

# THE MENA NEXUS INITIATIVE FOR A GREEN ECONOMY, HUMAN SECURITY AND STABILITY

RABI H. MOHTAR

GLADA LAHN

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BONN, MAY 2014

# MOTIVATION

**Fast growing population and demands**

**Environmental degradation**

**Impacts of climate change**

**Resource scarcities and human insecurities**

**Increasing dependence on other regions (trade and FDI)**

# MOTIVATION - OPPORTUNITIES

**Improving resource use efficiencies**

**Reducing environmental stress  
and promoting development**

**Building on energy:  
renewables and others**

**Building on diversity -> opportunities for sharing of  
knowledge, technologies, best practices etc**

**Maintaining and promoting wealth and heritage  
for future generations**

# GOALS OF THE MENA NEXUS INITIATIVE

- **identify opportunities for implementation / mainstreaming**
- **demonstrate practical solutions**
- **provide a platform for dialogue, sharing of experience, data, tools**
- **build a community of practice**
- **develop national / regional sustainability roadmaps**
- **support conflict resolution and cooperation**
- **develop funding proposals**

## NEXT STEPS

- **feedback to this session and concept paper**
- **continuous development of the initiative and action plan**
- **national consultations**
- **Rabat, Morocco, June 11-13, 2014**
- **World Water Week, Stockholm, August 2014**

# SESSION OUTLINE

short interventions, followed by moderated discussion

**Nadim Farajalla (AUB)**

*Nexus case study from Lebanon, solar energy for water supply*

**Jean Marc Faures (FAO)**

*Coping with water scarcity and energy smart agriculture*

**Rabi Mohtar (Texas A&M)**

*Nexus tools for assessing tradeoffs and synergies*

**Divyam Nagpal (IRENA)**

*A nexus approach to renewable energy*

**Manfred Lange (Cyl)**

*Nexus database and high performance computing node for MENA*

**Jane Glavan (EAD)**

*Abu Dhabi Global Environmental Data Initiative*

**Glada Lahn (Chatham House)**

*Economic incentives for a nexus approach*

# Implementing the Nexus in Lebanon – Ras Baalbek Case Study



NADIM FARAJALLA AND ELIE GHADBAN

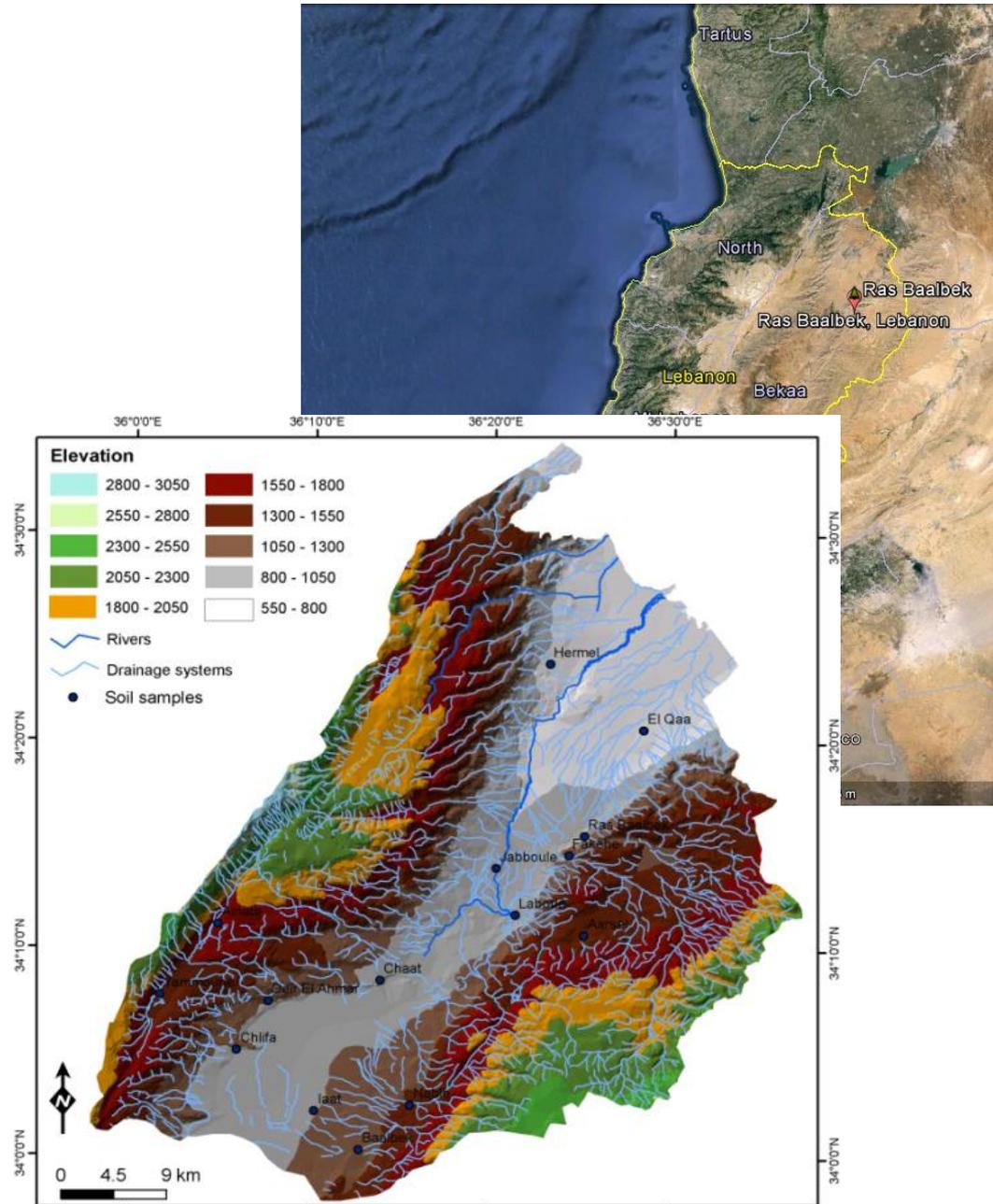
AMERICAN UNIVERSITY OF BEIRUT

ISSAM FARES INSTITUTE FOR PUBLIC POLICY AND INTERNATIONAL  
AFFAIRS

CLIMATE CHANGE AND THE ENVIRONMENT IN THE ARAB WORLD  
PROGRAM

## Ras Baalbek, North Eastern Lebanon

- Population of: 4000 + 1000 Syrian Refugees
- Average annual rainfall: 200 - 250 mm
- Agricultural land use (field crops, seasonal vegetables)
- Elevation ~1100 m amsl
- Within the Orontes catchment
- Underlain by significant aquifer





## Solution:

- Solar power pump:  
Initial investment  
\$70,000

## Benefits

- Stable and secure access to water
- Reduced annual cost
- Villagers able to safely plant in their private lots and sell surplus

- Higher cost of access to private  
00/yr  
25% of



# QUESTIONS RAISED

**Will more water be used?**

**Will more people access this resource now?**

**What is the role of the local authority?**

**What is the role of the central government?**

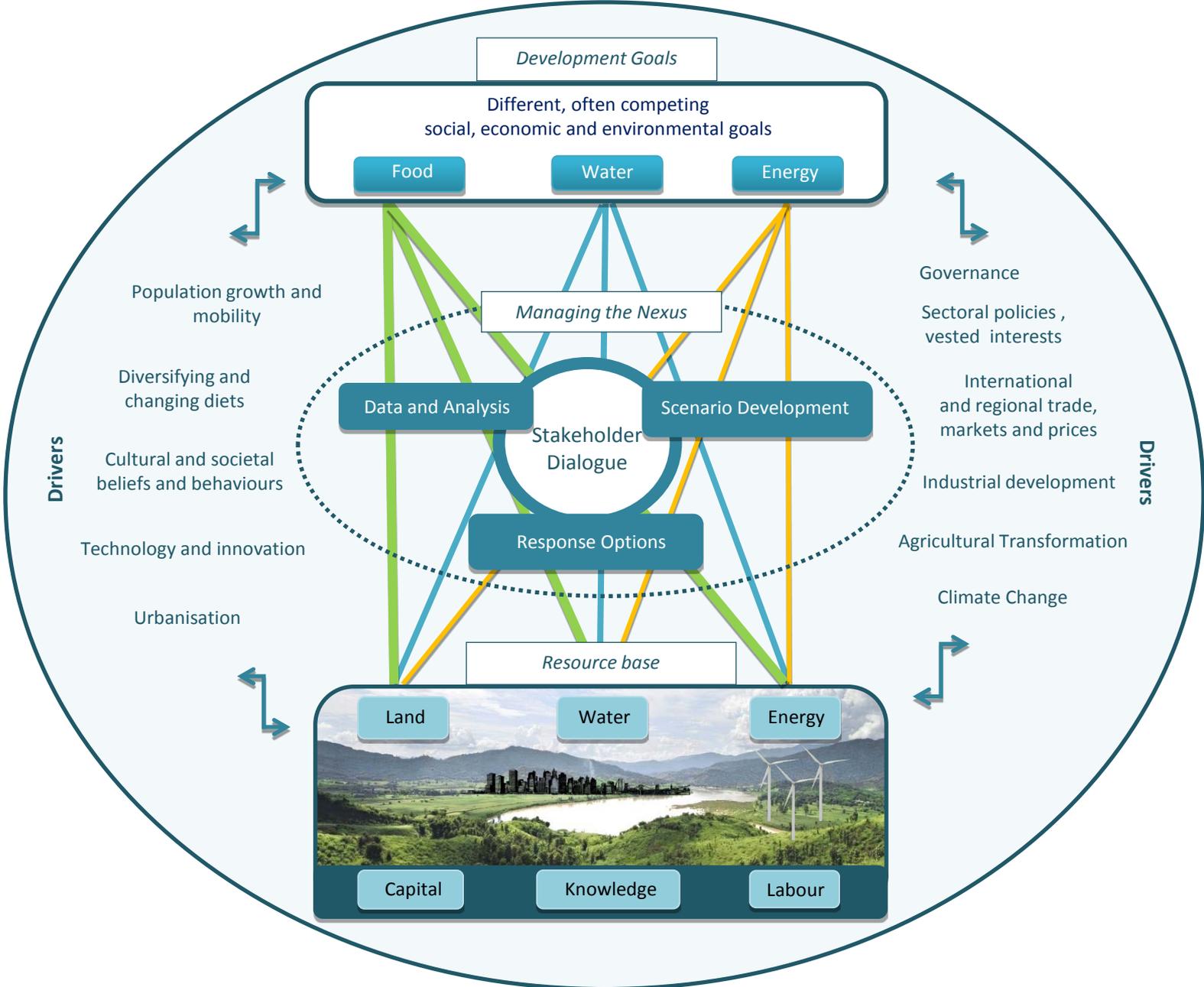
**How sustainable is this option given the lack of regulations controlling access to groundwater?**

# IMPLEMENTING THE WATER-ENERGY-FOOD NEXUS IN THE MENA REGION

## FAO WATER SCARCITY INITIATIVE FOR THE NEAR EAST AND ENERGY-SMART FOOD CONCEPT

JEAN-MARC FAURÈS  
FAO LAND AND WATER DIVISION

# The FAO approach to the Water-Energy-Food Nexus



# Approach

- Identify and quantify most relevant interlinkages
- Develop scenarios and assess impacts

# Response options

- **Across sectors:** ●
  - Transparent and effective allocation mechanisms
  - Management of trade-offs
  - Enhancement of synergies
- **Within sectors:** ●
  - Resources use efficiency → increased productivity of resources
  - Reduction of wastes and losses

## Example 1: the Water Scarcity initiative for the Near East

- Target: food security
- Acknowledges and addresses cross-sectoral interactions on water
- Works both within sector (Ag, Agwater) and across sectors

### Elements of the programme:

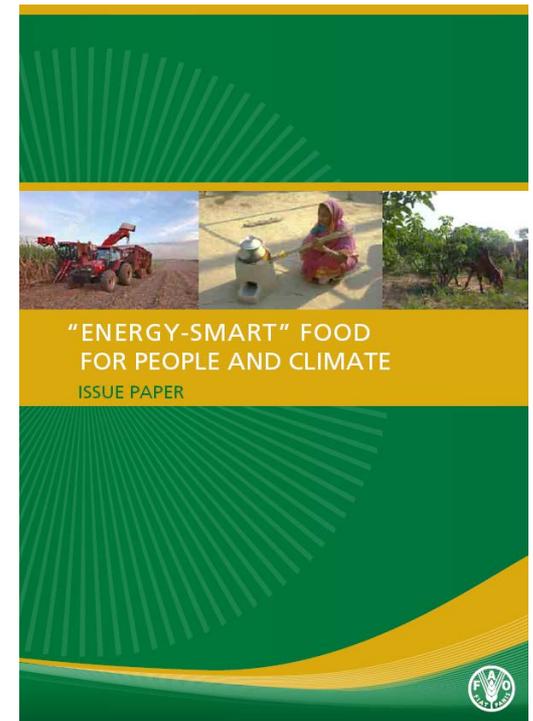
1. Strategic planning of water resources. ●
2. Innovative **governance** mechanisms and modern **institutions** ● ●
3. Improve **agriculture water use efficiency and crop water productivity** in both **rainfed** and **irrigated** agriculture ●
4. Enhance the **supply-side** through the optimal use and reuse of **unconventional** water (brackish and wastewater use) ● ●
5. Support **benchmarking, monitoring and reporting** mechanisms ● ●

## Example 2: FAO's Energy-smart Food for people and climate

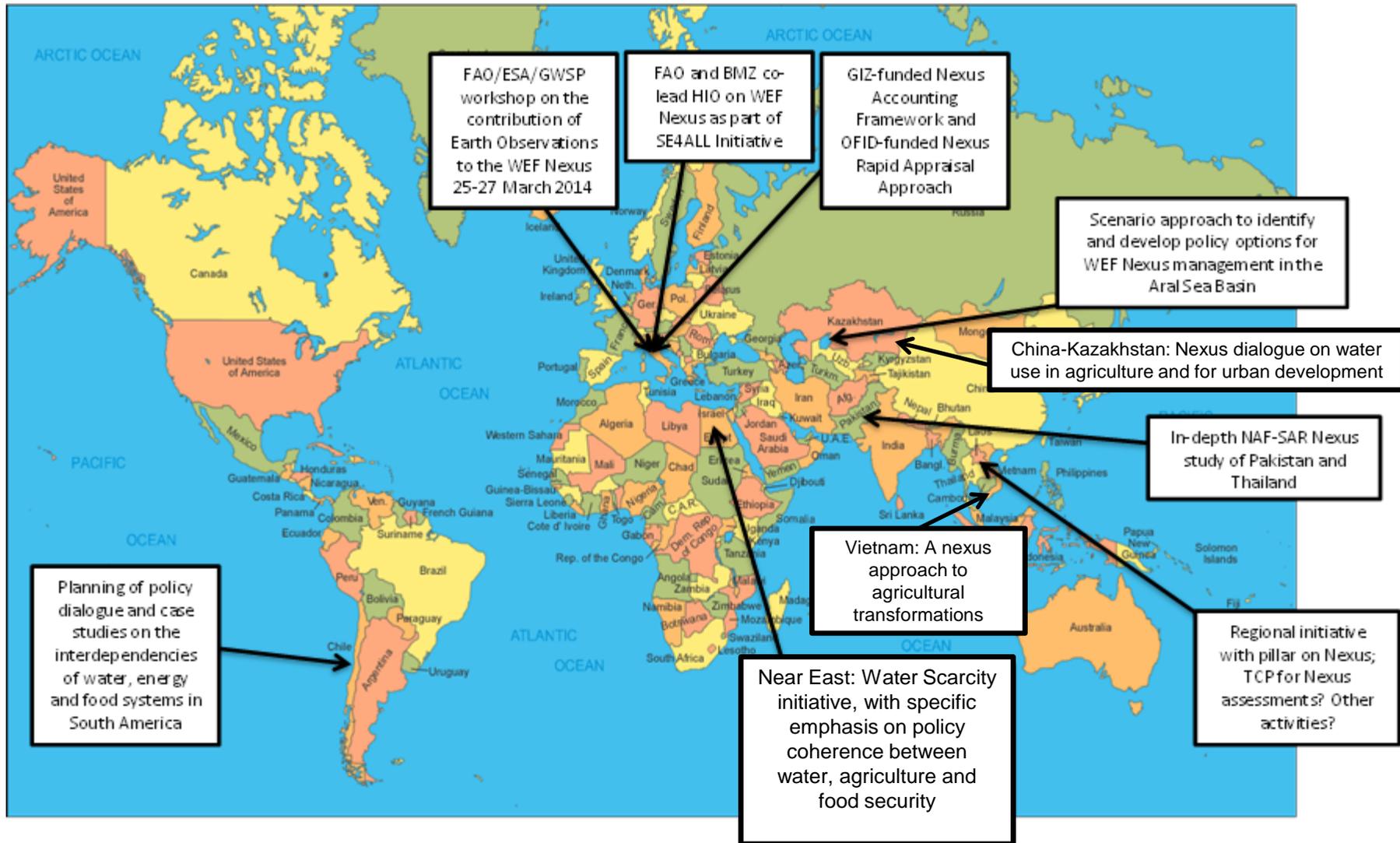
- Target: food security, energy
- Adopts a systems approach
  - Production
  - Food chain
- Focus on energy intensity defined as the amount of energy used per unit of food produced or consumed
- Considers:
  - Energy **for** the food chain
  - Energy **from** agriculture, forests
- FAO and GIZ co-lead SE4ALL initiative on WFE-Nexus



SUSTAINABLE  
ENERGY FOR ALL



# FAO AND THE NEXUS



## **The Nexus at FAO:**

**Programme: Strategic Objective 2:** Sustainable production improvement and increase from agriculture, forestry and fisheries

- Major Area of Work: Sustainable Intensification through resources use efficiency

**Institution: Deputy General Directorate for Natural Resources**

- Land and Water Division
- Climate, Energy and Tenure Division

# THE WATER, ENERGY AND FOOD (WEF) NEXUS: A BASIS FOR STRATEGIC PLANNING FOR NATURAL RESOURCES SUSTAINABILITY

## Problem Statement

Decision makers in the MENA region suffer from the absence of a comprehensive framework that allows integrative management and planning for the future of resources, thus posing a threat to socioeconomic sustainability and resilience to global stresses.

## Project Objectives

1. Development and deployment of an integrated resource management tool based on the water- energy-food nexus framework
2. Implementation and evaluation of the tool over a wide range of climatic and socio-economic zones represented by different countries in the MENA region
3. Avail, as a by-product, a standardized WEF-nexus optimum institutionally coordinated database
4. Engage decision makers in the process of improving current policies, and strengthening relevant public-private collaboration through the use of the proposed tool.

## Case Studies

Qatar - Jordan  
- Tunisia -  
Indiana USA

## Project



# Renewable Energy and the Water, Energy and Food Nexus

## Project Objectives

- Leverage on existing knowledge to develop an empirical energy-centric nexus tool which will provide qualitative estimates of the impact of renewable energy deployment on the different elements of the water, energy, and food nexus.
- The tool should support policy makers in:
  - optimizing the level of renewable energy that can be sustainably integrated into the national energy mix; and/or
  - assessing the impact of existing renewable energy targets on other national resource needs.
- Disseminate the key findings from the study among different stakeholders through platforms such as the World Future Energy Summit 2014.

## Scope

The geographical scope of the work is global.

## Target Audience

Policy makers within national governments, specifically those involved in national resource planning.

Ongoing (Phase I to end in August 2014)

Partnership between  
 IRENA  
International Renewable Energy Agency

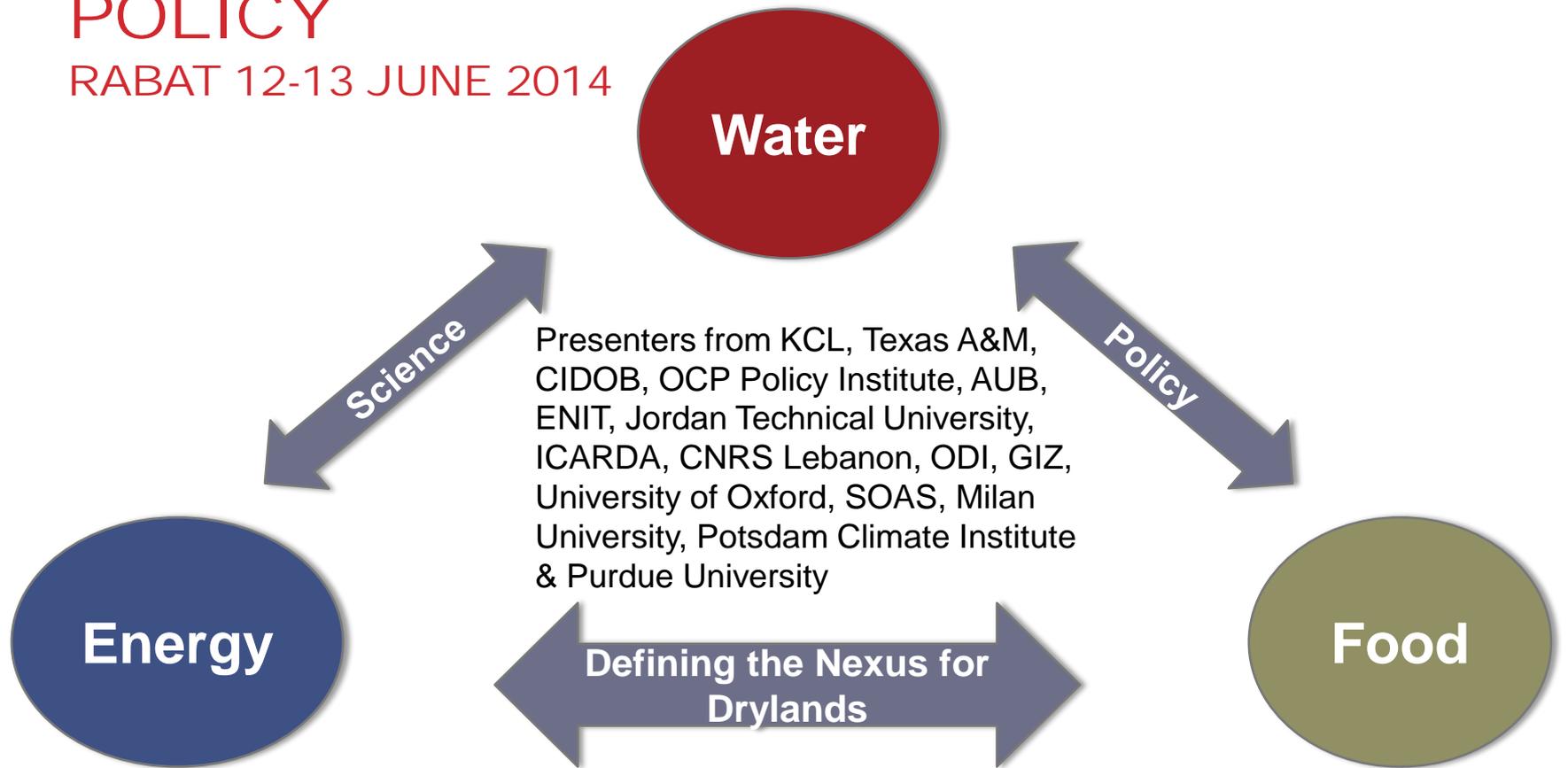
and



TEXAS A&M  
UNIVERSITY

# THE WATER-FOOD-ENERGY-NEXUS IN DRYLANDS: BRIDGING SCIENCE AND POLICY

RABAT 12-13 JUNE 2014



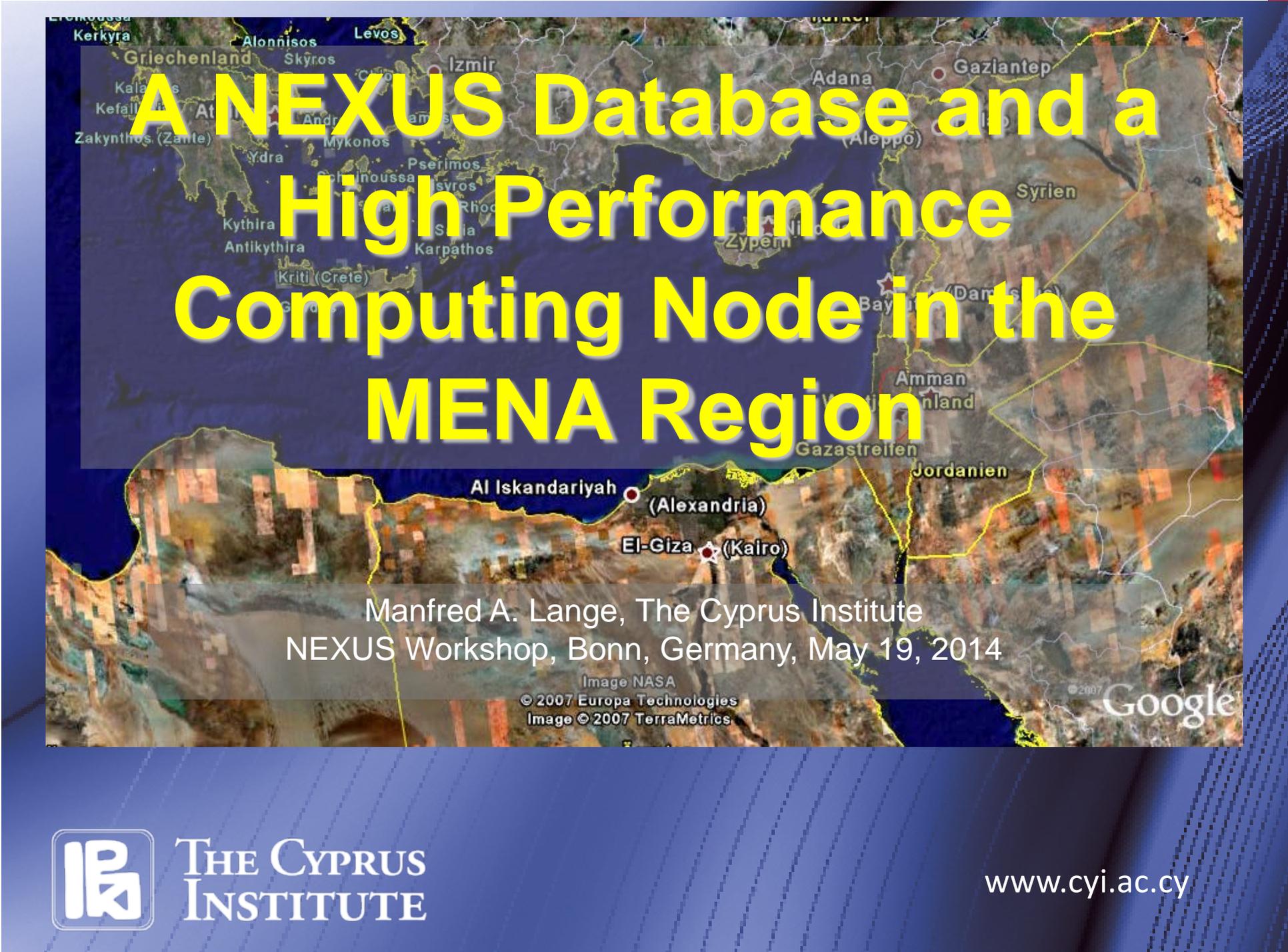
Convened by:



TEXAS A&M  
UNIVERSITY



Convenors:  
Rabi Mohtar,  
Tony Allan,  
Karim Al-Aynoui, Eckart  
Woertz &  
Martin

A satellite-style map of the Mediterranean region, showing parts of Greece, Turkey, Syria, Jordan, and Egypt. The map is overlaid with a semi-transparent blue rectangle containing yellow text. The text reads: "A NEXUS Database and a High Performance Computing Node in the MENA Region". The map shows various cities and islands, including Athens, Izmir, Adana, Gaziantep, Aleppo, Damascus, Amman, Jordanien, Gazastreifen, Al Iskandariyah (Alexandria), and El-Giza (Kairo).

# A NEXUS Database and a High Performance Computing Node in the MENA Region

Manfred A. Lange, The Cyprus Institute  
NEXUS Workshop, Bonn, Germany, May 19, 2014

Image NASA  
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Google



THE CYPRUS  
INSTITUTE

[www.cyi.ac.cy](http://www.cyi.ac.cy)

# THE CYPRUS INSTITUTE – BASIC SETTING

- A research and educational institution suited to a knowledge economy, taking advantage the Cyprus «gateway» niche
- A European institution, for the Eastern Mediterranean based in Cyprus
- A non-governmental institution devoted to advancing peace and prosperity in the region through science and technology

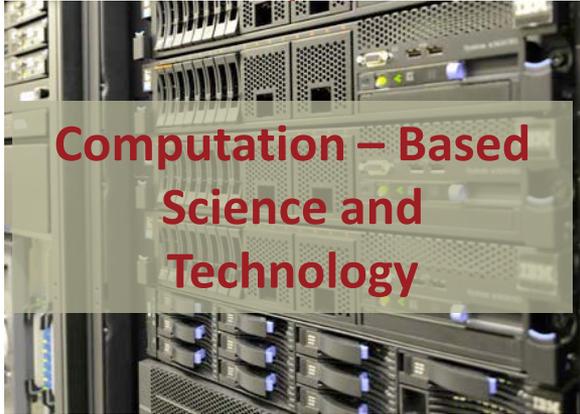
## Research Centers: the “fundamental” building- blocks of The Cyprus Institute



Energy, Environment  
and Water



Science and Technology  
in Archaeology  
(& Culture)



Computation – Based  
Science and  
Technology

# THE NEXUS INITIATIVE IN CONTEXT

The Cyprus Institute is currently involved in a number of initiatives:

- to become the Regional Hub for the large international initiative Future Earth (<http://www.icsu.org/future-earth>)
- to become the Eastern-Mediterranean Hub of the UN Sustainable Development Solutions Network (<http://unsdsn.org/>)
- to take on the role as National Focal Point in the context of the Blue Green Dream Project (EIT-Climate KIC; <http://bgd.org.uk/>)

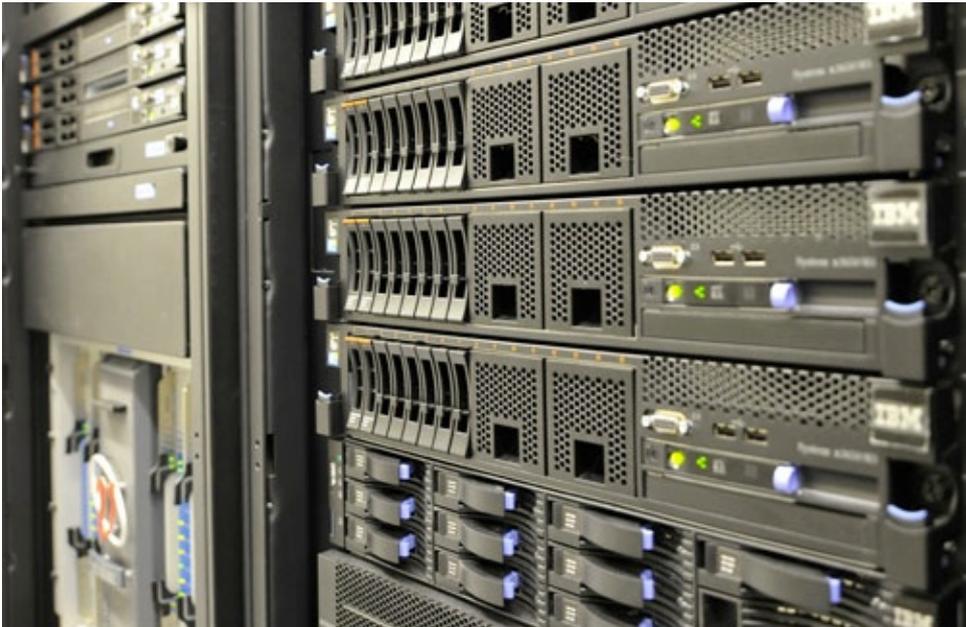


# HIGH PERFORMANCE COMPUTATION FACILITY

High Performance Computing: Cy-TERRA hybrid cluster

LinkSceem 2 (<http://www.linksceem.eu/ls2/>): HPC resources, data base hosting as well as training and capacity building

DARECLIMED (<http://www.cyi.ac.cy/index.php/dareclimed-welcome.html>): *paving the way* to design and implement a repository of climate, energy and water data



# ABU DHABI GLOBAL ENVIRONMENTAL DATA INITIATIVE

FACILITATING A  
SUSTAINABLE FUTURE.  
LOCAL TO GLOBAL.



مبادرة أبوظبي العالمية للبيانات البيئية  
Abu Dhabi Global Environmental Data Initiative

# BACKGROUND

## The first Arab Region Type II Initiative explained

- ❖ Established as a Type II partnership – joint venture between Environment Agency (EAD) – Abu Dhabi & United Nations Environment Programme (UNEP)
- ❖ Type II Partnership Initiative: **Partnerships for Sustainable Development.** Voluntary partnerships and initiatives to implement Agenda 21 and the Millennium Development goals
- ❖ AGEDI principles and objectives are in accordance with Rio Declaration principles, Chapter 8 & 40 of Agenda 21
- ❖ UNEP-EAD partnership is central to AGEDI - first of its kind in the Arab region
- ❖ Gives responsibility for EAD to the Arab world, as well as exposure and credibility regionally and internationally



# Milestones

Facilitating a sustainable future.



مبادرة أبوظبي العالمية للبيانات البيئية  
Abu Dhabi Global Environmental Data Initiative



❖ 2004: Inclusion of Abu Dhabi State of the Environment Reporting into AGEDI process

❖ 2006: 9 Environmental Sector Papers published

❖ 2009: SoE Report Abu Dhabi Published  
❖ 2009: Hosted Global Meeting on Environmental Information Networking

❖ 2013: Blue Carbon Demonstration Project  
❖ 2012: Local National & Regional Biodiversity Rapid Assessment  
❖ **2013: Local, National & Regional NRT**  
❖ 2013: Arabian Atlas of Our Changing Environment with UNEP

2002

2004

2006

2008

2010

2013 →

❖ Sept 2, 2002  
AGEDI launched @ WSSD, Johannesburg

❖ 2006: First web based reporting in Region: SoE Report for Abu Dhabi

❖ 2010: Review of State of the Environment Report Abu Dhabi & Sector Papers  
❖ 2010: Environmental Outlook  
❖ **2011: Eye on Earth Summit & inception of 8 Special Initiatives**



# COMMITMENT FOR 2014 AND BEYOND

## ❖ National Reporting Toolkit

Online reporting application that provides users with capabilities to upload data and edit reports. Phase I: within EAD – final stages of ‘proof of concept’ Phase II & III in collaboration with 3 – 6 countries in the Arabian Peninsula to develop a digital country level SOER

## ❖ Blue Carbon Project

Investigates the carbon and coastal ecosystems services and its potential contribution to climate change mitigation efforts, Five key assessment components: Scientific, Geographic, Ecosystem Services, Policy, Carbon Finance Feasibility

## ❖ Facilitation of the eight Eye on Earth Special Initiatives

## ❖ Rapid and Systematic Climate Change Impacts, Vulnerability and Adaptation Assessment for Local, National & Regional

12 sub-projects over a 4 year period; 2 local, 3 national and 7 regional projects across 5 strategic themes regional modelling, socio-economic, biodiversity, water resources and coastal zones



**AGEDI.ae**  
**info@agedi.ae**



## Growing experience in Western Asia & North Africa

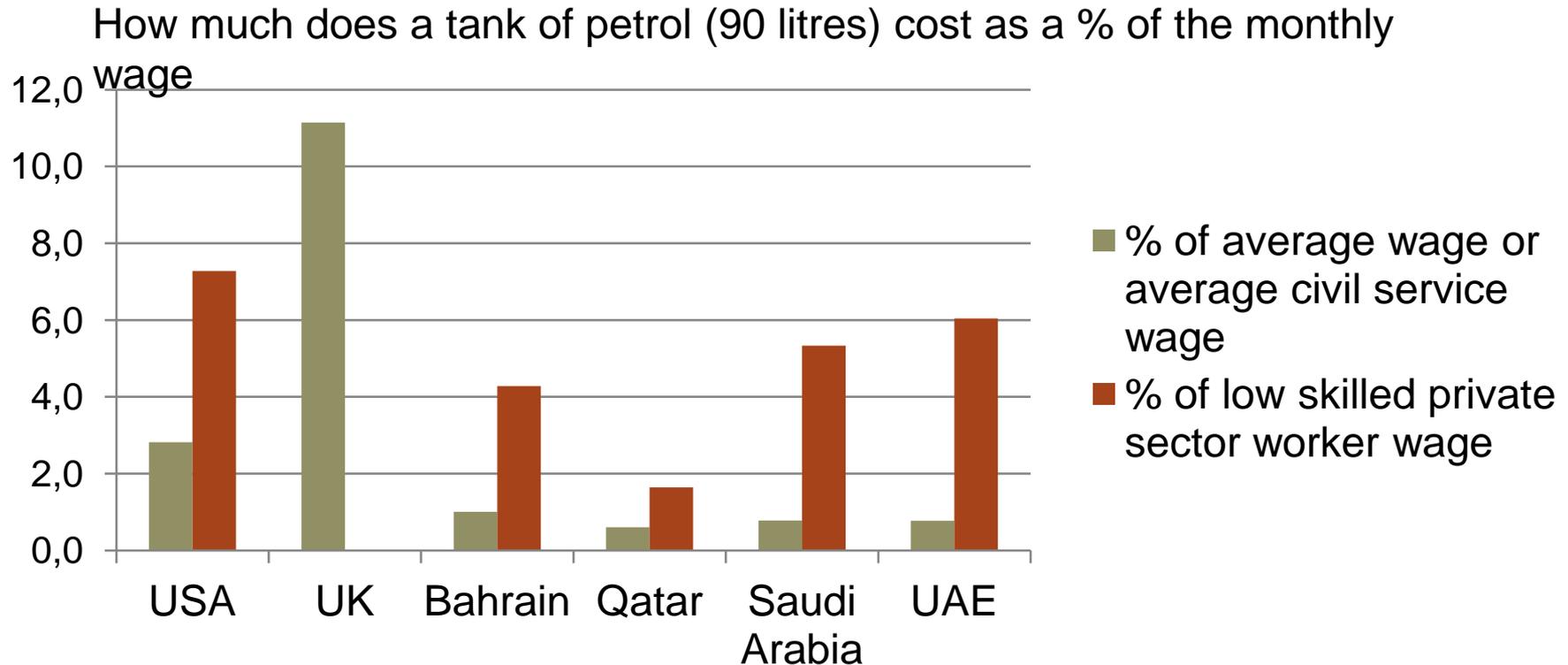
- **Morocco – 1980 – 2006: municipal water price reform** Prices increased by four-to-seven fold during the period.
- **Algeria – 2005 reform of oil and gas sector with attempts to liberalize natural gas markets – 2013 foreign companies must be remunerated at export based cost**
- **Jordan – 2005 – fuel and electricity price rises with targetted transfers & increased food price subsidy**
- **Iraq – 2004-2006 fuel prices rise by 130% + social safety net programme**
- **Iran – 2010 – 2015 ‘Targeted subsidy reform’** gas and fuel product price rises, tariff reform for electricity water and plan for subsidy reduction on basic food stuffs.
- **Dubai – 2011 raises electricity and water prices to cost recovery levels**
- **April 2014: Qatar raises fuel price by 50%**
- **Very little rigourous evaluation of reforms, particularly of inter-sectoral impacts over a realistic timeframe**



Al-Jazeera report on Iran price reforms, March 2010

# Problem is often more political & psychological than about affordability

**“People pay SAR200 (\$53) a month for their mobile phone bills, yet less than SAR1.00 (\$0.27) a month for their household water”** Saudi minister of water and electricity, Abdullah Al-Hussayen



Authors estimates based on World Bank Development Indicators & Hertog (2013): The Private Sector and Reform in the Gulf Cooperation Council, LSE Kuwait Programme on Development, Governance & Globalization in the Gulf States

# SOME ISSUES FOR OIL EXPORTING COUNTRIES IN WESTERN ASIA

**How to price gas? Could greater transparency of cost formulae across the region help?**

**Should non-renewable water resources be priced? If not, how regulated?**

**How can governments best incentivize less water intensive crops and farming practices as part of a subsidy reform plan?**

**How to shift to payment for energy services rather than \$/kwh?**

**What are the costs of the whole desalinated water cycle?**

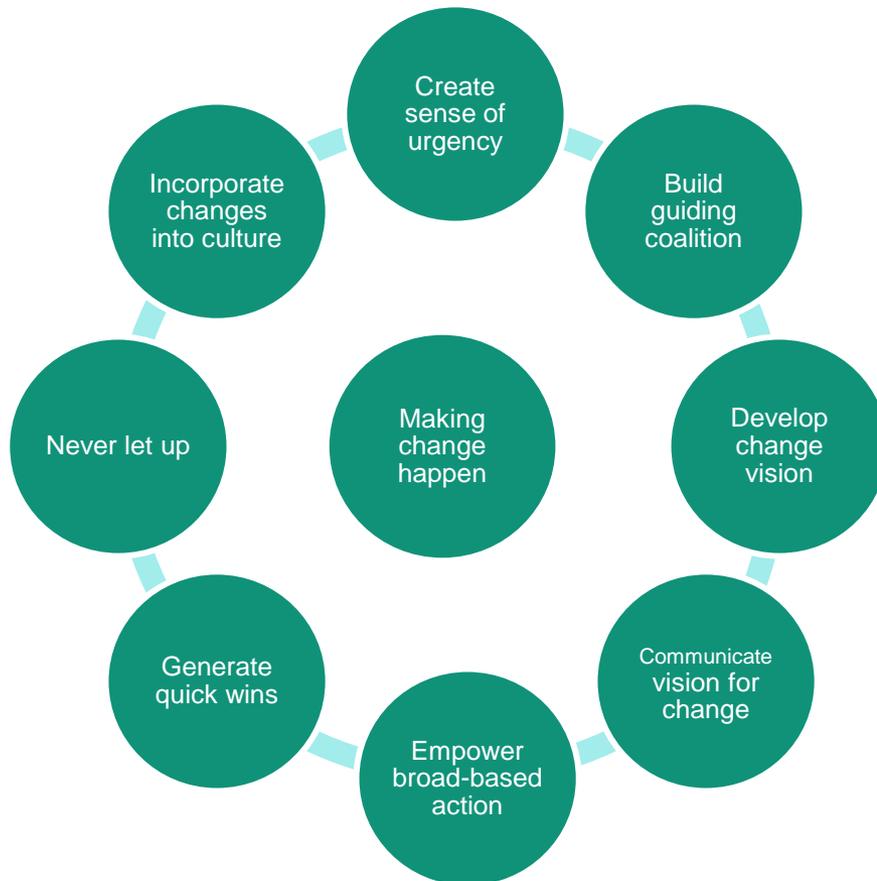
**To what extent will people accept transport fuel rises?**

**What mechanisms are available to smooth inflation?**

**How best to redistribute income/reshuffle subsidies? Universal or targetted transfers?**

## Where might the network engage on price reform issues?

Reforming resource price incentives is about purpose, people and persistence



Adapted from John Kotter 1995/ Graeme Simms 2012

- Sharing well researched facts and data to help make the case to leaders, finance ministries, treasuries and other key policy makers, researchers and journalists
- Working with government entities to conduct modelling to show potential intersectoral impacts e.g. fuel price rises on food, water price rise on households
- Promotion of international experiences of reforms with realistic timelines
- Supporting and learning from national champions through promotion of ideas and networking opportunities, engagement with students
- Discussion of what works governance-wise e.g. administration strategy and capacity building to enable management of accompanying schemes

# ISSUES FOR DISCUSSION

**Motivation – added value of the MENA nexus initiative for sustainable development?**

**Entry points for mainstreaming: what are current issues, concerns, activities that may benefit from a nexus approach?**

**What useful products can a MENA nexus initiative deliver - e.g. best practices, examples of successful integration, economic incentives etc. ?**

**What knowledge and data gaps need to be covered?**

**How do we ensure continuity, e.g. by way of a nexus platform / dialogue, community of practice, network of experts and practitioners?**

**Funding opportunities?**