



Institute of  
Development Studies

جامعة الخليج العربي  
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# 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**



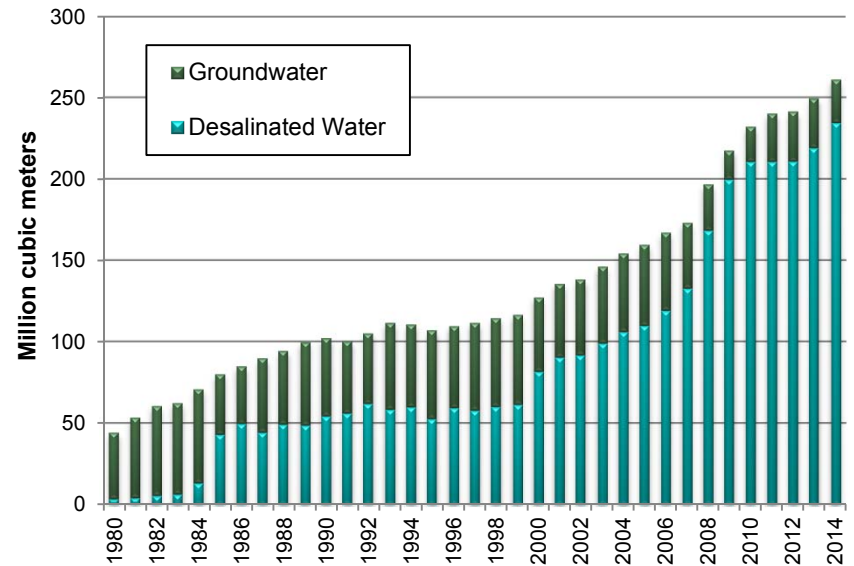
**Bahrain in 2015**



# 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

## Desalinated water and groundwater contribution



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# 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

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## 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



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# 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



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# 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

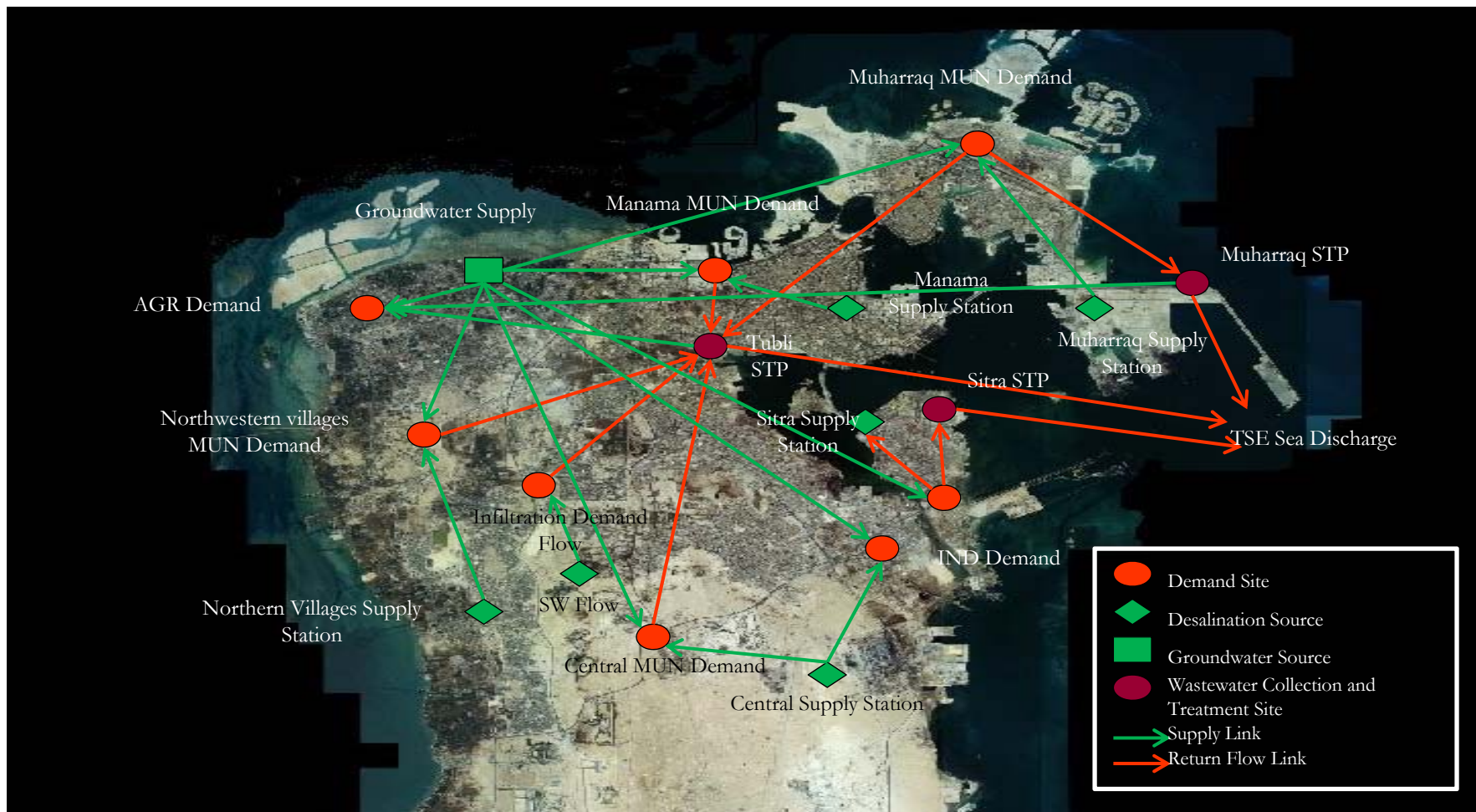
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## **WEAP package (policy evaluation tool)**

- 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



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# 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

## *findings cont's*

### Prominent themes & suggested scenario

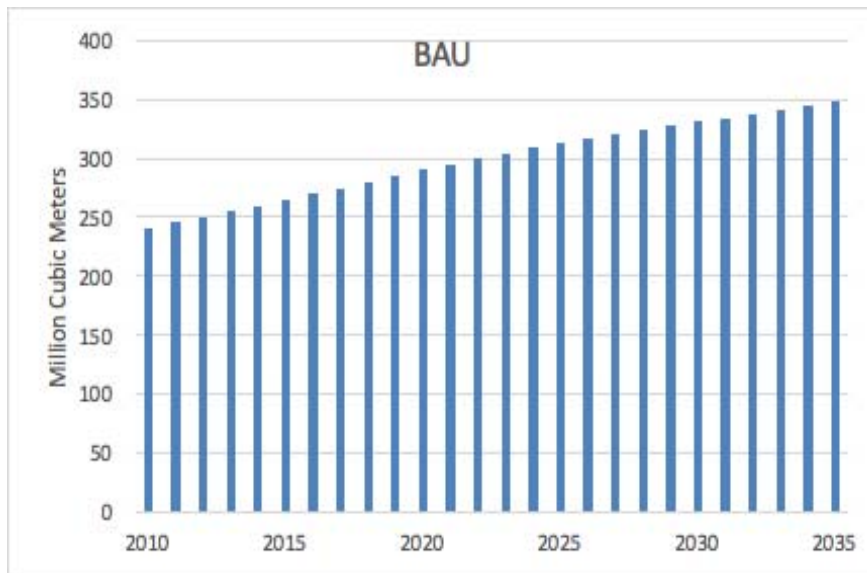
#### options

Scenario	Proposed By	Tools / Interventions
Business As Usual (BAU)	Consumers	Maintain population growth, consumption rate
Capacity expansion and reducing groundwater abstraction	Public Authorities (EWA), practitioners	Increase desalination capacity by building more plants
Leakage reduction in the distribution network	Academics, NGOs	Investment in leakage control unit to ensure the reduction of leakage to 10% over the study period*
Reduce consumption rate	Academics, NGOs, media	Awareness and water saving devices*

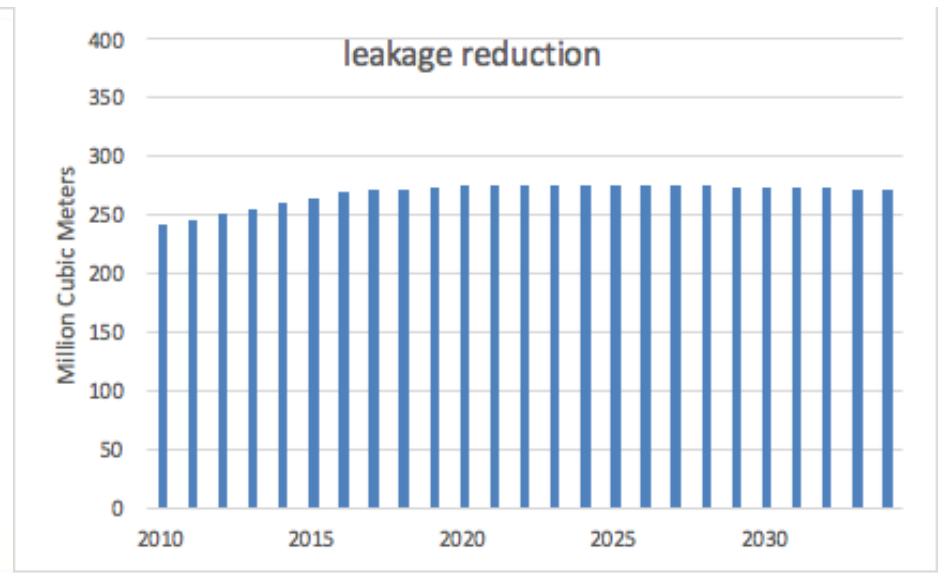
**Table.** Details of WEAP scenarios

# *findings cont's*

## Results of isolated scenarios and combinations



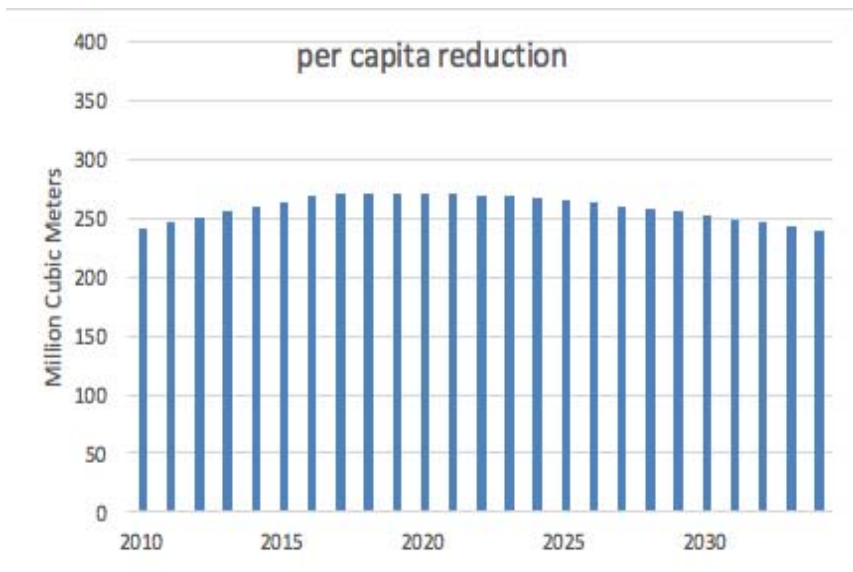
BAU Scenario



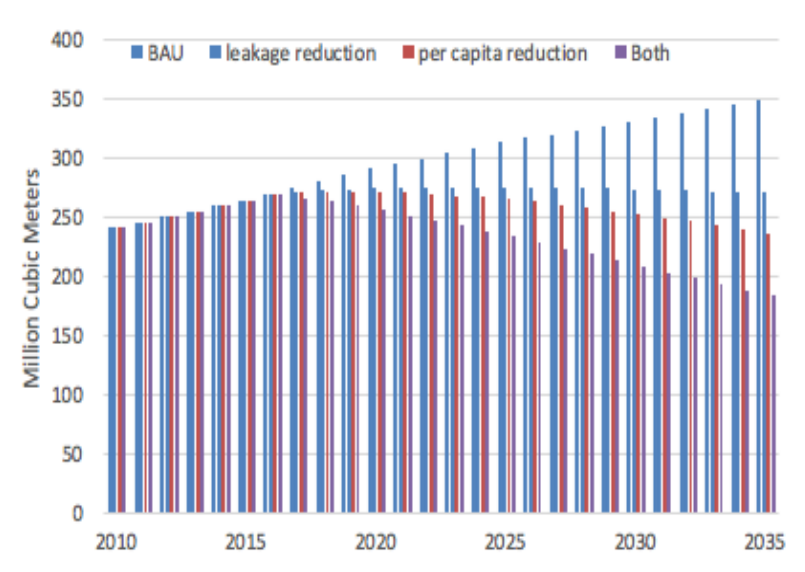
Leakage Reduction Scenario

# *findings cont's*

## Results of isolated scenarios and combinations



Per-capita Reduction Scenario

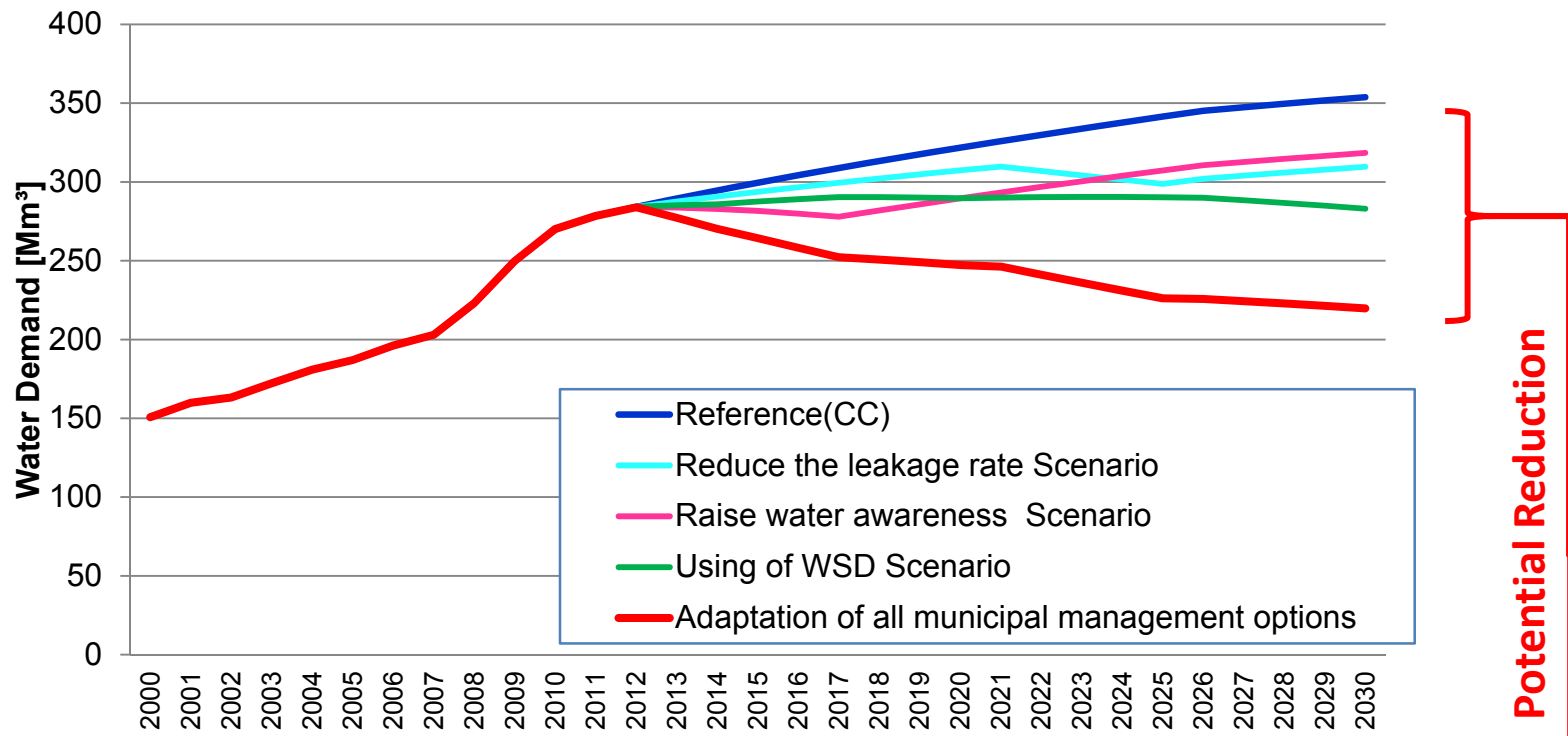


Combination Scenario



# Stakeholder mapping and classification

## Impact of managerial remedies on the municipal water sector demands



**Reduction in Municipal water demand by 220 Mm<sup>3</sup> by 2030**  
**Cumulative 19 years water saving = 1,500 Mm<sup>3</sup>**

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## 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