The Water-Energy-Food Nexus: An Overview

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Roadmap

Closing Remarks
Data and Modeling Challenges
Nexus Case Studies
Nexus Platform
What is Being Projected
Global Shifts and Changes
Who We Are?
1. Water-Energy-Food Nexus tradeoffs & analysis platform

2. Green Water accounting & modeling for localizing food security

3. Long term impact of non-traditional water re-use.

4. Advise private & public sectors on W-E-F security
Global Risk 2015 Report

Top Global Risks of highest concerns

The Big Risks: Economic, environmental and societal risks dominate. Although they were noted as major causes for concern, geopolitical and technological risks didn’t come high on the radar.
What is Being Projected?
Many Drying Regions

River Flows

Soil Moisture


Source IPCC 2013, WGI
The need for a holistic and system level platform for resources nexus solution assessment
Grand Challenges
achieving water and food security; harmonizing humans and nature; feasible implementation mechanisms

Water-Energy-Food nexus interconnectedness (Mohtart, 2011)
Water-Energy-Food Nexus Tool 2.0 ©
Rabi Mohtar & Bassel Daher (Chatam House, 2014)

Local Characteristic Data
- Local Yields
- Water Requirements
- Import Data
- Land Availability
- Energy Requirements
- Other

Scenario Components
- Food Self-Sufficiencies
- Water Sources & Amounts
- Energy Sources & Amounts
- Sources of Import Countries

The Resource Management Strategy Guiding Tool
wefnexus2tool.org

Scenario Resource Requirements

Resource Indices

Sustainability Indices
### Case Studies

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<tr>
<th>Food security</th>
<th>Fracking-Water-Transportation</th>
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<tr>
<td>(Case study: Qatar)</td>
<td>(Texas)</td>
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<tr>
<th>Water gap in Texas</th>
<th>US-China Trade</th>
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<th>Renewable Energy</th>
<th>MENA Food Security</th>
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Qatar Food Security (cont’d)

Hypothetical Scenario

Percentage change for resources as a result of 10% increase in self-sufficiency per product

- WATER: +82%
- LAND: +153%
- E1: +82%
- E2: +97%
- C1: +82%
- C2: +93%
- F Local: +78%
- F Import: -12%
- E-IMP: -11%
- C-IMP: -11%

% CHANGE
Data and Modeling Challenge

A. Stakeholders:
   • Define your stakeholders!
     – Private, public, or science sector
     – At local, regional or national

B. Modeling:
   • Scale & Scope of modeling consistent with needs
   • Process modeling or tradeoffs analysis

C. Data:
   • Interlinkages data
   • Data resolution: Aggregation ad Disaggregation
   • Data quality and access