



Challenges and issues in Water, Climate change and Food security in the Arab Region

Hammou Laamrani

Department of Environment, Housing, Water Resources and Sustainable
Development, League of Arab States

Advisor, Adaptation to Climate Change in Water Sector in MENA, GIZ, Cairo



Outline

- Water Scarcity : current challenges and solutions we already know
- Food security
- Climate change an overarching development challenge:
mainstreaming and proofing
- Concluding remarks



Water scarcity

Supply and demand management, innovation and technology,
governance and social equity

Features of the current water situation

Nature

Water Scarcity
in the AR is the
highest worldwide

AR depends on
transboundary
water for 2/3 of its
surface water

Beyond
control

Institutions and policies

Practices

Supply
driven
policies

Low efficiency
and productivity
in agriculture

Depletion of
groundwater

Fragmented
Institutions

Innovation and
technology not
grounded enough

Water quality
depletion

Room
For
change



Available Water Resources

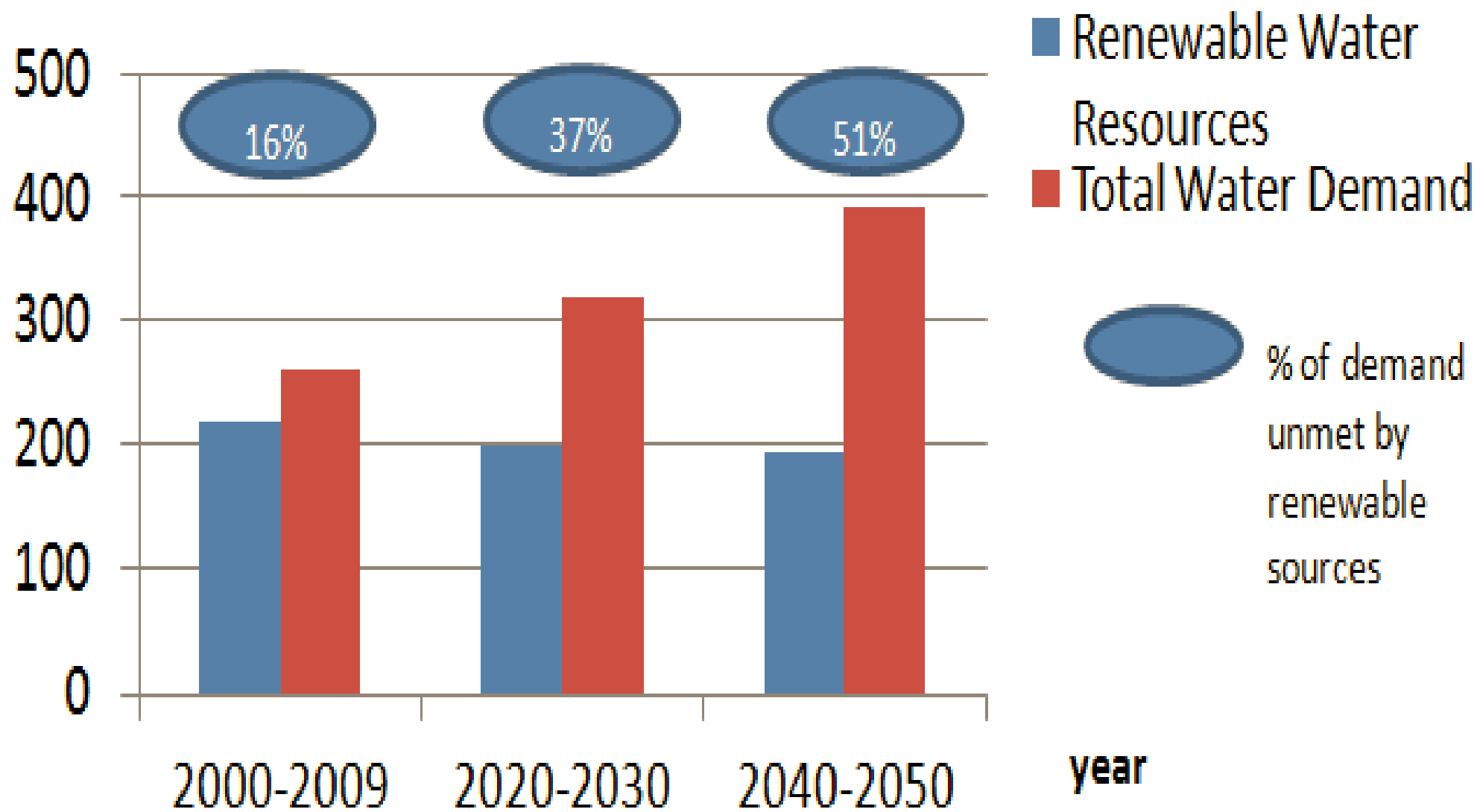
- Surface water 296 Bm³
- Groundwater reserve: 7734, renewable 42
- Total renewable, surface and groundwater: 338 Bm³
- Non conventional water resources : drainage 8.1 desalinated 2.5
- Total available water resources 348.6 Bm³



Water Per Capita in Arab Sub region

Sub Region	Total Renewable Water Resources Km³	Per capita m³/year
Mashreq	79.9	1108.8
Arab Peninsula	15.4	241.5
Middle	10.30	814.2
Maghreb	59.2	708.9
Arab region	257.5	744.5

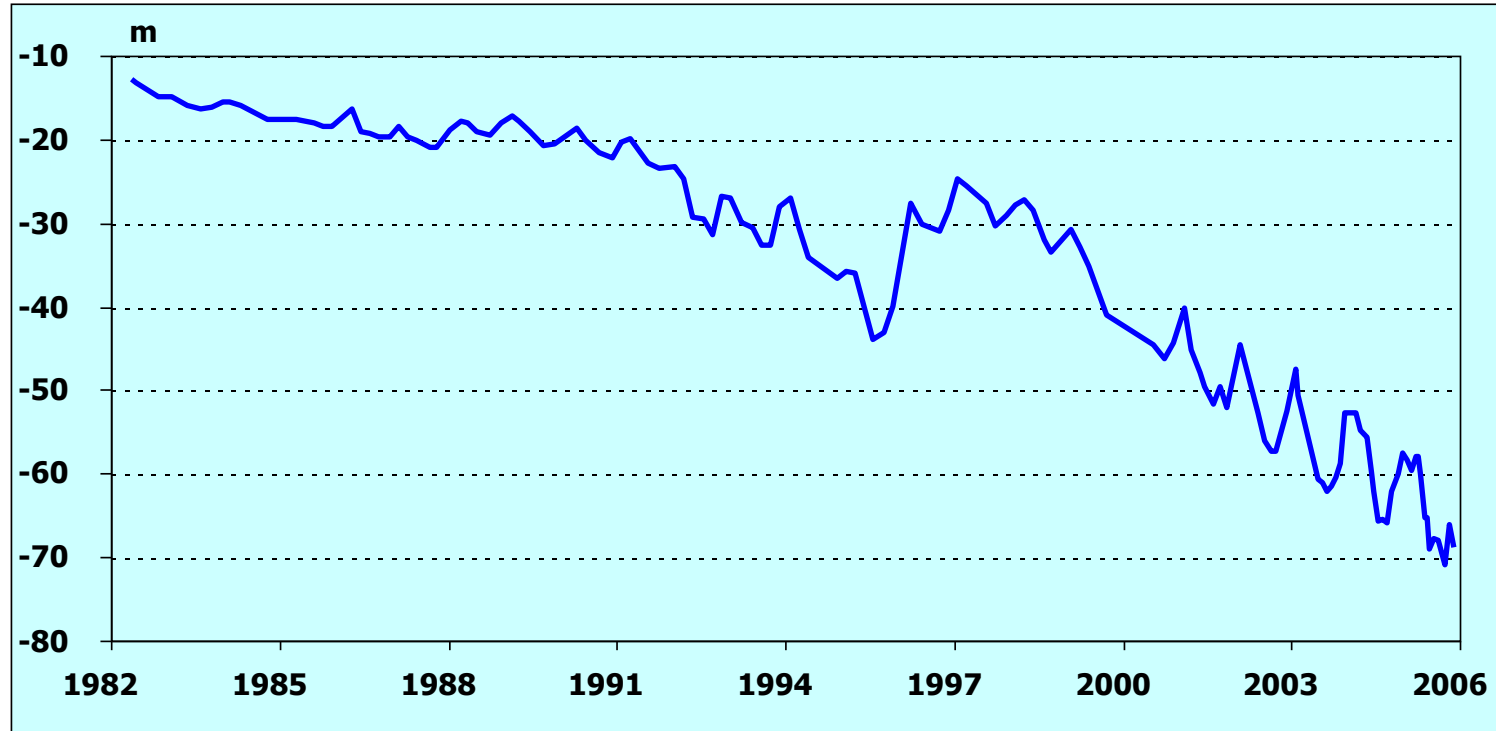
Water, km³





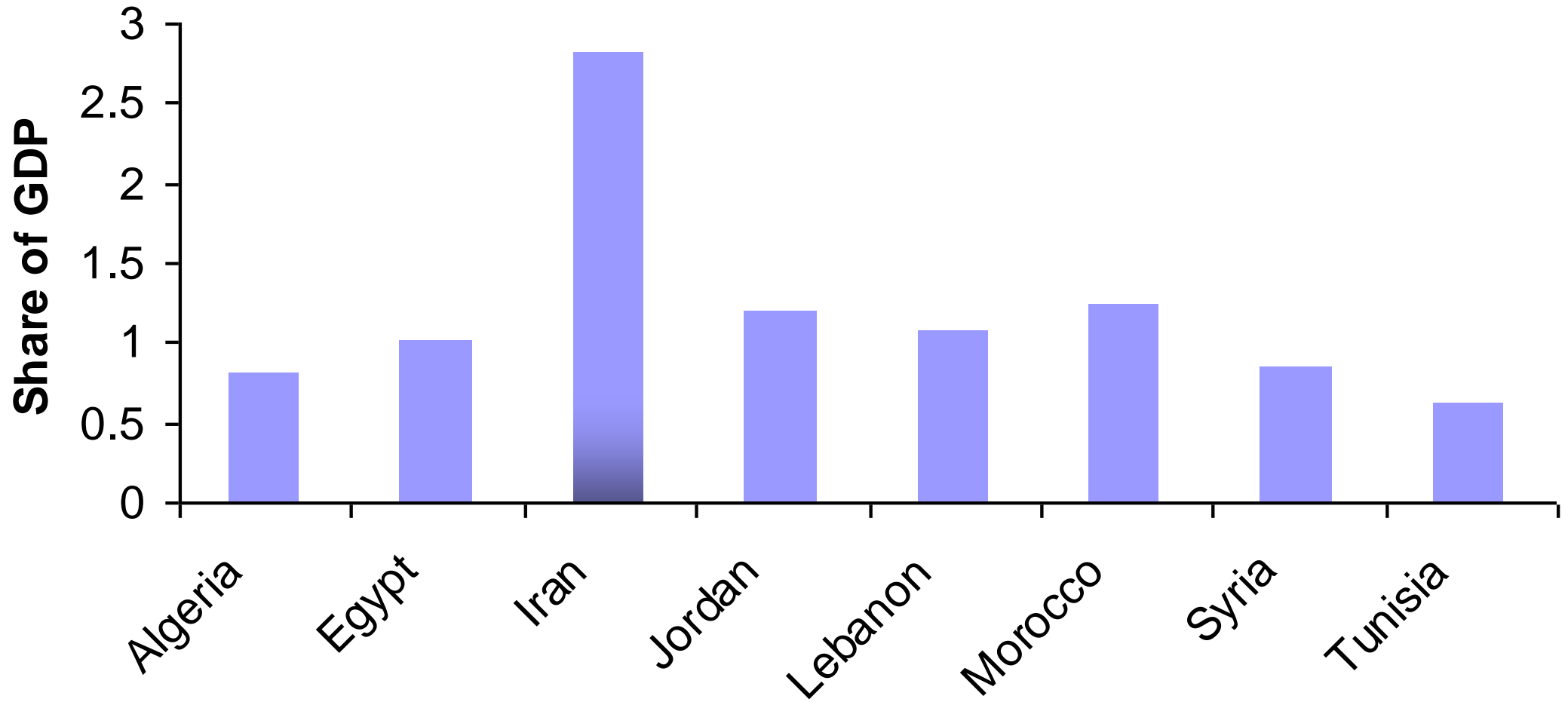
Law enforcement is yet to be fostered to reverse the on-going trend in depletion of “buffer” groundwater reserves

Drop in level of the Souss Aquifer, Morocco





Cost of Environmental Degradation of Water



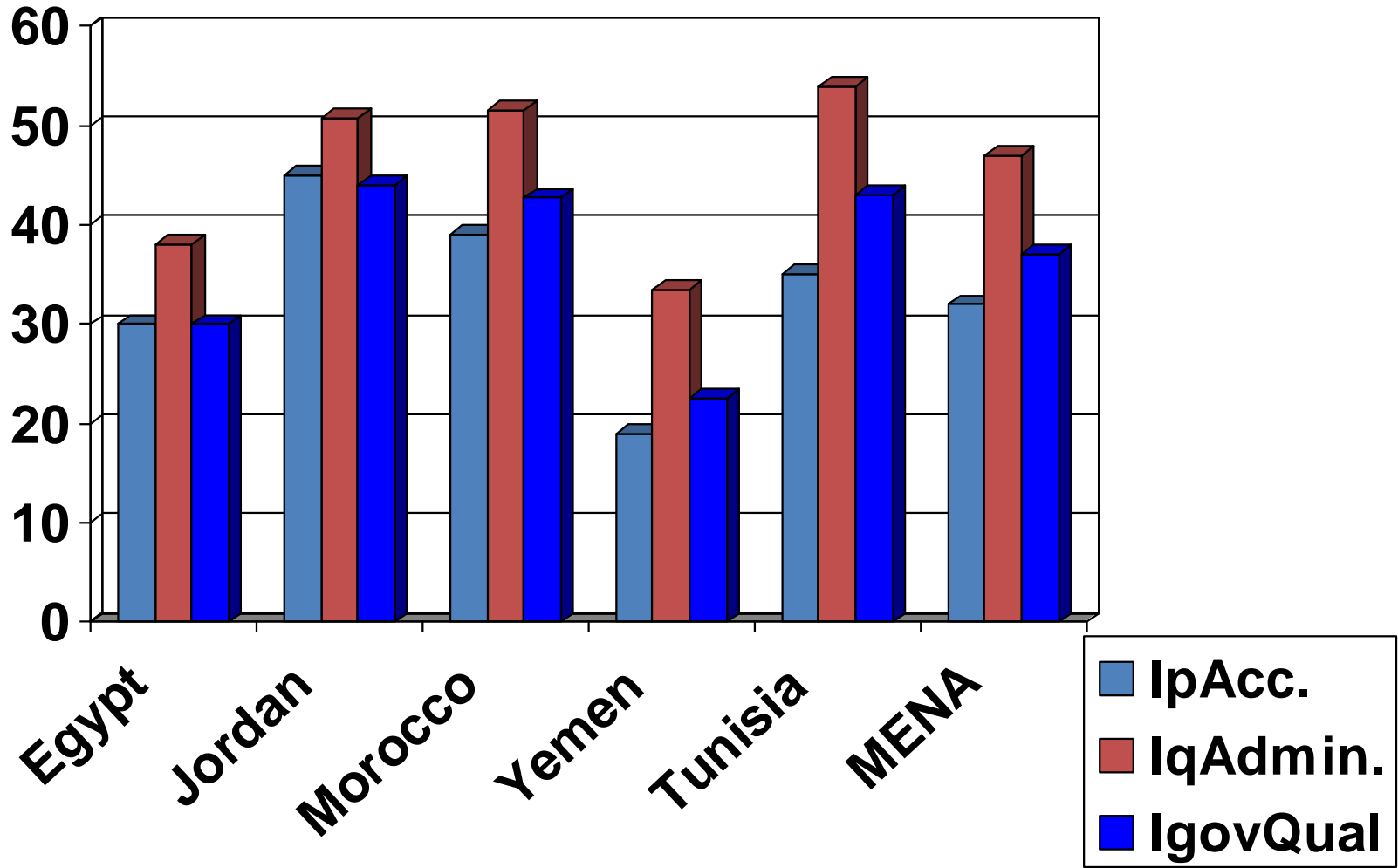
(WB 2007)



Managing the supply side has come to its limit

Country	1990			2005		
	Desalination production (mcm)	Domestic demand (mcm)	Desalination-to-demand ratio (%)	Desalination production (mcm)	Domestic demand (mcm)	Desalination-to-demand ratio (%)
Bahrain	56	103	54	123	133	92
Kuwait	240	303	80	589	610	97
Oman	32	86	37	68	170	40
Qatar	83	85	98	250	252	99
Saudi Arabia	795	1,700	47	1,063	2,458	43
UAE	342	540	63	813	951	85
Total	1,548	2,817	55	2,906	4,574	64

Note: mcm = million cubic meters.





Food Security

The supply side and food production do not mirror the complexity. Access and utilization are often not given attention. Heavy untargeted subsidies, 30% post harvest loss for some commodities and unhealthy diets make obesity and undernourishment/malnutrition coexist in the region

INCREASING FOOD GAP expected to reach 70 B \$ by the year 2025



Arab food trade (\$millions)



Arab food self-sufficiency in %

	2008	2009
Cereal	45.4	49.3
Wheat	41.7	47.9
Corn	35.3	34.1
Rice	74.1	75.05
Barley	21.5	28.9
Vegetable	101.8	101.1
Fruit	98.1	97.5
Sugar	29.1	27.6
Cooking Oil	36.7	32.1
Meat	86.6	86.1
Poultry	75.1	74.5
Egg	98.7	98.1
Fish	106	106
Dairy	70.1	68.5

CEREAL IMPORTS 2009

	Volume '000 Ton	Volume US\$ Millions
Wheat	29,467	9,050
Corn	15,582	3,240
Rice	3,982	2,475
Barley	10,725	2,499
TOTAL	59,756	17,264

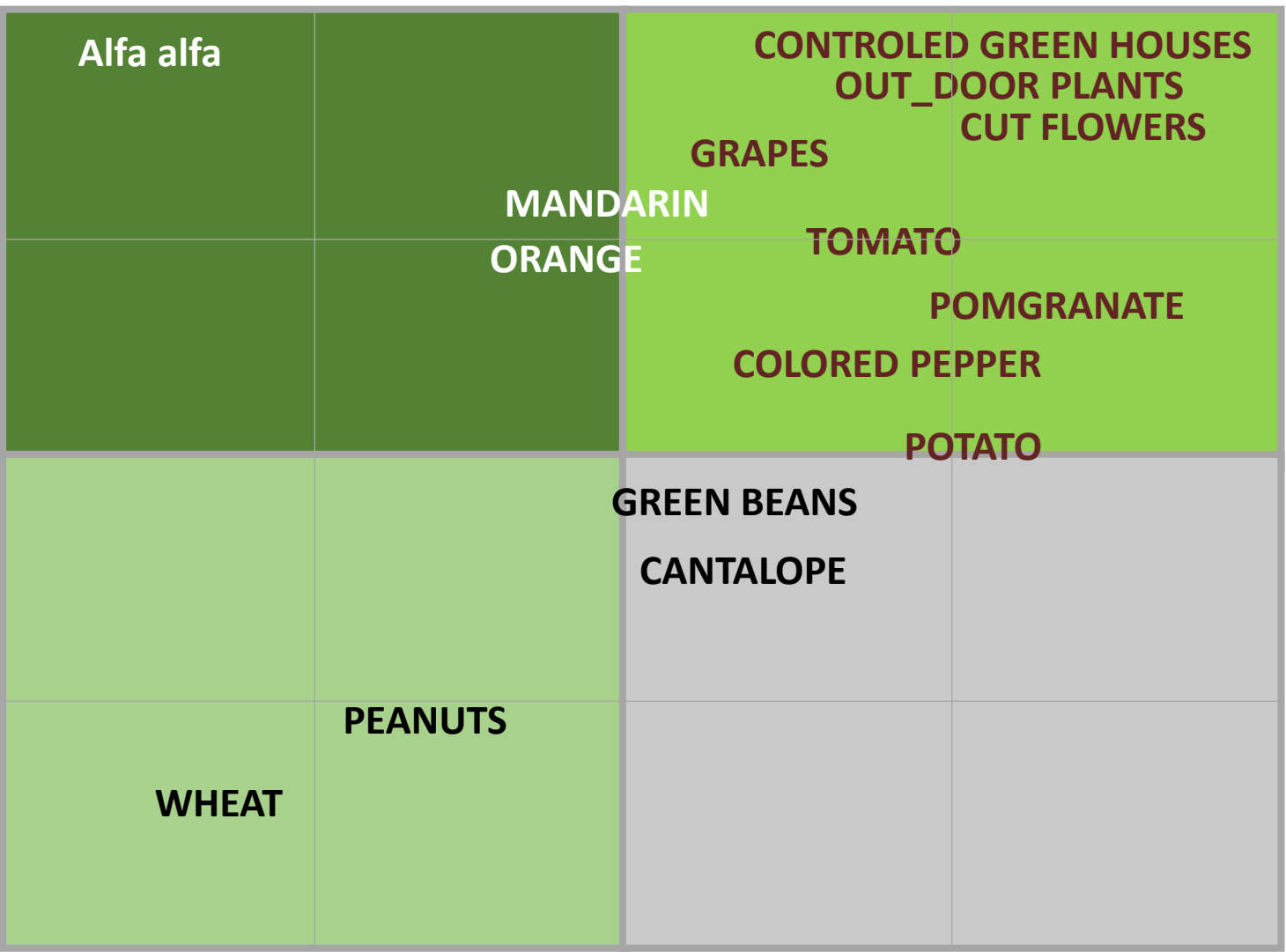


REVENUE per CUBIC METER in RELATION TO ENERGY and CULTIVATED CROPS



REVENUE / CUBIC METER / ENERGY

LOW ← → HIGH

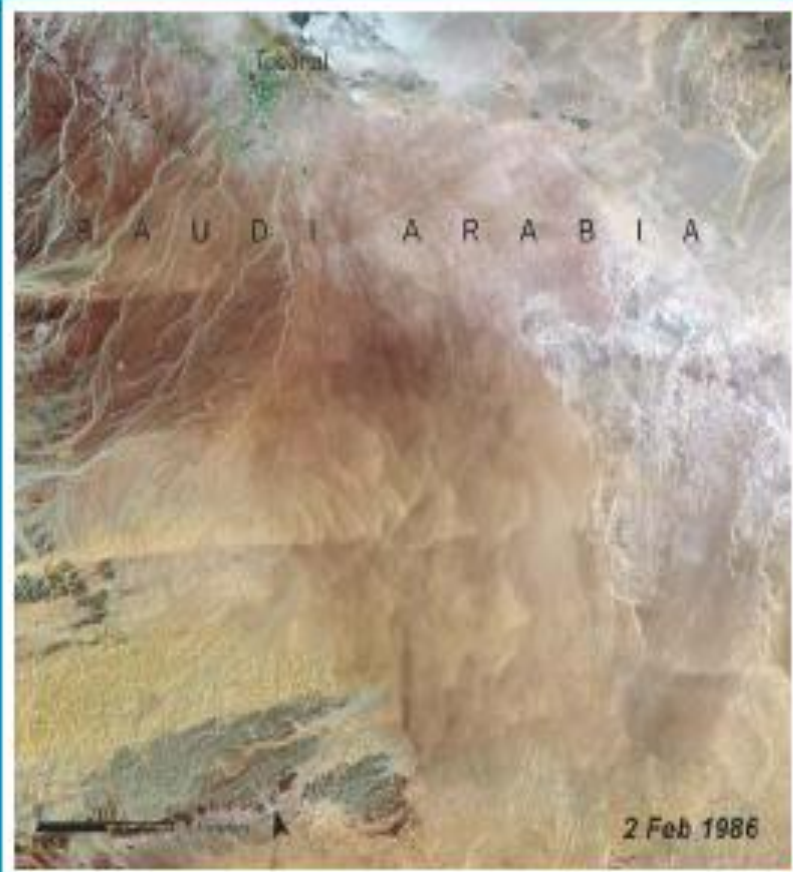


HIGH

LOW

WATER and ENERGY
CONSUMPTION

From a technical “rational” point of view The question today is not what agriculture we want in the region, but what agriculture we can afford and sustain,



Source: UNEP/GRID - Sioux Falls



The drivers of change are beyond the sector

- Transformation of economies
- Social protection systems in place (untargeted, limited impact)
- Sustainable development
- Employment and growth
- Regional instability
- Demographics and urbanization
- Trade policies

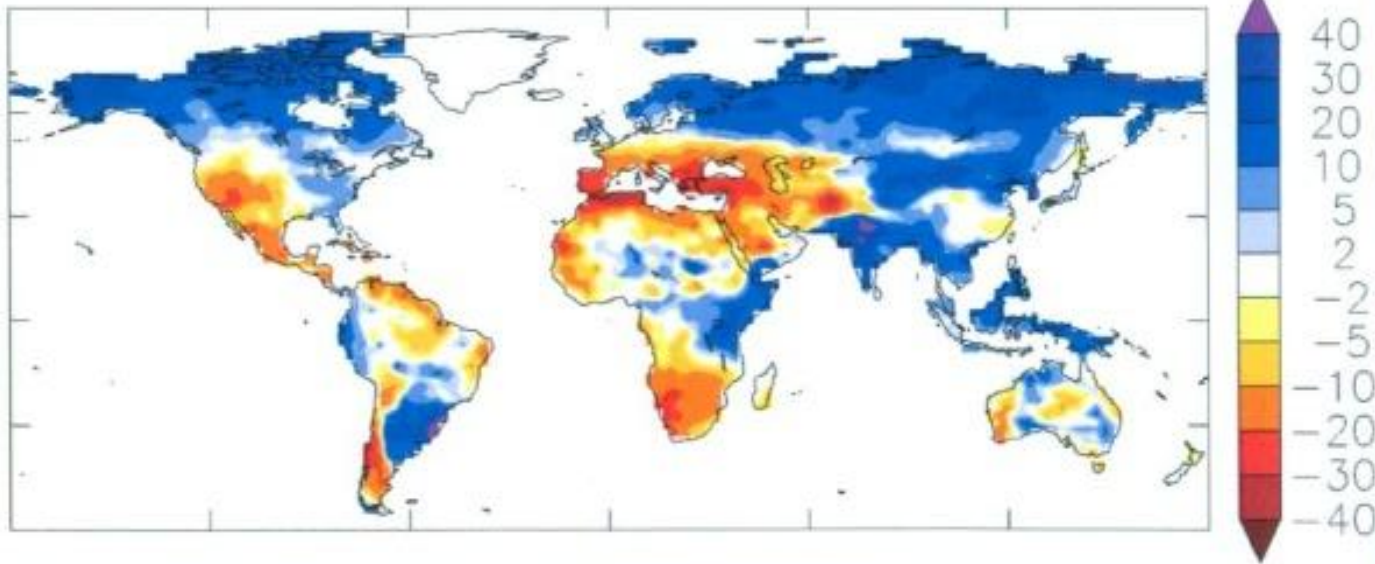
What we know about climate change is already enough to take action

Tolerable windows approach Posner (2004)



Implications of climate change : More climatic extremes

Run off variation (1960-90 / 2070-90)



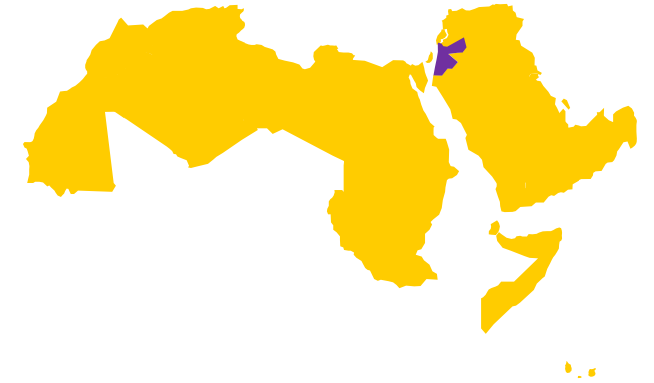


The vulnerability of the Arab region to climate change is twofold

- 13 models are convergent that the region will be hit hard (PP, runoff, T, ET). However:
- The scale of impact is yet to improve to become DSS for informed policies
- The region being no 1 grain importer worldwide, any impact affecting the exporting countries will affect the Arab region that imports 1 out of each 2 calories consumed



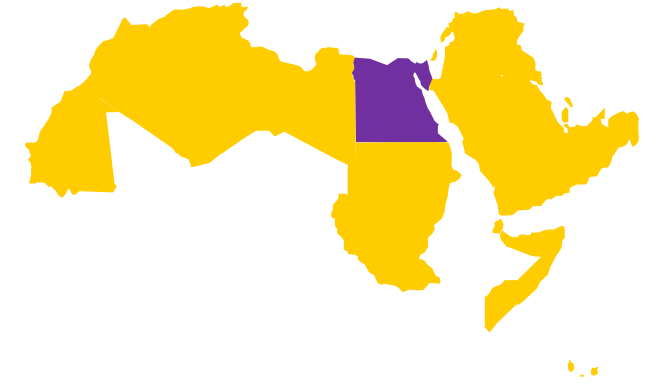
Socio-economic implications of CC in Jordan (2050)



- 50% less water
- Water demand will double
- Key agricultural commodities can no longer be locally produced



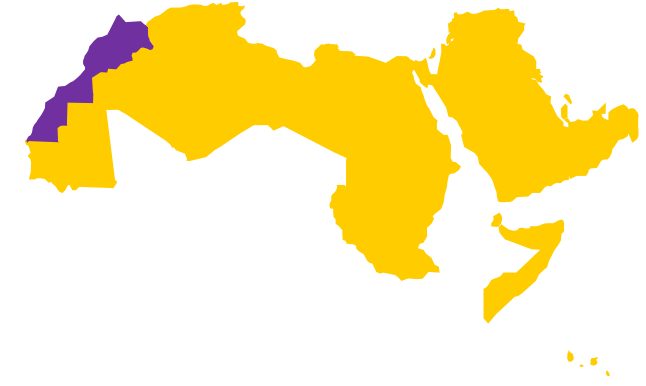
Egypt (2060)



- 10-30% decrease in water resources
- Increase in population: 50-100%
- Potential sea level rise
- Agricultural production decrease 8-47%
- Food price 16-68% increase
- As a result GDP will lose 2-6% per annum



Morocco 2050



Up to 50% decrease in available water resources



Existing policy frameworks addressing climate change, assessment, adaptation and mitigation

- Arab Ministerial Declaration on climate change
- Arab Framework Action Plan on climate change
- Arab Water Security Strategy and Action Plan
- Arab Strategy on DRR (and action plan)
- Arab Sustainable Development Initiative
- Arab Sustainable Consumption and Production Strategy
- Arab Green Economy Road Map



Collaborative initiatives with LAS

- RICCAR - UNESCWA
- ACCWaM- GIZ
- Water Scarcity Initiative- FAO



Policies are regional or national, disasters are often local

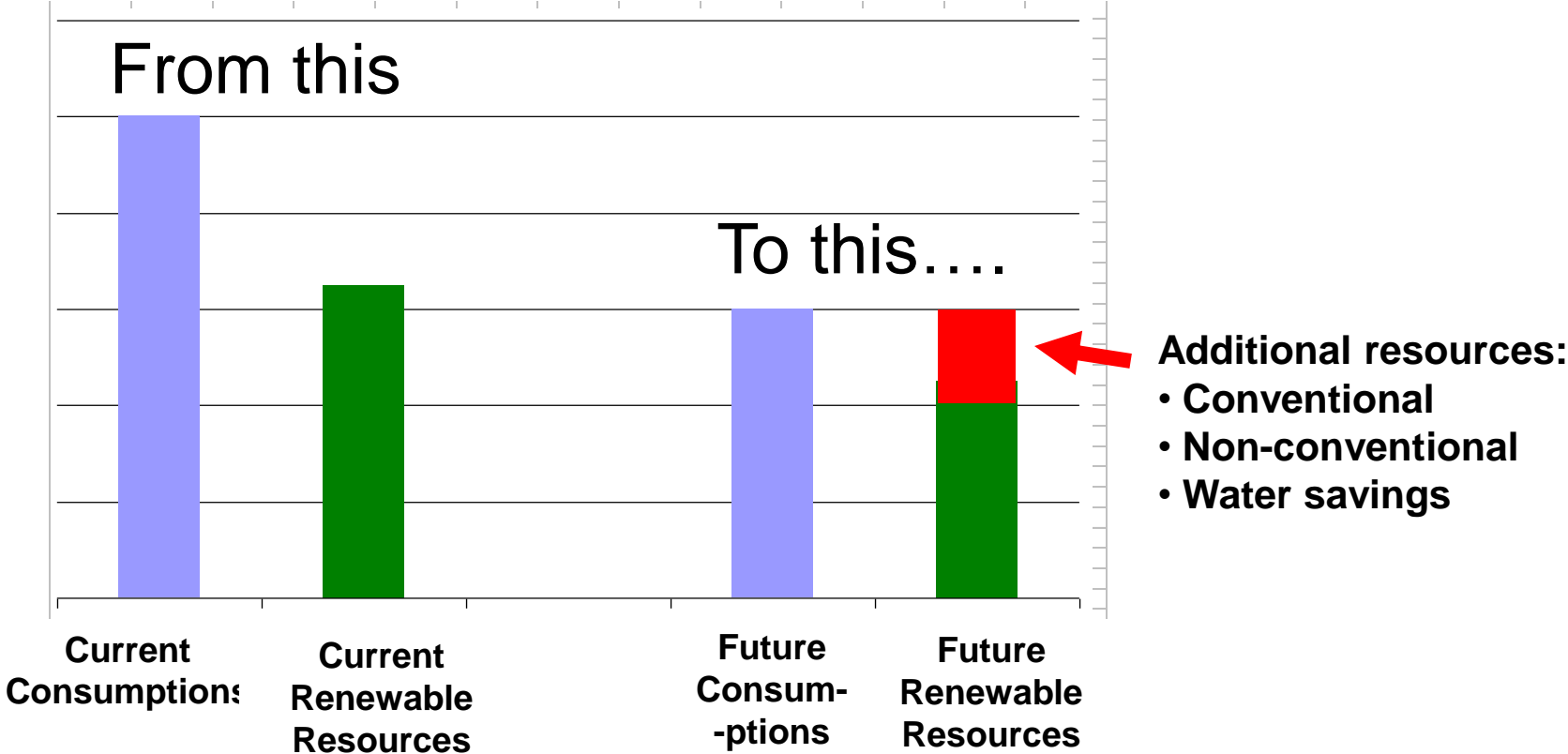
Governance, poverty alleviation, enforcement of policies and regulations are key entry point to community resilience to water and food insecurity with or without climate change



Tolerable windows approach

A range of plausible estimates are established to ascertain a level of risk-reduction effort where the benefits clearly exceed the costs and a level where costs clearly exceed the benefits: Policies then can be adopted that fall within this window

Curb consumption to level of precipitation by managing demand & adding supplies





Why are coordinated policies needed and why is the nexus WEF relevant to the region

- It is necessary to improve policy coordination and harmonization to account for trade-offs and build on the increased interconnectedness of WEF . Part of this process is promoting, identifying and eliminating contradictory policies (World Economic Forum, 2011).
- Subsidizing efficiency in food and water, subsidizing sustainability
- The hope lies in innovation and technologies, desalination, treatment and reuse, institutional and regulatory frameworks reform



Water, Food security under CC is to put in a context

- In 50 years some of oil countries will no longer be so
- In 30 years some of the Arab countries will emerge as knowledge economies
- In 10 years, demography, cities, diets will likely to change drastically
- Resilience of local communities to shocks will be proportional to the Arab nations' progress in reducing poverty, creating wealth and employment
- Adaptation to climate change should be part of the adaptation to all changes that nations and communities will be forced to go through over the coming couple of decades in the Arab region

Concluding remarks

- **Put subsidies in the right links of the water food and climate change adaptation and mitigation chain: subsidize saving, subsidize sustainable development and value co-benefits**
- **Remedy to institutional fragmentation and incoherent policies**
- **Invest in communities as water- Food and CC are local in nature**
- **Invest in Science and innovation for informed policies**
- **Invest in improving governance**
- **Climate proofing will add a relatively small investment to overall development costs**