), practitioners</td>
<td>Investment in leakage control unit to ensure the reduction of leakage to 10% over the study period*</td>
</tr>
<tr>
<td>Leakage reduction in the distribution network</td>
<td>Academics, NGOs</td>
<td>Investment in leakage control unit to ensure the reduction of leakage to 10% over the study period*</td>
</tr>
<tr>
<td>Reduce consumption rate</td>
<td>Academics, NGOs, media</td>
<td>Awareness and water saving devices*</td>
</tr>
</tbody>
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*Table. Details of WEAP scenarios*
findings cont’s

Results of isolated scenarios and combinations

BAU Scenario

Leakage Reduction Scenario
findings cont’s

Results of isolated scenarios and combinations

Per-capita Reduction Scenario

Combination Scenario
Stakeholder mapping and classification

Impact of managerial remedies on the municipal water sector demands

Reduction in Municipal water demand by 220 Mm³ by 2030
Cumulative 19 years water saving = 1,500 Mm³
Discussion and Conclusion

- No single solution to achieving sustainable results in the municipal sector without incurring significant cost.
- Need to rely on a combination of interventions that takes into account soft and hard approaches.
- Desalination to continue to play a vital role in supplying the municipal water sector
- Supply sector to remain stable in the long run despite all obstacles and challenges.
Thank you