Food Security in the GCC Countries
Waleed K Al Zubari

Overview
- Water in GCC
- Water Uses & Supply
- Agriculture Water Use
- Food Security
- Maximizing Food Self-Sufficiency
- Concluding Remarks

Water in GCC
- Very poor endowment of water resources; no surface water
- Rapid socio-economic development and population growth; continuous decrease in per capita freshwater availability

Trends in per capita freshwater availability

Driving Forces
- Agricultural development policies that will shift GCC water consumption
- Environmental degradation
- Increase of agricultural land and irrigated areas
- Increasing population
- High water consuming crops
- Limited water for the rest as urban and industrial uses

Water Uses & Supply

Agricultural Water Use
Agricultural water use and irrigation water requirements for the GCC countries

Food Security
- Food Security vs. Self-sufficiency
- Food Security: availability, accessibility, utilization, and stability
- GCC has medium to low food security risk index (FAO-Maplecroft, 2014)

Concluding Remarks
- GCC food security can be achieved by a complementary and balanced agricultural policy mix between
  - Efficient, rational local agriculture (takes into account the limited water resources)
  - Food imports
  - Agricultural investment abroad in food strategic commodities

Maximizing Food Self-Sufficiency
- Agriculture is the largest water consumer with the largest potential for water saving, imperative to:
  - Improving irrigation efficiency
  - Improving crop productivity (kg/ha)
  - Improving water productivity (kg/m³)
  - Expansion in the use of FISE
  - Reducing post-harvest losses
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Driving Forces
- Agriculture development indicators
- Food security
- Population growth indicators
- Climate change and variability
- Food consumption and production
- Economic growth and poverty reduction

Long-term Water Use
- Agricultural, industrial, and domestic uses

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Regional Arab agricultural integration combining the relative comparative advantages in water & land, human resources, and financial resources
- PPP and supported by active agricultural R&D
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Trends in per capita freshwater availability
IPCC (2007) Fifteen model mean changes
Water Uses & Supply

- AGR: 77%
- MUN: 18%
- IND: 5%
- TWW: 3%
- DES: 19%
- GW: 78%
Agricultural Water Use

- Agricultural water consumption continues to grow with no consideration to limited water resources in many GCC countries

![AGR water consumption, MCM](chart)

**AGR expansion based on fossil water**

![Fossil water map](image)
Groundwater Over-exploitation

GW Level Changes in Eastern AD, 2008-2010 (EAD, 2014)

Agricultural activities and groundwater nitrate pollution in UAE (Rizk, 2014)

Sea water intrusion and aquifer salinization in south Al-Batinah region, Sultanate of Oman (Al-Amri, et al., 2014)
Driving Forces

• Agricultural development policies (food self-sufficiency) & socio-economic development
• AGR Consumption is exaggerated by:
  • predominance of traditional irrigation systems
  • cultivating high water consuming crops
  • lack of water tariff (as well as lack of metering in many countries)
Food Security

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Maximizing Food Self-sufficiency

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WEF Nexus
Approach Initiatives
from the Region
Qatar National Food Security Program (QNFSP)

By overcoming the natural constraints through innovation and implementation of sustainable infrastructure

- Renewable Energy
- Desalination and water management technologies
- Agricultural Production
- Food Processing

SUSTAINABILITY MATRIX

- Policy
- Legislation
- Regulation
- Sustainability Matrix

Basic and Fundamental R&D
Applied R&D
Concluding Remarks

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cont., Concluding Remarks

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