



INTERNATIONAL FOOD POLICY
RESEARCH INSTITUTE

sustainable solutions for ending hunger and poverty

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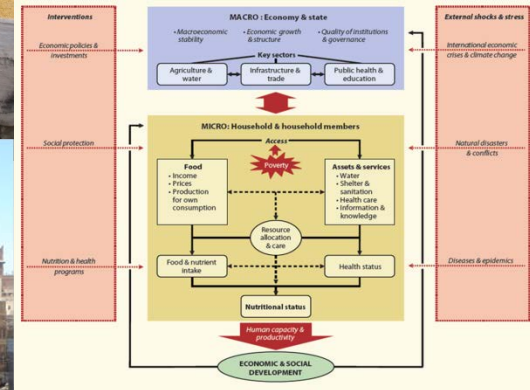
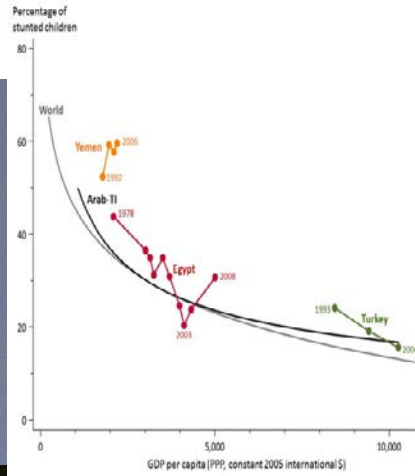
The Arab Awakening, food security and climate change

Clemens Breisinger

UNU-WIDER Conference
Climate Change and Development Policy
Helsinki, Finland , September 23, 2012



Overview

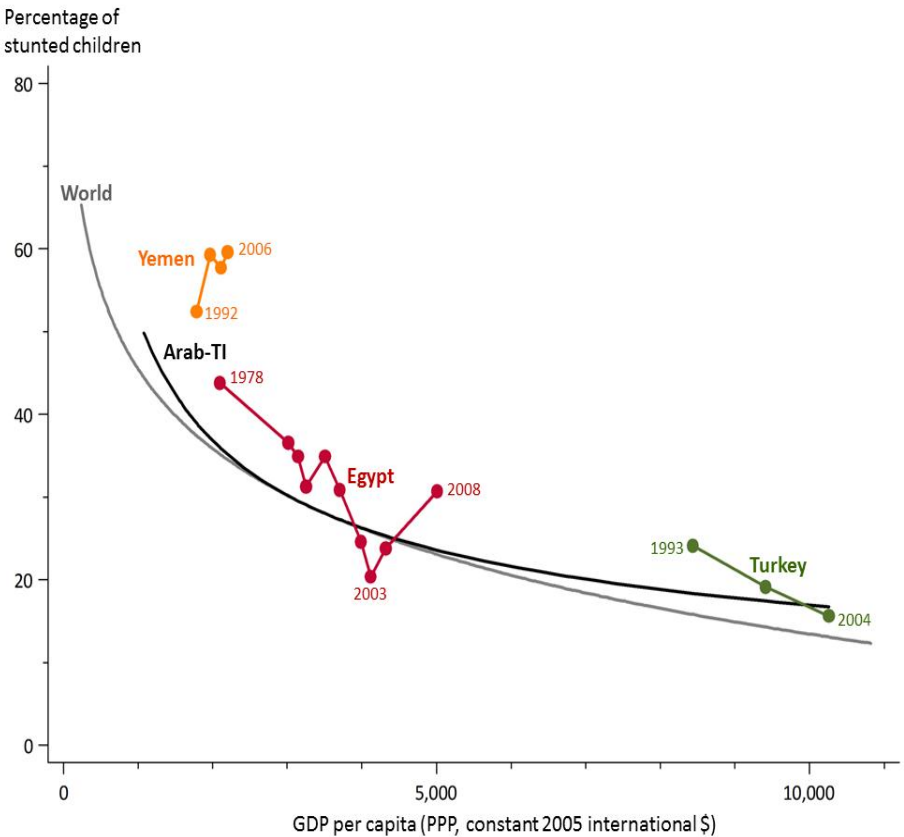
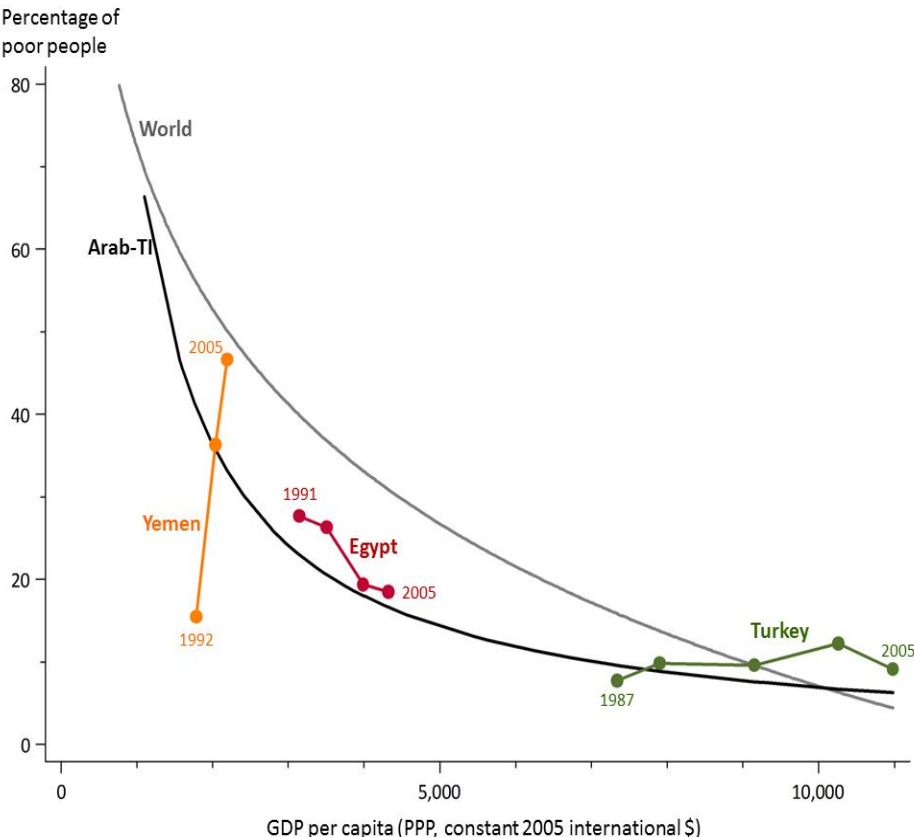


Source: O. Ecker and C. Breisinger, The Food Security System: A New Conceptual Framework, draft paper (Washington, DC: International Food Policy Research Institute, 2011).



Arab Awakening a surprise? Social indicators are likely worse than suggested by official sources

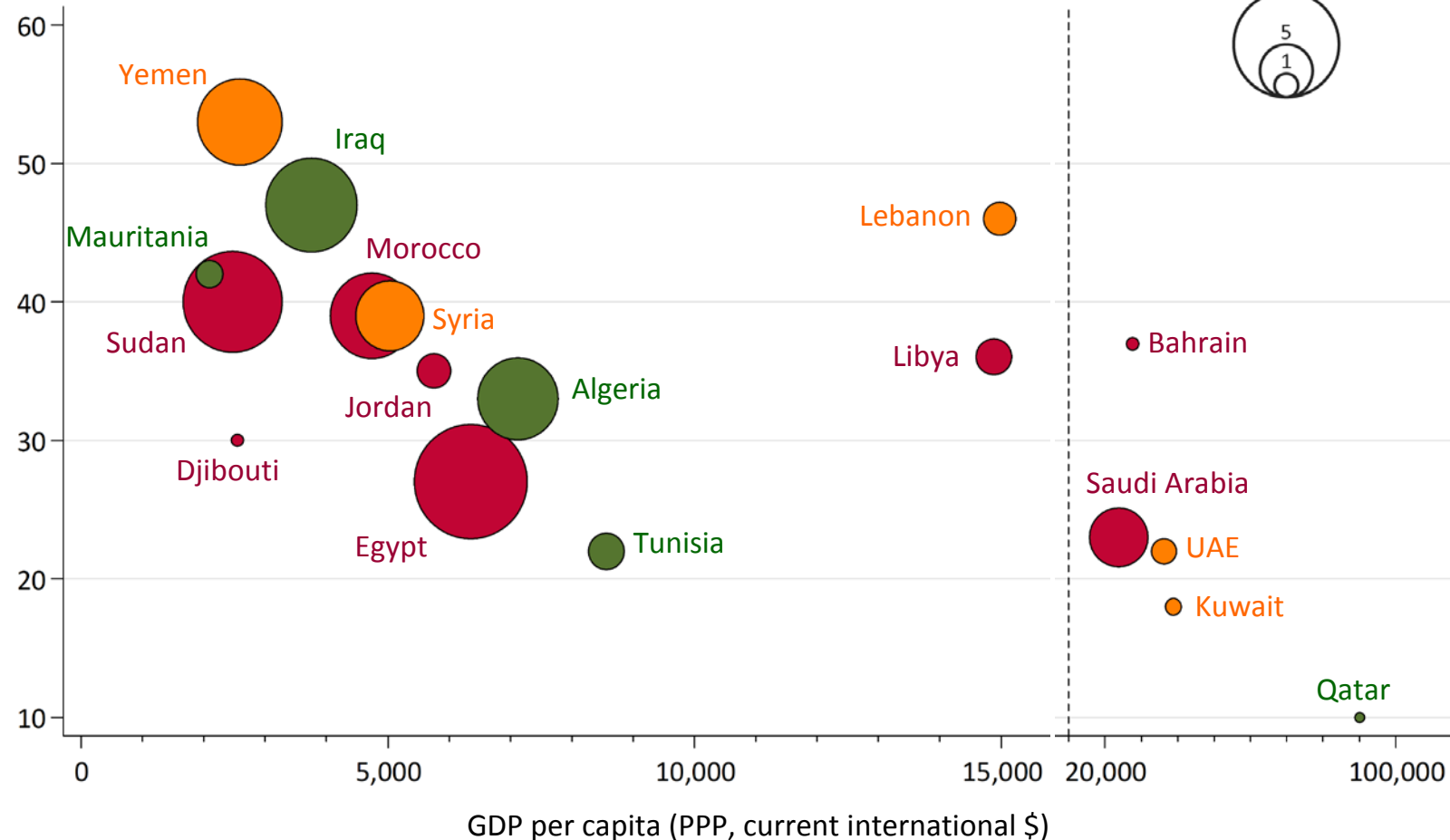
1. Is growth in Arab countries really more pro-poor than elsewhere?



2. GINI coefficients: Is Egypt really among the top 20 most equal societies, ahead of Switzerland and Canada?

Gallup data suggests a worsening economic situation since 2005, suggesting that economics did play a role (among other factors)

Percentage of people dissatisfied with their standard of living



Source: Breisinger et al. 2012. Based on Gallup World Poll (2011) and WEO (2011) data. <http://www.ifpri.org/sites/default/files/publications/bp018.pdf>

Note: Bubble size: Number of dissatisfied people. Color scale: Change in level of dissatisfaction (time period between first and last surveys undertaken in the country; last survey: 2010, first survey: 2005-2009): green: decrease; orange and red: increase, with red: increase at an annual growth rate of at least 2 percentage points.

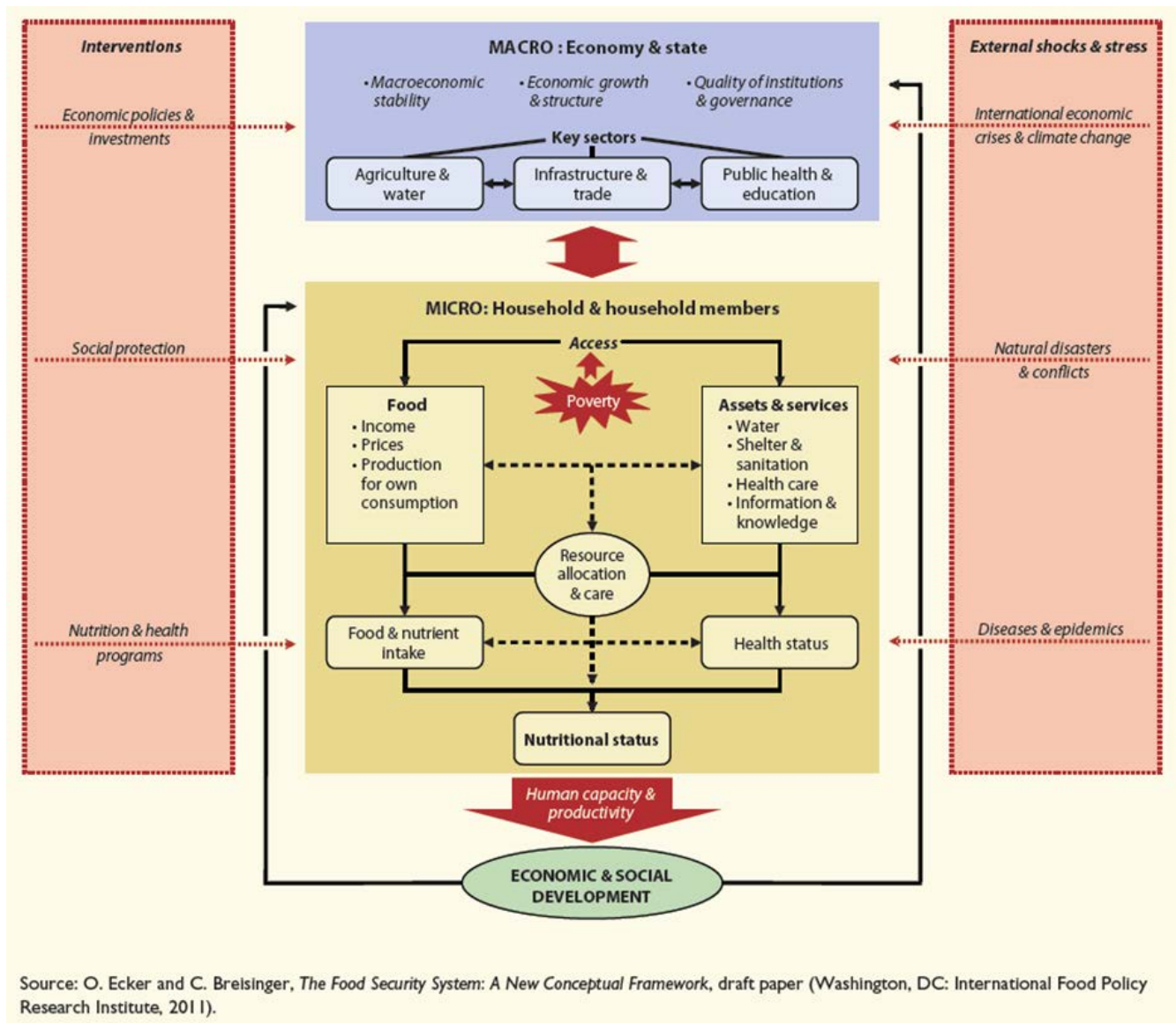
Food security emerges as a key factor for stability and successful transition in the Arab world

- History shows that transition periods are risky, but provide opportunity for change
- Collier and Hoeffler find economic growth as a key determinant of conflict globally
- In the Arab world, we find that food security emerges as the main cause of conflicts
- A price-induced change in child stunting, mortality rate, and the macro food security index increases the risk of conflict by 10.2, 11.0 and 0.04 percentage points.

Regression	(2)	(4)	(6)	(8)
Dependent variable	Incidence of major intra-state conflicts			
Model	FE2SLS			
Peace duration	0.003 [0.006]	-0.0099*** [0.003]	-0.005*** [0.002]	-0.005*** [0.002]
GDP growth (t-1)	0.196 [0.213]	-0.312 [0.283]	-0.178 [0.163]	-0.184 [0.195]
Child stunting	0.0420*** [0.016]			
Child mortality		0.011*** [0.004]		
Macro Food Insecurity			0.011*** [0.004]	
Macro Food Insecurity incl. remittances				0.013** [0.006]
<i>Country Fixed Effects</i>	incl.	incl.	incl.	incl.
<i>Time dummies</i>	incl.	incl.	incl.	incl.
Observations	433	246	685	685
Number of countries	22	22	22	22
F-test	2.731**	4.603***	5.335***	4.484***
Underid test	15.23***	13.76***	17.14***	8.819**
P-value Hansen test	0.52	0.24	0.66	0.46
F-test on excl. IV	10.83***	6.85***	7.74***	3.99**
Root MSE	0.25	0.26	0.24	0.26

Maystadt et al. 2012: <http://www.ifpri.org/publication/does-food-security-matter-transition-arab-countries>

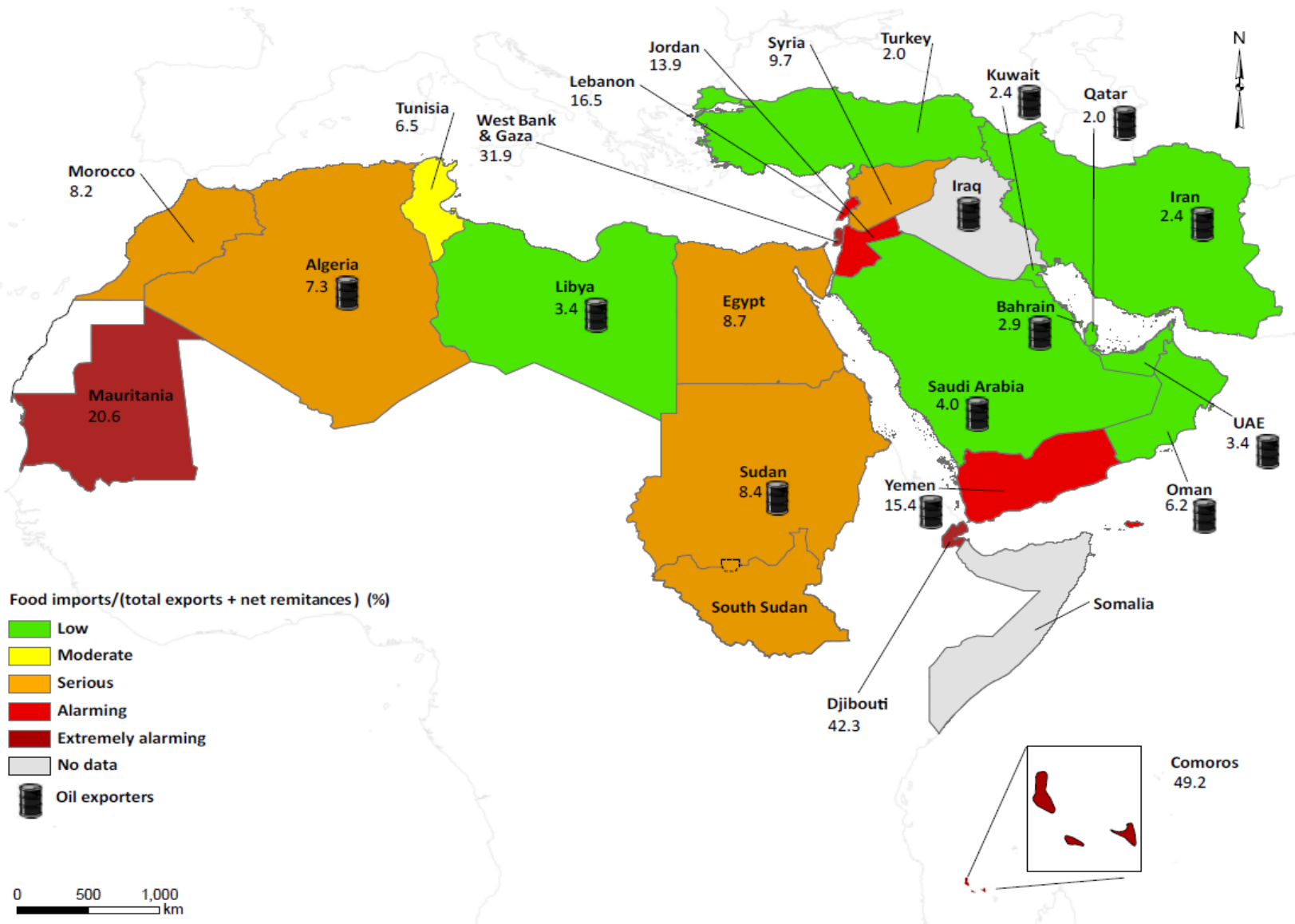
Food security framework



Source: O. Ecker and C. Breisinger, *The Food Security System: A New Conceptual Framework*, draft paper (Washington, DC: International Food Policy Research Institute, 2011).

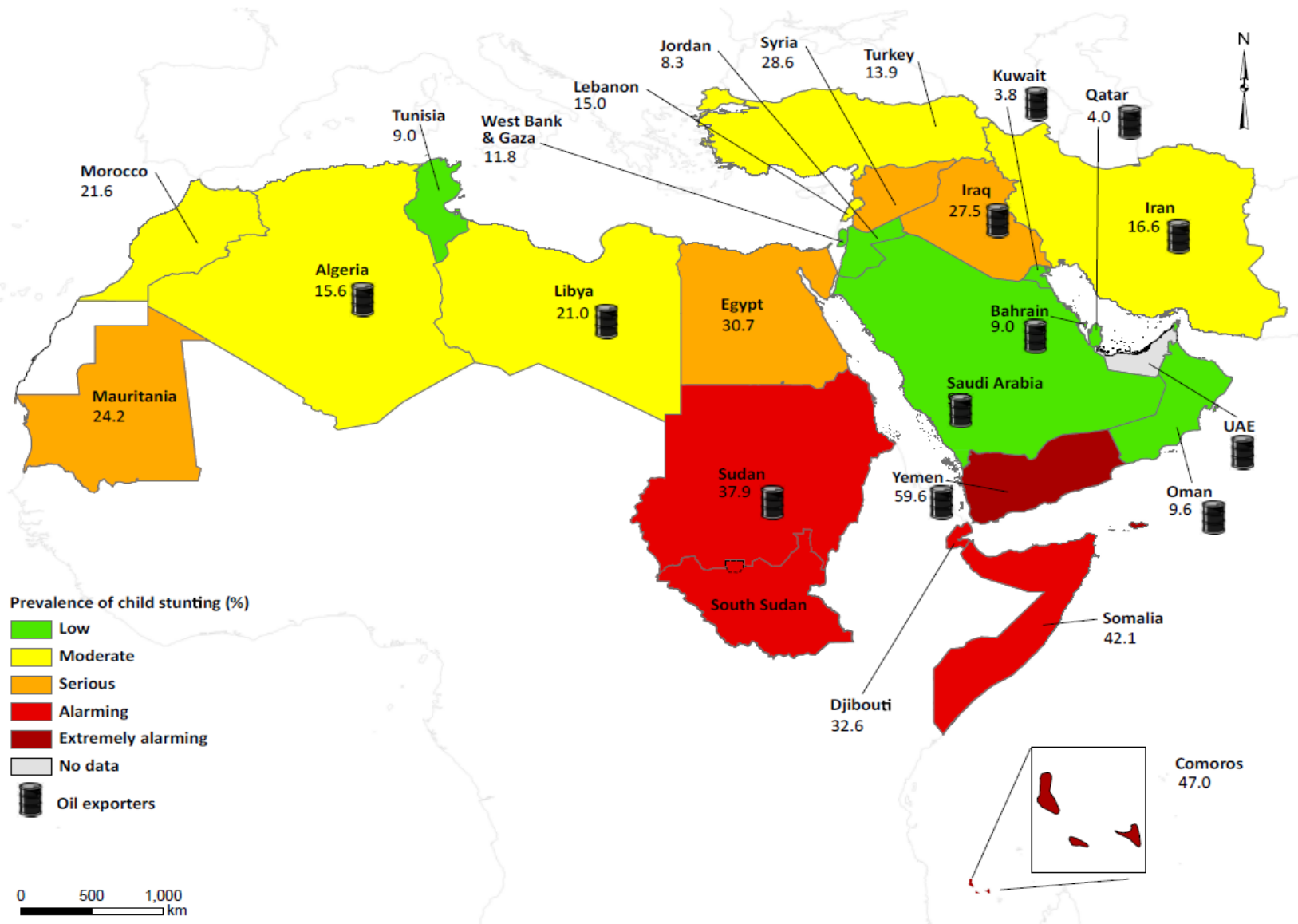
<http://www.ifpri.org/sites/default/files/publications/ifpridp01166.pdf>

Arab macro food insecurity



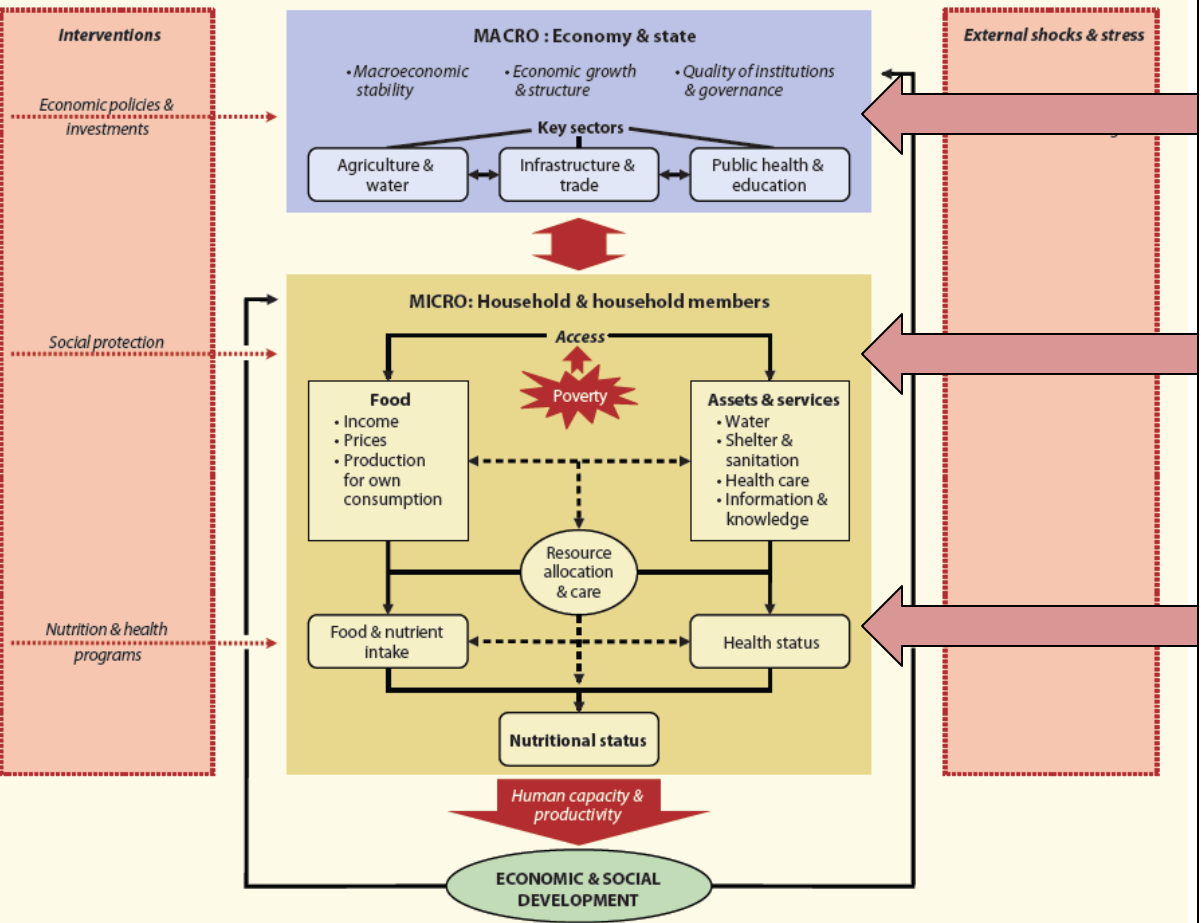
Source: Breisinger C., O. Ecker, P. Al-Riffai and B. Yu. 2012. *Beyond the Arab Awakening: Policies and Investments for Poverty Reduction and Food Security*. IFPRI Food Policy Report. Washington, DC: International Food Policy Research Institute.

Arab micro food insecurity



Source: Breisinger C., O. Ecker, P. Al-Riffai and B. Yu. 2012. *Beyond the Arab Awakening: Policies and Investments for Poverty Reduction and Food Security*. IFPRI Food Policy Report. Washington, DC: International Food Policy Research Institute.

Food security and climate change impact channels



Bio-physical impacts:

- More frequent droughts/floods
- Sea level rise
- Infrastructure
- Reductions in agricultural yields

Economic impacts:

- Changing food and energy prices
- Changes in GDP and household incomes
- Fiscal impact

Source: O. Ecker and C. Breisinger, *The Food Security System: A New Conceptual Framework*, draft paper (Washington, DC: International Food Policy Research Institute, 2011).

See <http://www.ifpri.org/climatechange/casemaps.html>

GCM temperature results vary as well

monthly maximum temp change scenarios, MIROC and CSIRO GCMs

2000

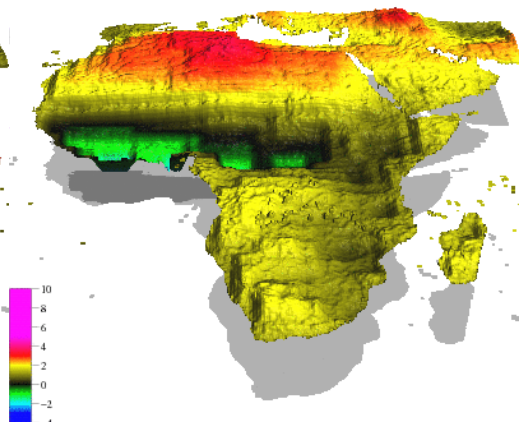
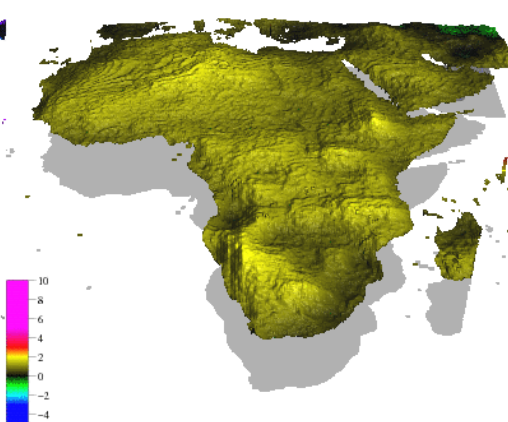
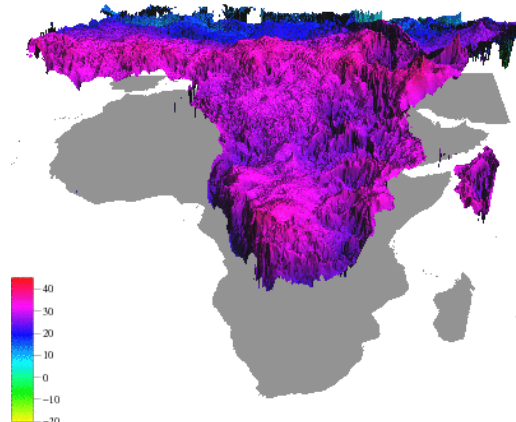
2000-2030 change, CSIRO
A1B

2000-2030 change, MIROC
A1B

base 2000 tx 1

csi a1 2030 tx 1 change

mir a1 2030 tx 1 change

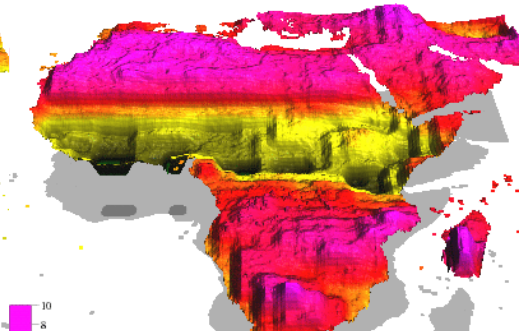
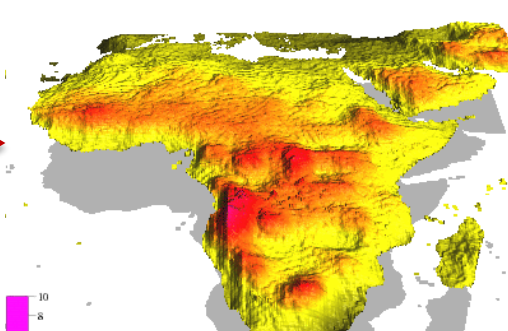


csi a1 2050 tx 1 change

csi a1 2080 tx 1 change

mir a1 2080 tx 1 change

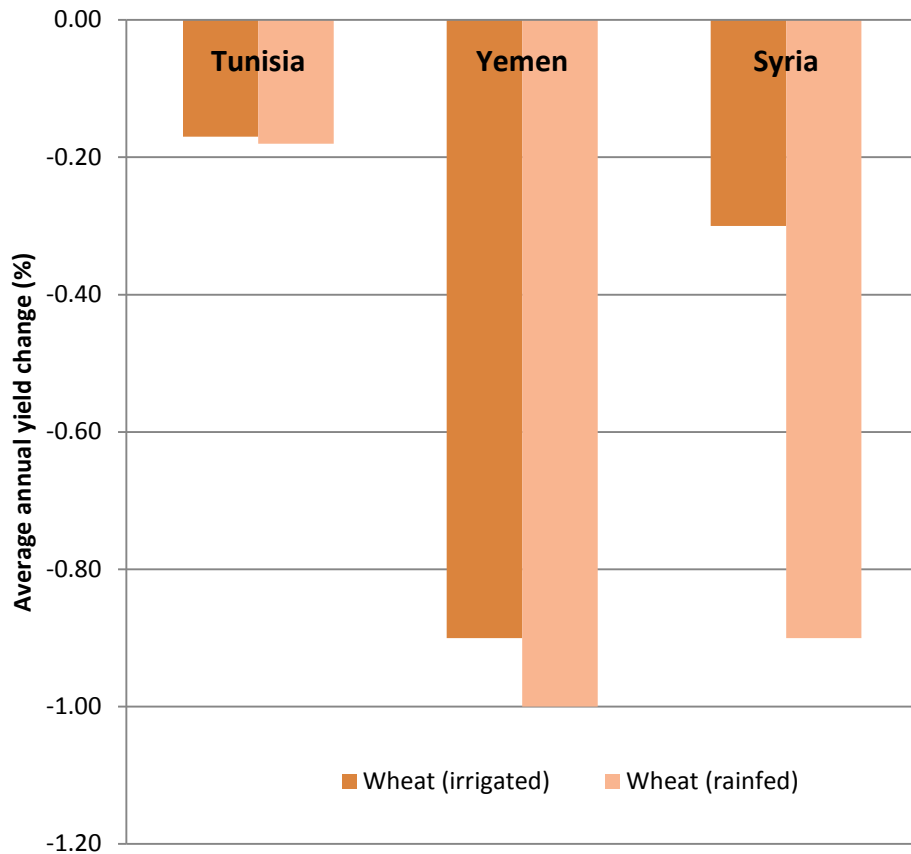
2000-2080 change



Climate change is projected to reduce yields in Arab countries

(examples Syria, Tunisia, Yemen)

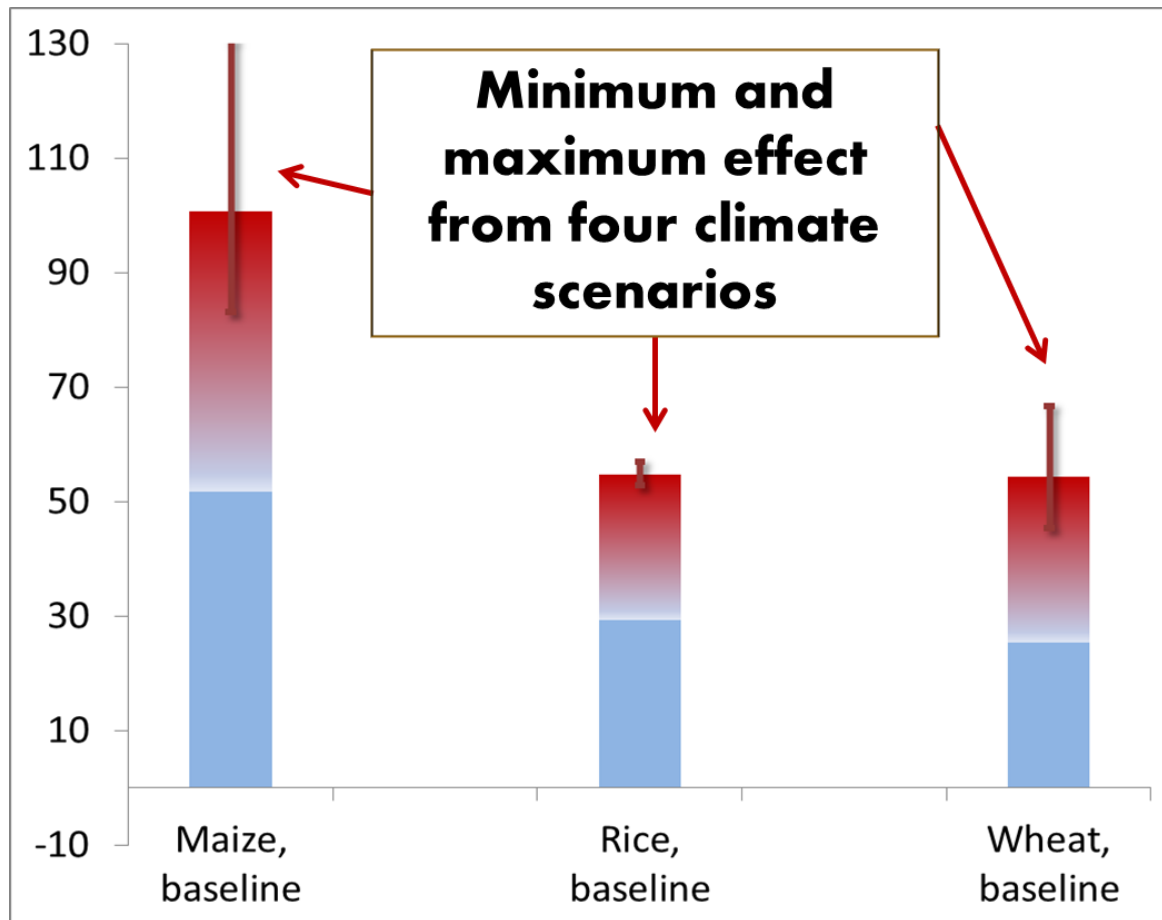
Climate change induced yield changes (MIROC, 2010-2050)



- Yields for most crops are projected to decline, mainly due to changes in temperature and rainfall patterns
- Both rain-fed and irrigated agriculture are likely to suffer

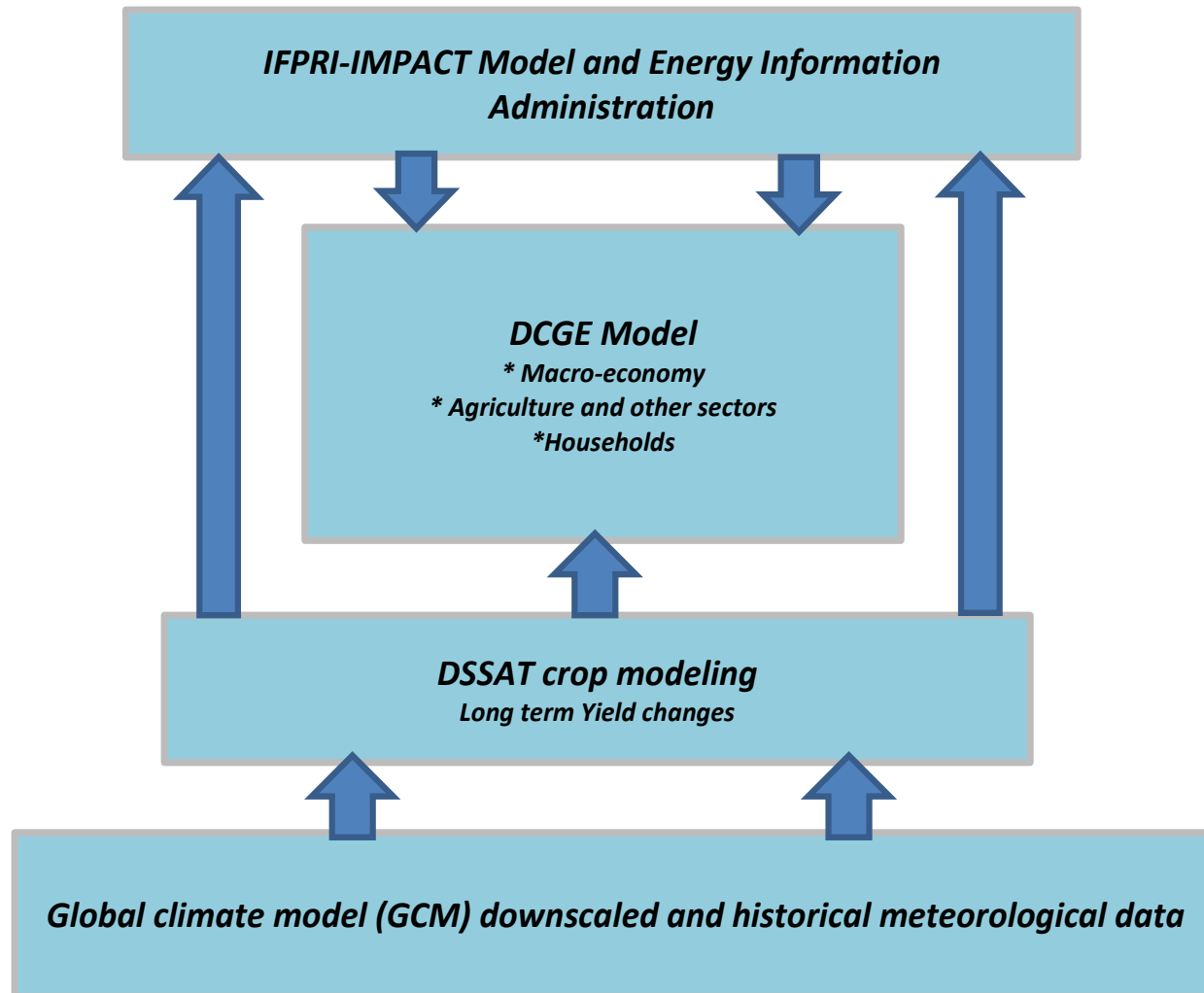
Climate change is projected to increase global food prices

Price increase (%), 2010 – 2050, Baseline economy and demography



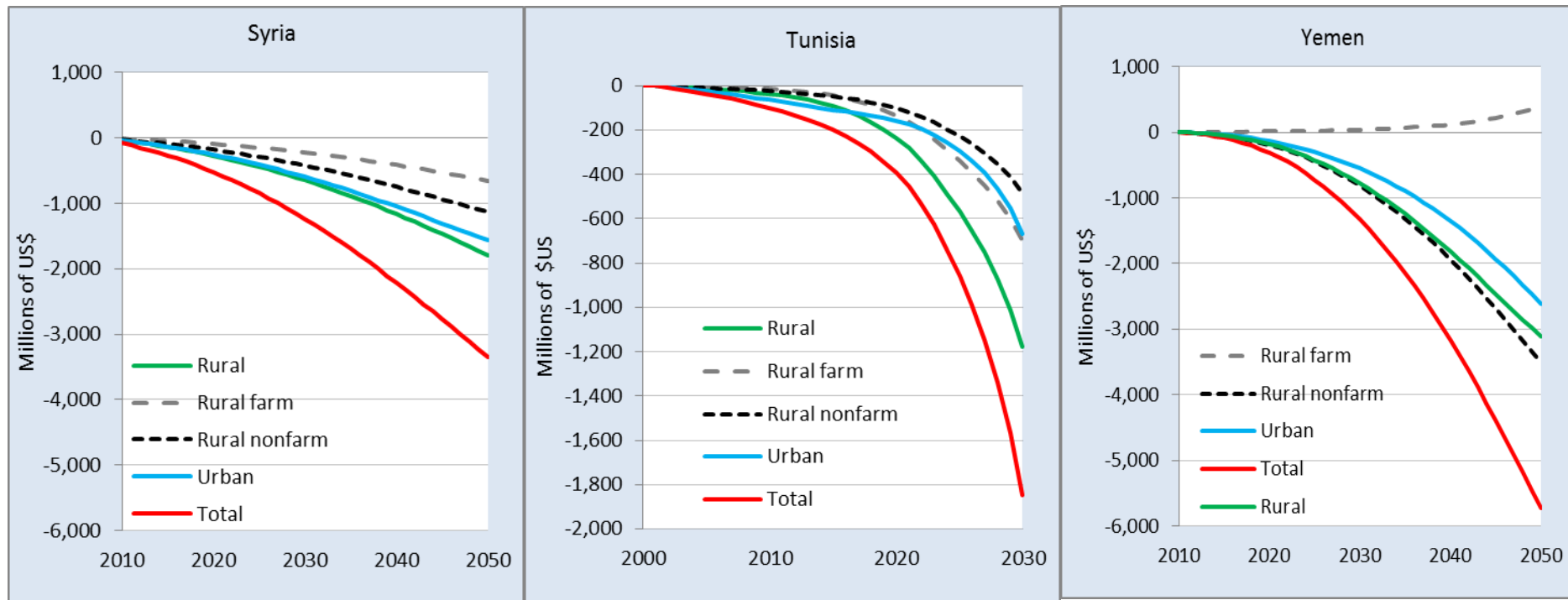
- Maize price mean increase is 101%
- Rice price mean increase is 55%;
- Wheat price mean increase is 54%.

A comprehensive modeling framework is needed to bring biophysical and economic dimensions together



CGE model results: global and local impacts on households depend on net food consumption position

(examples Syria, Tunisia, Yemen)



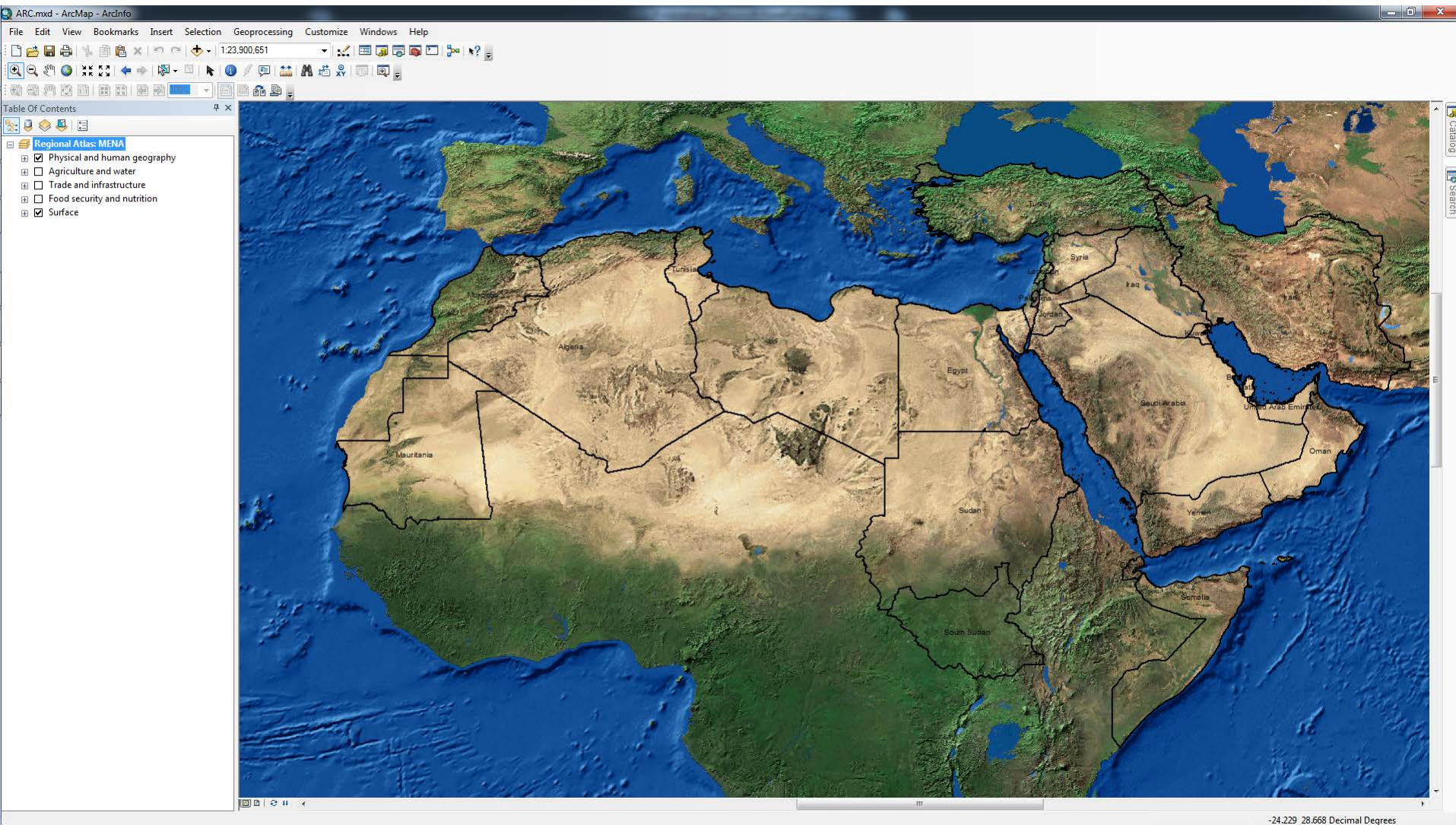
Key messages

- There is an urgent need for improving data quality and access
- Economics played a role in the Arab Awakening
- Improving food security will be critical for successful transition
- Climate change in Arab countries will be felt through global food price changes

Closing data gaps and promoting food security: an Arab food security Atlas

IFRPI with support from IFAD

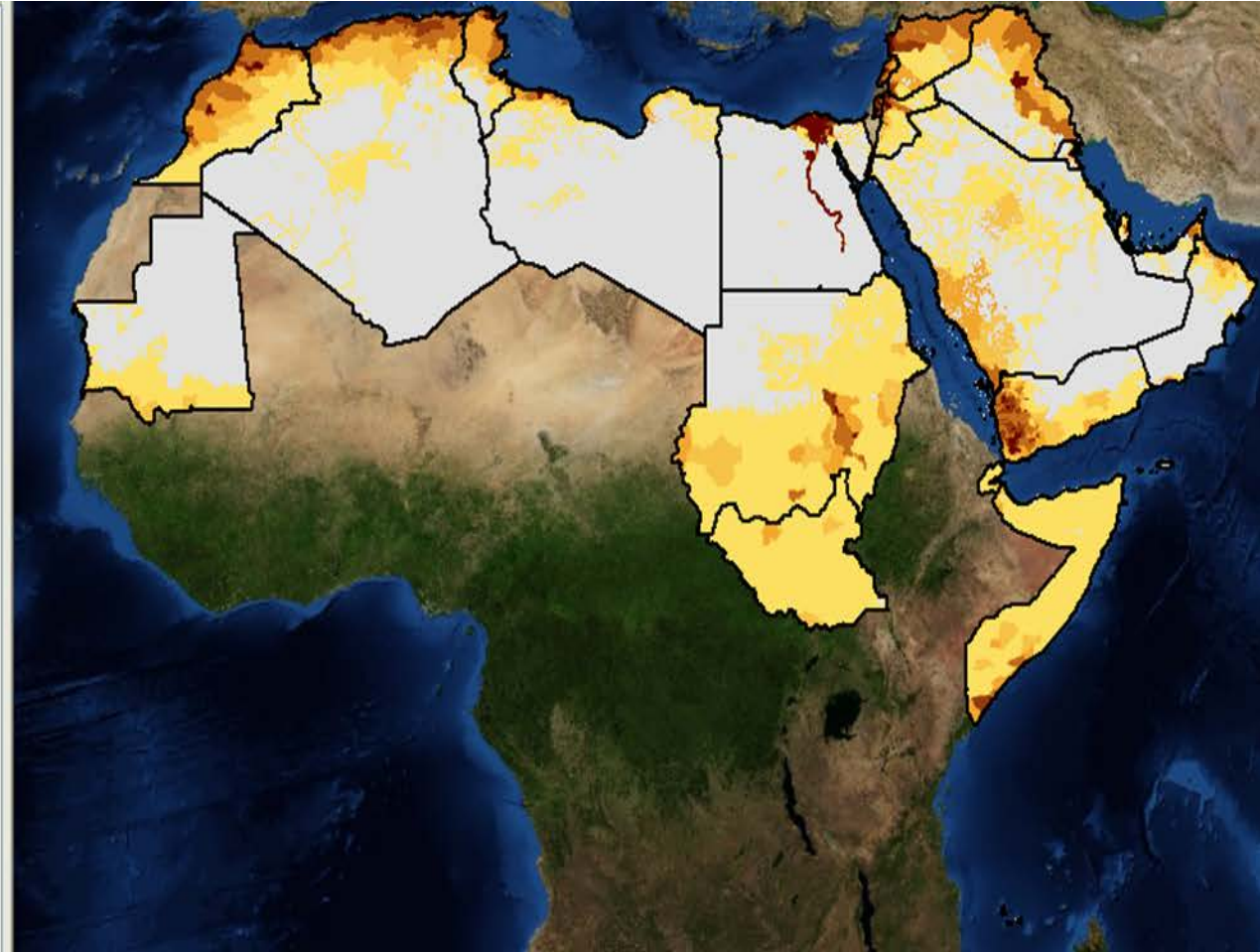
The Atlas is GIS based and the interface is very user-friendly



So far, the Atlas includes about 150+ variables, for example population density...

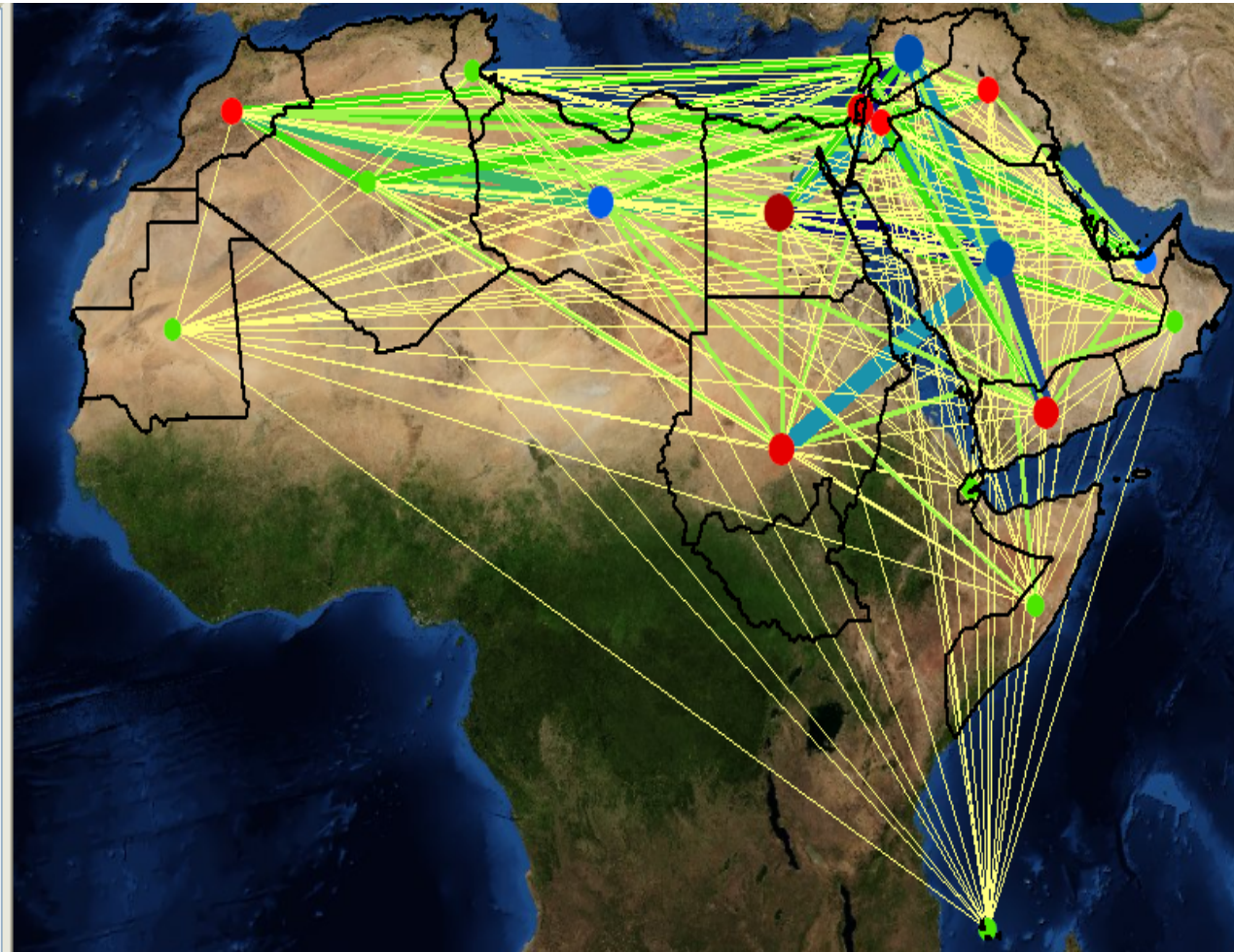
Mapping Arab food security & development

- Boundary and view
- Macro dimension
- Micro dimension
- Population and migration
 - Population density
 - Population density (persons/km2), 1990
 - Population density (persons/km2), 1995
 - Population density (persons/km2), 2000
 - Population density (persons/km2), 2005
 - Population density (persons/km2), 2010
 - Population density (persons/km2), 2015
 - 0
 - 1 - 25
 - 26 - 50
 - 51 - 100
 - 101 - 250
 - 251 - 500
 - >500
- Town and cities
- Migration
- Social status
- Crises and shocks
- Basemap



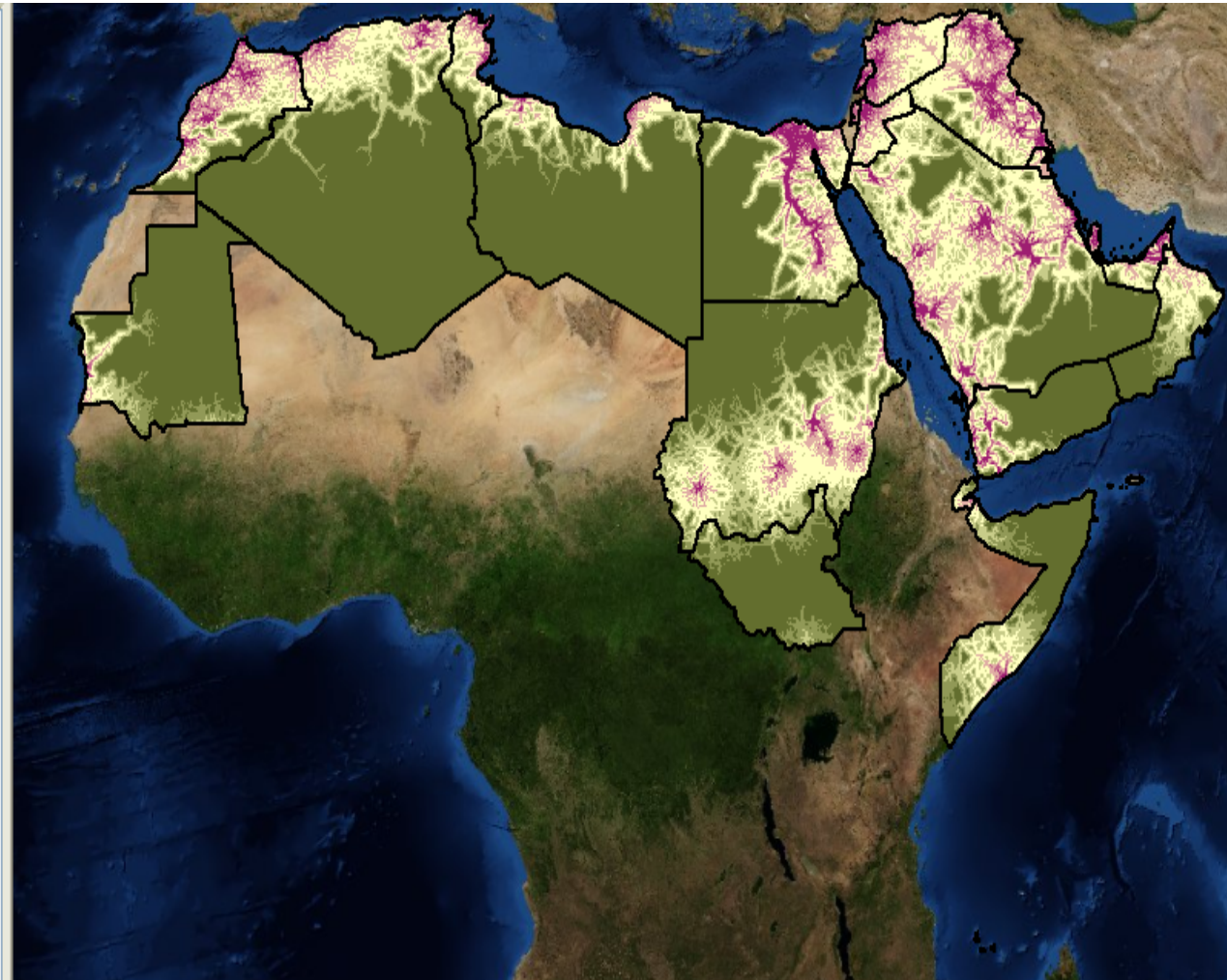
...migration patterns...

- Mapping Arab food security & development**
- Boundary and view
 - Macro dimension
 - Micro dimension
 - Population and migration
 - Population density
 - Town and cities
 - Migration
 - Net migration
 - Inflow of migrants (thousand)
 - Outflow of migrants (thousand)
 - In- and outflow of migrants within MENA region (thousand)
 - >0 - 10
 - >10 - 25
 - >25 - 50
 - >50 - 100
 - >100 - 250
 - >250 - 500
 - >500
 - Social status
 - Crises and shocks
 - Basemap

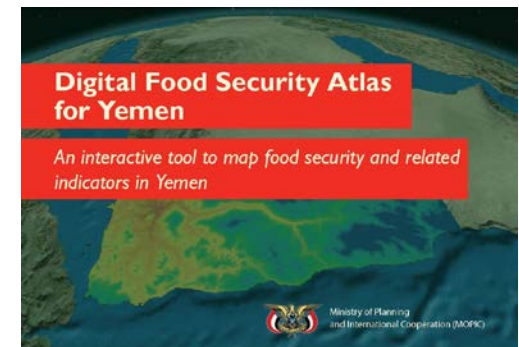
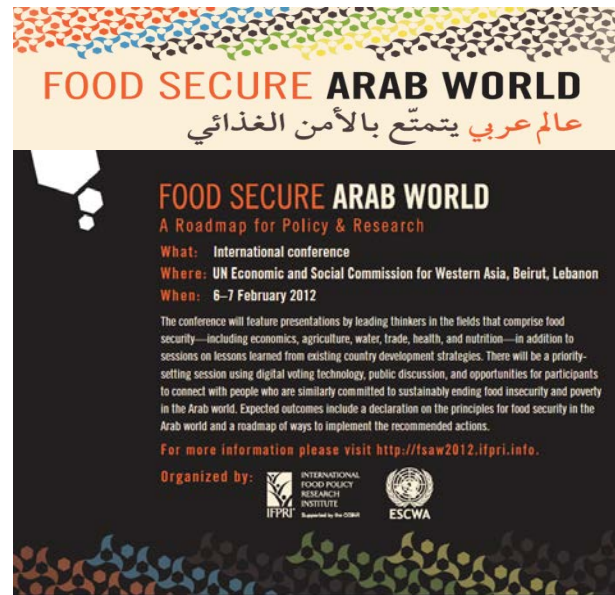


...infrastructure – travel time...

- Land degradation (% of saline soils)
- Irrigated area (% of cultivated area)
- Harvested areas and yields
- Total crop value (US\$/ha)
- Livestock and aquaculture
- Irrigation dams
- Hydroelectric dams
- Fossil fuel resources
- Trade and transport
 - World street map
 - Airports
 - Ports
 - Grain storage
 - Access to cities
 - Travel time to cities with >50k residents (hours)
 - Travel time to cities with >250k residents (hours)
 - 0 - 1
 - >1 - 2
 - >2 - 4
 - >4 - 8
 - >8 - 12
 - >12 - 16
 - >16
 - Travel time to cities with >500k residents (hours)
- Micro dimension
 - Population and migration
 - Social status
 - Nutrition and health
- Crises and shocks



Some of IFPRI's products on the Arab World



IFPRI MENA Website:

<http://www.ifpri.org/book-6959/ourwork/researcharea/middle-east-and-north-africa>

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