INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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Climate Change and Food Security

Impacts, Adaptation and Synergies in an Uncertain Future

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Preview of Results

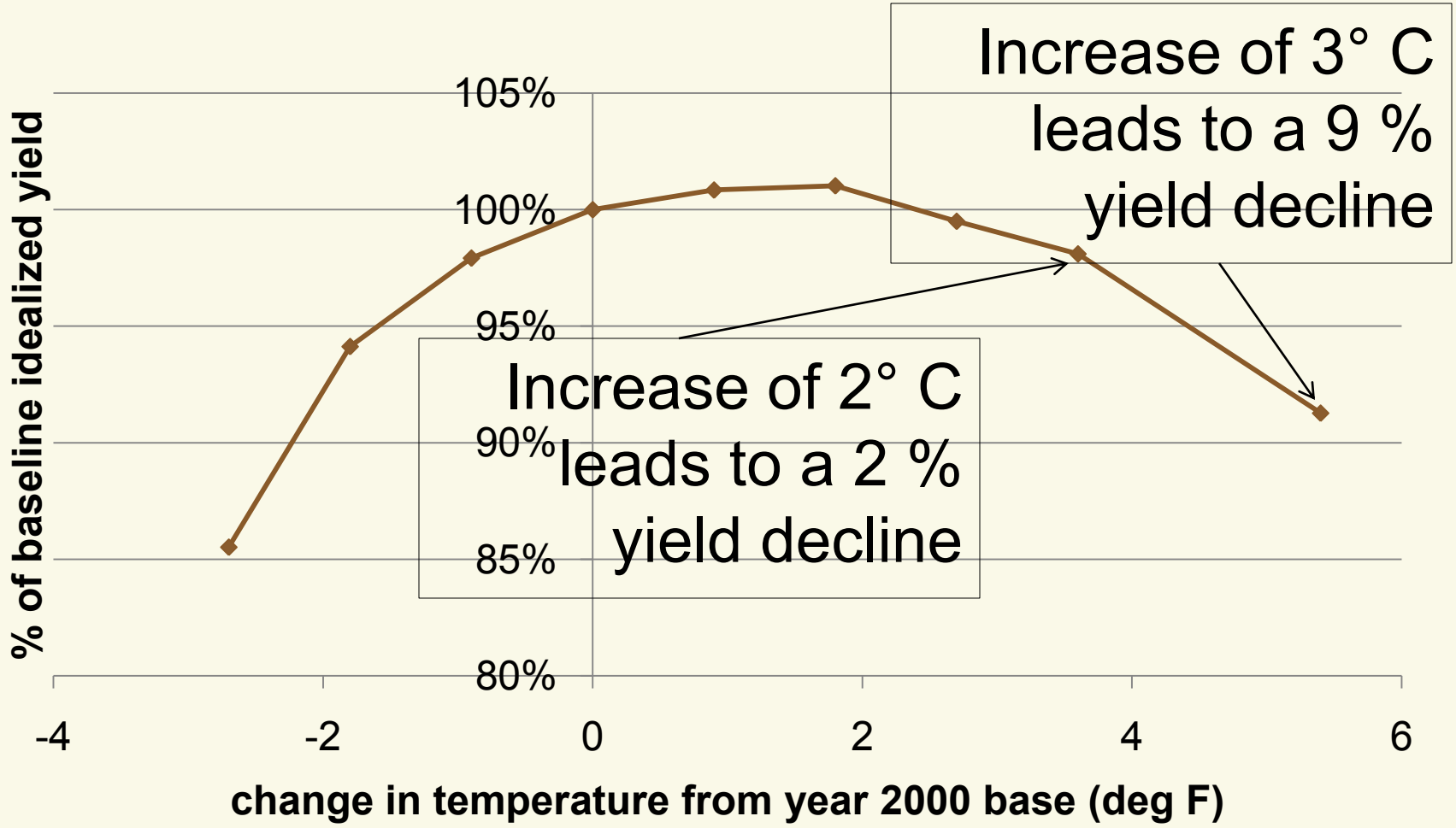
- *Unchecked* climate change will result in a 20 percent increase in malnourished children by 2050

- Agricultural productivity expenditures of over $7 Billion per year are needed to compensate
  - Public sector research
  - Irrigation
  - Rural roads

Climate Change Affects Agriculture

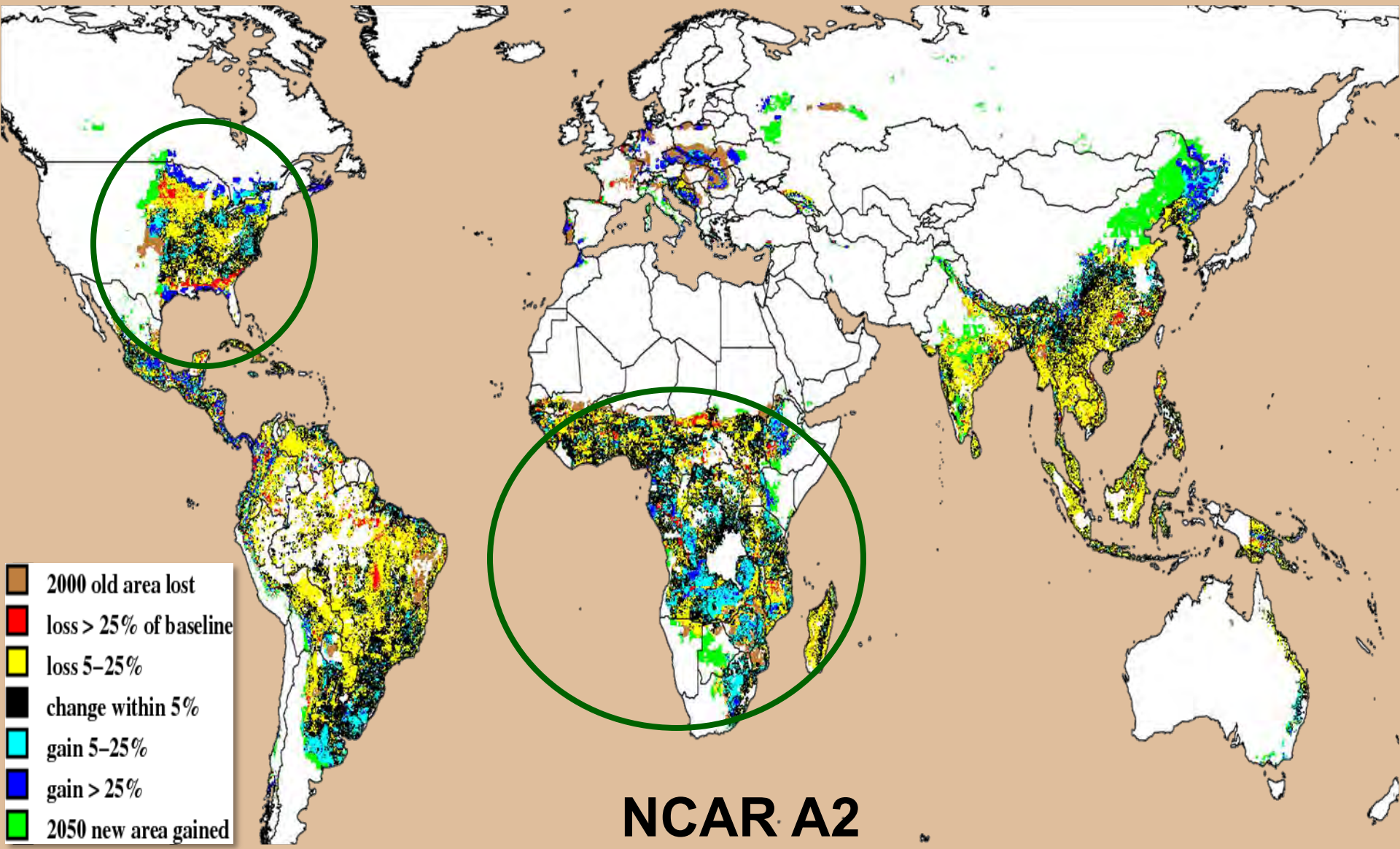
- Lower yields for crops and livestock from
  - Higher temperatures
  - Changes in precipitation patterns
  - Extreme events
- Sea level rise

Iowa Corn Yields Decline as Temperature Increases



Rainfed Maize Yield Changes Are Diverse

2050 climate relative to 2000 climate



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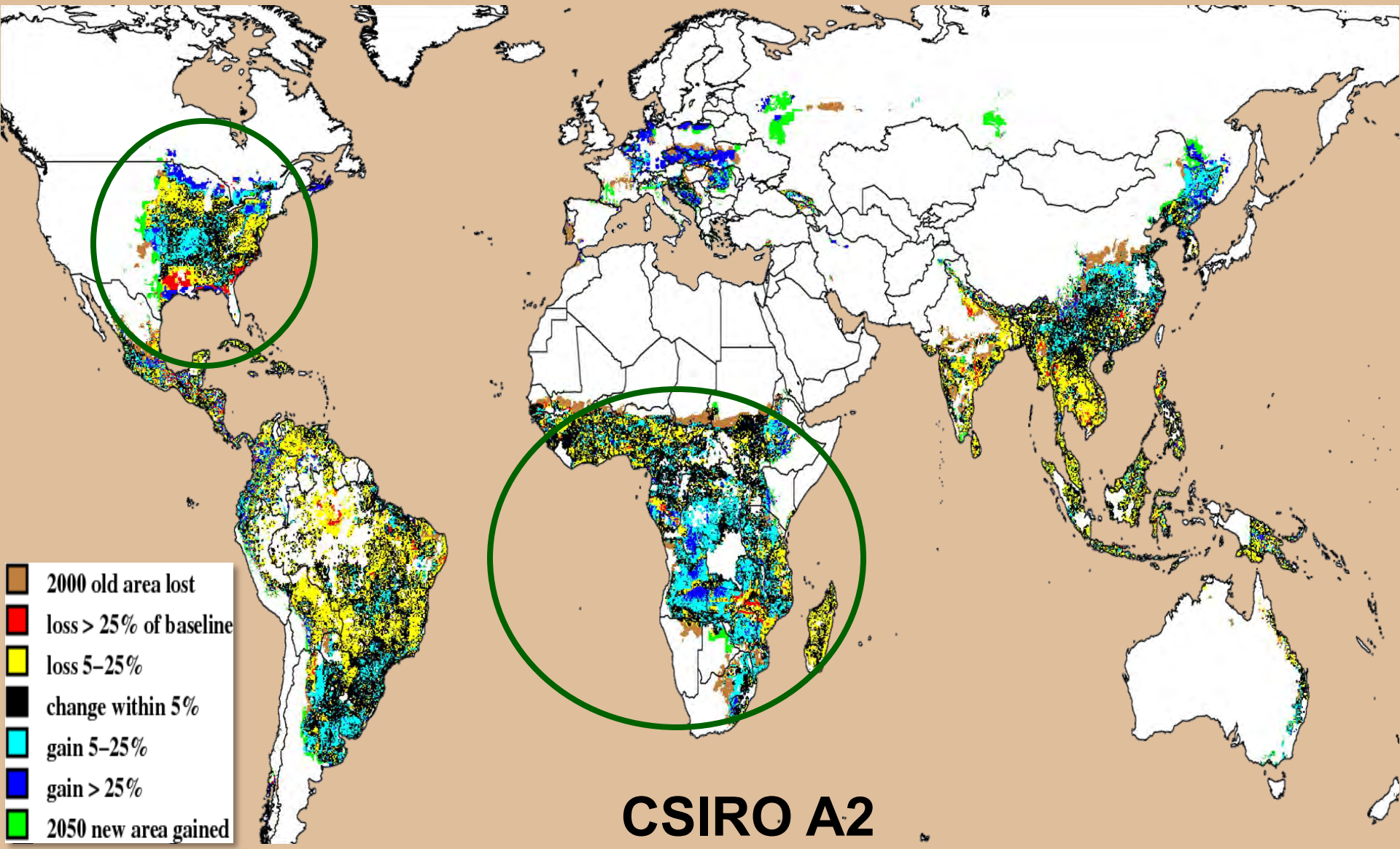
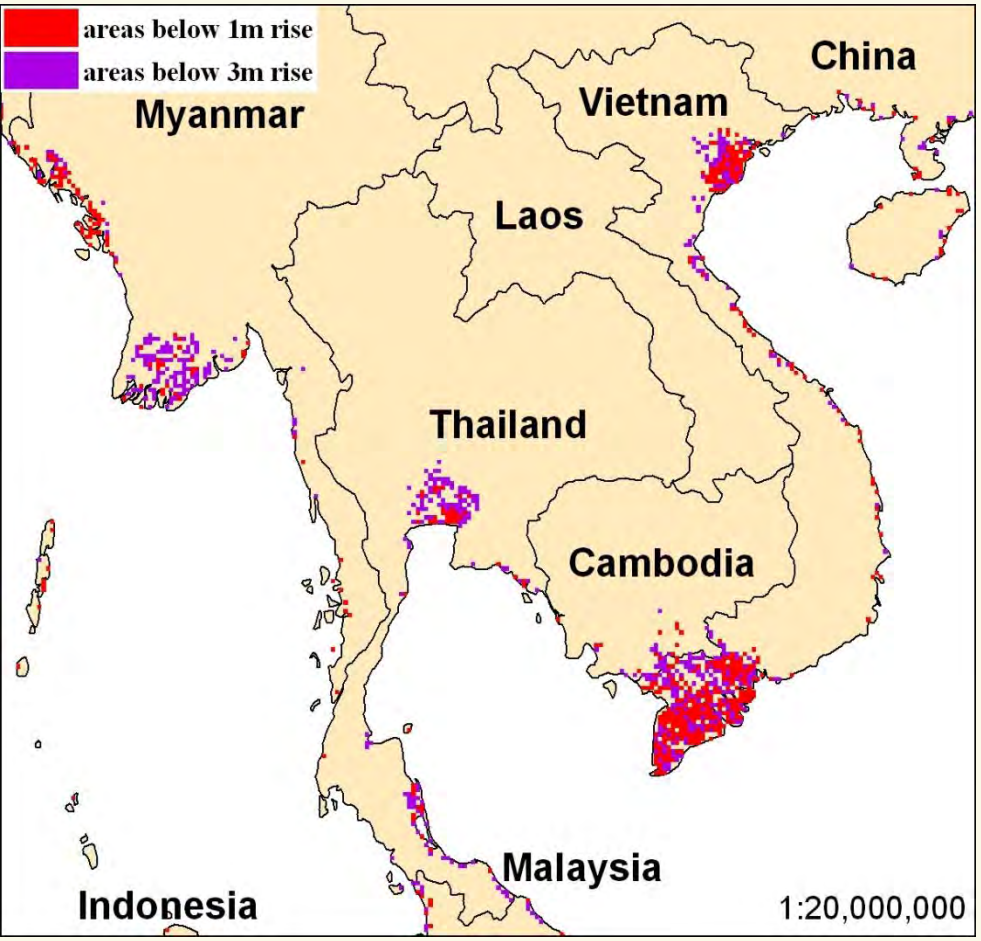


Lost agricultural area from sea level rise



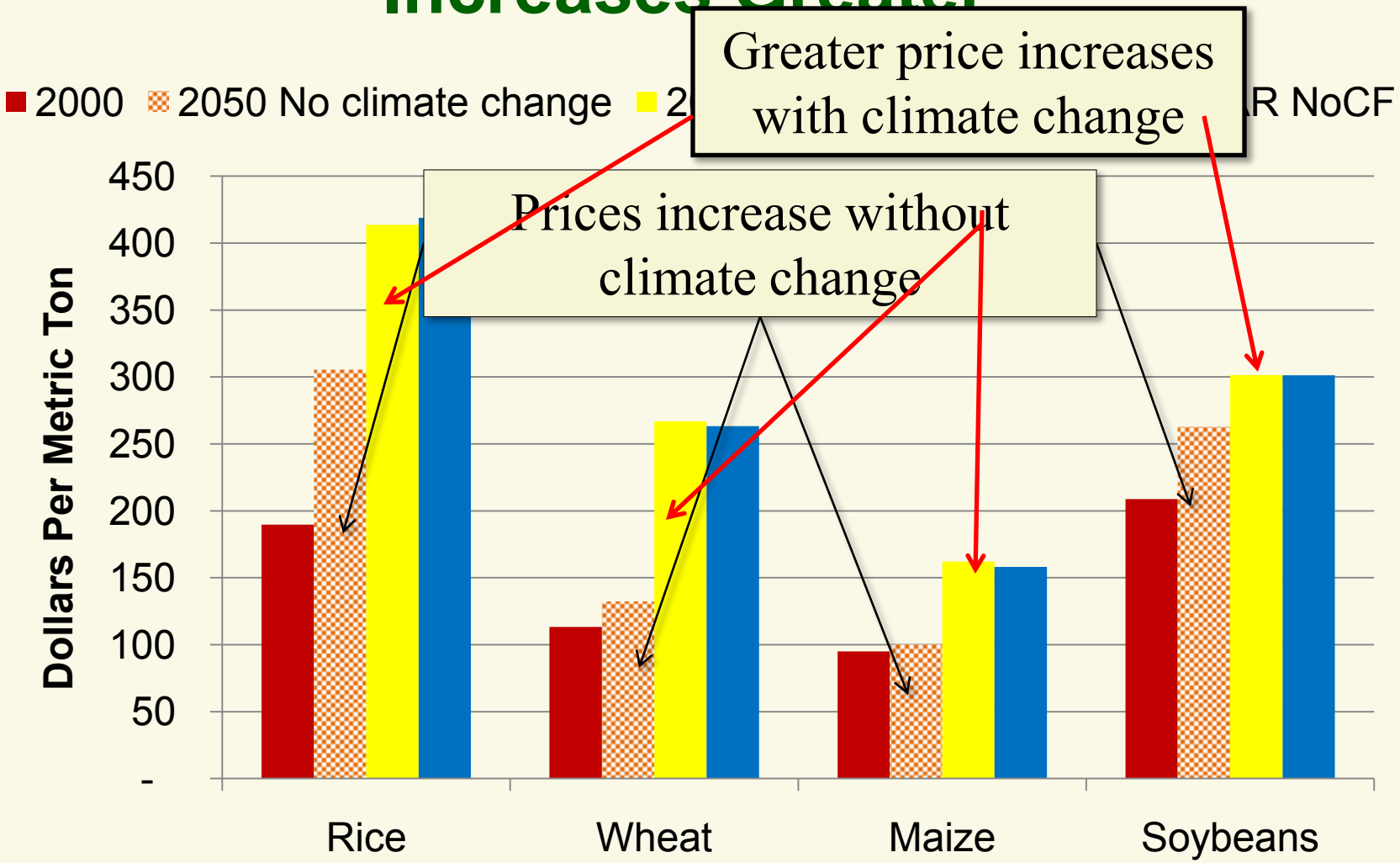
	With 1 meter rise (000 ha)	With 3 meter rise (000 ha)
Myanmar	295	1,214
Thailand	199	796
Cambodia	35	118
Vietnam	2,513	4,281

Climate change reduces average yields

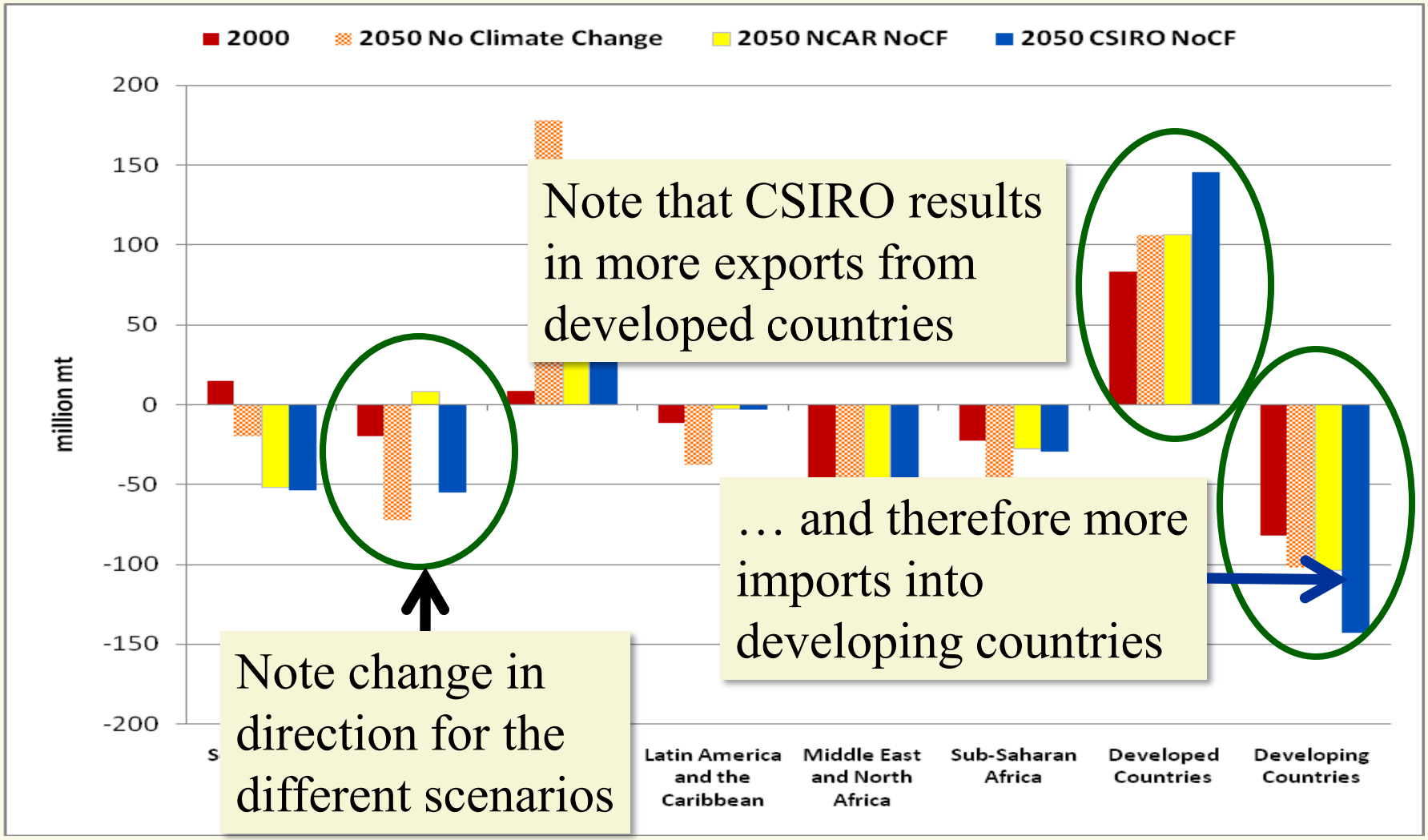
Crop/ management system	Sub Saharan Africa	East Asia and Pacific	South Asia
Irrigated rice			
NCAR	-14.1	-19.8	-15.5
CSIRO	-11.4	-13.0	-17.5
Rainfed maize			
NCAR	-4.6	1.5	-7.8
CSIRO	-2.4	-3.9	-2.9
Rainfed wheat			
NCAR	-21.9	-14.8	-44.4
CSIRO	-19.3	-16.1	-43.7

CLIMATE CHANGE PRODUCTIVITY EFFECTS PLAY OUT IN DOMESTIC AND GLOBAL MARKETS

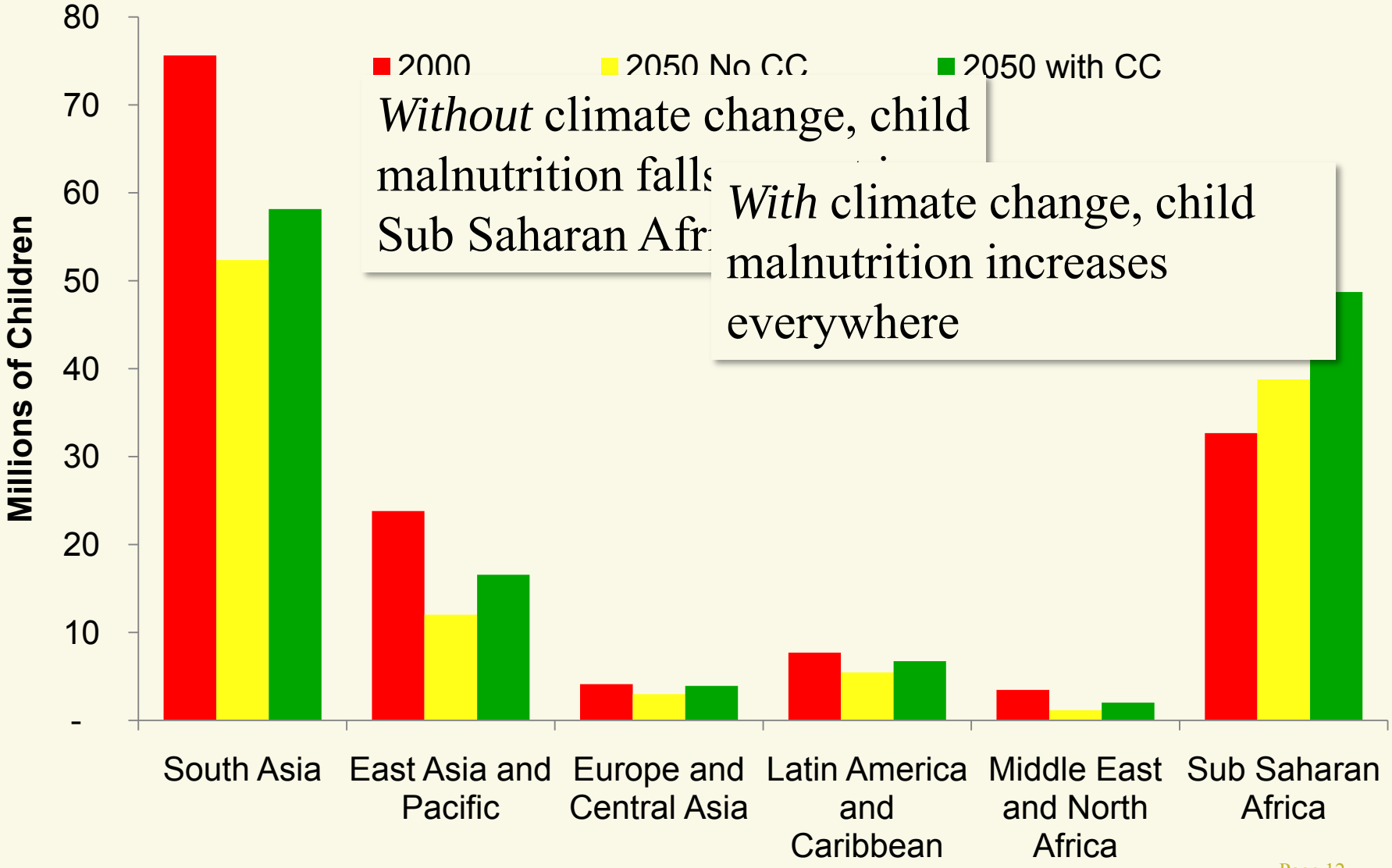
Climate Change Makes Food Price Increases Greater



Developed Countries Export More Grain



Climate Change Increases Childhood Malnutrition



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CLIMATE CHANGE ADAPTATION COSTS

Our Definition of Agricultural Adaptation

- Agricultural investments that reduce child malnutrition with climate change to the level with no climate change

- What types of investments are considered?
  - Agricultural research
  - Irrigation expansion and efficiency improvements
  - Rural roads

Adaptation Costs are over $7 billion per Year

- Required additional **annual** expenditure in developing countries
- Wetter NCAR scenario = US$7.1 billion
- Drier CSIRO scenario = US$7.3 billion
  - Research - $1.3 billion
  - Irrigation - $3.0 billion
  - Rural roads - $3.0 billion

NEXT STEPS FOR AGRICULTURE AND CLIMATE CHANGE ADAPTION

- Good development policies and programs
- International public (research) goods
- Revitalize national research and extension systems
- Invest in
  - Rural roads
  - Irrigation area and efficiency
- Global data collection and information sharing

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