

# Environmental Security & Resource Scarcity



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Image source:  
[AGU Eos](#)

# Agenda

- **Projecting Natural Resource Demands**
- Resources and conflict
- The nemesis of climate change
- Managing Complexity: The food-water-energy nexus
- Areas for cooperation to address emerging environmental security concerns
- Conclusions

# Rising Population = Growing Demand for Resources

## The world's population

Regional % change, 2013-2050



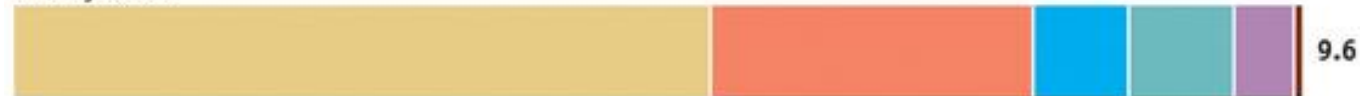
Source:  
[The Economist.](#)  
[Daily Chart.](#)  
[Jun 18, 2013](#)

## Total population, bn

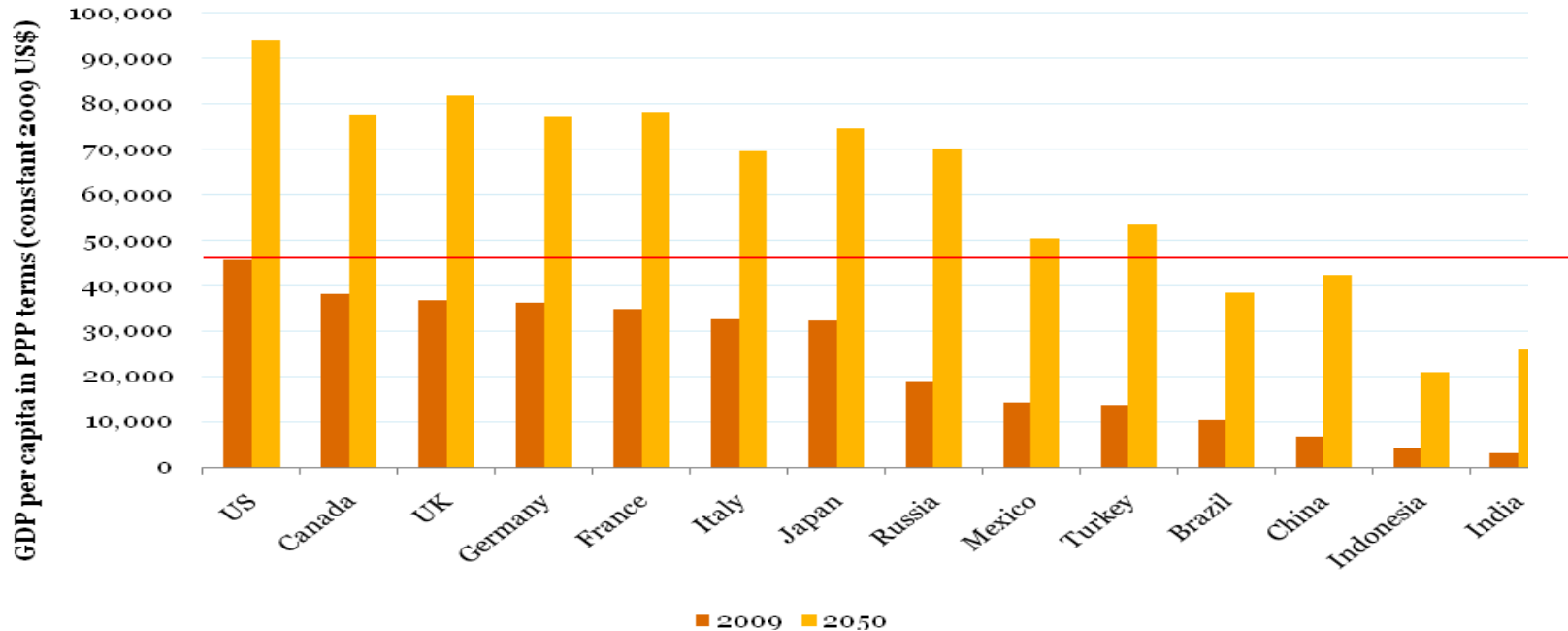
2013



2050 forecast



# Rising Prosperity= Growing Demand for Resources



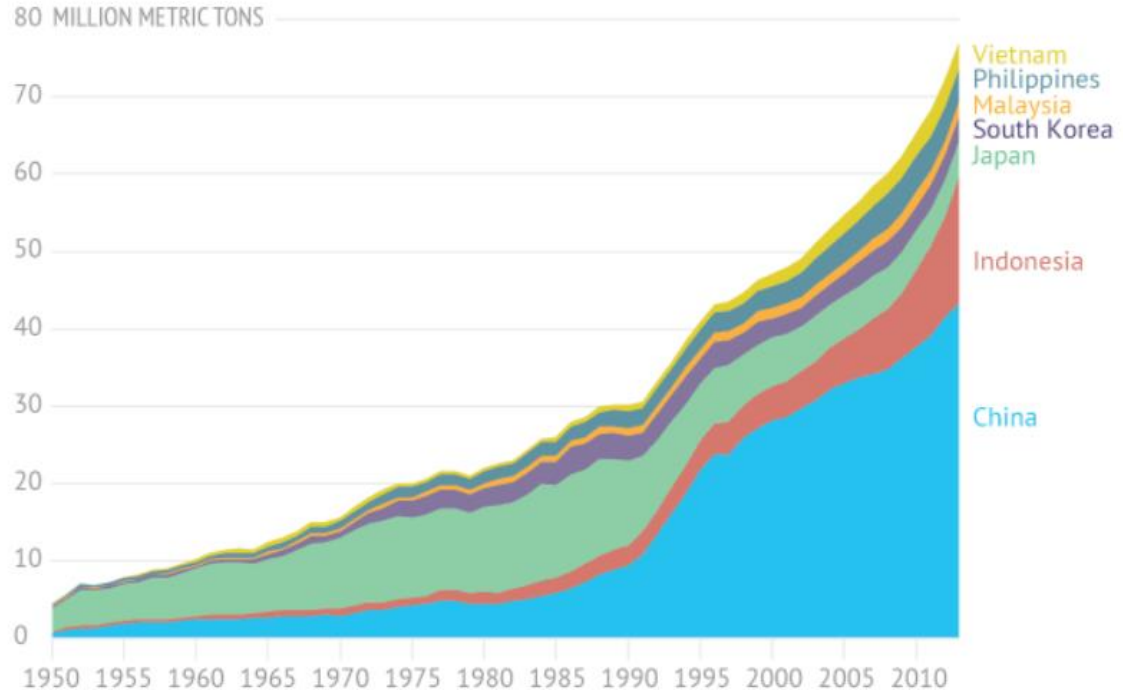
Source: [PricewaterhouseCoopers LLP. 2011. The World in 2050](#)

## Example: Growing Demand for and Capture of Fish by Asian Countries

Source: [Stratfor. 2016. "Fish: The overlooked destabilizer in the South China Sea," in Financial Sense \(Feb 12\)](#)

### Annual Marine Capture Production, Select Asian Nations (1950-2013)\*

In 2013, China produced nearly 60 times as much fish as in 1950. Indonesia's annual haul had increased at three times that rate, bringing it up to 16 million tons. Japan reached a plateau after a boom in the 1990s.

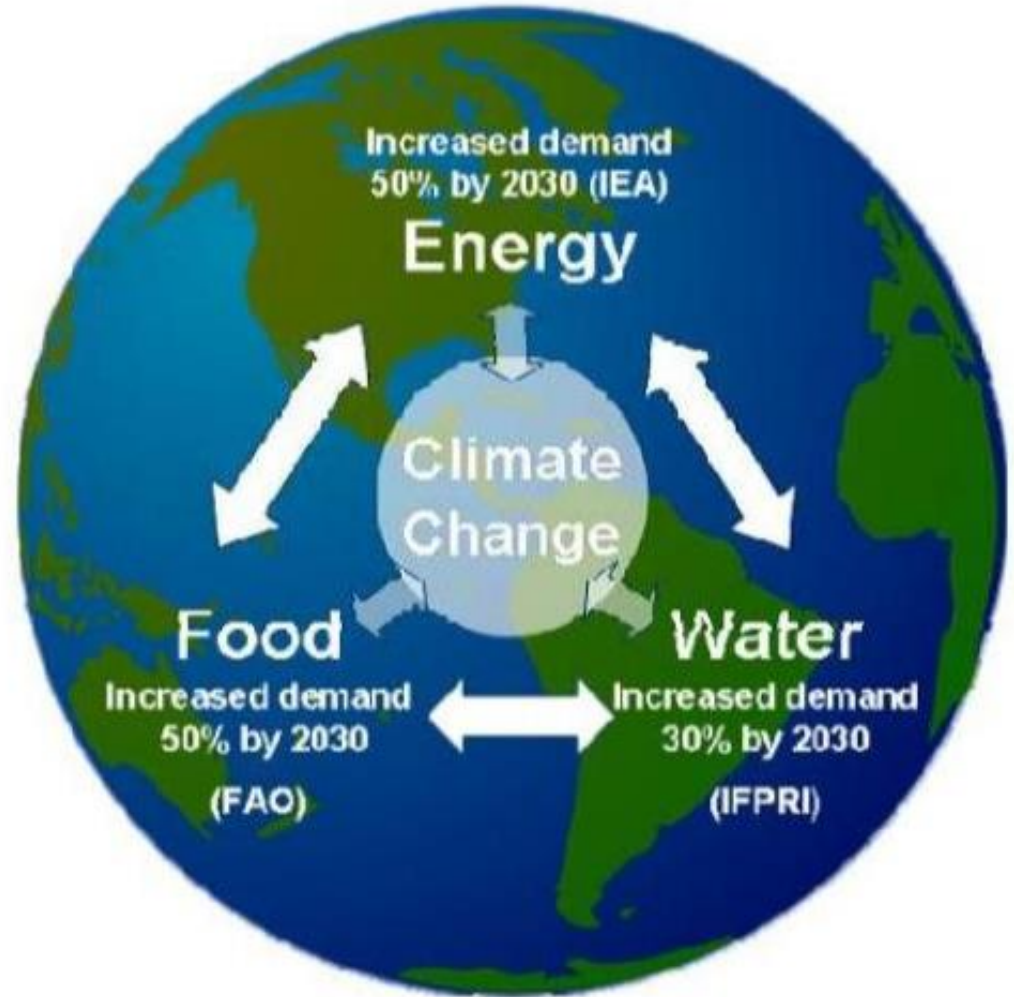


\*"Marine capture production" is all volume landed in marine waters. It excludes captive-raised production.

Source: UN Food & Agriculture Organization

Copyright Stratfor 2016 www.stratfor.com

# Estimated Demand for Resources



Source: Hassan Tolba Aboelnga. 2018. *Water Energy Food Security Nexus*. Bonn: Nexus Regional Dialogue Programme. P. 8.

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# Drivers of Resource Conflict

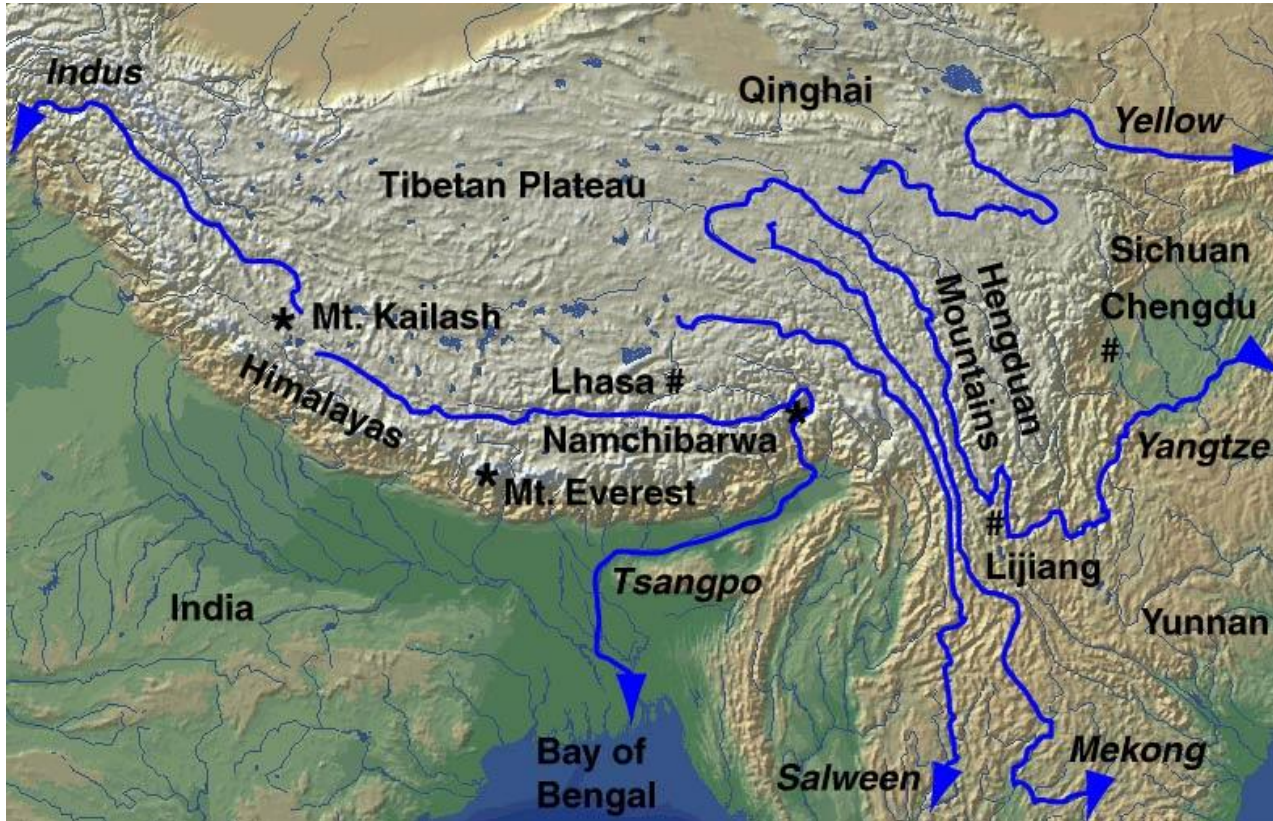
- Competition over increasingly scarce resources
- Poor governance of renewable natural resources and environment'
- Transboundary natural resource dynamics and pressure

**Climate change compounds each of these drivers**

[UN Interagency Framework Team for Preventive Action.](#)  
2012, *Renewable Resources and Conflict*. pp 9-11.

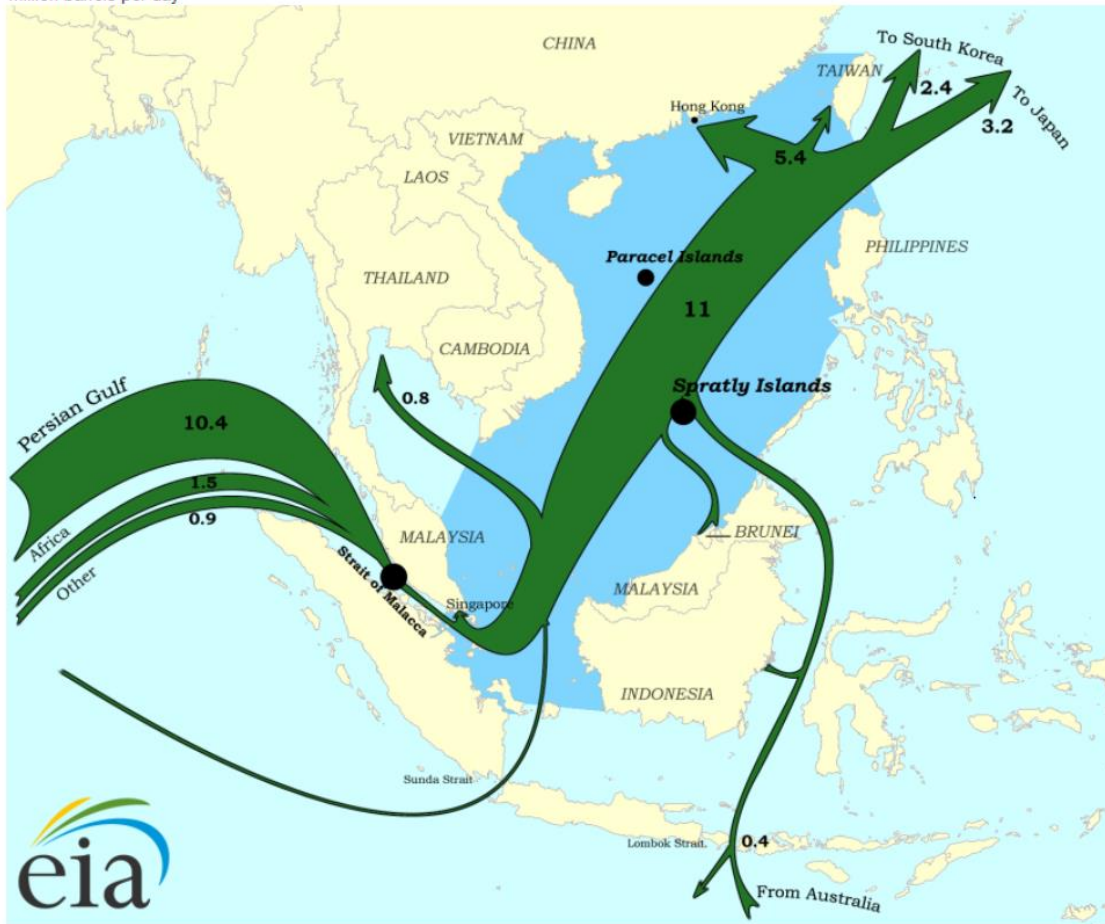


# Conflict over Water Resources



Source: B. Chellaney. 2007. [“China-India Clash over Chinese Claims to Tibetan Water. The Asia-Pacific Journal 5:7.](#)

Major crude oil trade flows in the South China Sea (2011)  
million barrels per day



# Conflict over Energy Resources

Source:  
[U.S. Energy Information Administration](http://www.eia.doe.gov)



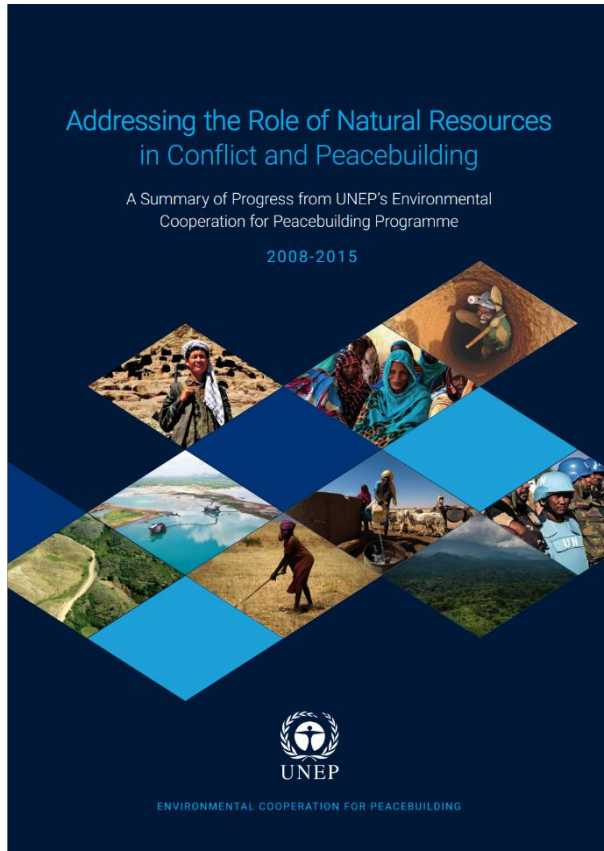
# Conflict over Food Resources



Indonesia blows up 23 fishing boats from Viet Nam and Malaysia caught poaching in Indonesian Waters  
April 2016

Source: [Foreign Policy.com](https://www.foreignpolicy.com)  
Image credit: SEI  
RATIFA/AFP/Getty Images  
April 7, 2016

# Resources & Conflict



“Resolving natural resource conflicts is a defining peace and security challenge of the 21st century. The geopolitical stakes are high as the survival or authority of states may depend on securing access to key natural resources.”

[UNEP. 2015, Addressing the Role of Natural Resources in Conflict and Peacebuilding, p 1.](#)

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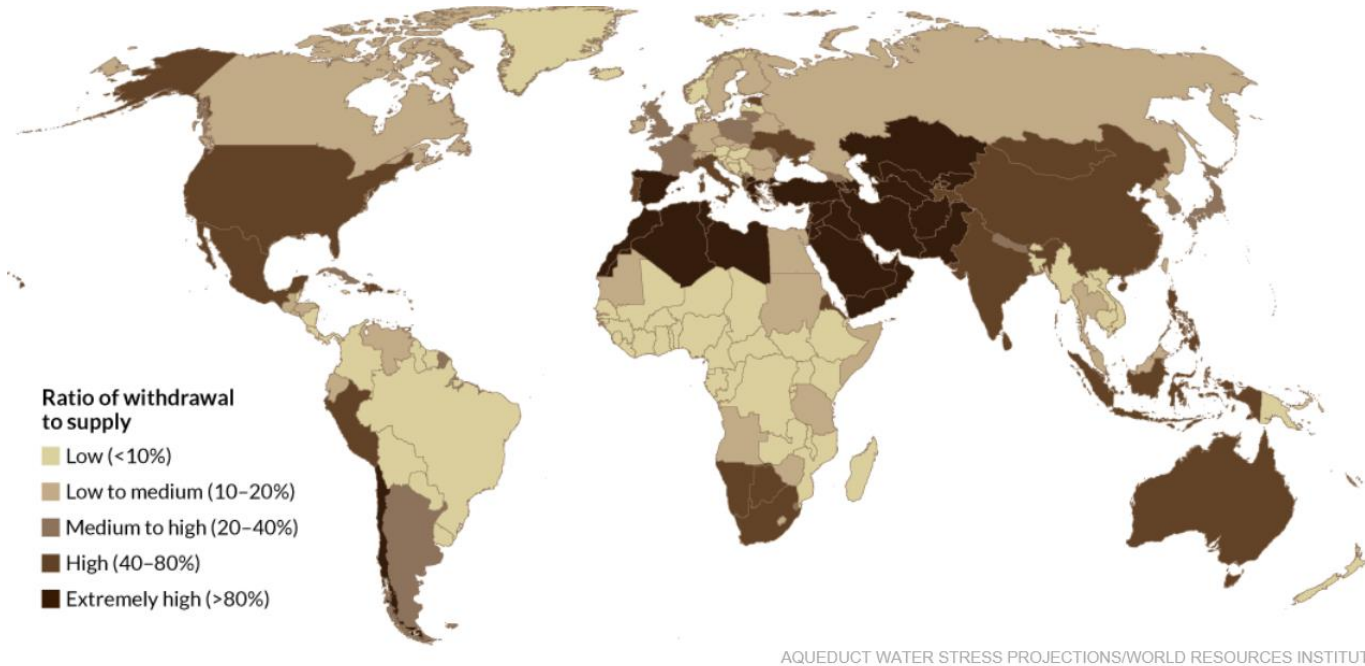
# Environmental Impacts of Climate Change:

- **Higher ocean temperatures.**
  - Evaporation, precipitation.
  - Tropical cyclones.
  - Rising sea levels.
- **Higher air temperatures.**
  - Ice melt / snow runoff.
  - More extreme weather
- **Higher ground temperatures**
  - Desertification.
  - Permafrost melting.
- **Ocean acidification**
  - Reef and marine life stress.



Image source: [Philippines Atmospheric, Geophysical and Astronomical Services Administration](#)

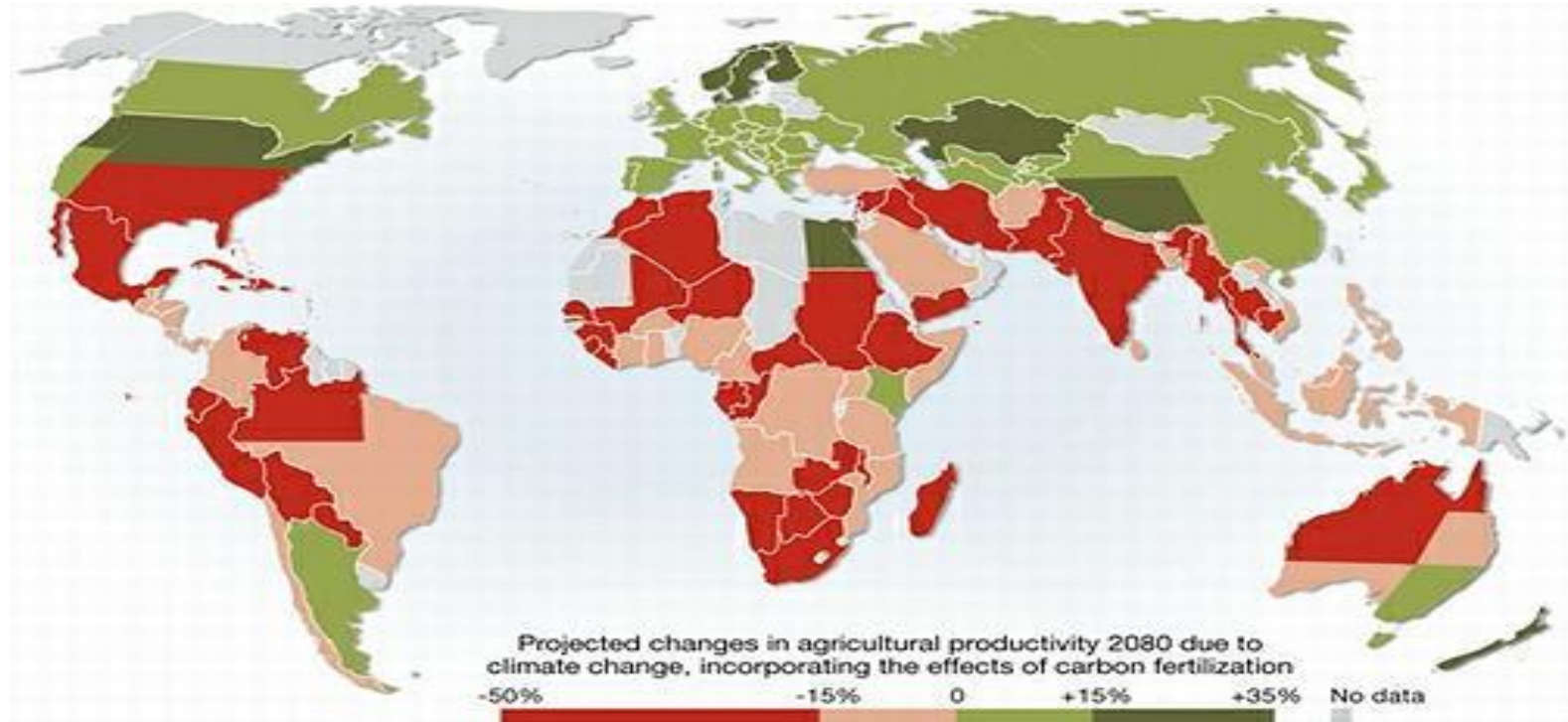
# Example: Projected water stress, 2040



AQUEDUCT WATER STRESS PROJECTIONS/WORLD RESOURCES INSTITUTE

Source:  
[Alexandra Witze. 2018. "More than 2 billion people lack safe drinking water. That number will only grow," in Science News \(August 16\)](#)

# Example: Projected Climate Impacts on Agricultural Productivity



Source: [UNEP The Environmental Food Crisis 2008](#). Map by William Cline.



# Example: Climate and Energy

Will another storm mean



Our electricity grid faces serious risks from storm surge and sea level rise.

Union of  
Concerned Scientists

Learn more: [ucsusa.org/LightsOut](https://ucsusa.org/LightsOut)

© Union of Concerned Scientists 2016

Source: [Union of Concerned Scientists](https://www.ucsusa.org/)

# Security Impacts of Climate Change

## Environmental Impacts

- Rising sea levels
- Tropical cyclones
- More floods
- More droughts
- Riverine erosion

## Human Security Impacts

- Freshwater access
- Food production
- Infrastructure destruction
- Disease outbreak
- Migration

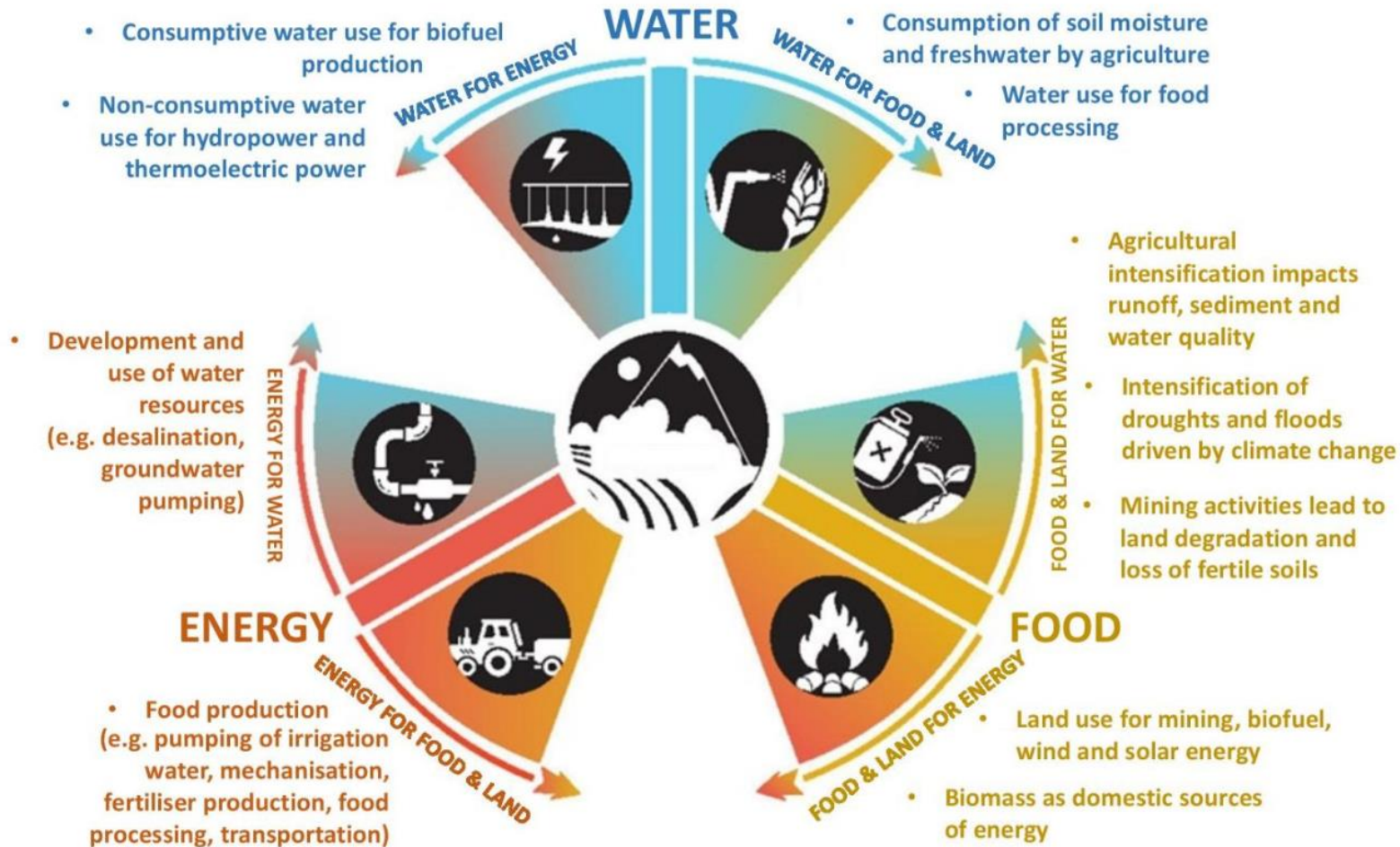
## Traditional Security Impacts

- Conflict over:
  - Blame
  - Resources
  - Migration
  - Maritime boundaries
- Increased stress on weak governments

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# The Food-Water-Energy Nexus

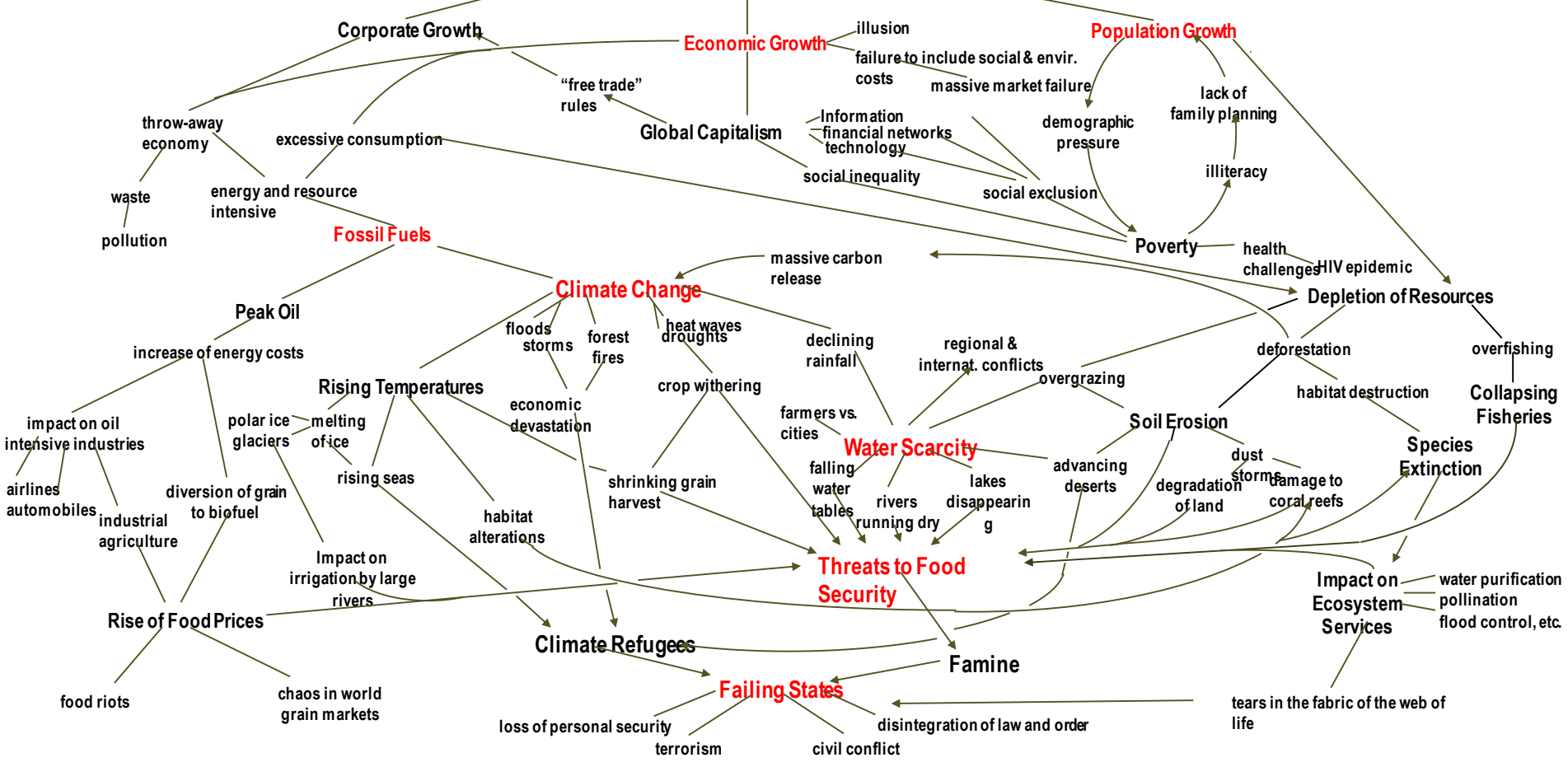


Source:  
[Future Earth](#)

It's a complex

problem!

UNLIMITED GROWTH



Source: Interconnectedness of World Problems. A Conceptual Map by Fritjof Capra.



# SUSTAINABLE DEVELOPMENT GOALS



# Good governance can:

Anticipate emergent problems

Alleviate environmental stressors

Innovate resource alternatives

Cooperate Interagency,  
internationally,  
Cross-sectorally

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# Resource Scarcity and the Security Sector

## How can security leaders prepare?

- **Anticipate: Develop better knowledge of environmental trends and how they will impact security.**
- **Alleviate: Reduce potential security stressors in a complex environment**
- **Innovate: Promote regional security sector development. New norms & institutions:**
  - to better address slow motion emergent crises.
  - to better support comprehensive and collaborative approaches to emergent transnational problems,
- **Cooperate: Link knowledge communities:**
  - Researchers, policy makers and security practitioners,
  - Economic development and environmental protection.
  - International collaboration for sharing knowledge and resources.
- **Participate and lead inter-agency and whole-of-society efforts to ensure human security.**

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# Summary

- Global trends will place increasing demands on natural resources.
- There are complex security issues at the food-water-energy nexus.
- Resolving natural resource conflicts will be a defining peace and security challenge for the 21<sup>st</sup> century.
- Climate change will be a “threat multiplier.”
- Security governance must anticipate, innovate, and cooperate to manage potential conflict over resources.

# Questions for Discussion

- What are the most likely crises at the food-water-energy nexus that will impact Thailand (and when)?
- Should the security sector take a proactive role in advocating environmental security? Why or why not?
- What is one collaborative step that security professionals can take to improve prospects for environmental security?

# Mahalo!



Image source:

[Risk Management Monitor](#)