



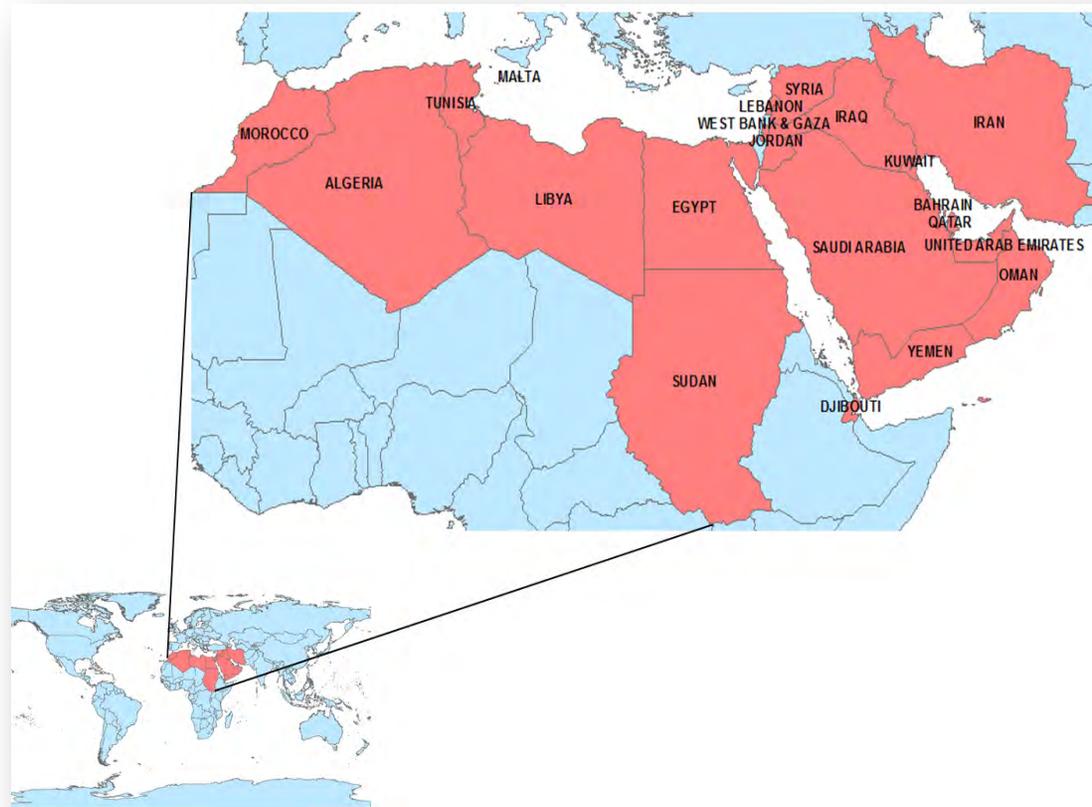
# The Added Stress of Climate Change on Food & Energy Security in the Middle East & North Africa (MENA)

## NSOE

Lincoln Pratson (PI), Drew Haerer, Kyra Moore

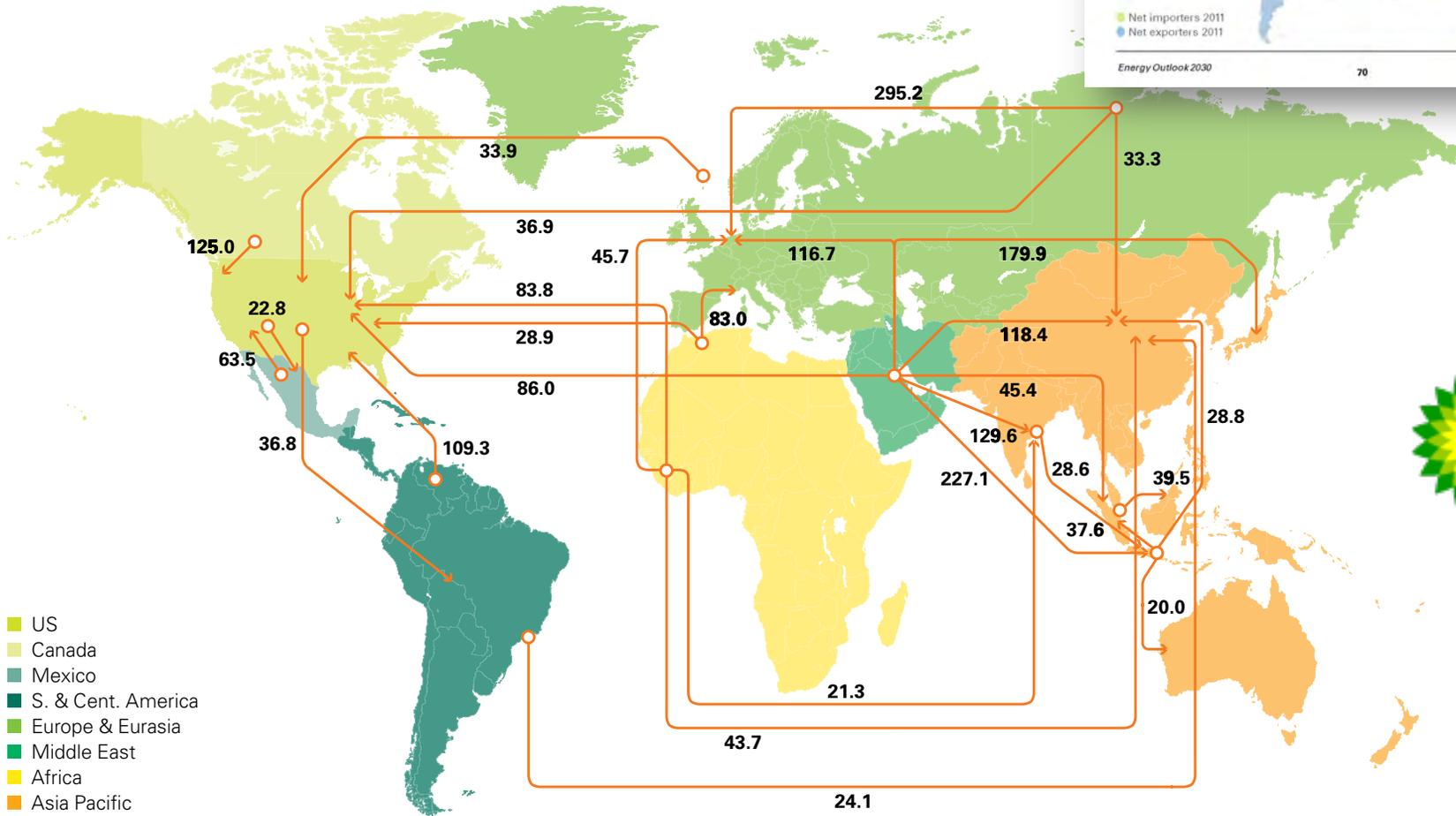
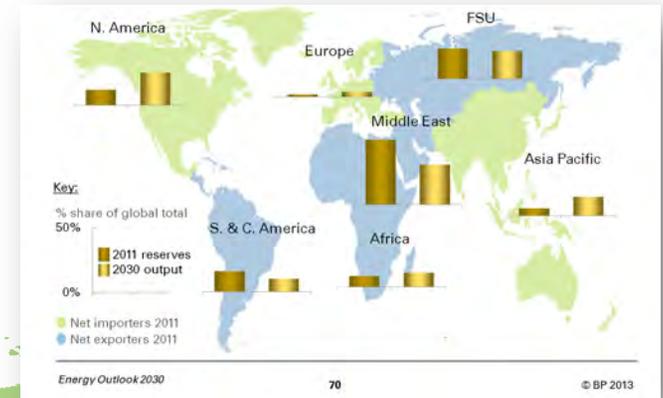
## CGGC

Gary Gereffi (Co-PI), Ghada Ahmed, Danny Hamrick,  
Andrew Guinn, Ajmal Abdulsamad





# MENA: GLOBAL SUPPLIER OF OIL & GAS



- US
- Canada
- Mexico
- S. & Cent. America
- Europe & Eurasia
- Middle East
- Africa
- Asia Pacific

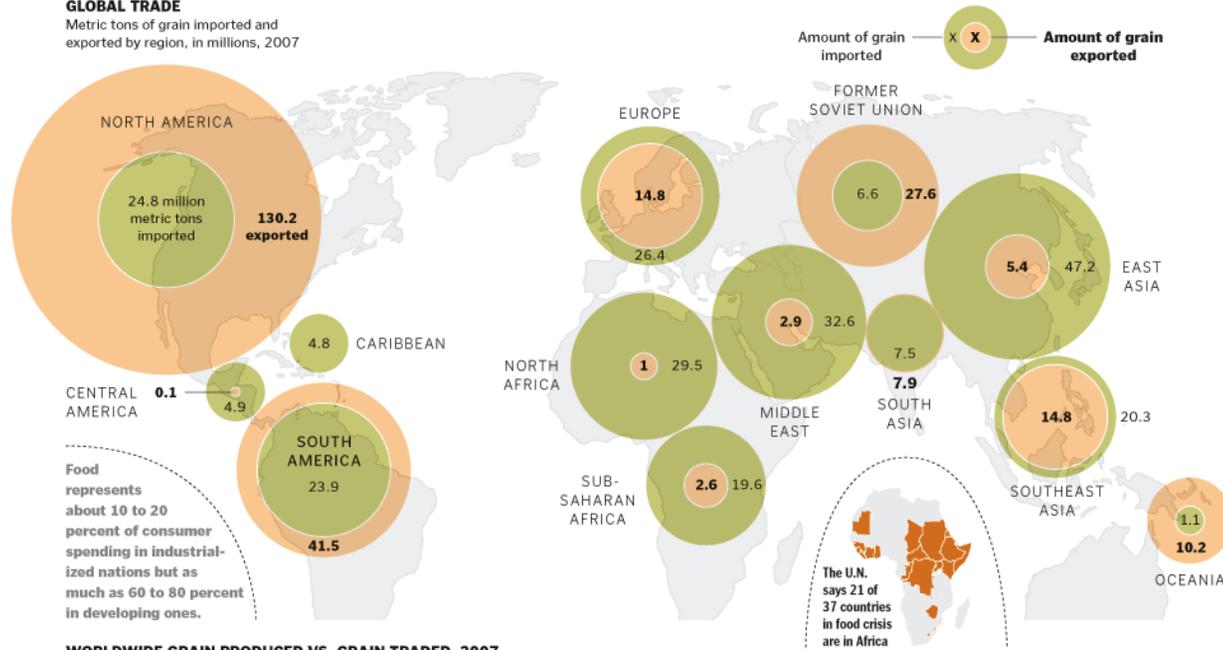




# MENA: MAJOR GRAIN IMPORTER

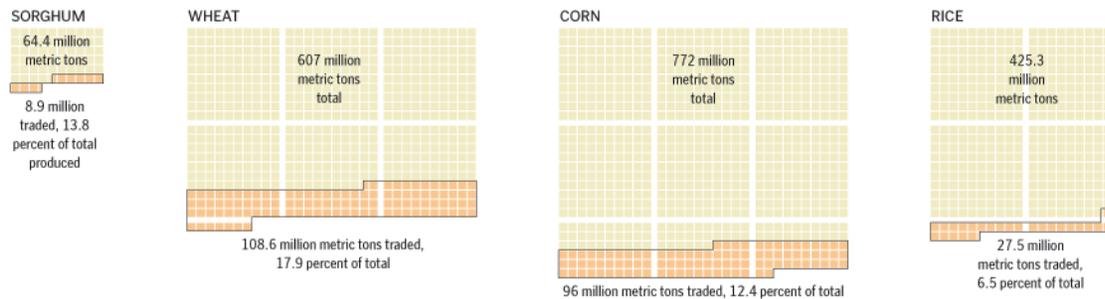
## GLOBAL TRADE

Metric tons of grain imported and exported by region, in millions, 2007



## WORLDWIDE GRAIN PRODUCED VS. GRAIN TRADED, 2007

The amount of grain traded on the global market is a small percentage of the total produced because countries keep most of their crop for domestic needs.

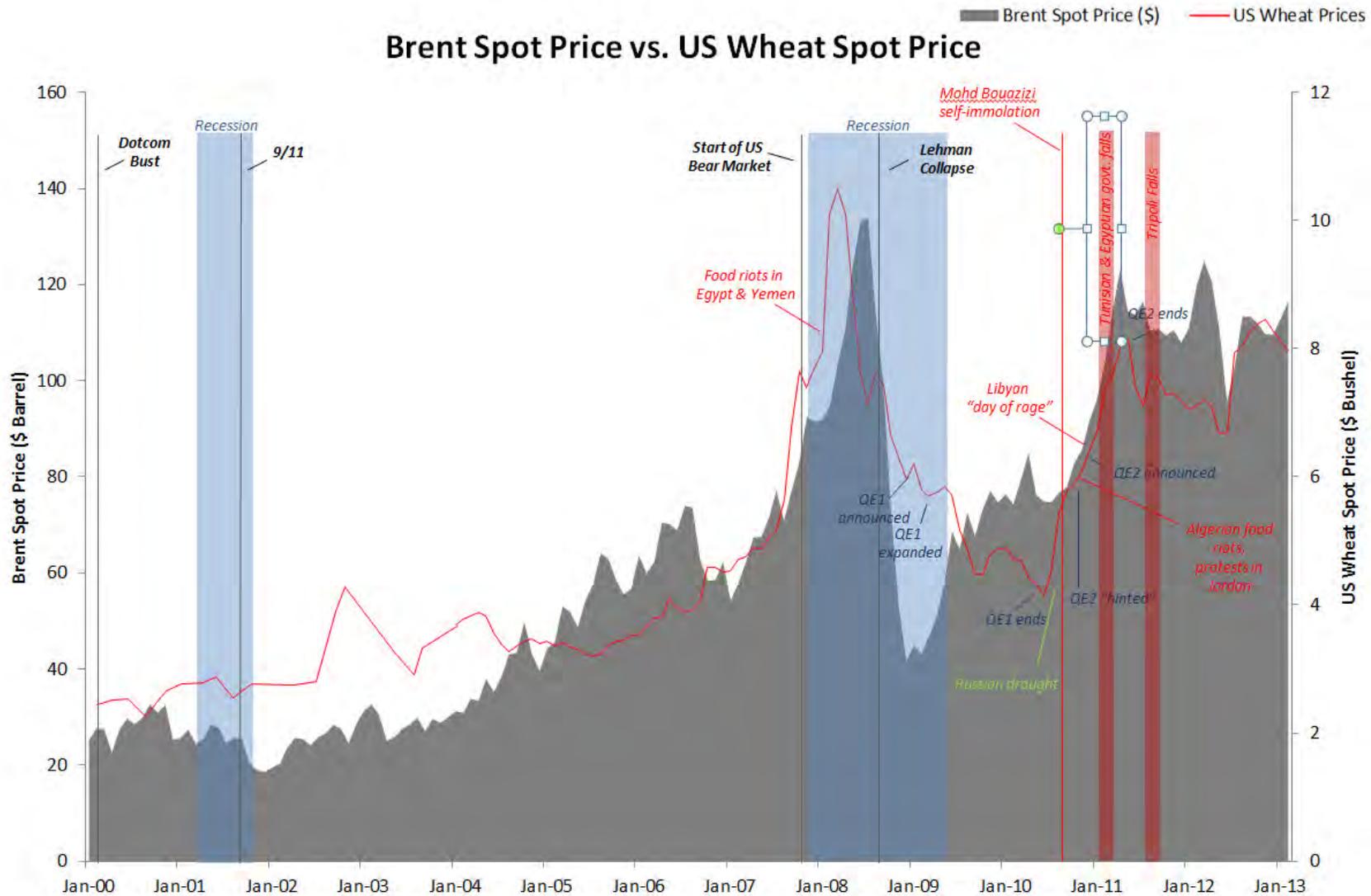


SOURCES: Food and Agriculture Organization of the United Nations, World Bank, U.S. Department of Agriculture, Renewable Fuels Association, Food and Agricultural Policy Research Institute, Bloomberg, International Grains Council

<http://futuresgroup.wordpress.com/2008/10/03/future-of-food/>



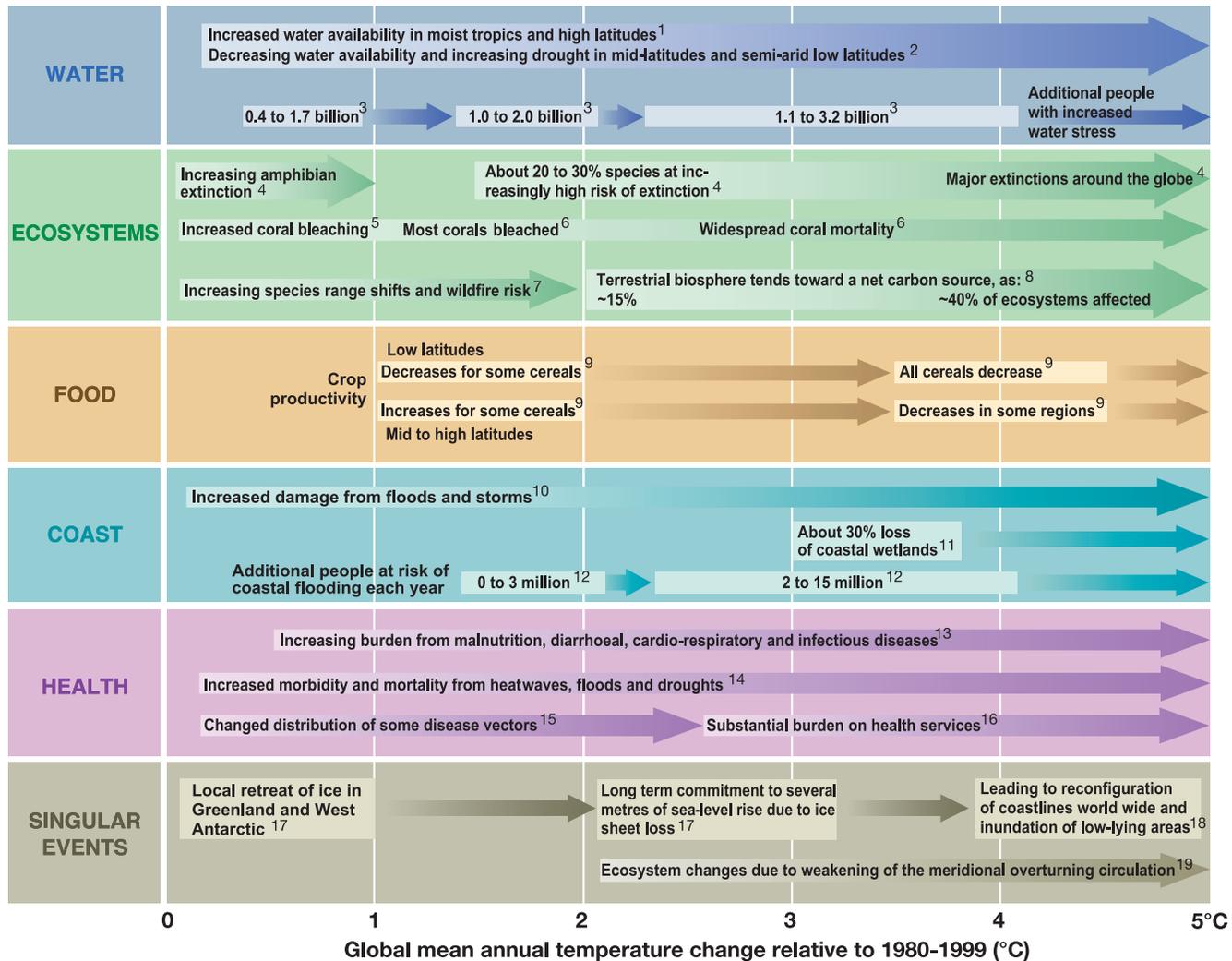
# WHEAT & OIL PRICE vs. MENA CONFLICTS



<http://grandemotte.wordpress.com/2013/04/24/syrian-oil-and-what-caused-the-war/>



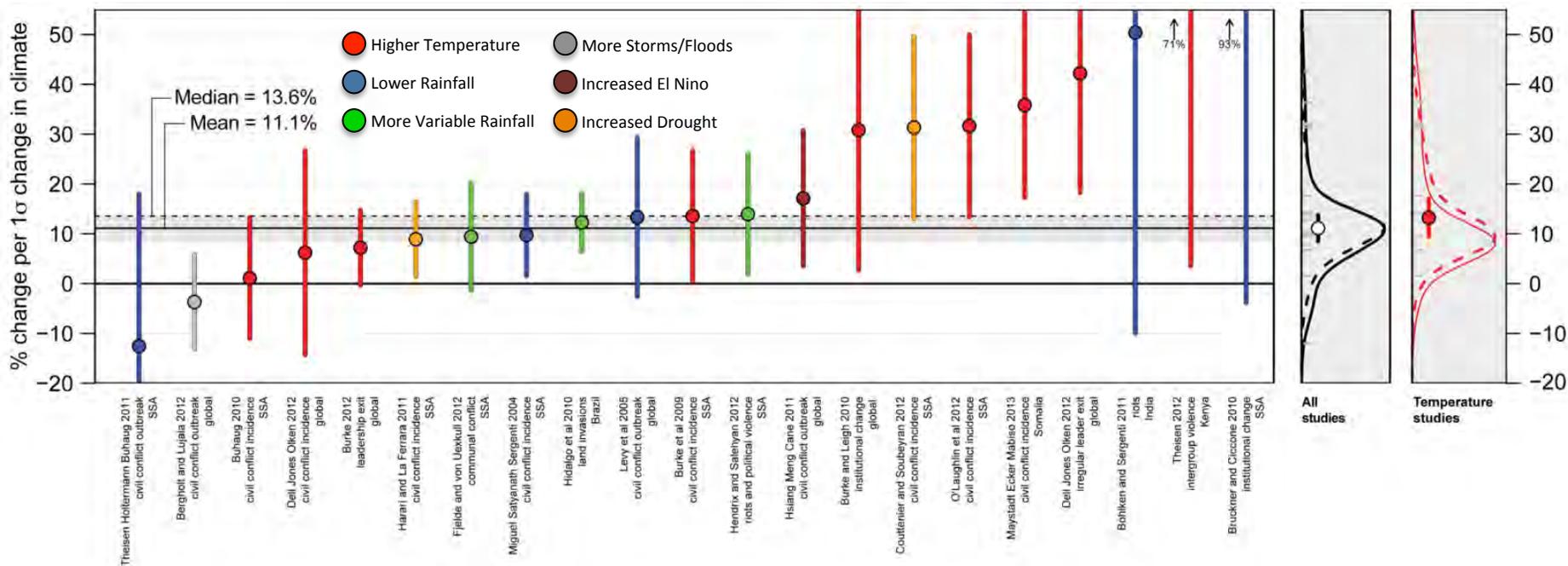
# MAJOR IMPACTS OF CLIMATE CHANGE



Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change



# CLIMATE CHANGE AND CONFLICT



"Quantifying the Influence of Climate on Human Conflict", Solomon M. Hsiang, Marshall Burke, Edward Miguel, Science, September 8, 2013.

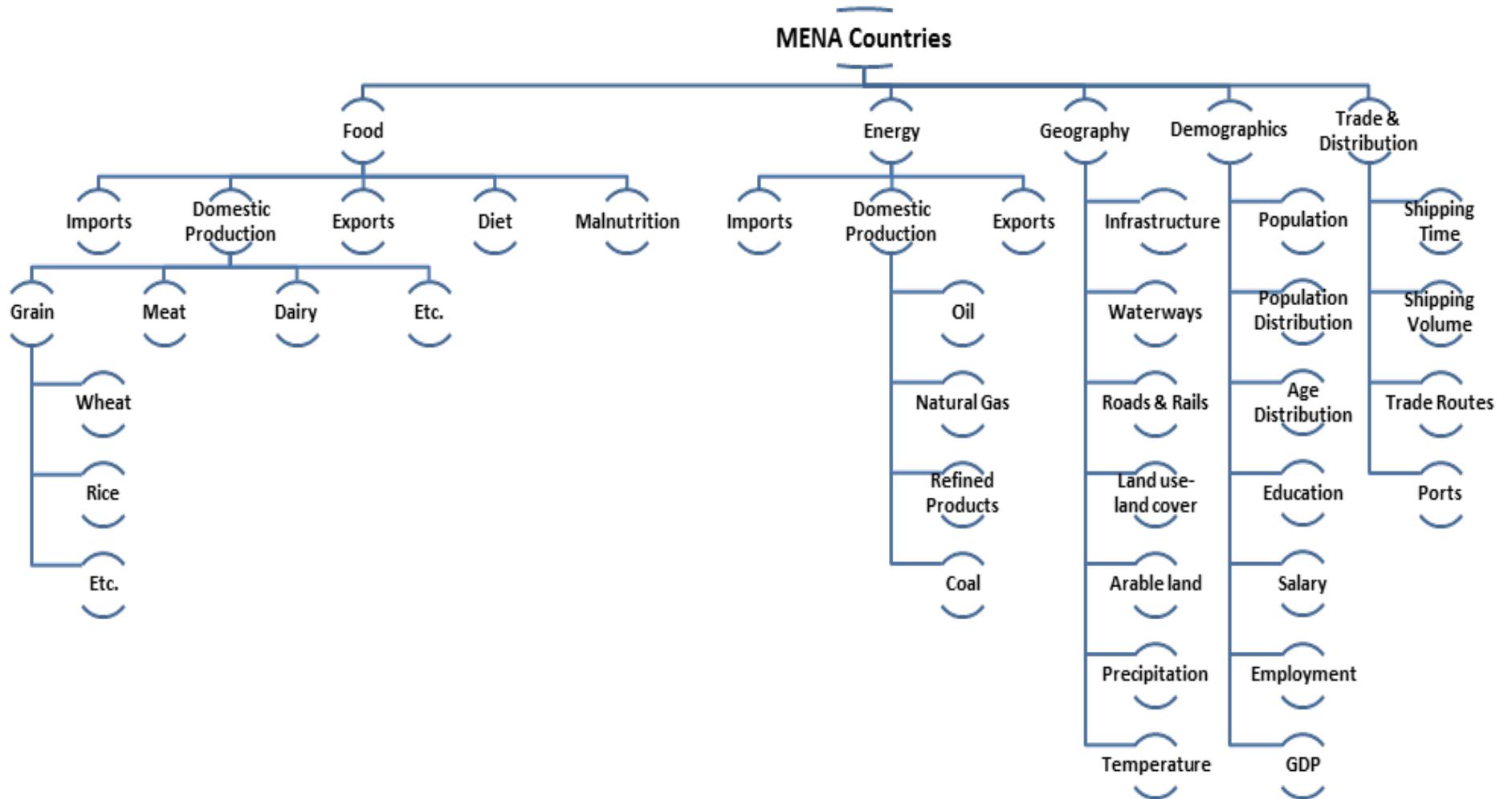


## PROJECT OBJECTIVES

- Rank food security of MENA countries
- Develop global value chain models for grains imported by key MENA countries
- Identify GVC risks and options for dealing with them.

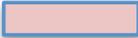


# DATABASE



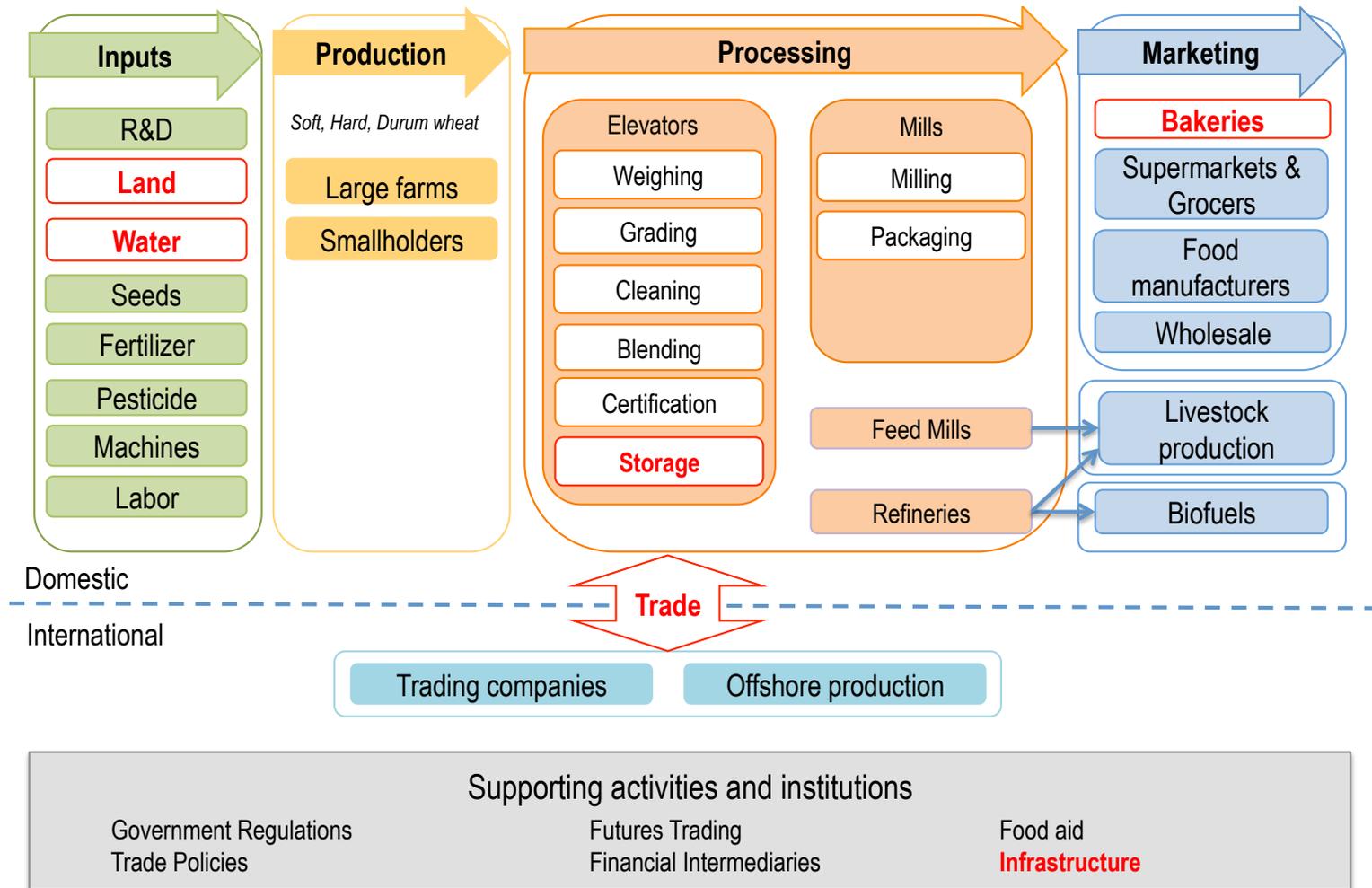


## FOOD SECURITY RANKING

Resource-Poor Labor Abundant	Resource-Rich Labor Abundant	Resource-Rich Labor Importing
Comoros	Yemen	Libya
Djibouti	Algeria	Bahrain
Mauritania	Sudan	Kuwait
Somalia	Syria	Oman
West Bank and Gaza	Iran	Qatar
Egypt	Iraq*	Saudi Arabia
Jordan		United Arab Emirates
Lebanon		
Morocco		
Tunisia		
Israel*		
Acute Food Insecurity 	Moderate Food Insecurity 	Low Food Insecurity 



# GENERAL MENA WHEAT GVC

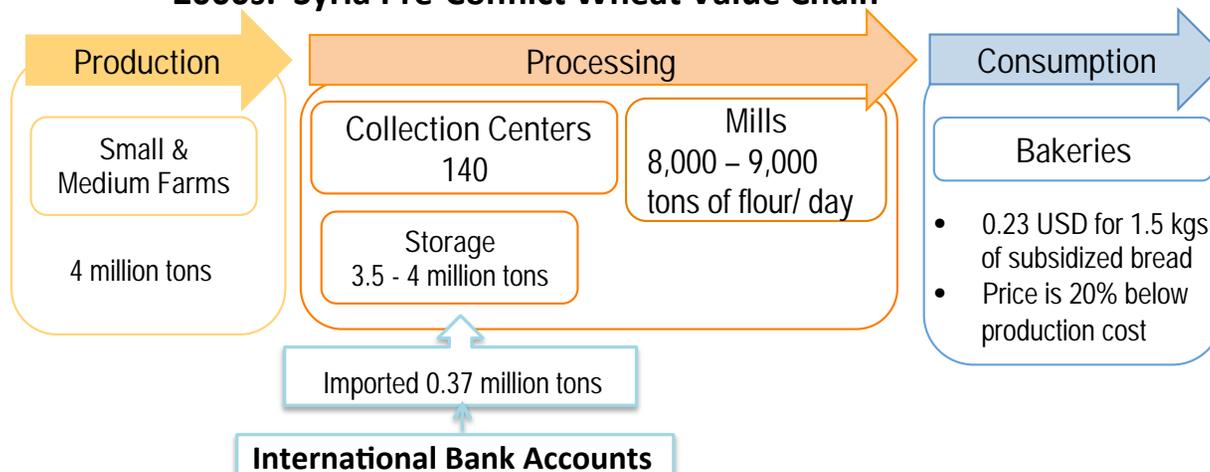


**Red: Acute disruption points in wheat GVC**

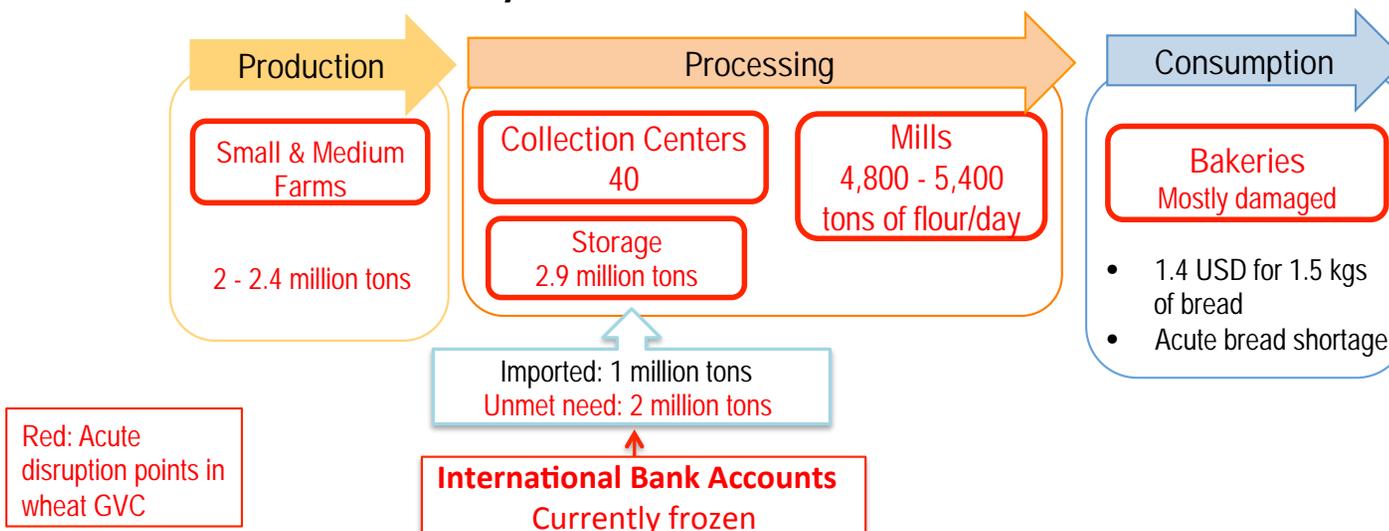


# SYRIA WHEAT GVC PRE- & POST-CONFLICT

## 2000s: Syria Pre-Conflict Wheat Value Chain



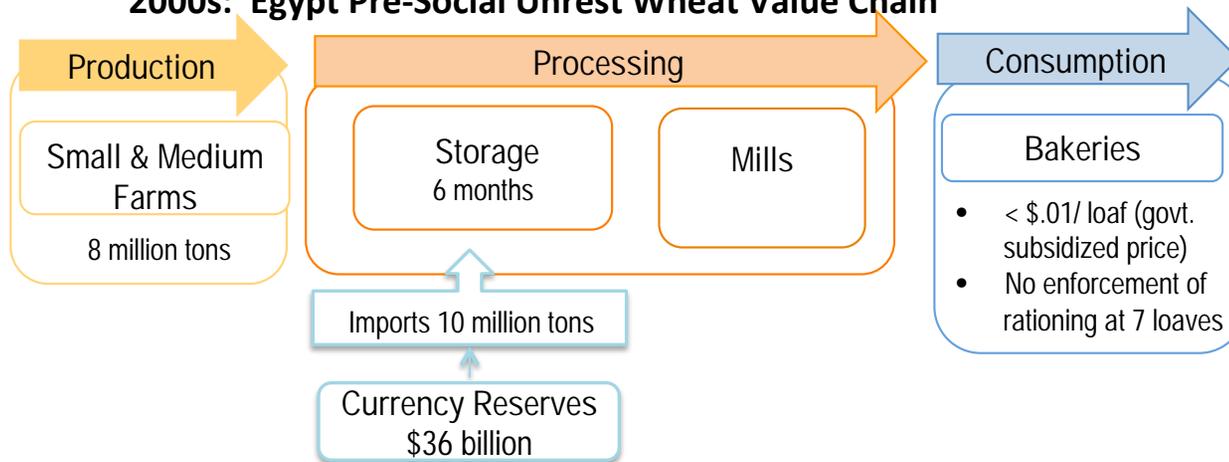
## 2013: Syrian Conflict Wheat Value Chain



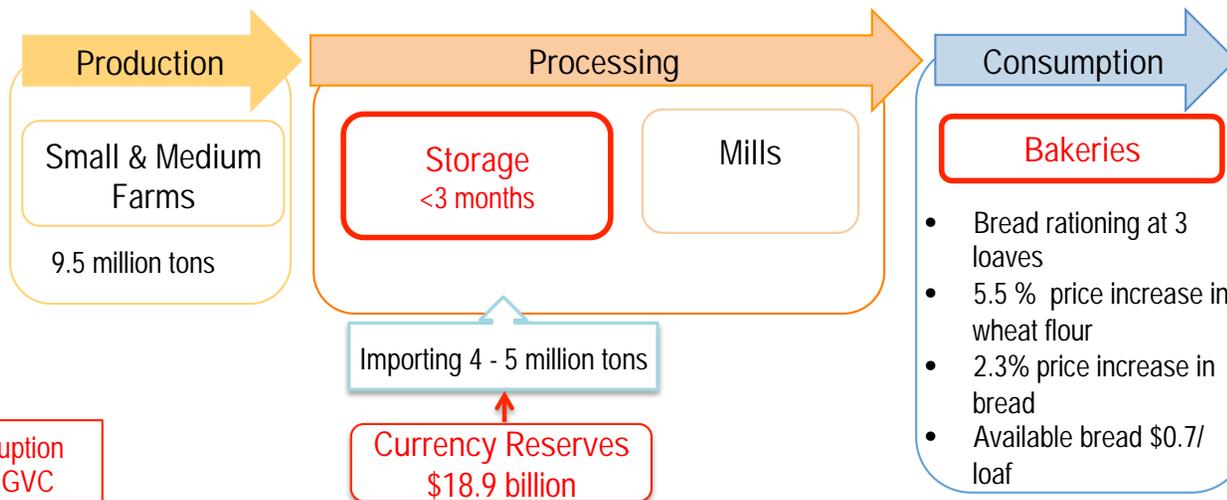


# EGYPT WHEAT GVC PRE- & POST-UPRISING

2000s: Egypt Pre-Social Unrest Wheat Value Chain



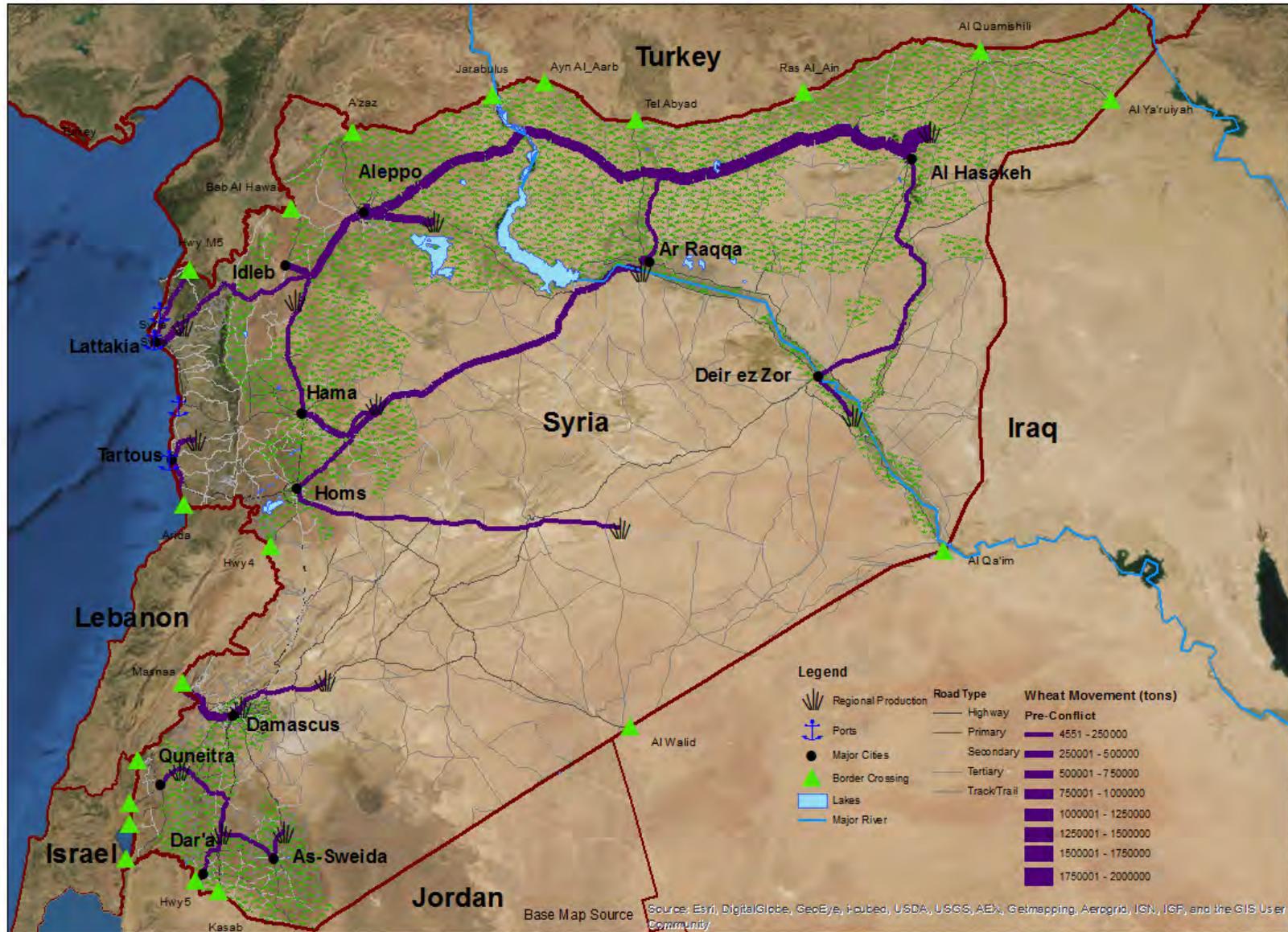
2013: Egyptian Social Unrest Wheat Value Chain



Red: Acute disruption points in wheat GVC

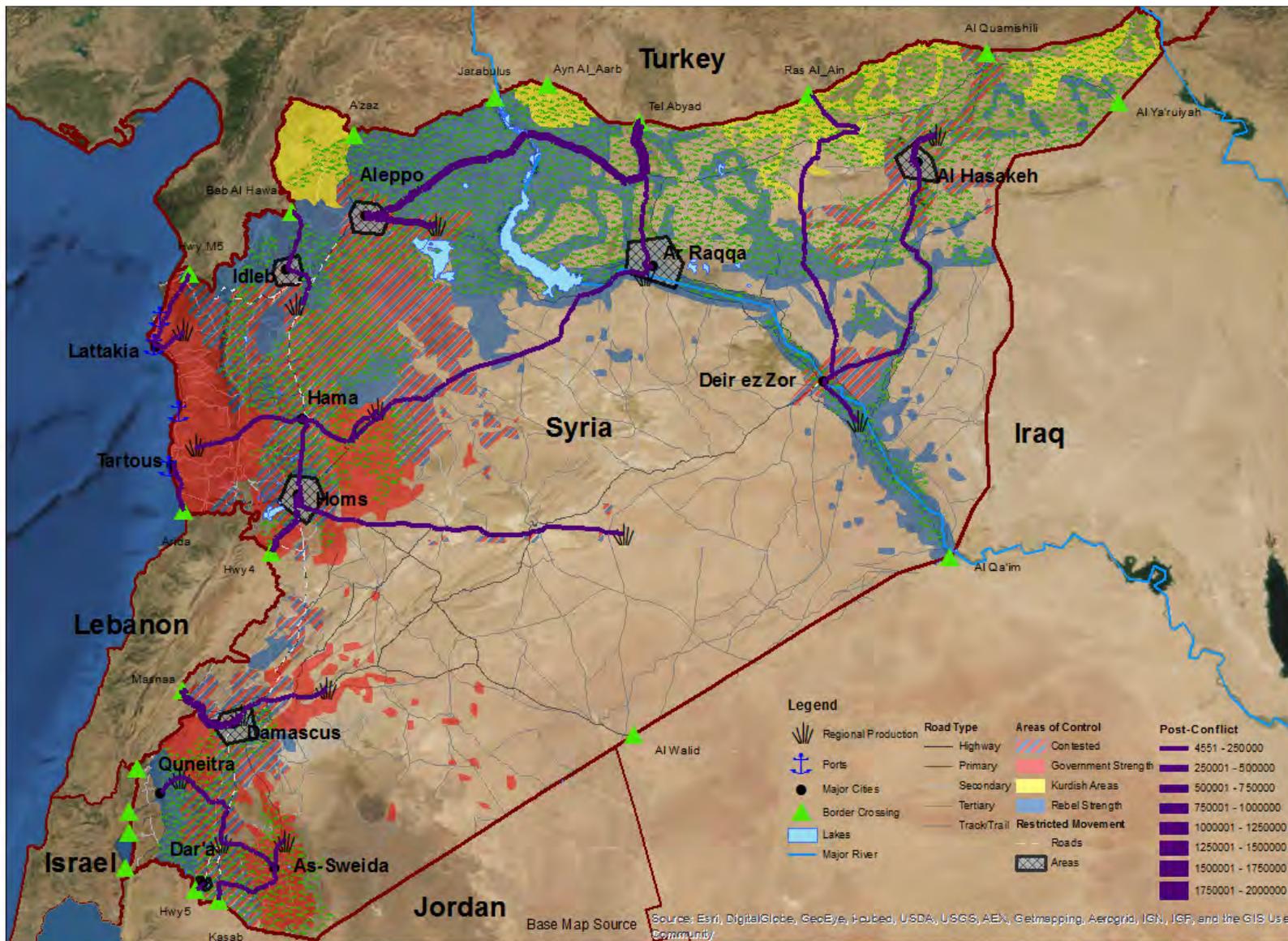


# SYRIA WHEAT "SUPPLY CHAIN" MODEL PRE-CONFLICT





# SYRIA WHEAT “SUPPLY CHAIN” MODEL POST-CONFLICT





## NEXT STEPS

- Refine Food Security ranking of MENA countries.
- Complete detailed GVC models of grains (and potentially other food staples) imported by key MENA countries.
- Improve supply-chain optimization model.