NATO Advanced Research Workshop

Enhancing Security in the Middle East Through Regional Cooperation on Renewable Energy

Energy and Water, the Two Sides Of the Same Coin

London School of Economics and Political Science

The Global Water Budget

Global Water
97% Seawater
3% Freshwater

Global Freshwater
87% Not Accessible
13% Accessible (0.4% of global)
Fresh Water Is Only 2.5% of All Water

97.5% is salt water

Only 2.5% is fresh water
A Challenge to Water Management

**World Population Growth**

- Developing regions
- Industrialized regions

Water Budgets

Global
97% Salt Water
3% Fresh Water

Freshwater
87% Not Accessible
13% Accessible

MENA
1% of Accessible Freshwater
5% of World Population
Water Scarcity
"The least per capita share in the World"

Global Shares of Renewable Water Resources (2000)

Per Capita Share (cu m/yr)

- Southern America: 35808
- Eastern Europe: 21622
- Northern America: 16368
- C. America & Caribbean: 10867
- World: 7243
- Africa: 4980
- W. & Central Europe: 4270
- Central Asia: 3681
- S. & Eastern Asia: 3518
- Near East: 1909
- Arab Region: 1060
- GCC: 177

GCC = Gulf Cooperation Council
Per Capita Availability Shows Huge Variation

<table>
<thead>
<tr>
<th>Country/region</th>
<th>Water availability</th>
</tr>
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<tbody>
<tr>
<td>North America</td>
<td>&gt; 10,000 m³/year</td>
</tr>
<tr>
<td>Egypt</td>
<td>1,100</td>
</tr>
<tr>
<td>Jordan</td>
<td>260</td>
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Syria’s water table has been declining one meter every year for the past 30 years!
Egypt Water Per Capita
More than one sign
Actual Renewable Water Resources & Dependency Ratio On Neighbors

Average Dependency Ratio of 60%
Absolute Water Scarcity by 2025

Source: The World Vision Report
Water Scenarios and Regional Perspective
New Water Sources
(US cents /cu.m)

- Reduce demand = 10 - 70
- Leakage repair = 10 - 70
- Desalination = 20 - 40
  - (brackish water)
- Wastewater reuse = 10 – 50
  - (Only for irrig. & some industry)
- Desalination = 50 – 90
  - (sea water)

Source: World Bank, 2003 in "From scarcity through reform to security, for WWF3, Kyoto, Japan 2003, p.13"
Scenario Approach

1995
Base year

2025
Sustainable Water Use

2025
Business as Usual

2025
Water Crisis
People without Access to Safe Water in the Middle East and North Africa, BAU

Number of people without access to safe water (millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
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<tbody>
<tr>
<td>1995</td>
<td>25</td>
</tr>
<tr>
<td>2015</td>
<td>20</td>
</tr>
<tr>
<td>2025</td>
<td>18</td>
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People without Access to Safe Water in the Middle East and North Africa, CRI

Number of people without access to safe water (millions)

- 1995
- 2015
- 2025
People without Access to Safe Water in the Middle East and North Africa, SUS

![Graph showing the number of people without access to safe water in millions for the years 1995, 2015, and 2025. The graph indicates a significant decrease from 25 million in 1995 to 8 million in 2015, with a projection of 5 million in 2025.](image-url)