Food, fibre and forest products

William Easterling (USA) &
Pramod Aggarwal (India)

Nine lead authors and nine contributing authors from 12 countries,

Reviewed ~450 references

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Summary of key points

Crop production

- Crop responses depend on latitude
- *High latitude:*
  production increases with 1-3°C rise in local mean temp, decreases above 1-3°C rise.
- *Low latitude:*
  production decreases with 1-2°C rise in local mean temperatures
- Increased drought/flood frequency affect esp. subsistence sectors at low latitudes
- Globally, production increases to as local mean temperature rises up to 1-3°C, then decreases

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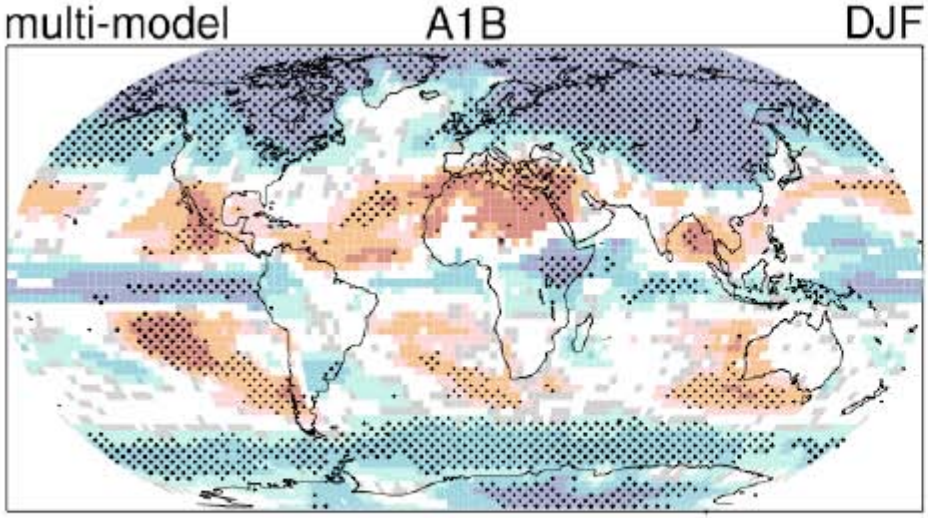
Summary of key points

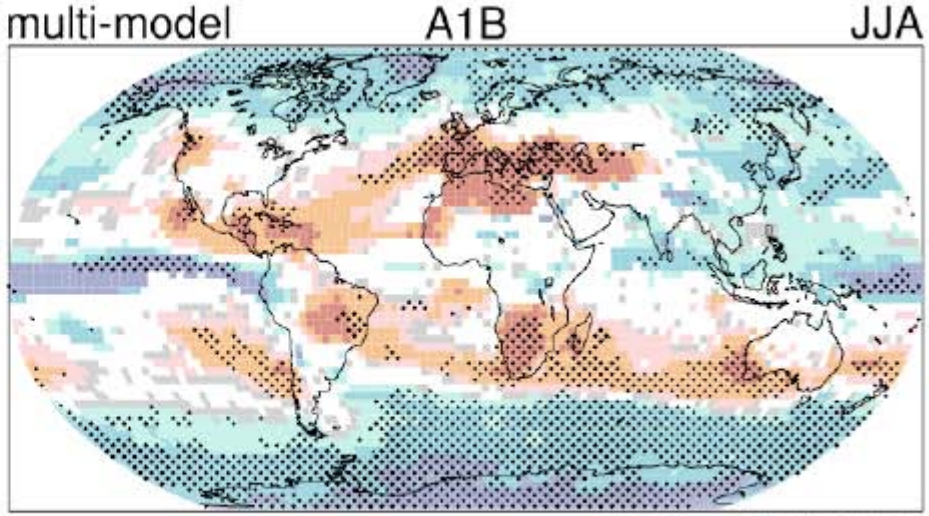
Commercial forestry

- Timber productivity rises modestly in the short to medium term, with large regional variability (and several uncertainties)

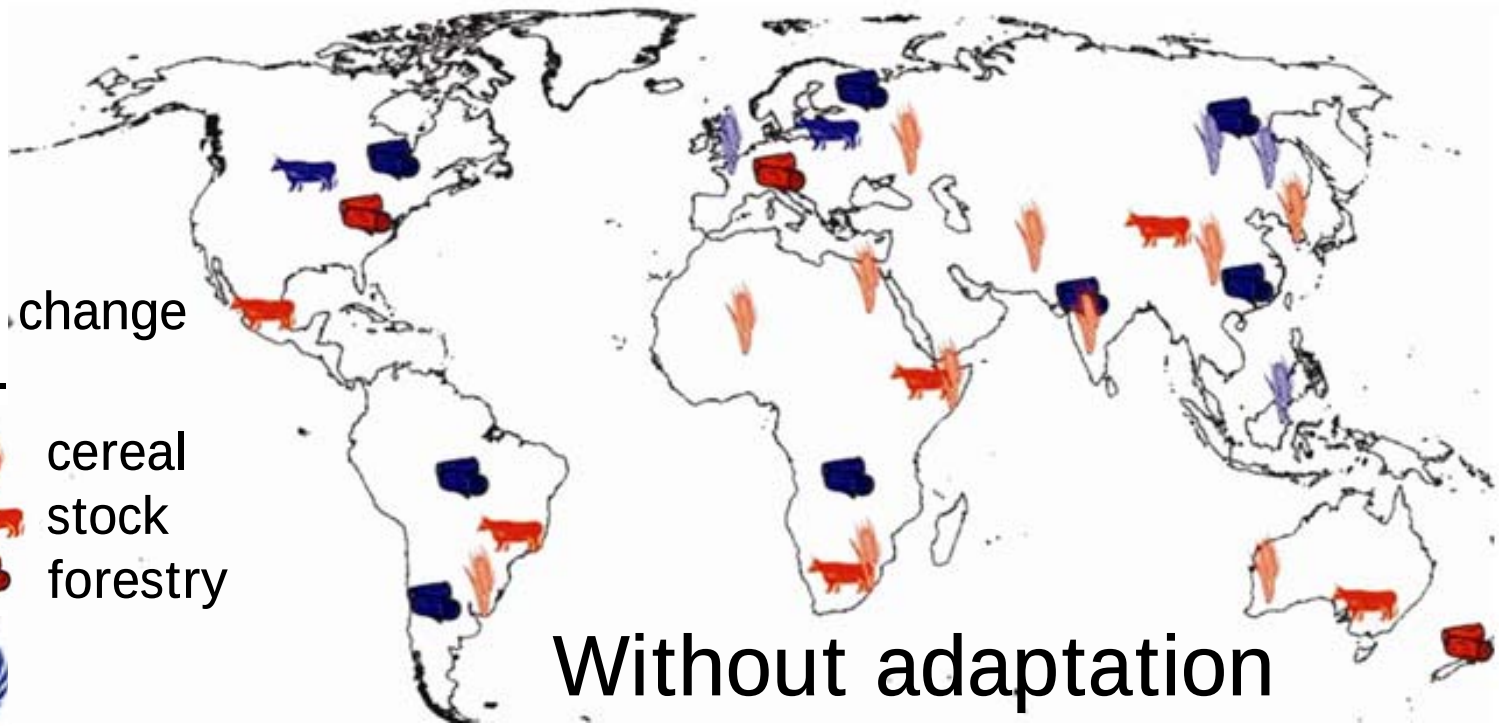
Aquaculture and fisheries

- Continued warming changes production and distribution of particular fish species, with adverse impacts (but few studies available)





2090-2099 rainfall change %



~2050 change

\+ -

cereal

stock

forestry

Without adaptation

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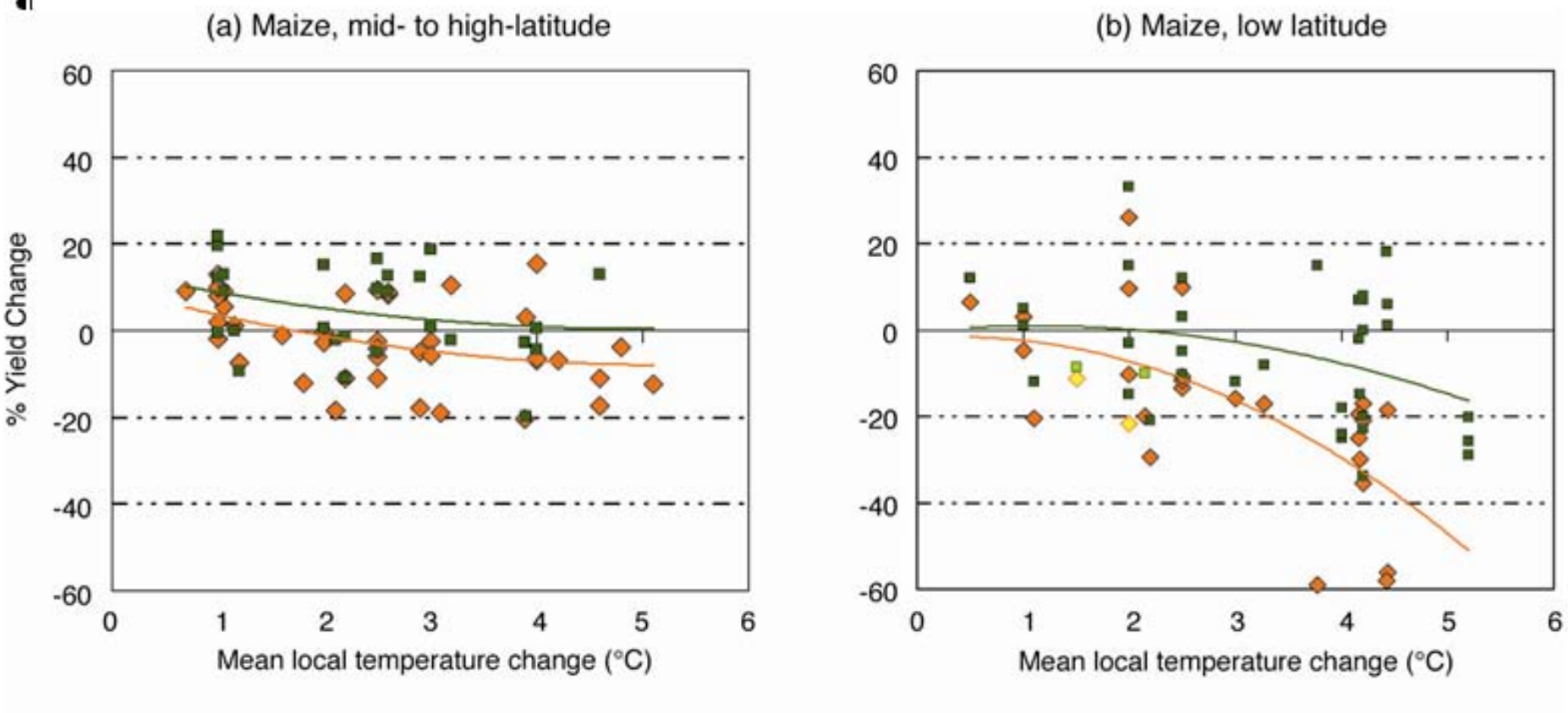
Maize



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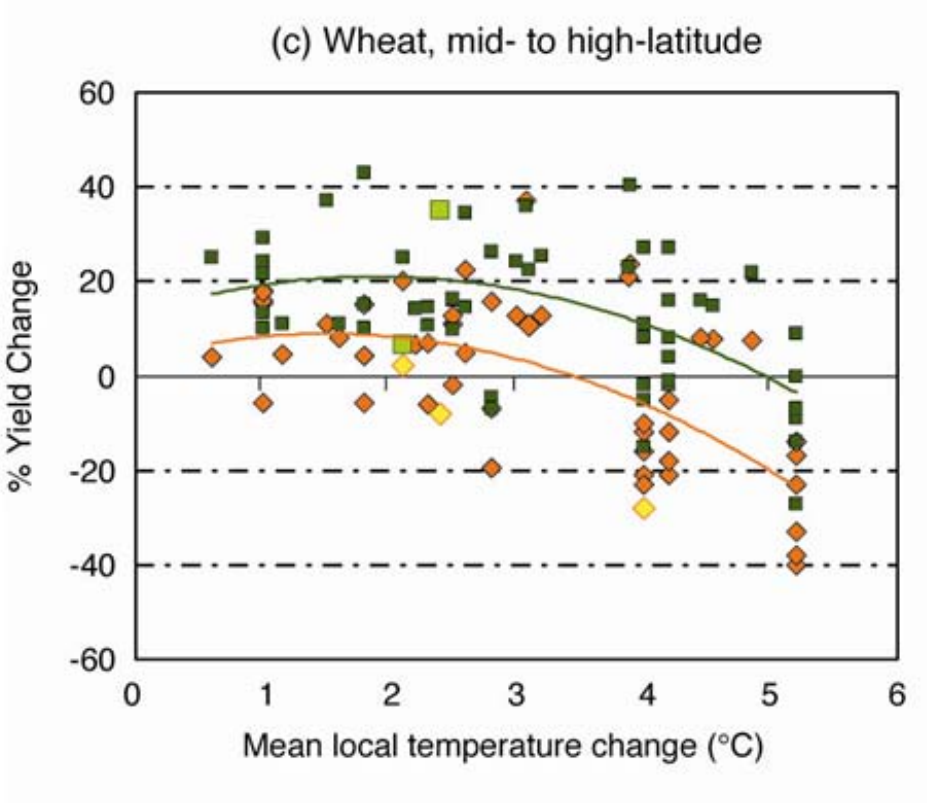
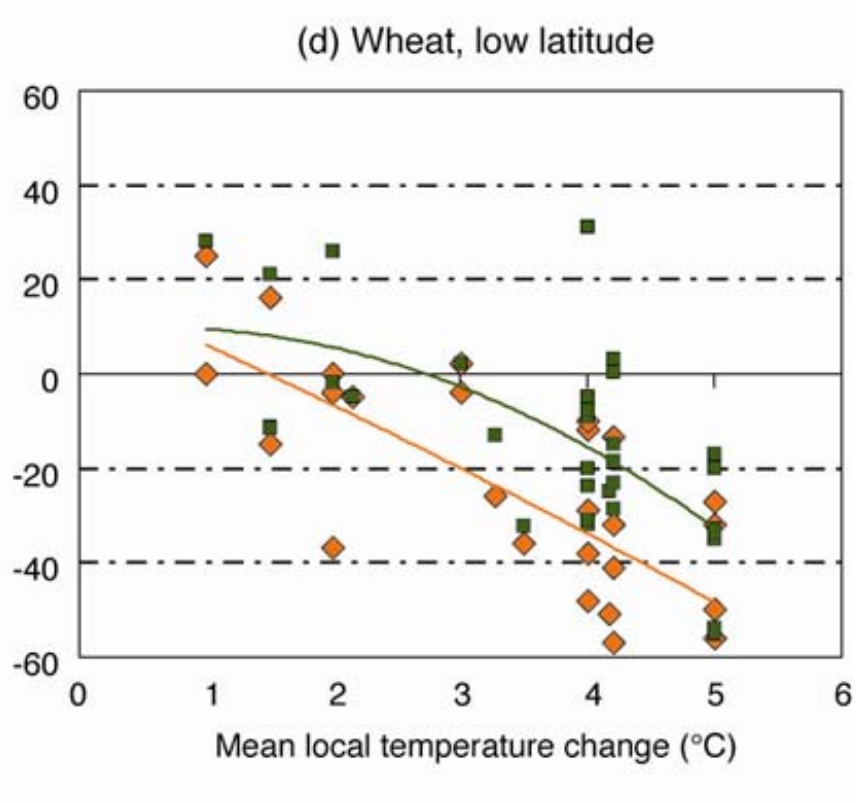
Wheat





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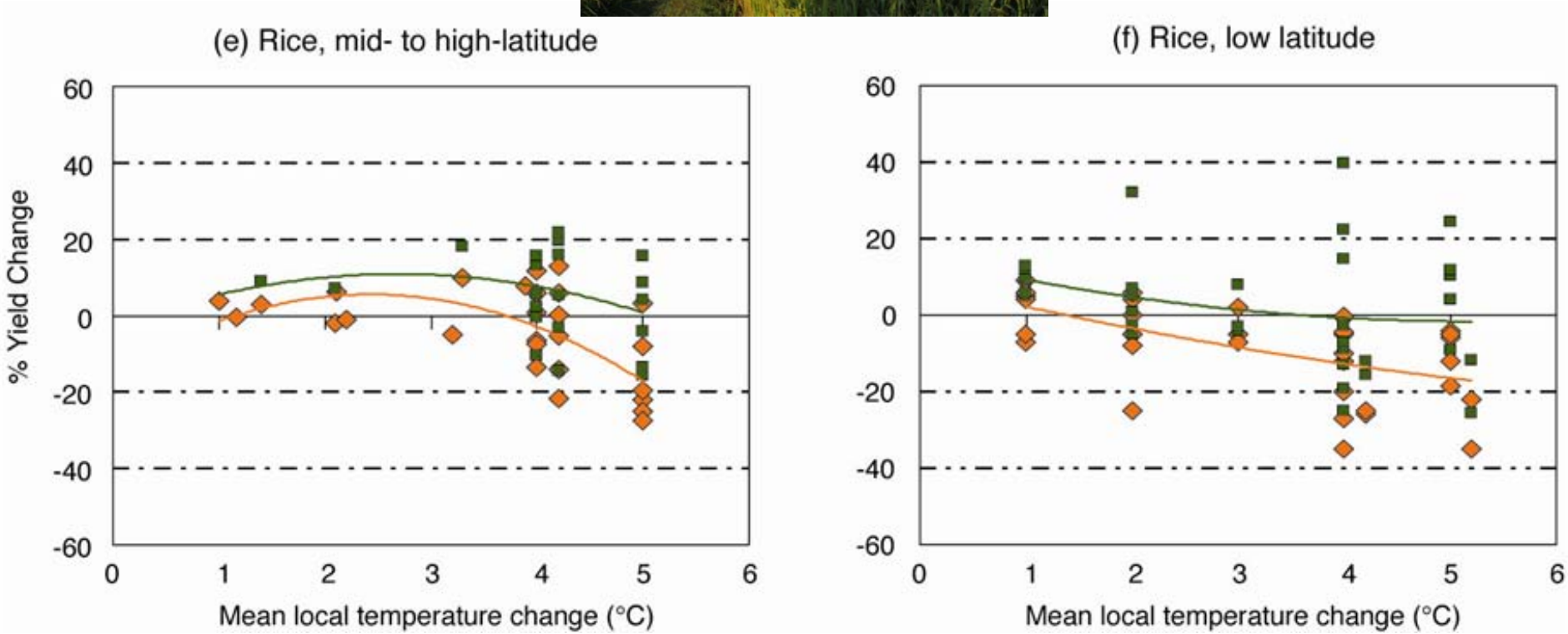
Rice



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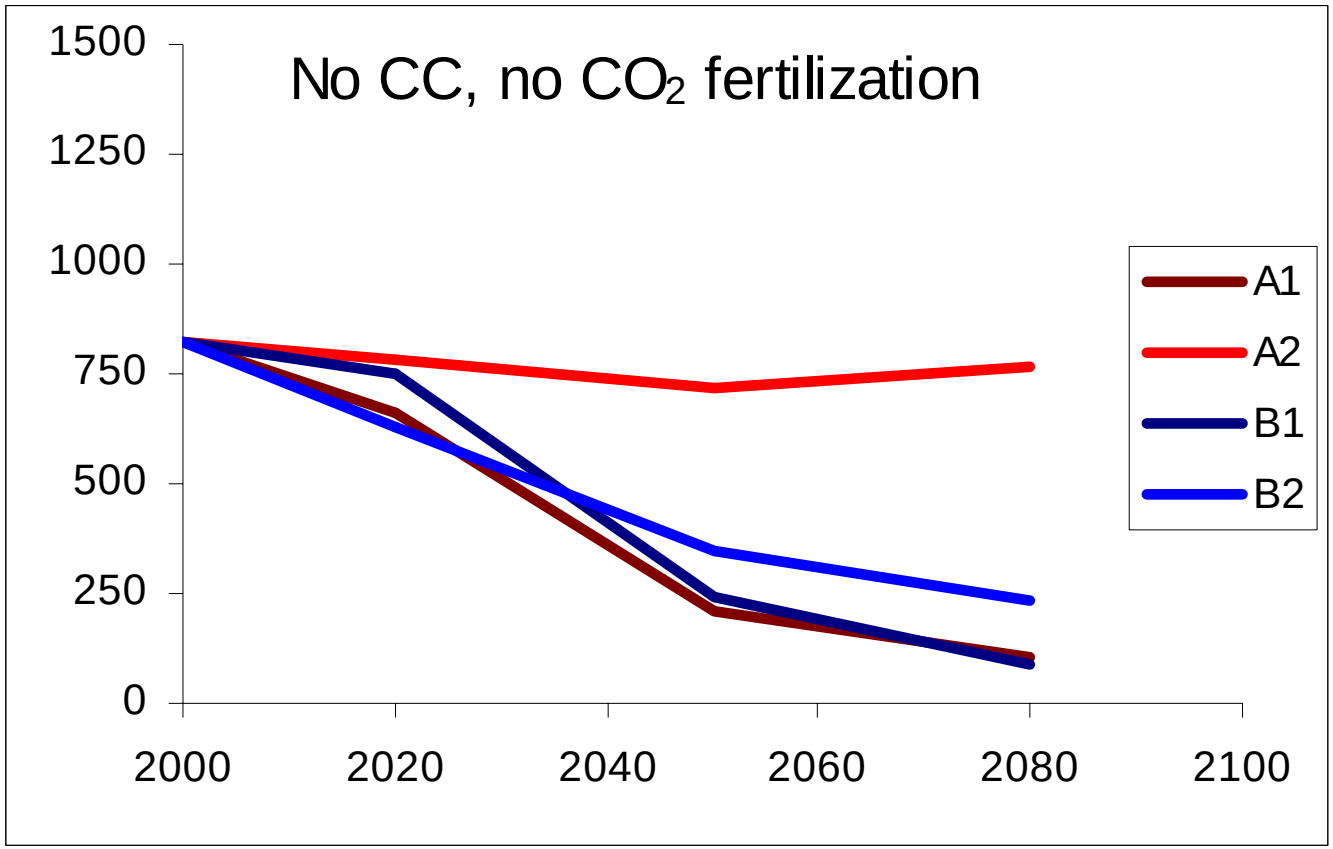
Uncertainties, scenarios, millions of people at risk of hunger



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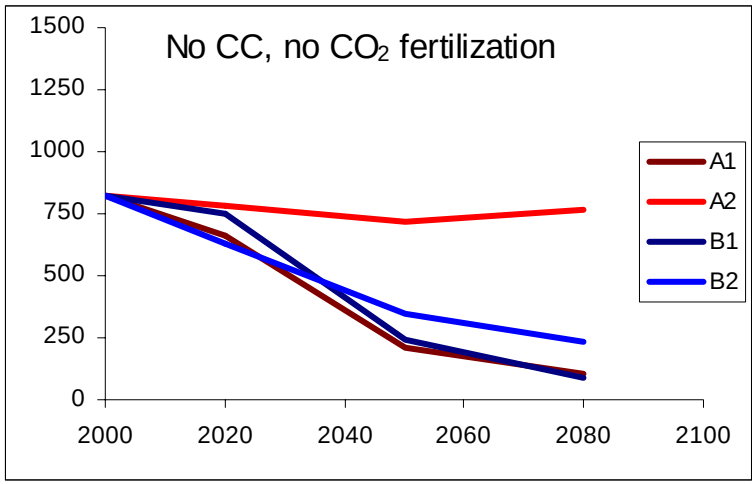
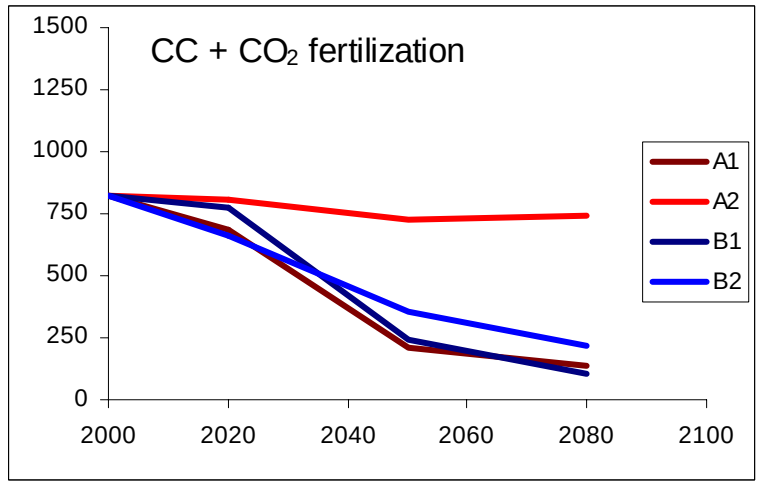
Uncertainties, scenarios, millions of people at risk of hunger





time →

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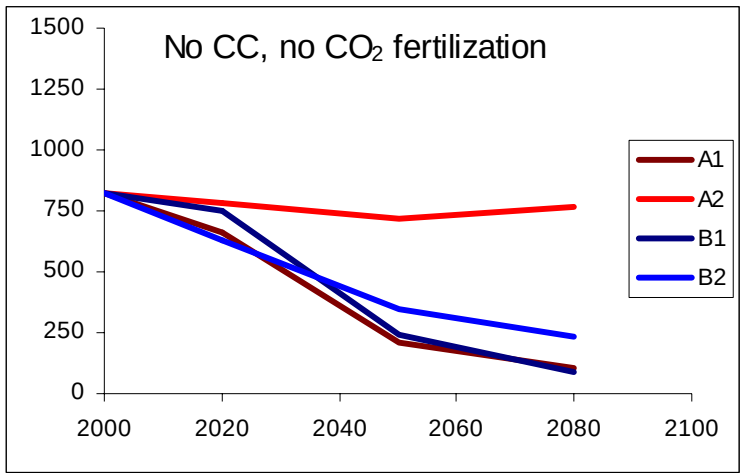
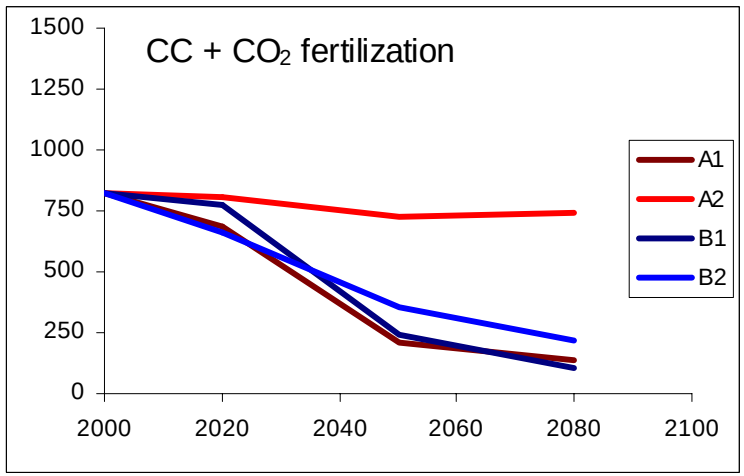
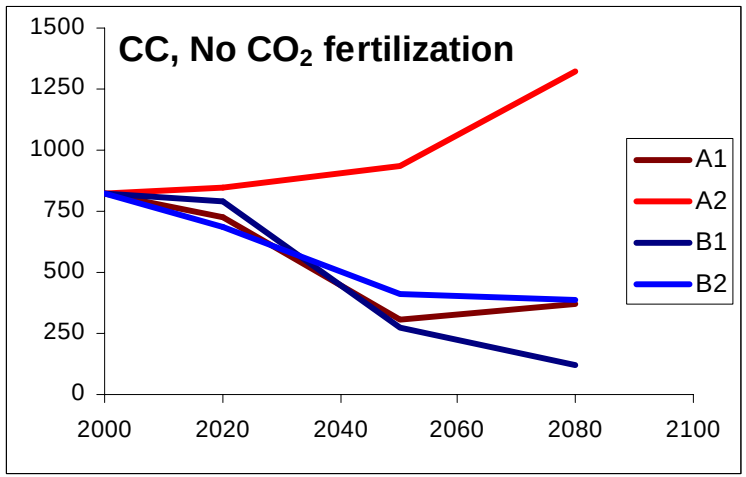
Uncertainties, scenarios, millions of people at risk of hunger





time →



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Will CO_2 fertilization effect be realised?

- Crop model projections generally consistent with experiments, but may tend to project fertilization effects (~15-20%) at the upper end of results from field experiments (10-20%)
- CO_2 fertilization experiments in developing countries lacking
- Forest CO_2 fertilization has probably been overestimated in mature stands, but not in young stands

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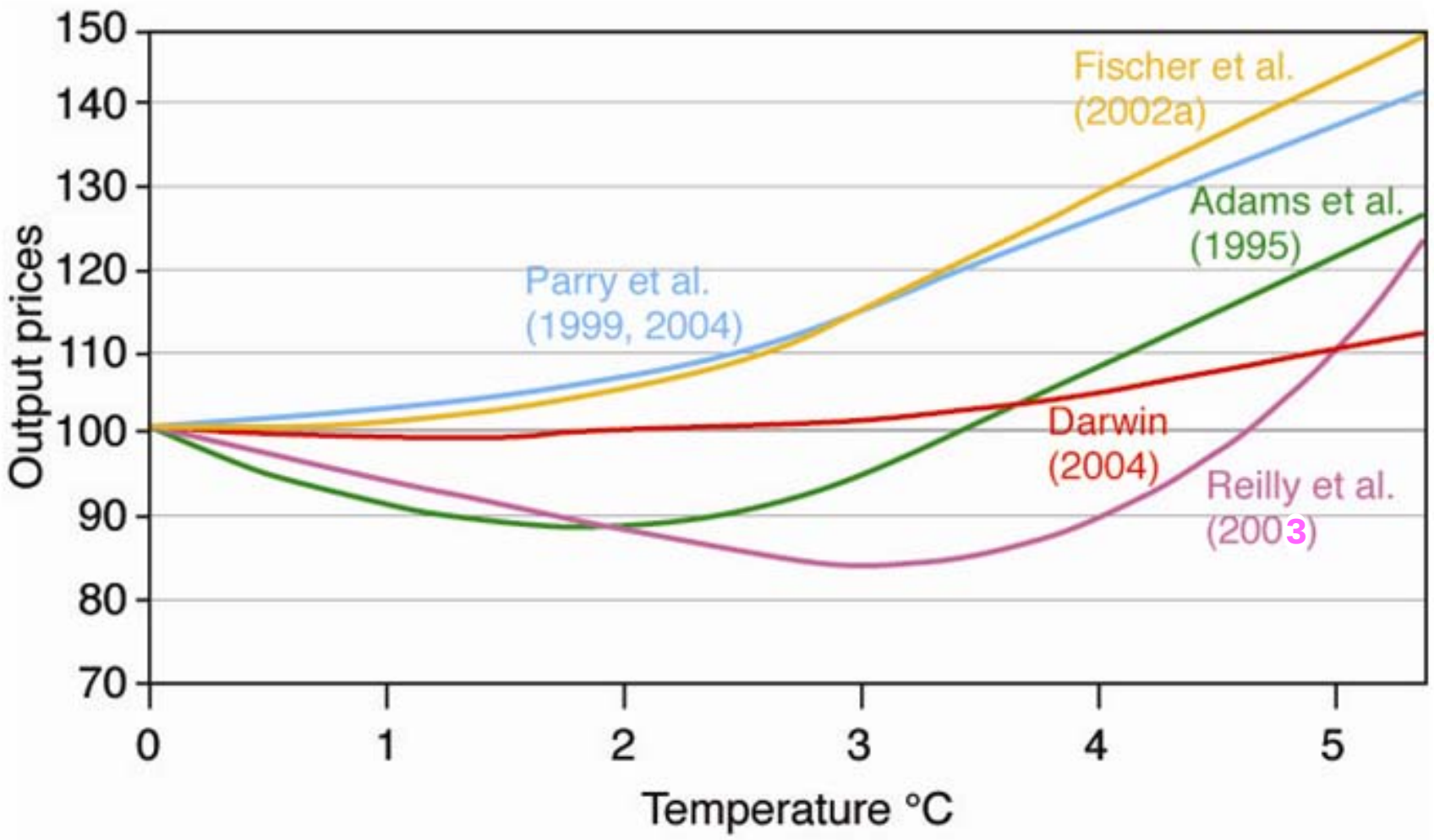
Impacts on food prices by global temperature increase



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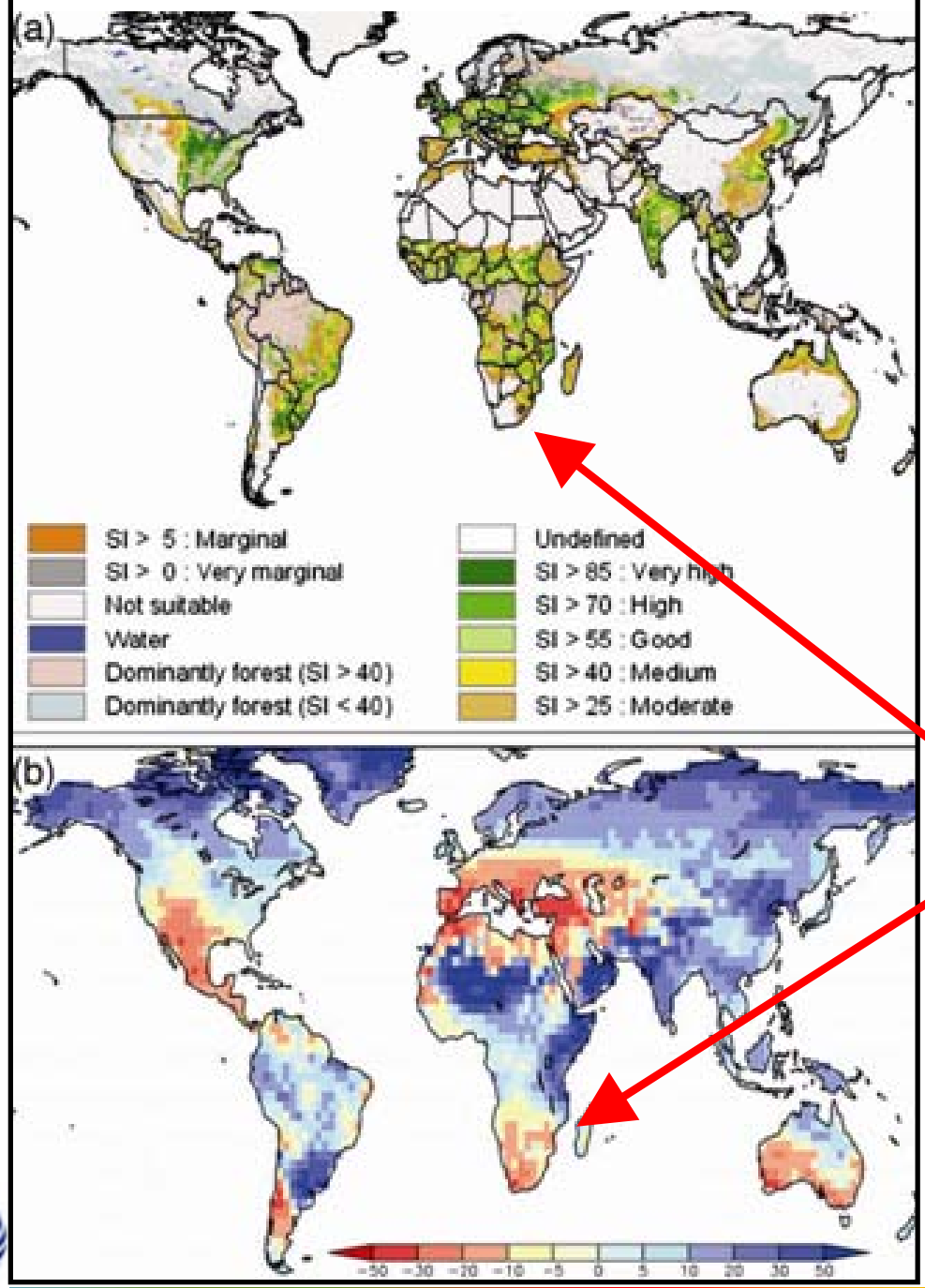
Severe impacts for subsistence cropping

- Not discussed explicitly in TAR
- Several studies have now been published
- Complex, mixed crop/land-use practices and include some use of wild resources
- Some effects mixed – e.g. in Tanzania maize – coffee/cotton +

Impacts on rain-fed agriculture



Suitability index

50% reduction in yield by 2020's

Water run-off change

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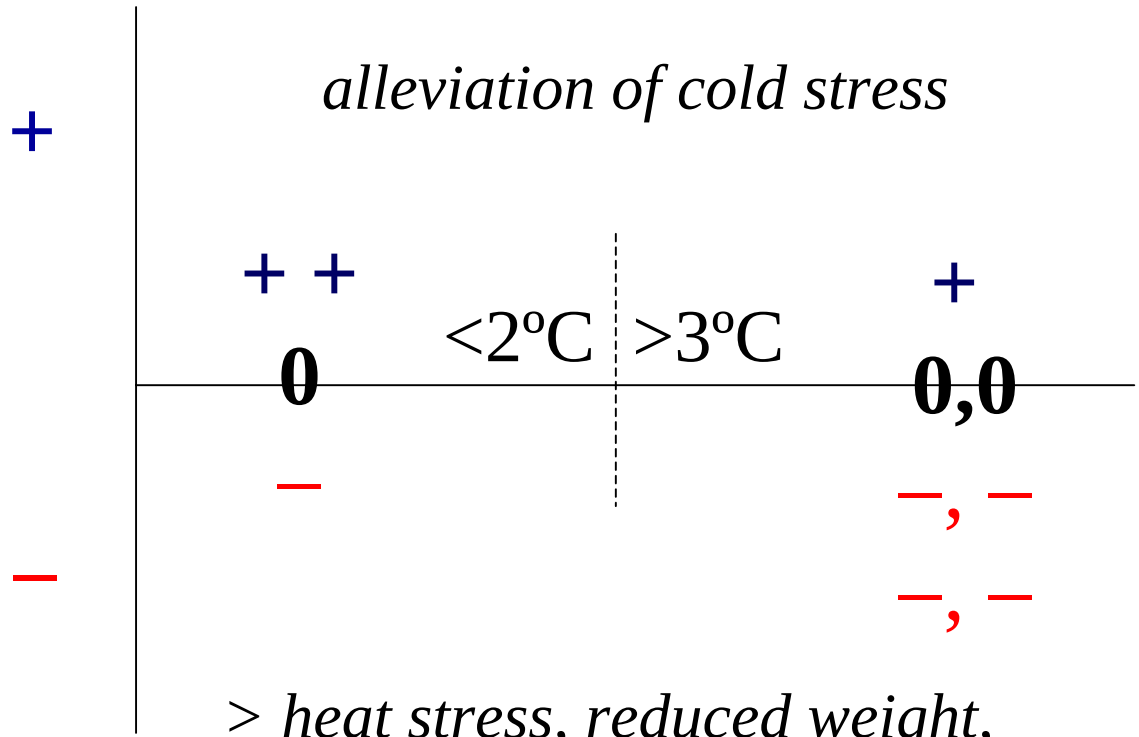
Pastures and livestock



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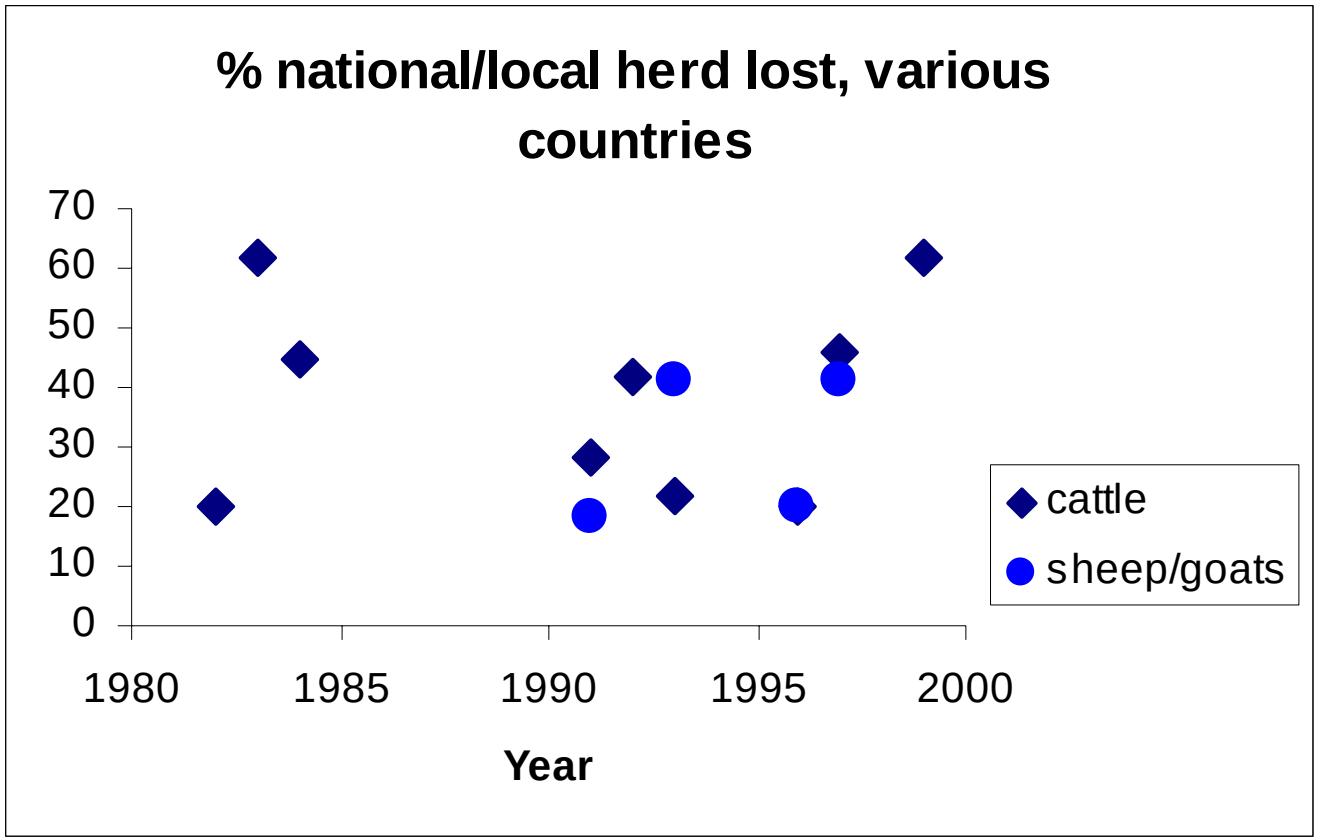
Pastures and livestock Extreme events in Africa



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Forestry

- TAR conclusions confirmed of potential increases in global timber production, especially with new, poleward locations and CO_2 fertilization
- New knowledge: Regional variability of forest productivity impacts, lower CO_2 fertilization effects of mature forests (young stands experience ~20% increase at 550 ppm CO_2)

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Forestry - uncertainties

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Fisheries

- TAR conclusions on aquaculture and fisheries confirmed of generally greater stress, but some positive impacts
- New knowledge: Supports these general conclusions, providing greater regional detail
- Some effects already observed – poleward range shifts in NE Atlantic, some local extinctions and other negative impacts esp. on freshwater fisheries, e.g. Lake Tanganyika

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Knowledge gaps

- CO_2 responses not well quantified – especially in developing countries
- Weed responses poorly understood
- Impacts of extreme climate events inadequately elucidated, local impacts even of mean changes not yet widely researched
- Aquatic resources – few projections available
- Adaptation research still not comprehensive across range of climate and socio-economic futures and developed and developing countries
- Impacts on biofuel and industrial crops not well understood

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