

The Outlook for Food Security in the Middle East and North Africa

Rosenberg International Forum on Water Policy

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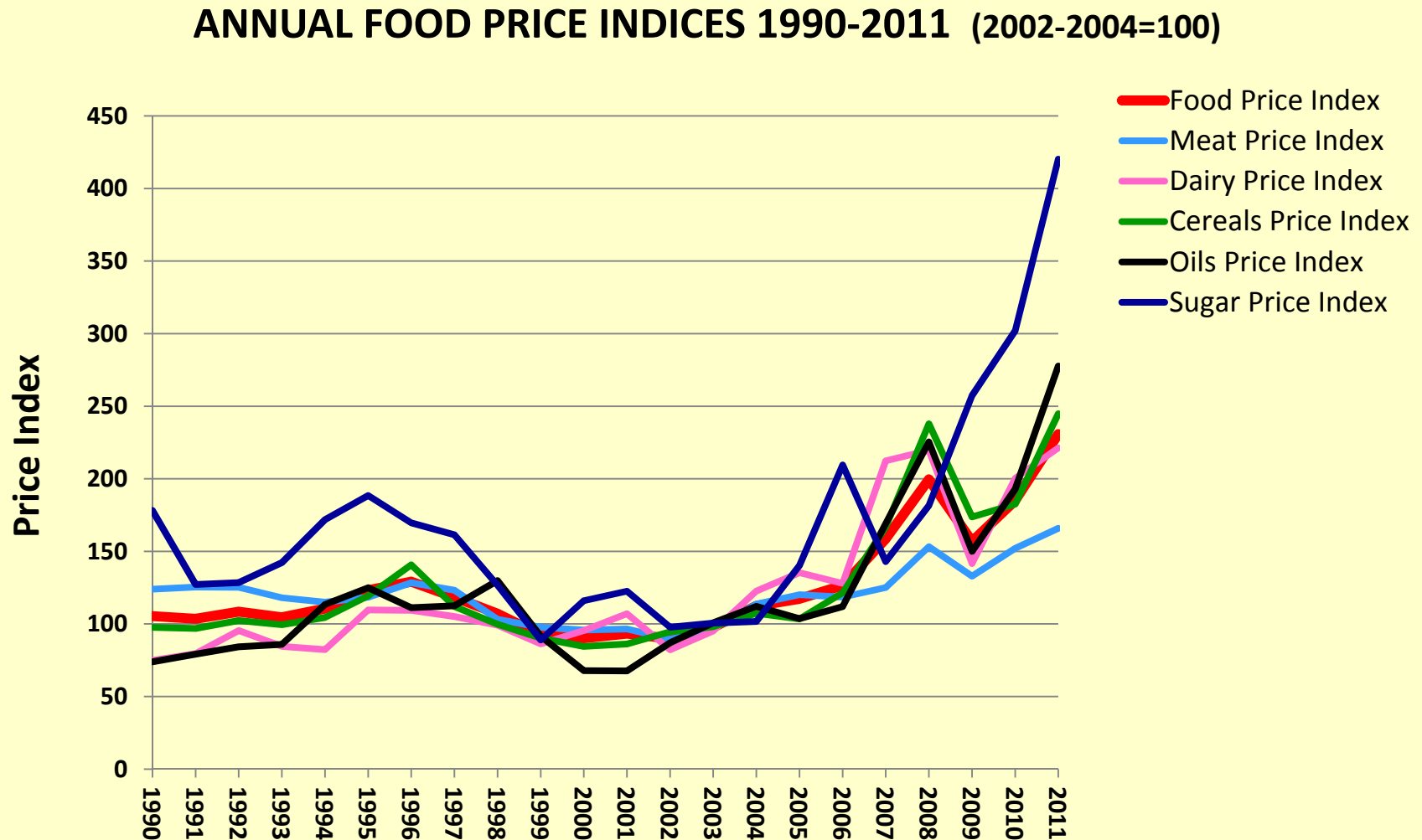


Outline

- Introduction: The Global Context
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- Food security in the MENA region
- The case of wheat: a staple food in MENA
- Yield gaps
- Enhancing food security: Examples
- Towards long-term food security
- The role of ICARDA

The Global Context

The global food crisis of 2008 ...continues



Source: FAO 2011. <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

New developments

- Severe drought in USA - worst in 50 years
- Increase in international prices of maize and soybeans
- The FAO Food Price Index climbed 6% in July 2012
- Wheat production in Russia, Kazakhstan, and the Ukraine – 25% global wheat exports – expected to be reduced
- International wheat quotations increased by 19% percent
- Iran's wheat harvest also affected by a severe drought.

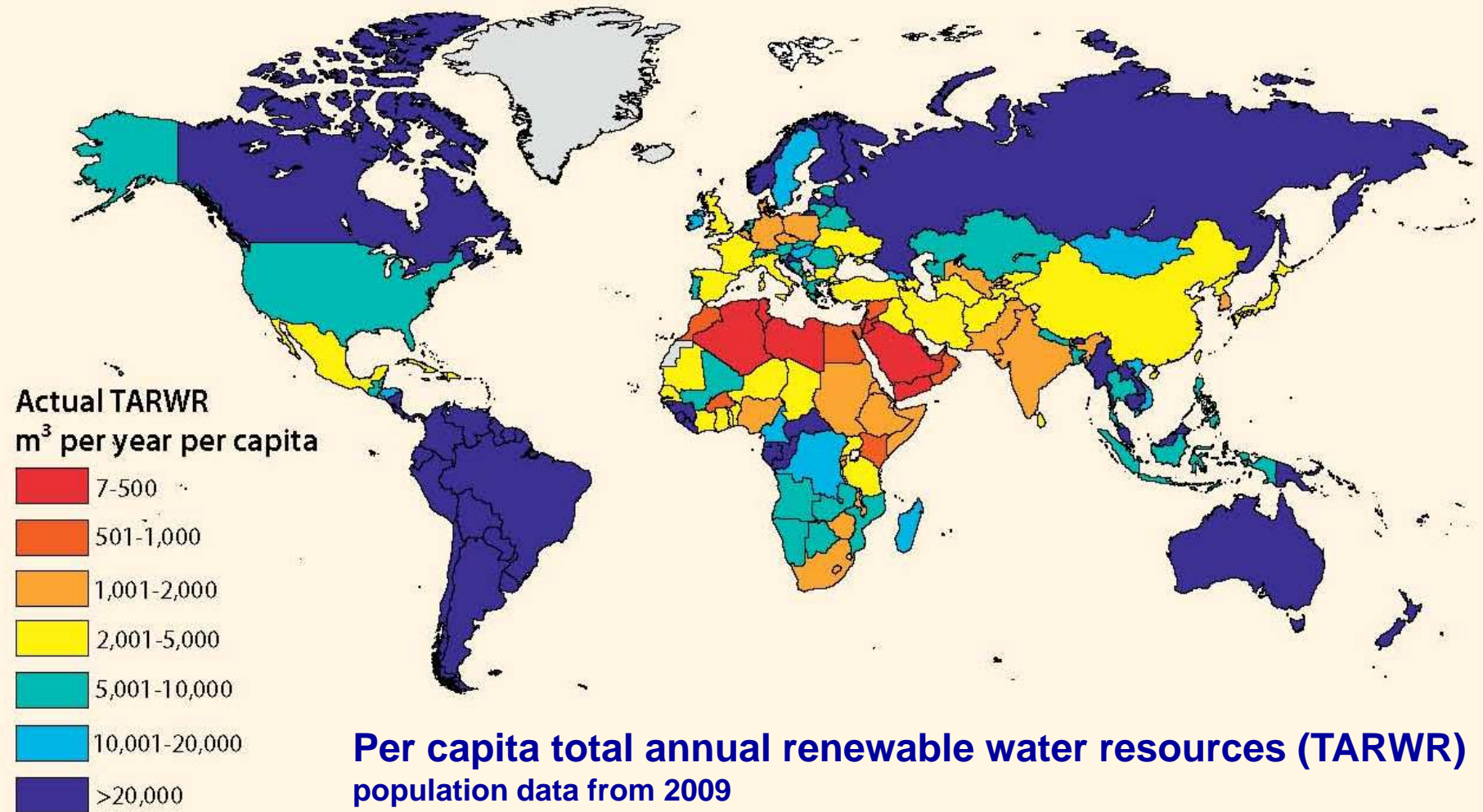
The countries of the Middle East and North Africa – the world's largest cereal importers – remain vulnerable to rising wheat prices

Implications

- High food prices = major threat to food security.
- Impact hits the poor hardest –they spend a higher percentage of their income on food.
- OECD-FAO Agricultural Outlook 2012: global agricultural annual output growth will slow to 1.7% over the next 10 years, down from a trend of over 2% in recent decades.
- Limits to expansion in crop area in MENA region coupled with increasing water scarcity
- **Additional production must come from increased productivity - including reducing productivity gaps in developing countries**

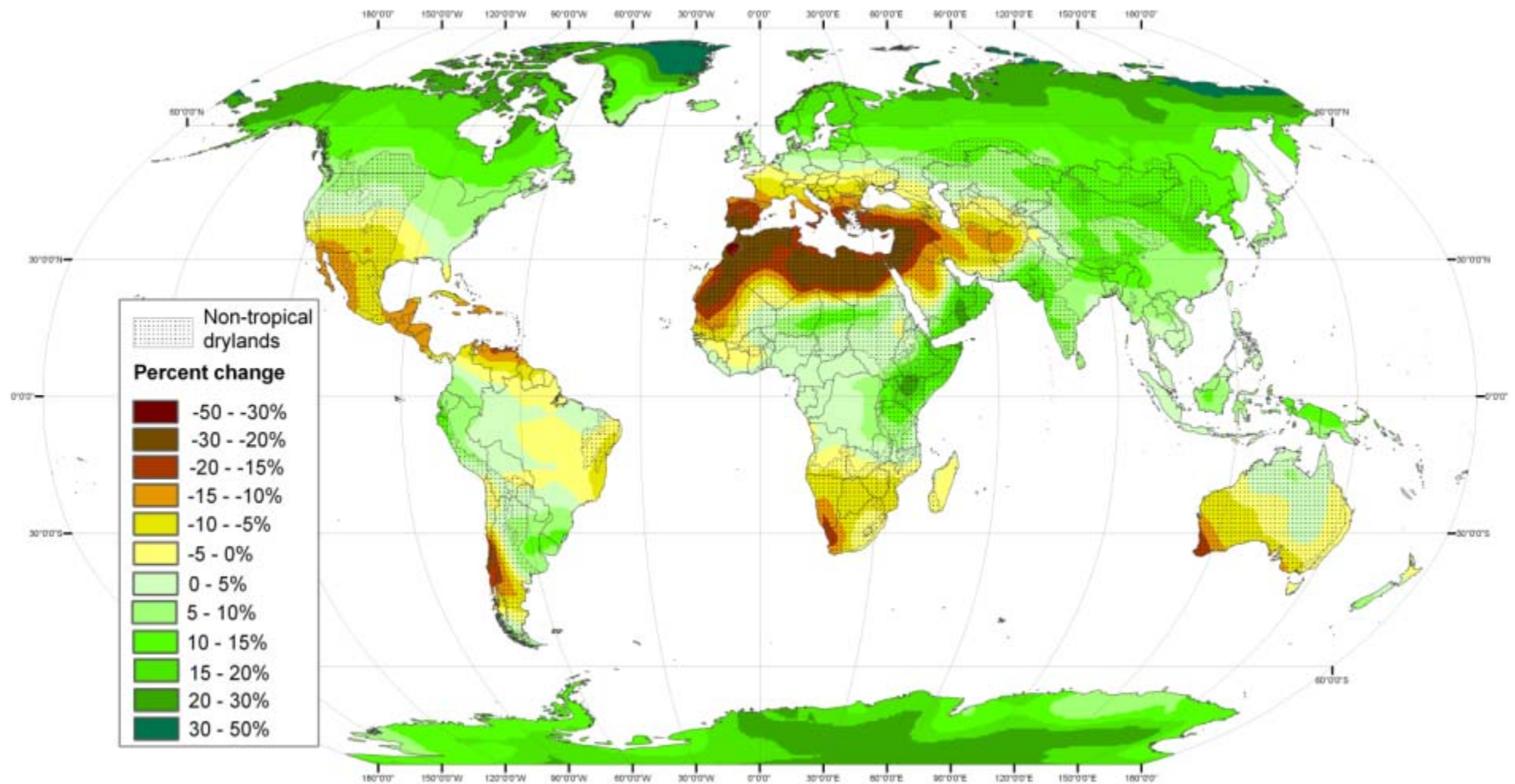
**Challenges in the
Middle East & North Africa
(MENA region)**

MENA region is the most water scarce region in the world



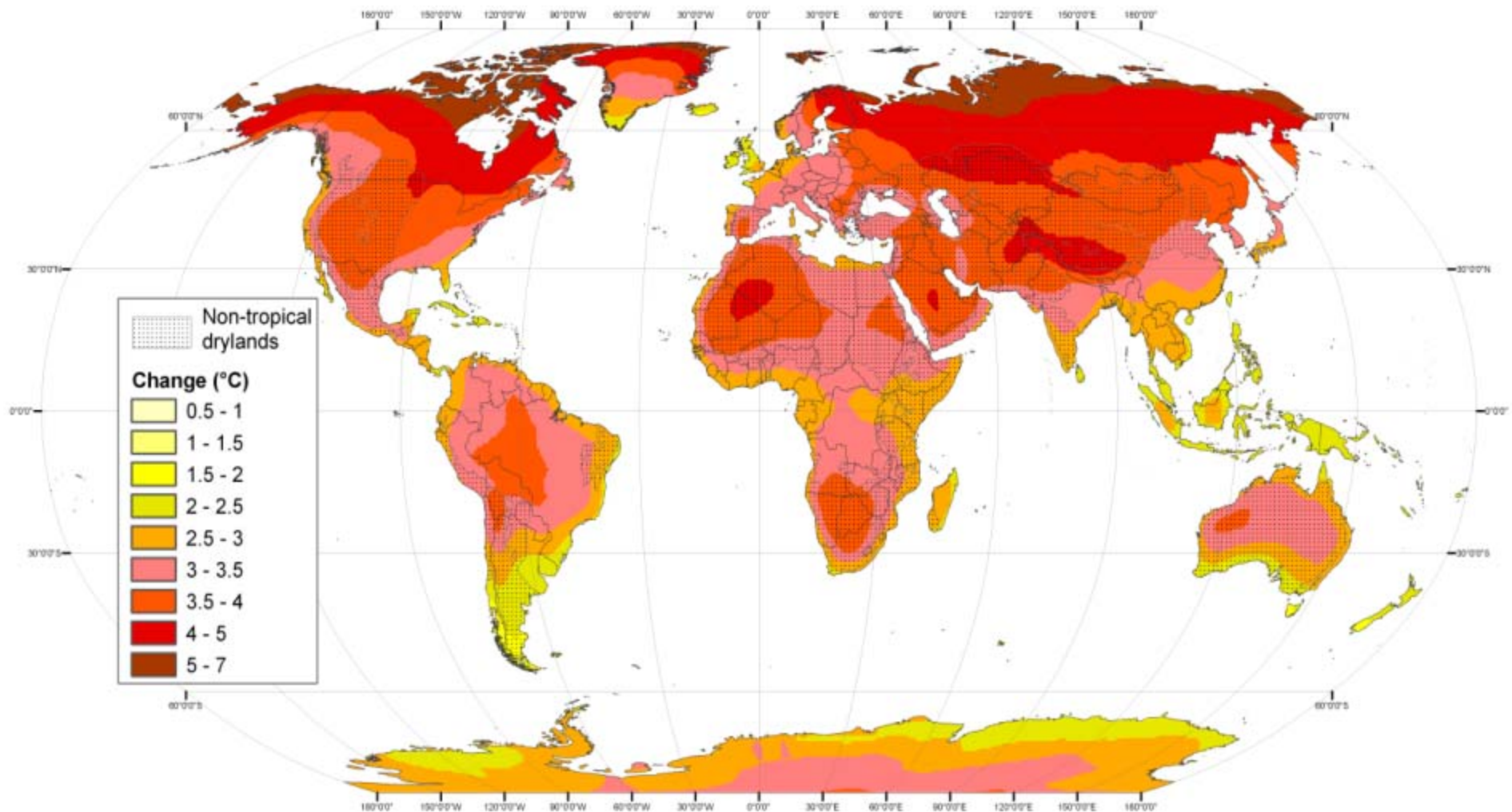
Source: FAO AQUASTAT database (<http://www.fao.org/nr/aquastat>, accessed in 2011).

Climate Change: Relative change in mean annual precipitation 1980/1999 to 2080/2099



Relative change of mean annual precipitation 1980/1999 to 2080/2099, scenario A1b, average of 21 GCMs
(compiled by GIS Unit ICARDA, based on partial maps in Christensen et al., 2007)

Absolute change of mean annual temperature 1980/1999 to 2080/2099



Absolute change of mean annual temperature 1980/1999 to 2080/2099, scenario A1b, average of 21 GCMs
(compiled by GIS Unit ICARDA, based on partial maps in Christensen et al., 2007)

Climate change affects not only food production ...

... it affects all four dimensions of food security

Availability

- Loss in food production
- Direct natural resource degradation
- Changes in abiotic and biotic stresses

Access

- Infrastructure damage, asset losses
- Loss of income and employment opportunities

Stability

- Increased livelihood risks, pressure on food prices
- Higher dependency on food imports and food aid
- Increased variability in abiotic and biotic stresses

Utilization

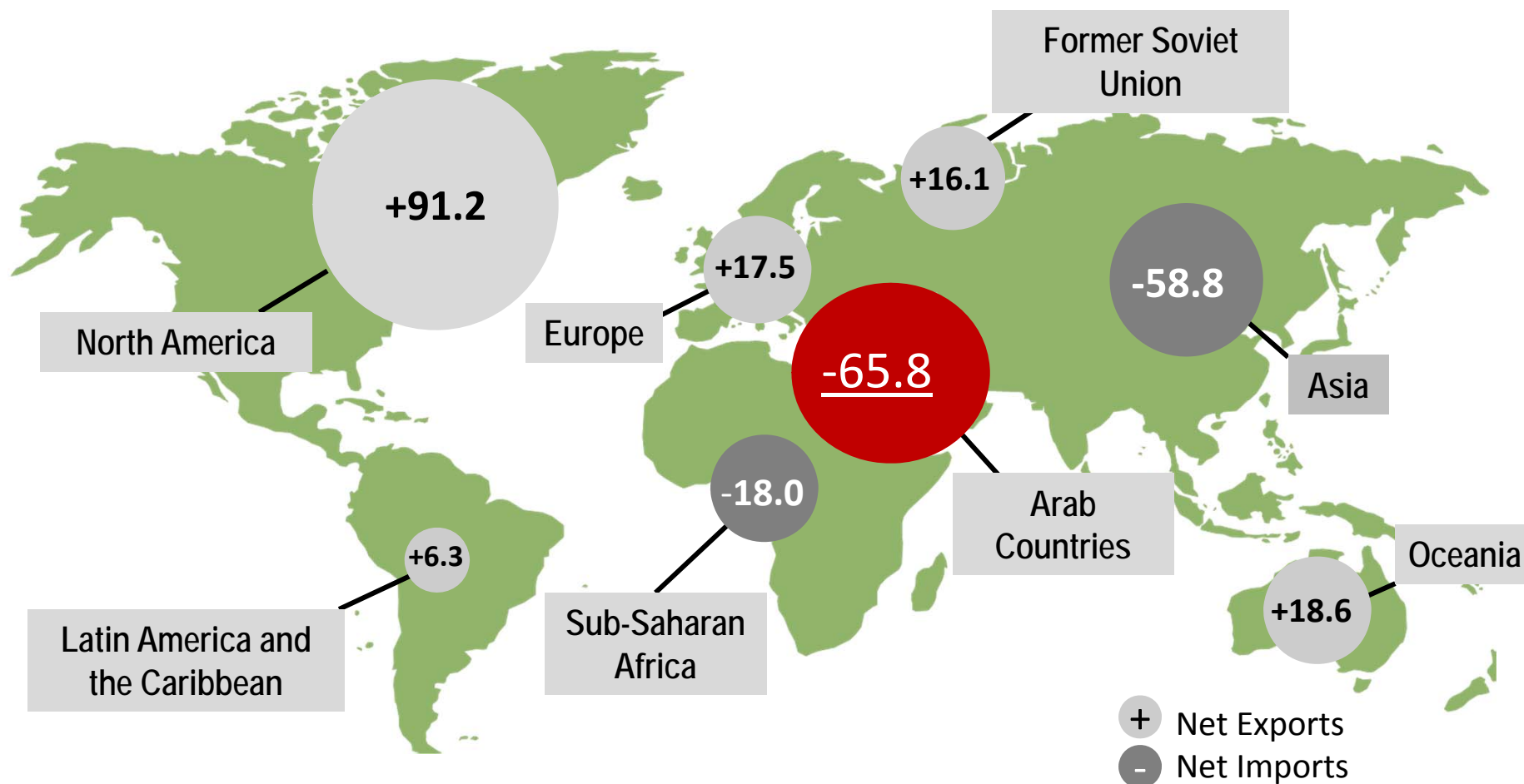
- Human health risks, nutrition



Food security in the MENA region

MENA Region is the largest grain importer (2010 million metric tons)

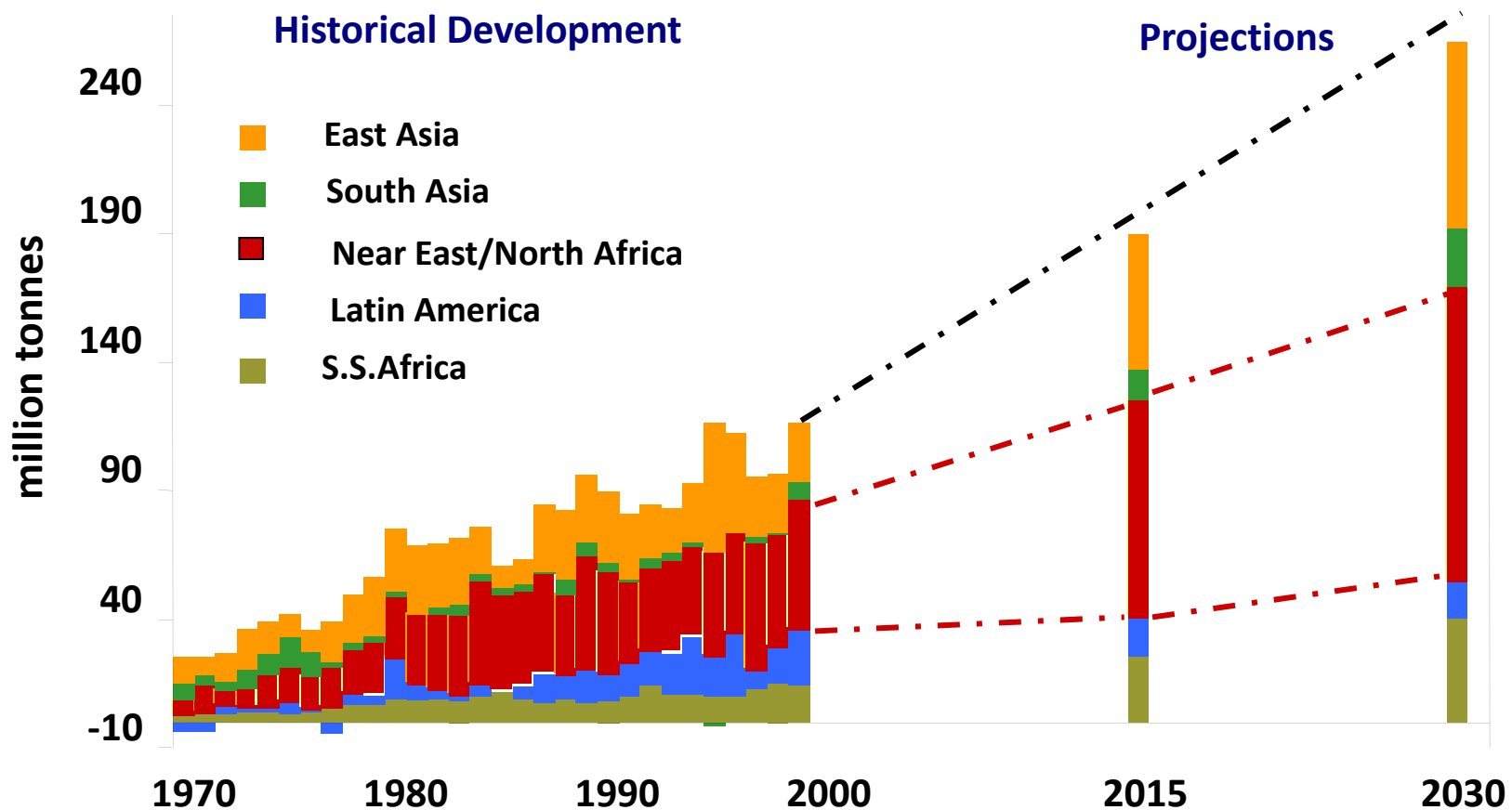
Global Trade: Net cereal imports (in million MT), by region, 2010



Sources: adapted from USDA 2011

Cereal imports projected to rise further in the future

Cereals imports, by region 1970-2030



Source: FAO, 2002 World Agriculture: towards 2015/30

<http://www.fao.org/es/ESD/gstudies.htm>

Projected cereal imports in MENA 2000-2030

Sub-region and country	Population growth 2000–2030 (%)	Income growth 2000–2030 (%)	Increase in net cereal imports 2000–2030 (%)
Arabian Peninsula: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE, Yemen	105	190	89
Near East			
Iraq	95	24	48
Jordan	74	238	61
Lebanon	30	186	52
Syria	78	189	98
North Africa			
Algeria	47	210	18
Egypt	59	168	137
Libya	57	211	72
Morocco	45	193	-17
Sudan	66	254	na
Tunisia	29	200	4

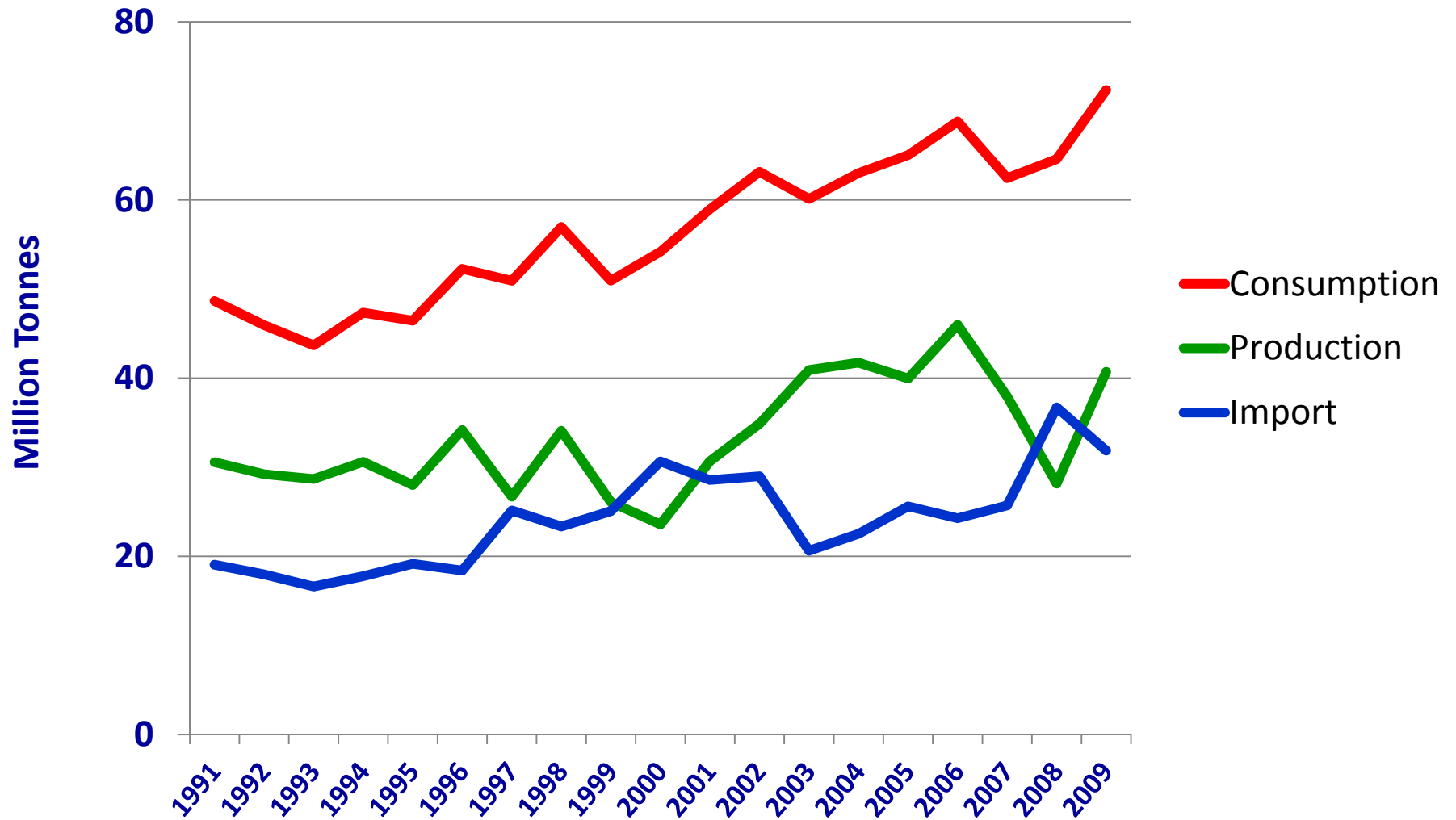
Source: World Bank, FAO and IFAD. 2009

The Case of Wheat Staple Food in MENA

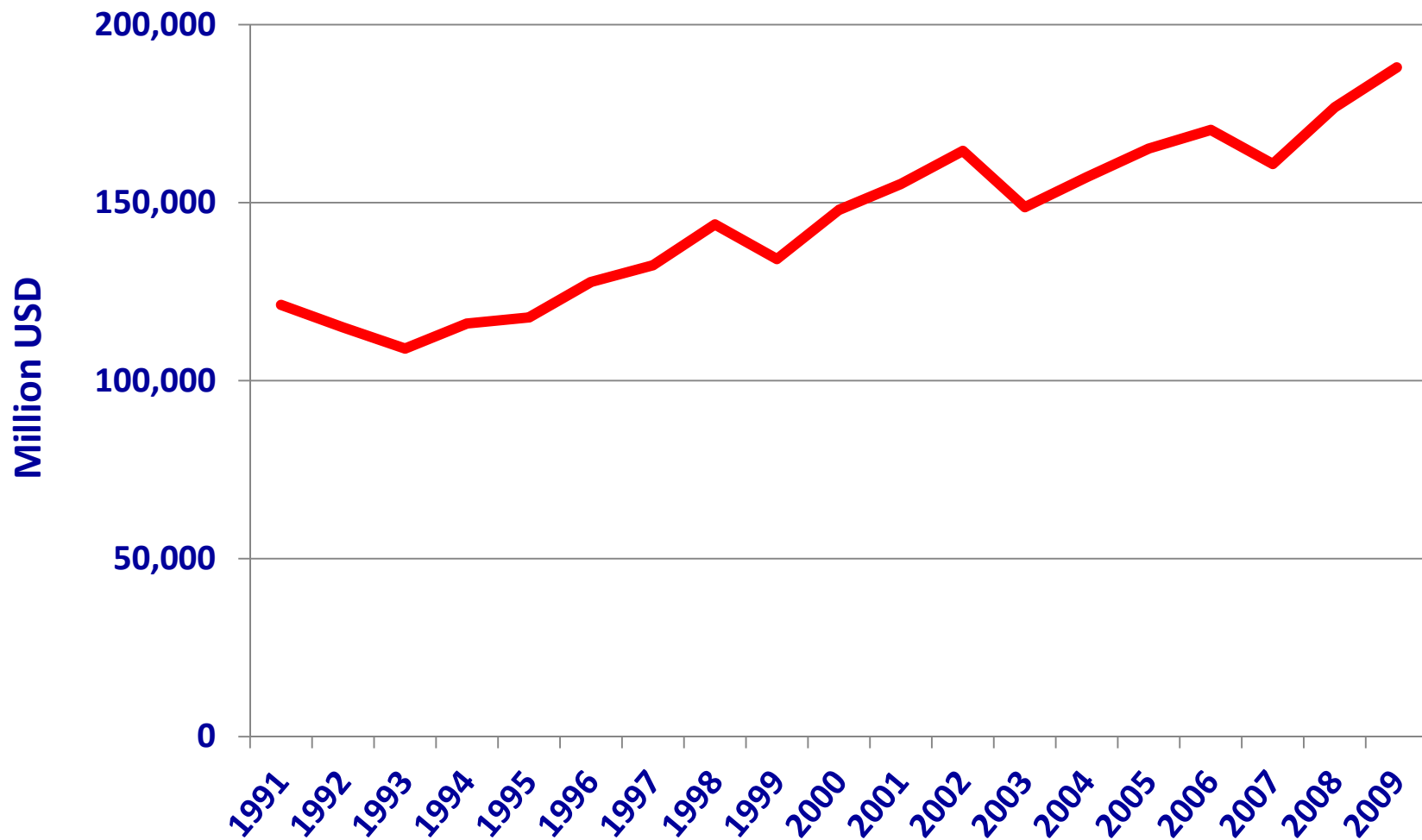
Wheat: a staple food in MENA

- Wheat = 37% of total food supply (calories) in MENA
- Average annual per capita consumption:
 - North Africa (Algeria, Morocco and Tunisia) = 174 kg
 - Middle East = 158kg
 - Total MENA = 166kg
 - World average = 66kg
- **The region imports almost half its wheat needs, but at an increasing cost**

Wheat production, imports and consumption in MENA



The increasing cost of wheat imports in MENA



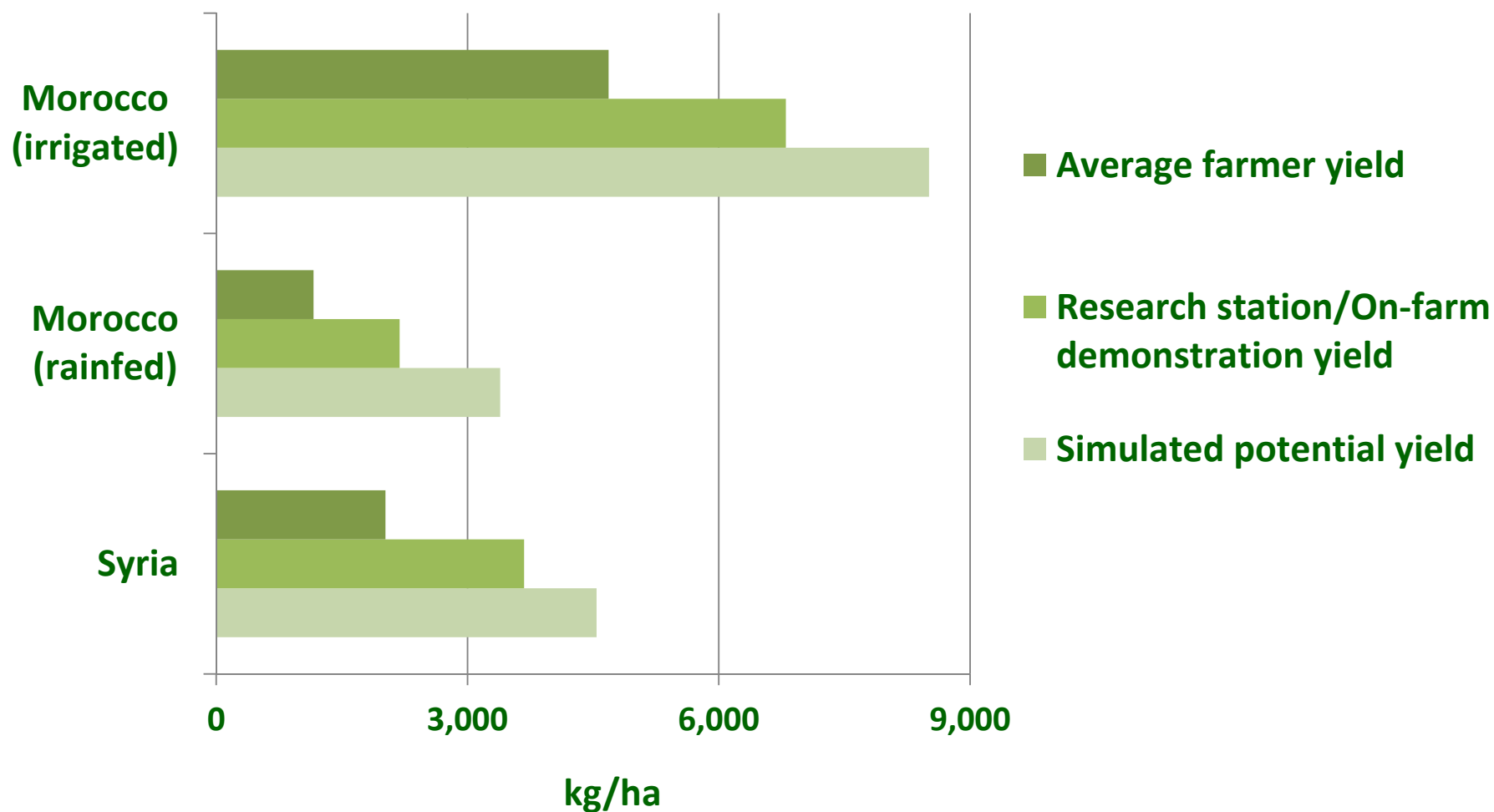
Yield gaps

Productivity in MENA

- Actual farm yields of crops in the MENA region are far below their potential.
- Evidence that productivity gains are slowing
- If production of wheat is to exceed population growth rates, yields must increase further.
- Limited scope for expansion in area
- **Future increases in production must come from increases in productivity per unit of water and land.**

Yield Gap Analysis

Wheat yield gaps in Morocco and Syria: Mean yields for 1995-2004



Wheat yield gap analysis: Morocco and Syria

	Morocco		Syria (rainfed)
Gap Analysis	Settat-Berrechid (rainfed)	Tadla (irrigated)	
Gap 1 (kg/ha)	1028	2115	1655
Gap 2 (kg/ha)	2228	3825	2520
Gap 1 (%)	88%	45%	82%
Gap 2 (%)	192%	82%	125%

Gap 1 = difference between average farmers' yield and research station/on-farm demonstration yield

Gap 2 = difference between average farmers' yield and simulated potential yield

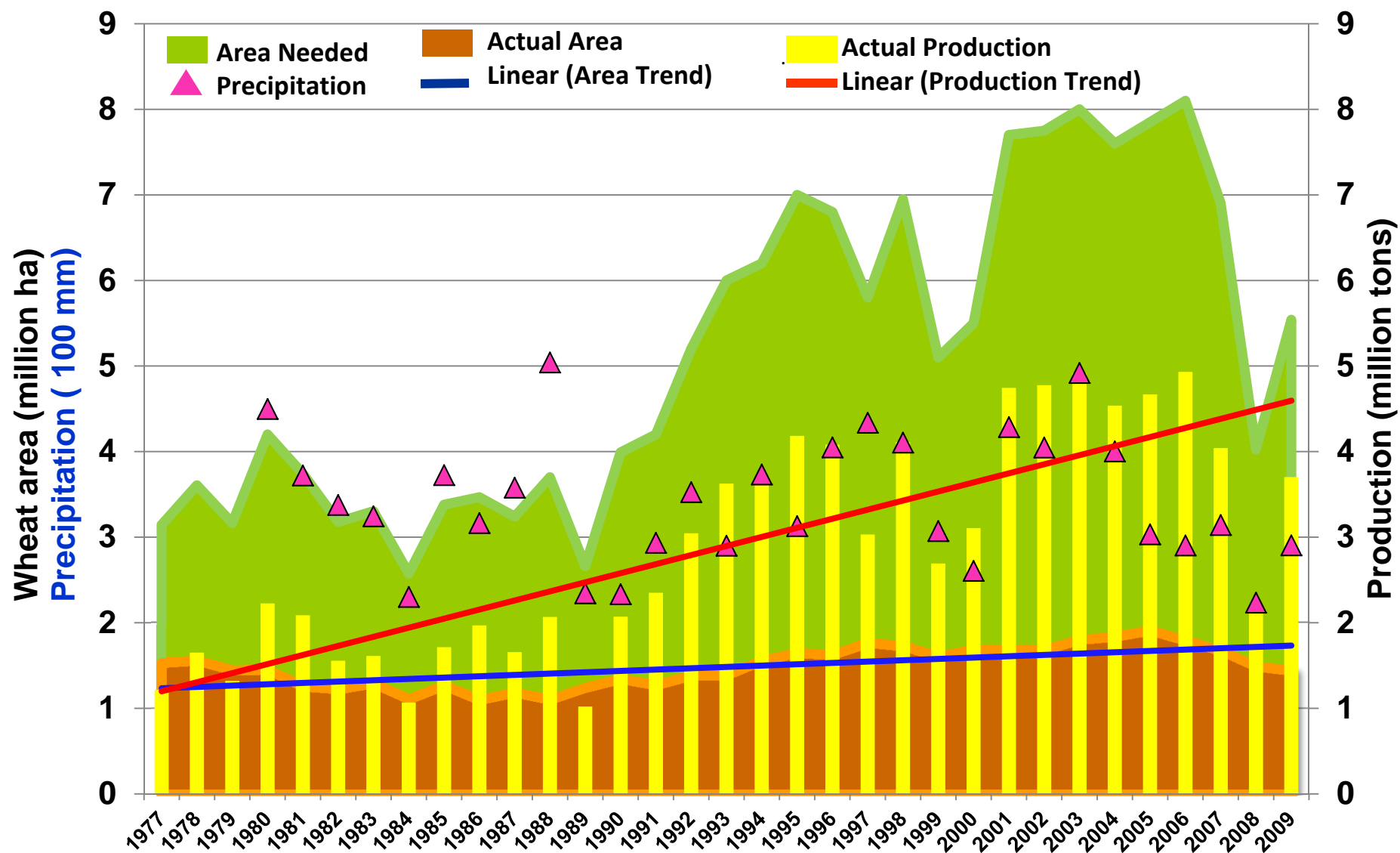
Enhancing food security: Examples

Impact in Syria

Formerly a wheat importer, the country became self-sufficient – and an exporter.

Between 1991 and 2004 wheat production rose from 2.1 million to 4.5 million tons, with a combination of new high-yielding varieties, supplemental irrigation technology and supportive policies.

Impact of improved wheat production technologies in Syria



Results from two years of a project on
Enhancing Food Security Project in Arab Countries

Enhancing Food Security in Arab Countries

Egypt, 2010 - 2011 season

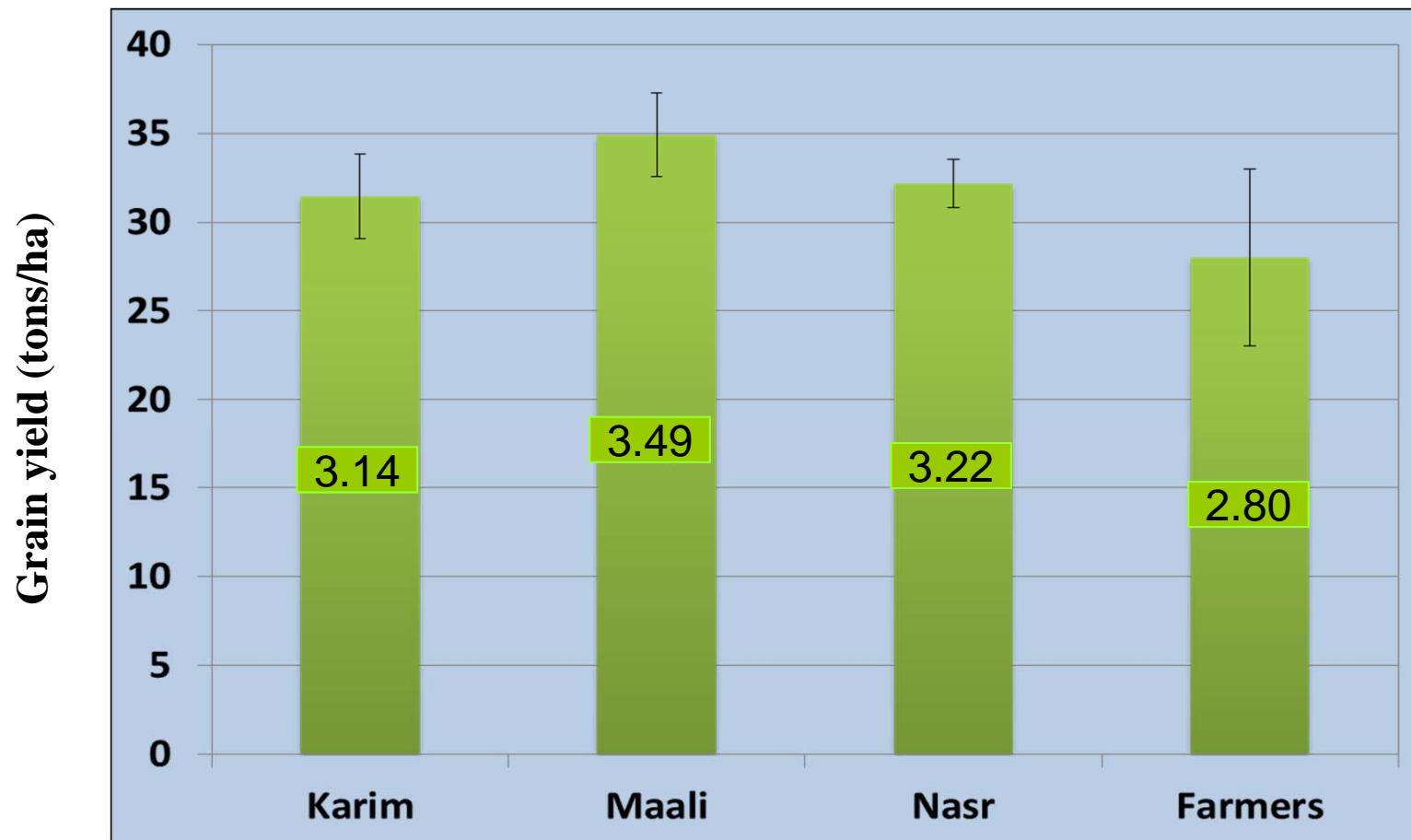
Average grain yield (ton/ha) of improved wheat cultivars in and out of demonstration plots
Average of 91 demonstrations in Sharkia Governorate of Egypt*

No.	Cultivar	Grain Yield (ton/ha)		Increase	
		In demonstration	Out of demonstration	ton/ha	%
1	Sids 12	8.83	--	--	--
2	Misr 2	8.71	--	--	--
3	Misr 1	8.57	--	--	--
4	Sakha 94	8.00	6.70	1.30	19.4
5	Gemmiza 9	7.98	6.98	1.00	14.3
6	Giza 168	7.87	6.67	1.20	18.0
7	Sakha 93	7.54	6.25	1.29	20.6
8	Gemmiza 10	--	5.75	--	--
Mean		8.21	6.47	1.20	18.1

* Water saving averaged 25%

Large scale demonstration fields in rainfed conditions at Fernana Site, Tunisia, 2010-2011

Average grain yield (tons/ha) of improved wheat cultivars
12% to 20% increase over farmers' varieties



Towards long-term food security

What can make the difference?

- Enabling policy environment to support sustainable productivity growth and encourage better farming practices
- Greater priority to and investment in enhancing water productivity
- Strengthening the agriculture innovation system (research, education, extension)
 - Investment in S & T and research
 - **Effective technology transfer mechanisms**
 - **Capacity development & institutional support**



The role of ICARDA

35 years of applied research experience in MENA

- Conservation and use of genetic diversity to develop improved, adapted crop varieties
- Crop improvement: plant breeding and improved crop management and IPM practices
- Improving water productivity: Technology, policy and institutional innovations
- Diversification and intensification of production systems
- Conservation agriculture: reducing production and energy costs
- Capacity development

THANK YOU

