

Climate Change and Food Systems

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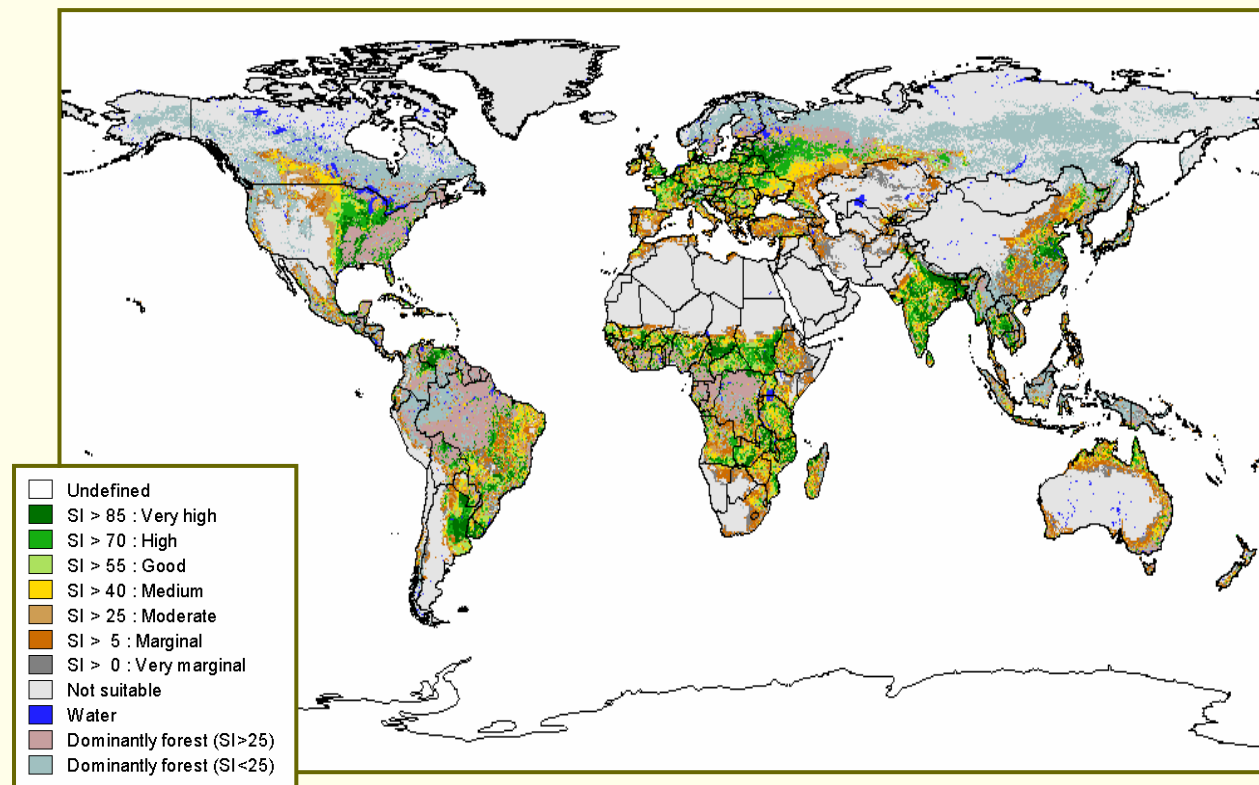


Food and Agriculture Organization of the United Nations – Rome

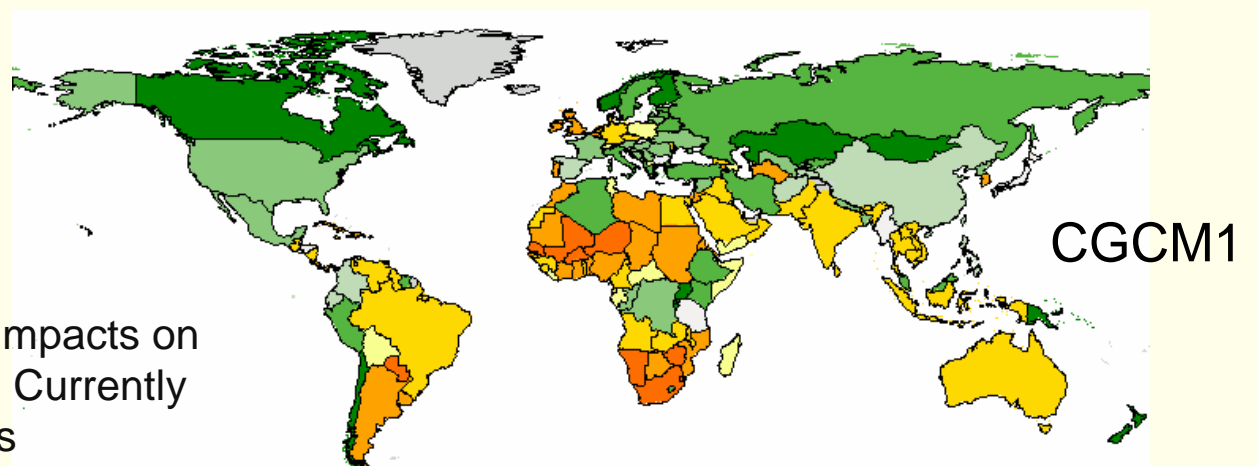
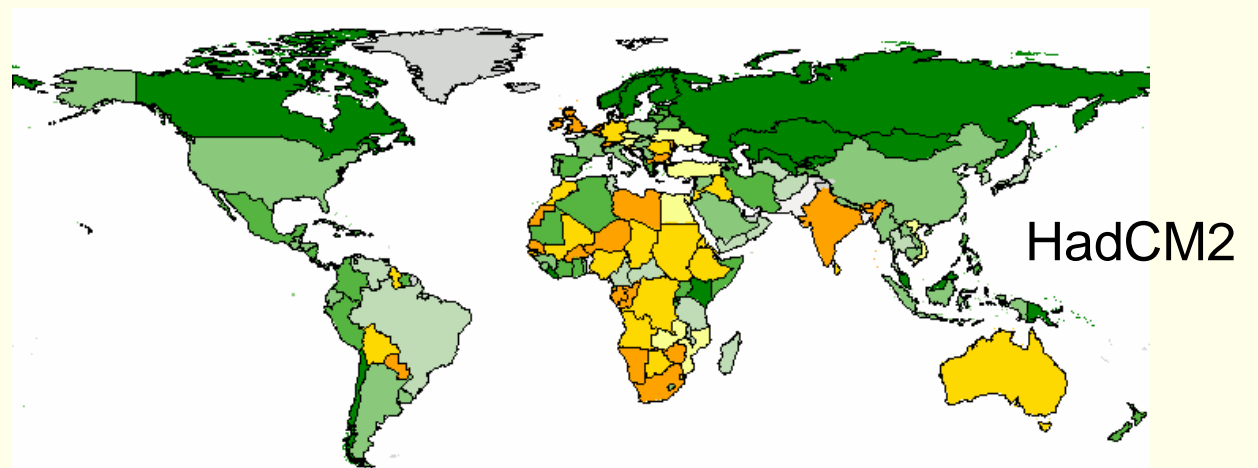
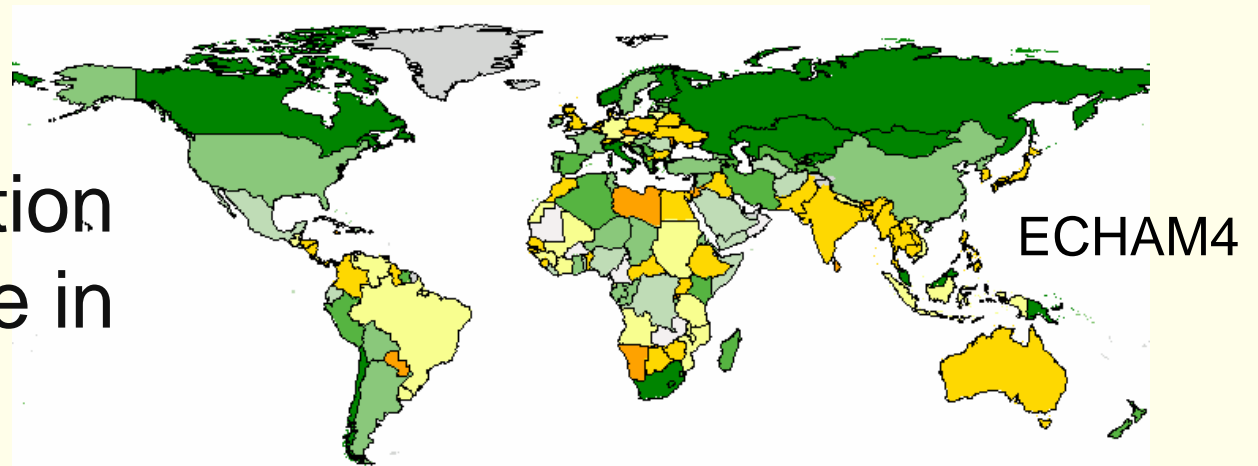
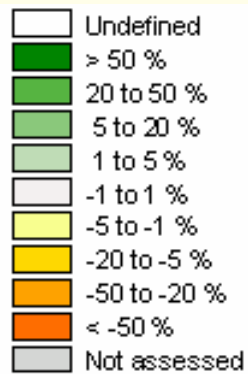
Global Agro-ecological Zones

- **FAO and IIASA** have developed the Global **AEZ** methodology:

Environmental resources database including climate, soil, terrain, and land cover, comprising 2.2 million grid cells, assessing the agricultural potential of 28 crops at three levels of farming technology.



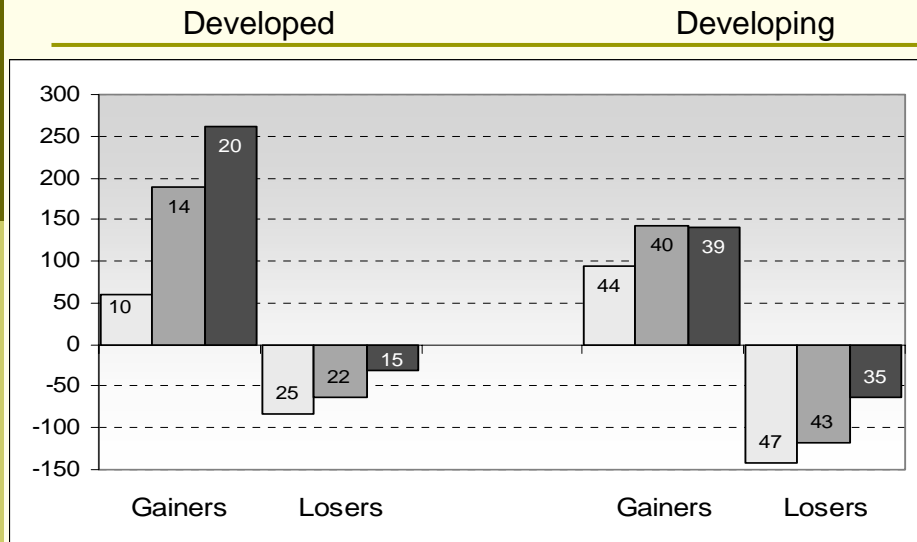
Globally: Distribution of impacts is more in favor of industrialized countries



Country-level Climate Change Impacts on Cereal Production Potential on Currently Cultivated Land 2080s

Impact of Climate Change, 2080s

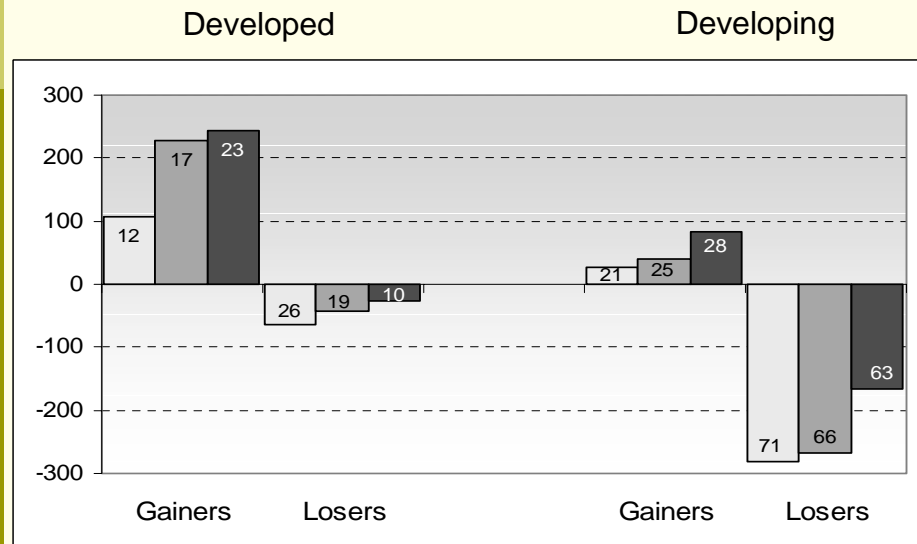
ECHAM4



on currently cultivated land (mill. tons)

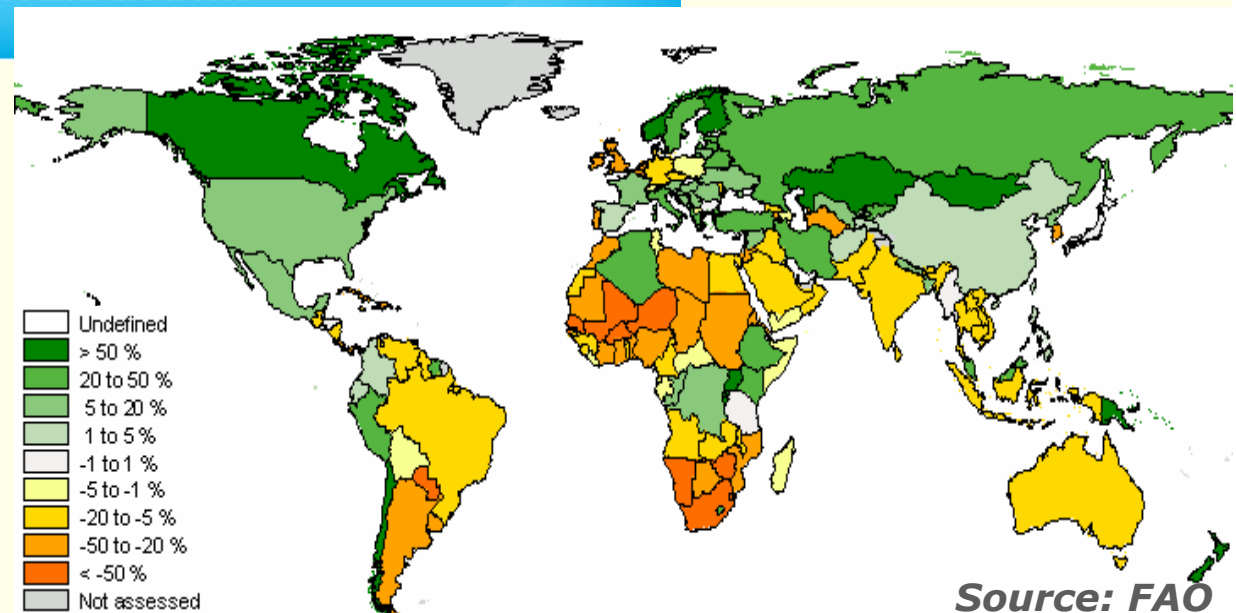
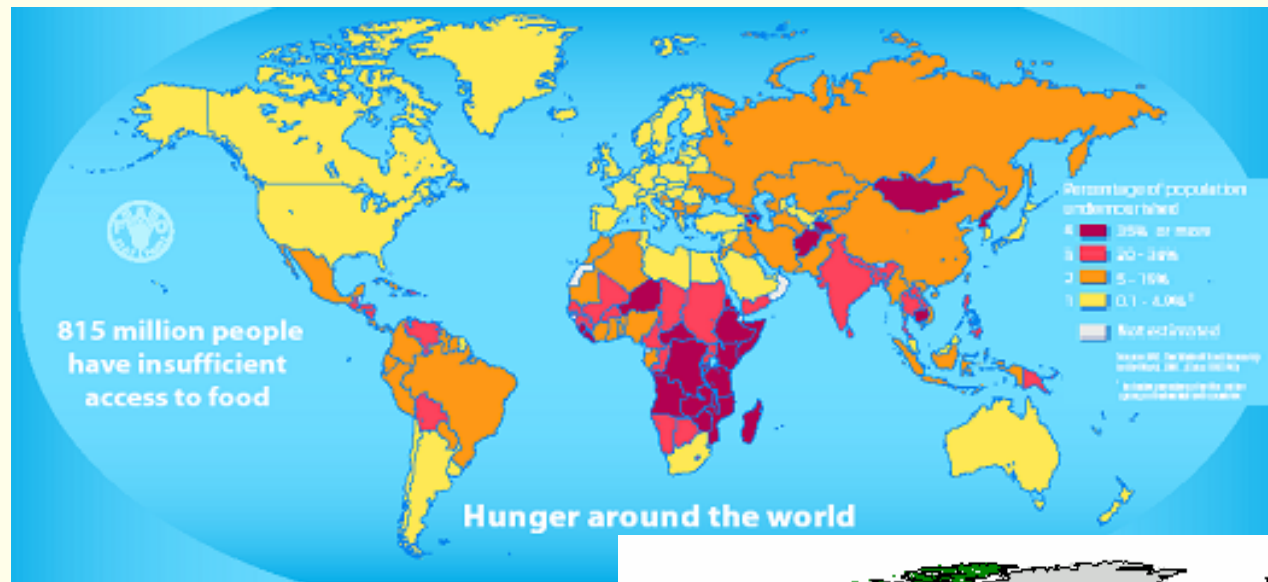
- Aggregate impacts of projected climate change on the global food system are relatively small
- Expected gains for developed countries
 - more effective options for adaptation
- Expected net losses for less-developed countries
 - least capacity to adapt
 - most vulnerable

CGCM1



- Rain-fed, single cropping
- Rain-fed, multiple cropping
- Rain-fed and/or irrigated, multiple cropping

Country level: Undernourished population Vs. Climate Change Impacts on Cereal Production Potential (2080s-ECHAM4)



Source: FAO

Food security: Links to changes in agricultural production

Availability

- **domestic production**
- import capacity
- **food stocks**
- food aid

Access

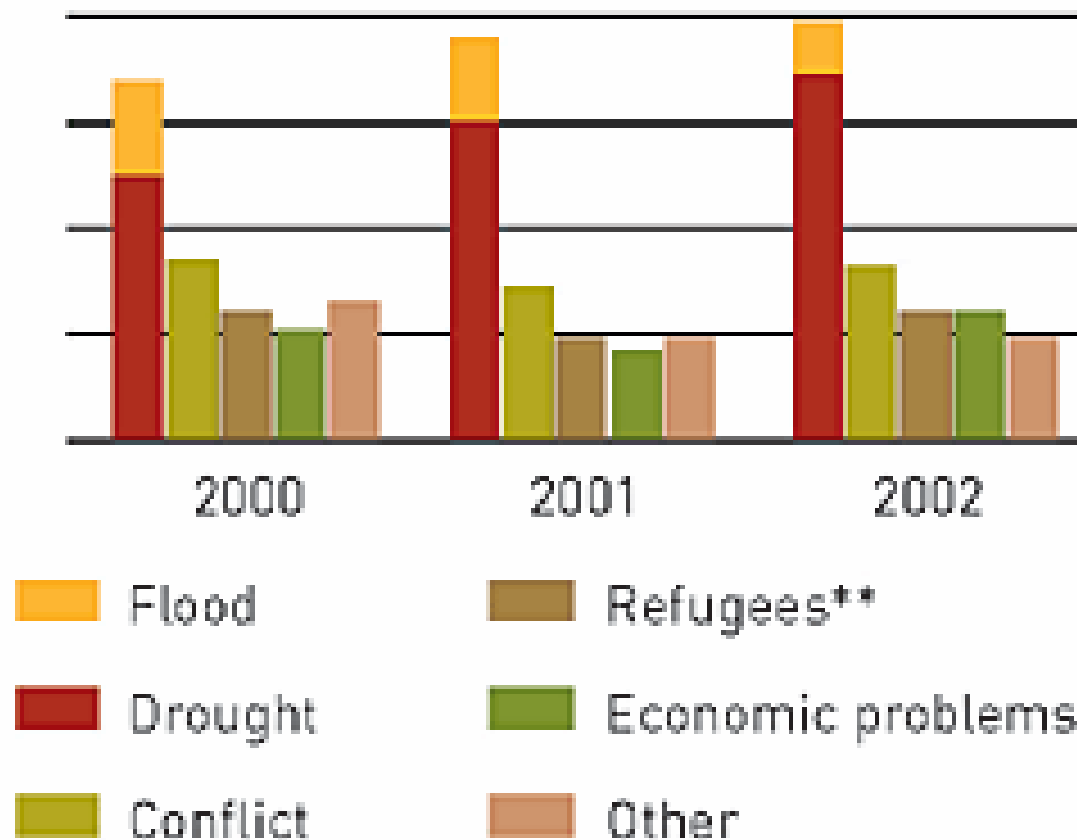
- poverty
- **purchasing power**
- transport and market infrastructure
- food distribution

Stability

- **weather variability**
- price fluctuations
- political factors
- economic factors

Causes of food emergencies in developing countries

% of food emergencies*



Floods and droughts are the main causes of food emergencies

*total exceeds 100% for multiple causes cited various times;

**includes internally displaced people

Source: FAO/SOFI
2003

Estimated Increases in Hungry and Vulnerable People

- 10% relative to baseline (80-90 million people) IPCCc 2001
- 4%-22% relative to baseline (45-175 million people) Fisher et. al. 2002

Conclusions I

- **Climate change likely to significantly reduce agricultural production potential in parts of Africa, Asia and Europe**

- **Low income developing countries are vulnerable to reductions because they have:**
 - **A high percent of GDP from agriculture**
 - **Strong linkages between agricultural production and incomes**
 - **High dependence on native diversity**
 - **limited capacity to adapt or respond**

- **Low income developing countries are likely to experience a significant increase in food insecurity and hunger.**

Conclusions II

- ❑ **Food insecurity imposes large economic costs through loss of economic growth; more work is needed to quantify**
- ❑ **Social and environmental costs also associated with an increase in hunger**
- ❑ **Investments in adaptive capacity of developing countries to current climate risks likely to produce high rates of return to avoided future damages.**
- ❑ **Costs of increased food insecurity are a critical to consideration in setting climate change policy.**