

Climate Change Induced Farming Uncertainty: The Regional Concerns



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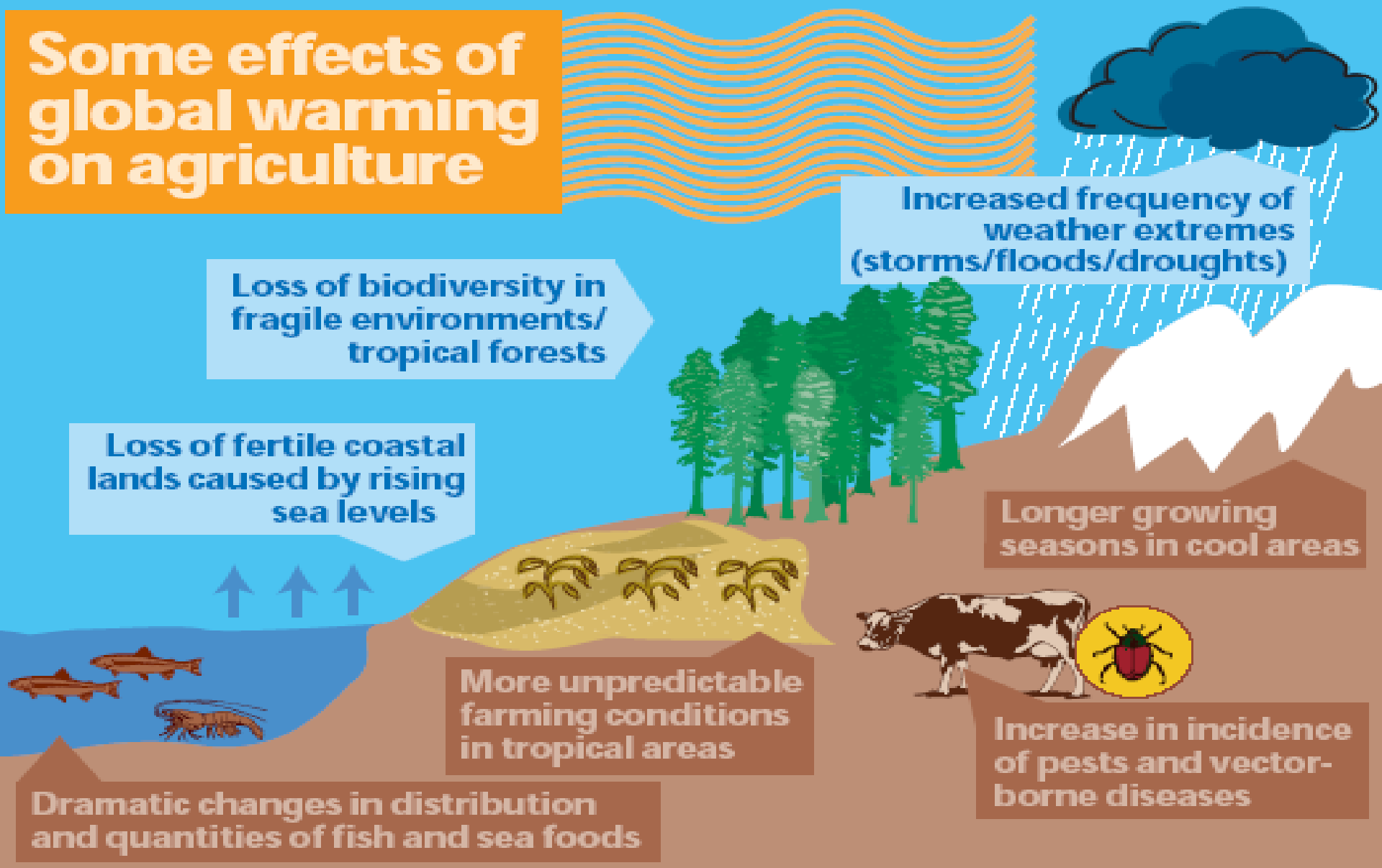
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CCS Haryana Agricultural University
Hisar, INDIA



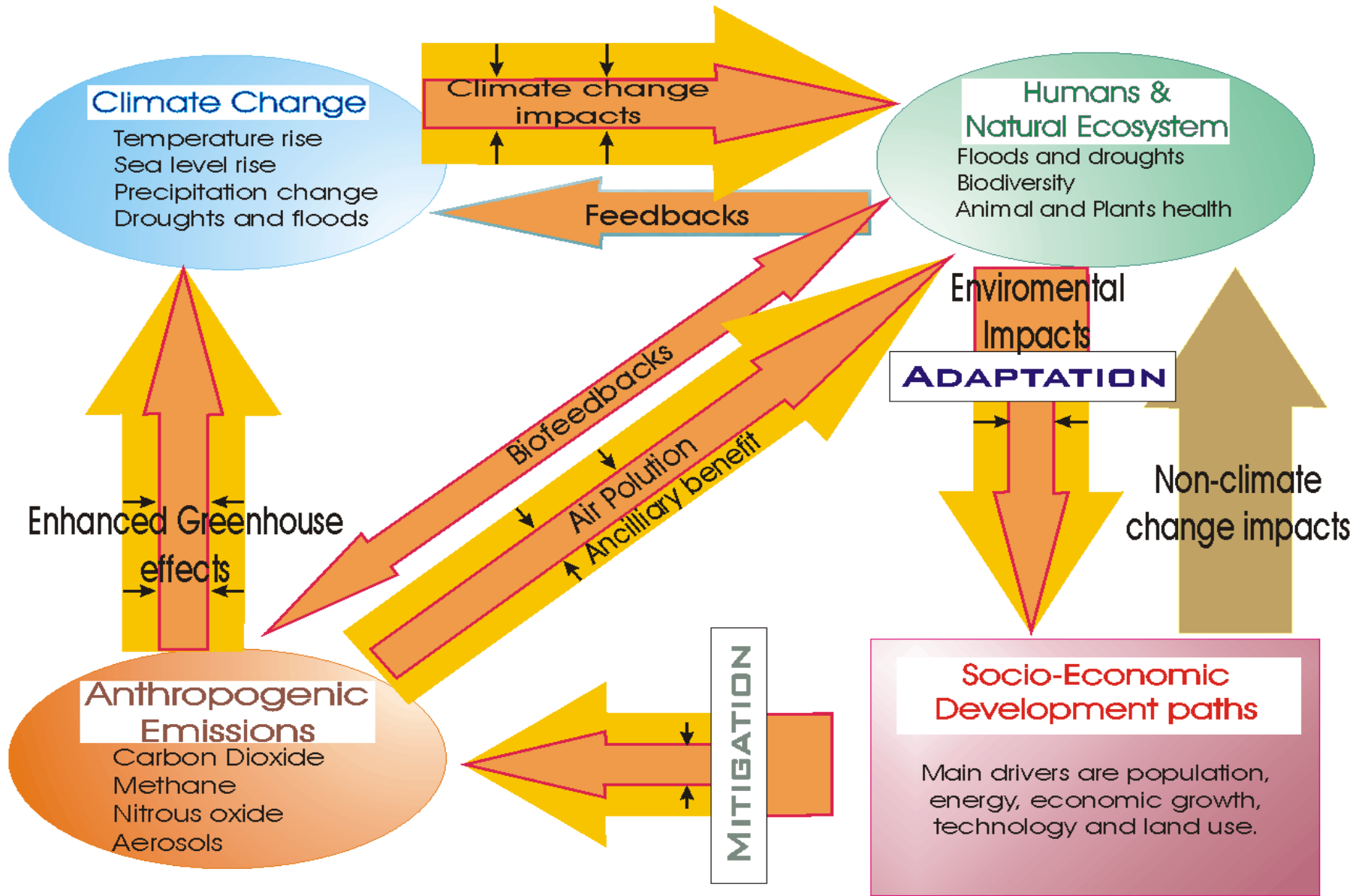
*** Univ of Natural Resources and Applied Life Sciences**
Vienna, AUSTRIA

Some effects of global warming on agriculture

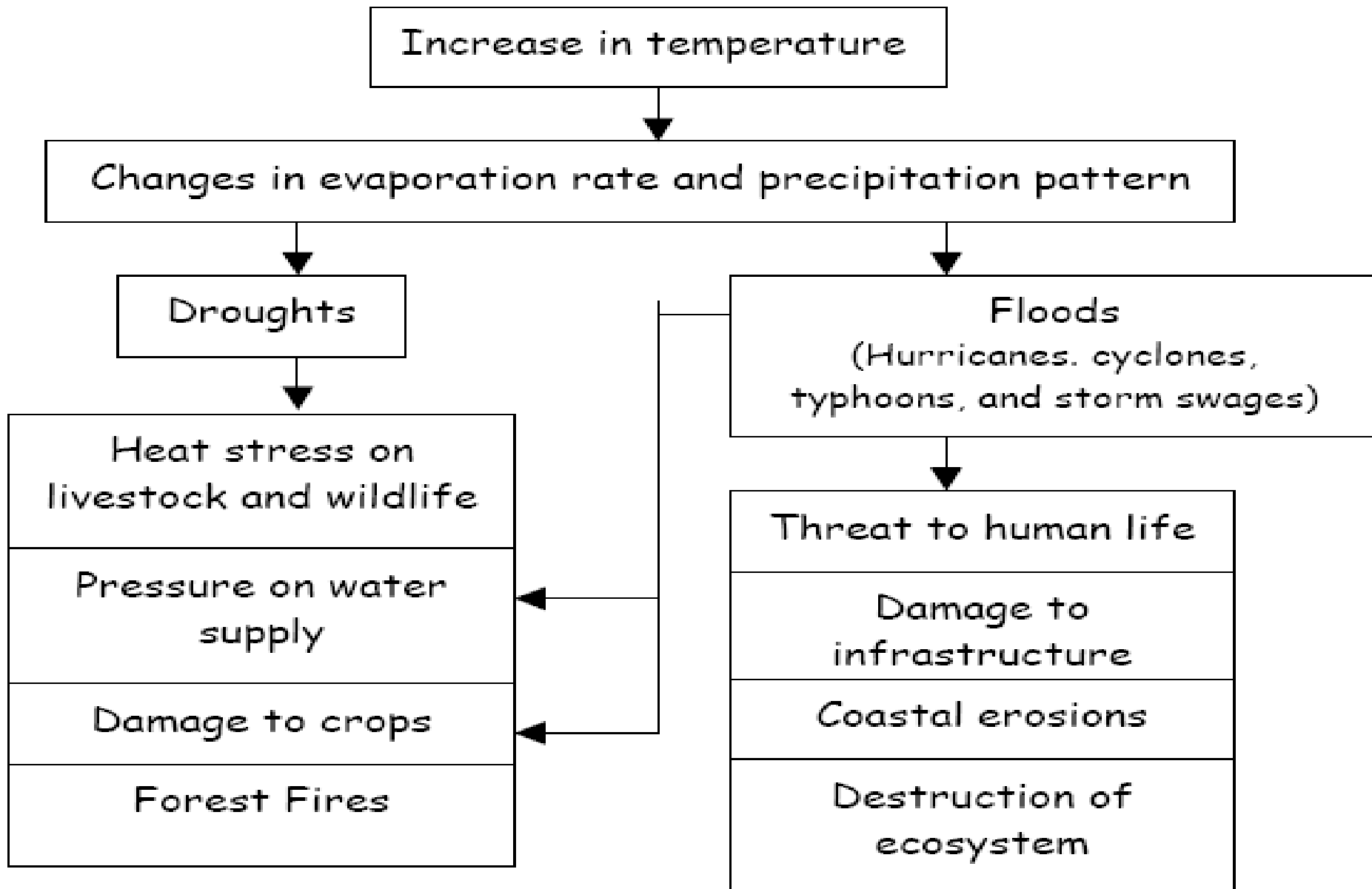


Long-term fluctuations in weather patterns could have extreme impacts on agricultural production, slashing crop yields and forcing farmers to adopt new agricultural practices in response to altered conditions.

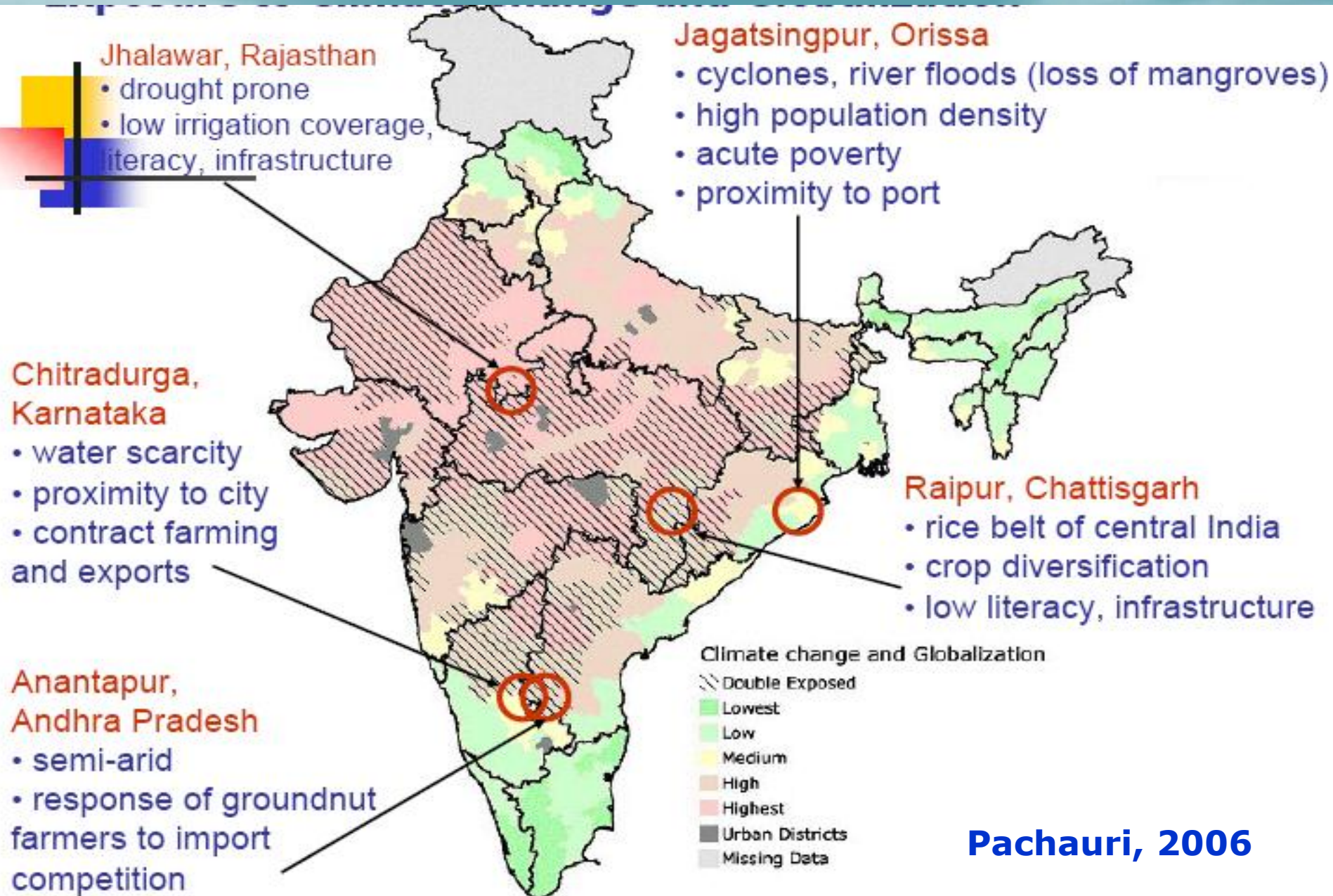
Integrated assessment framework for considering climate change



Climate change and extreme events



Varying vulnerabilities in India based on double exposure to climate change and globalization



Pachauri, 2006

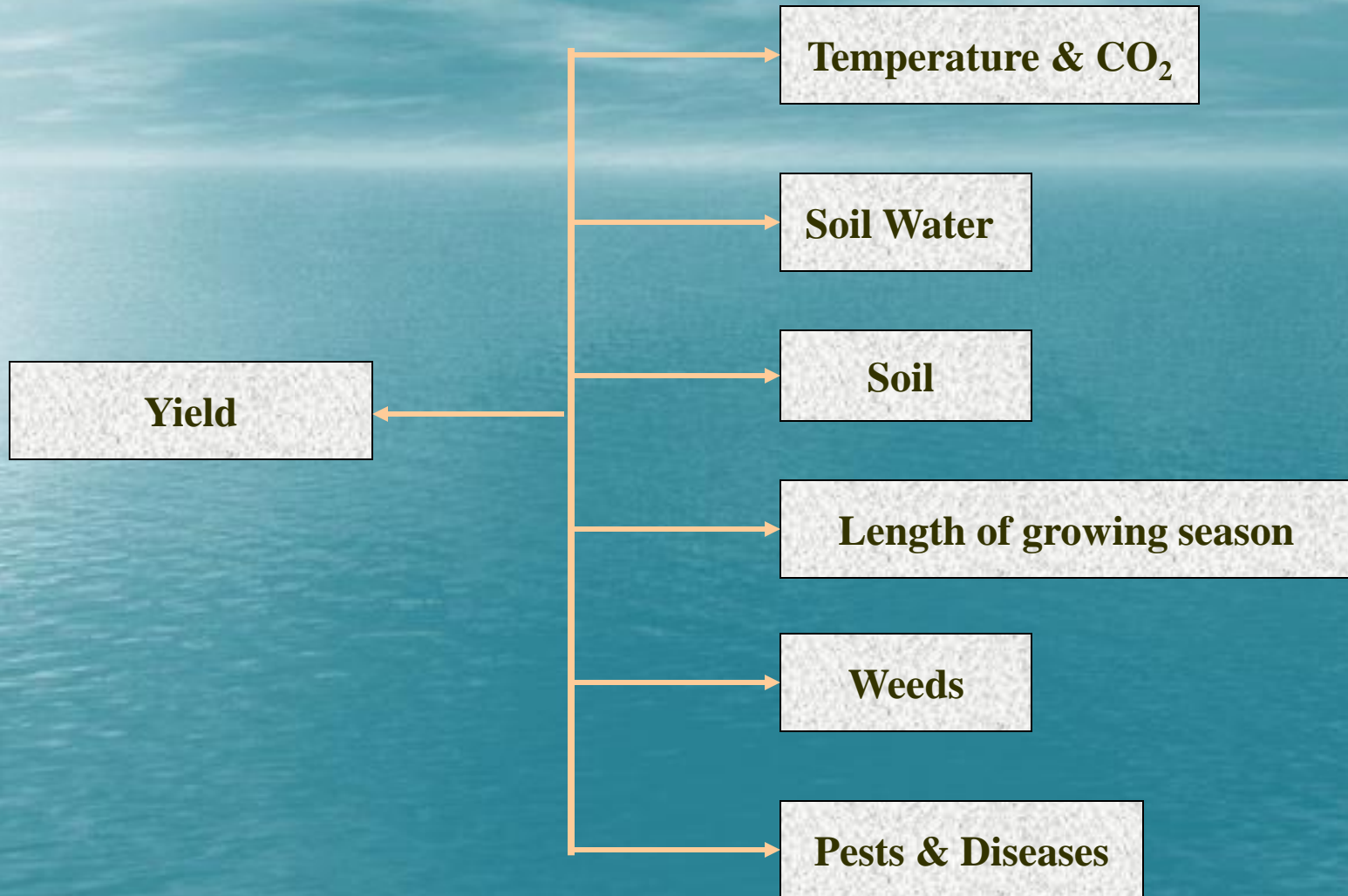
Climate change scenarios for India

Year	Season	Increase in Temperature, °C		Change in Rainfall, %	
		<i>Lowest</i>	<i>Highest</i>	<i>Lowest</i>	<i>Highest</i>
2020s	Rabi	1.08	1.54	-1.95	4.36
	Kharif	0.87	1.12	1.81	5.10
2050s	Rabi	2.54	3.18	-9.22	3.82
	Kharif	1.81	2.37	7.18	10.52
2080s	Rabi	4.14	6.31	-24.83	-4.50
	Kharif	2.91	4.62	10.10	15.18

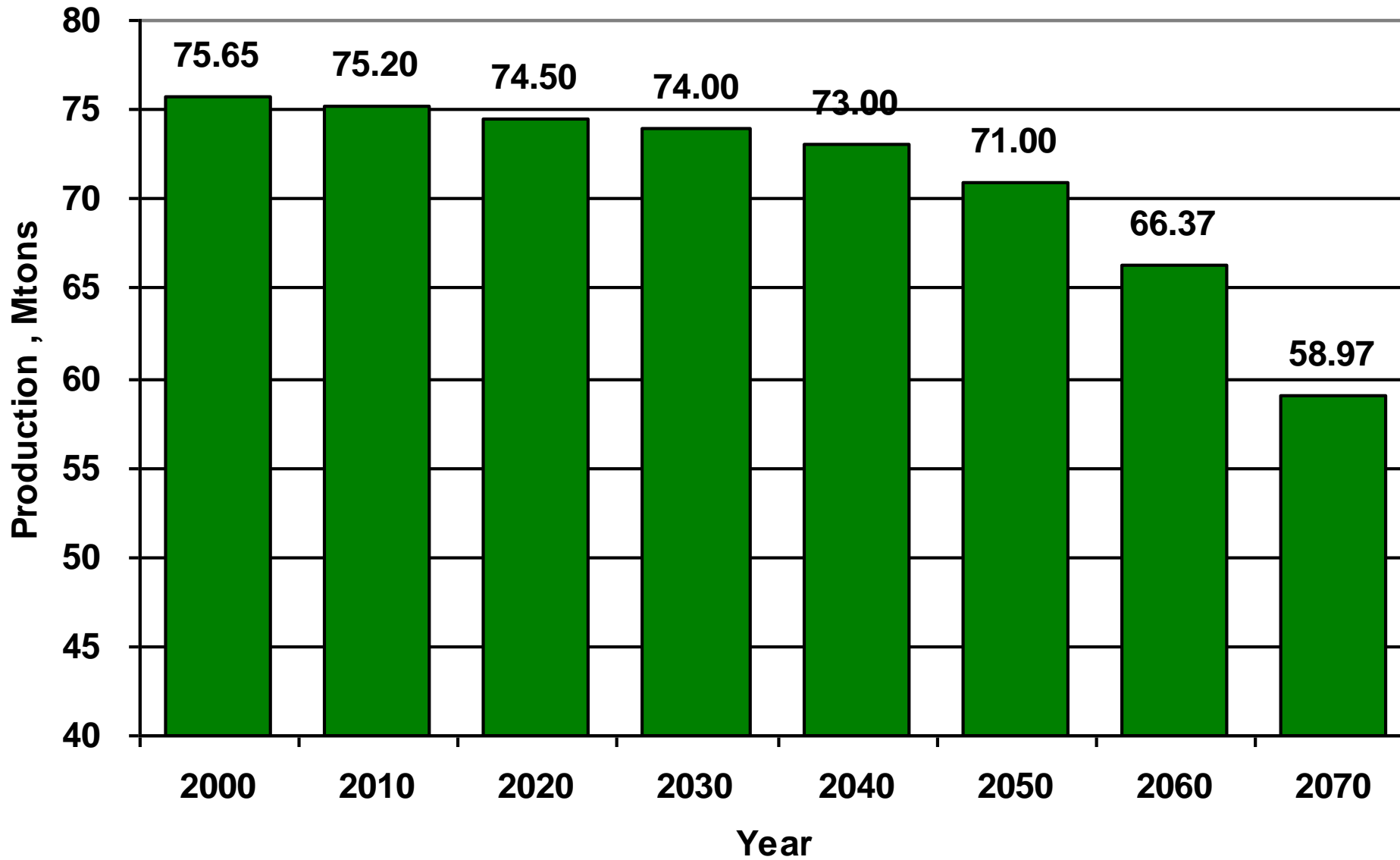
Some Specific Impacts on India

- ❖ **Stress on the land and water resources**
- ❖ **Threat to ecosystems and biodiversity**
- ❖ **Yields of major crops expected to decline**
- ❖ **Greater vulnerability to extreme climate events like cyclones, droughts and floods, particularly in coastal areas**
- ❖ **Potential for drier conditions in arid and semi-arid parts of India**

Factors effecting crop production in changing climate



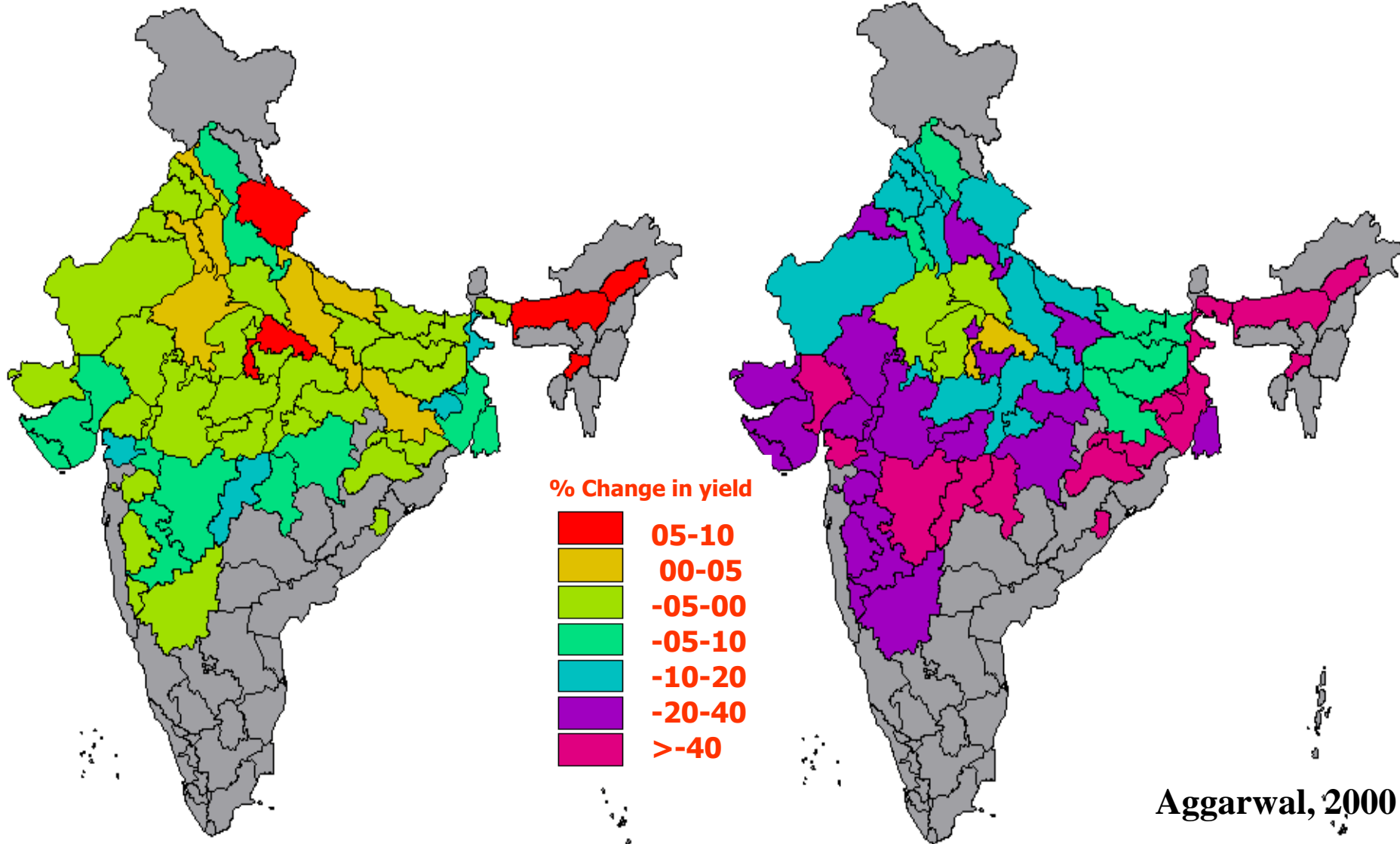
Potential impact of climate change on wheat production in India



Impact of climate change on wheat yields in a pessimistic technology scenario

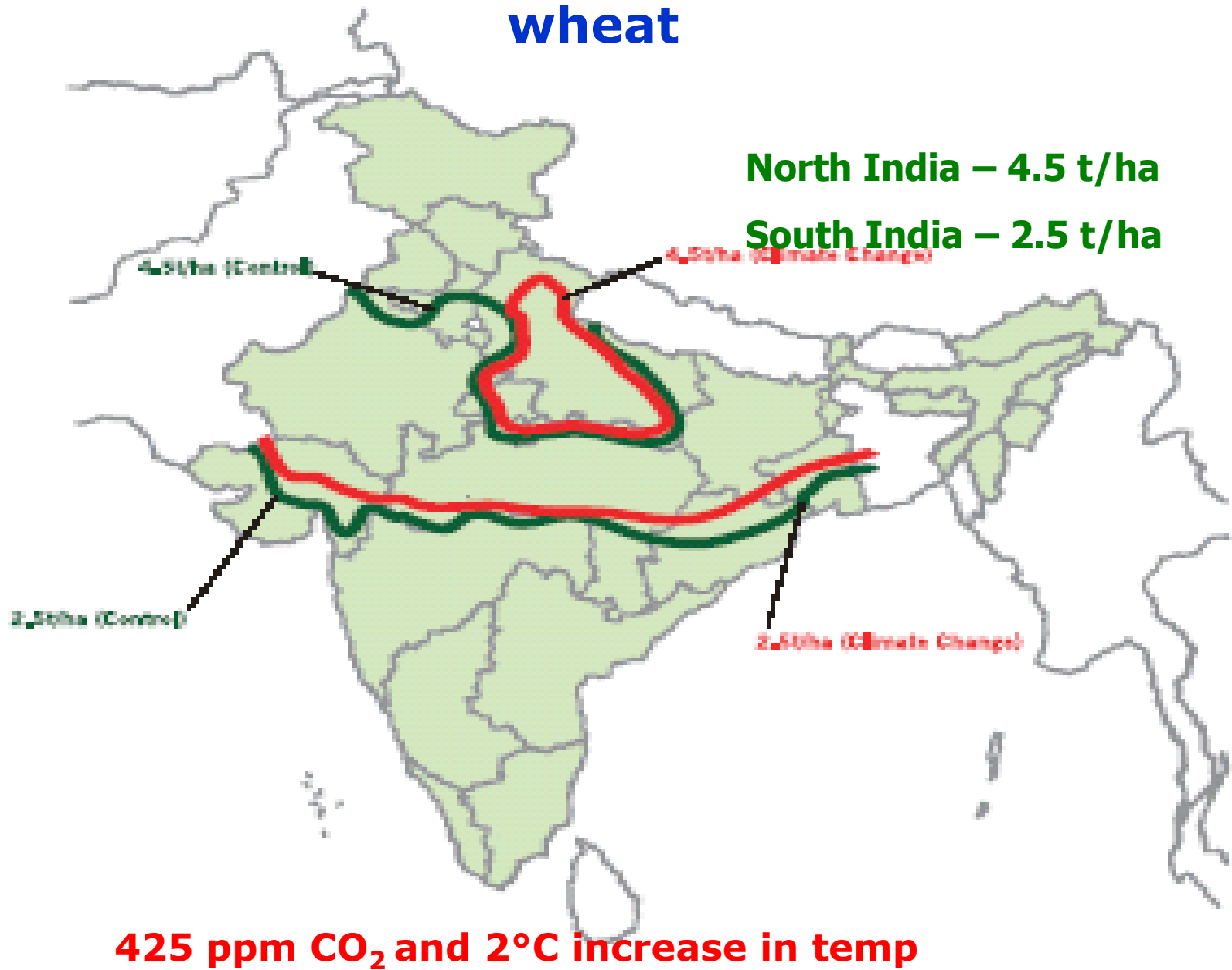
2020

2050

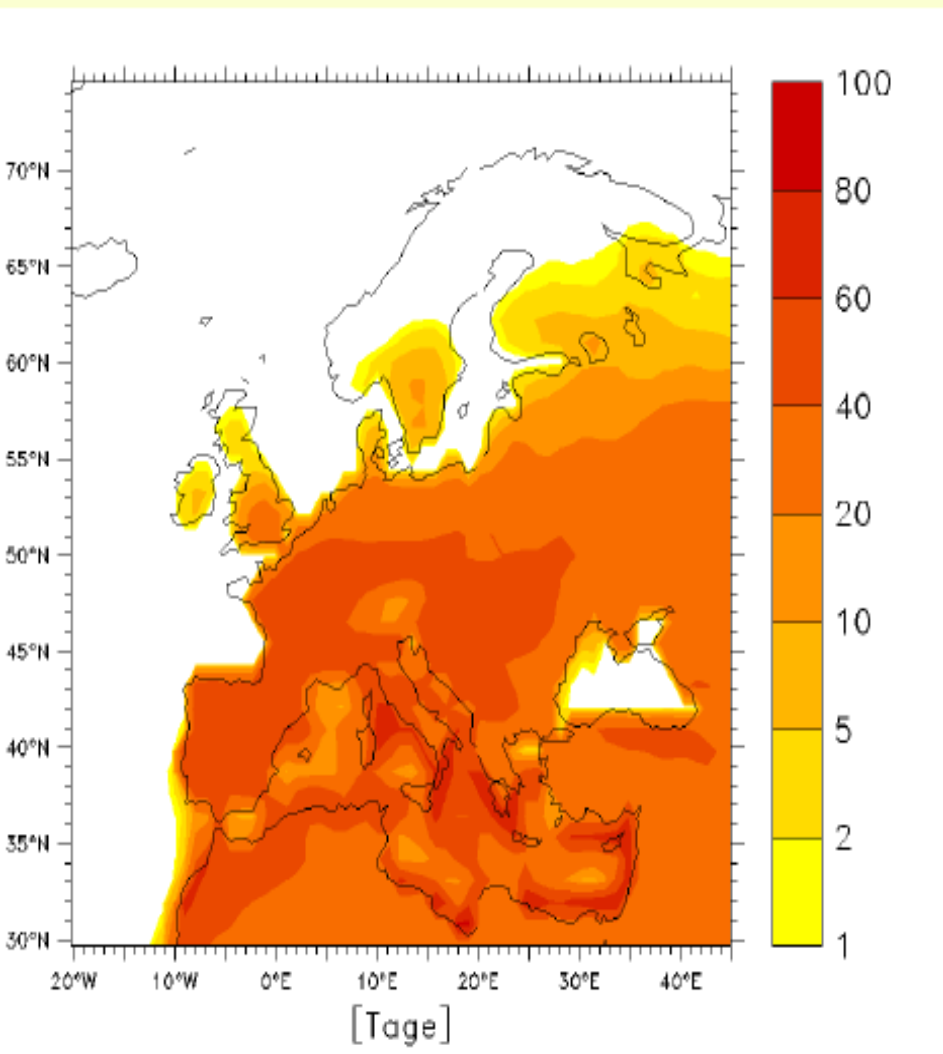


Aggarwal, 2000

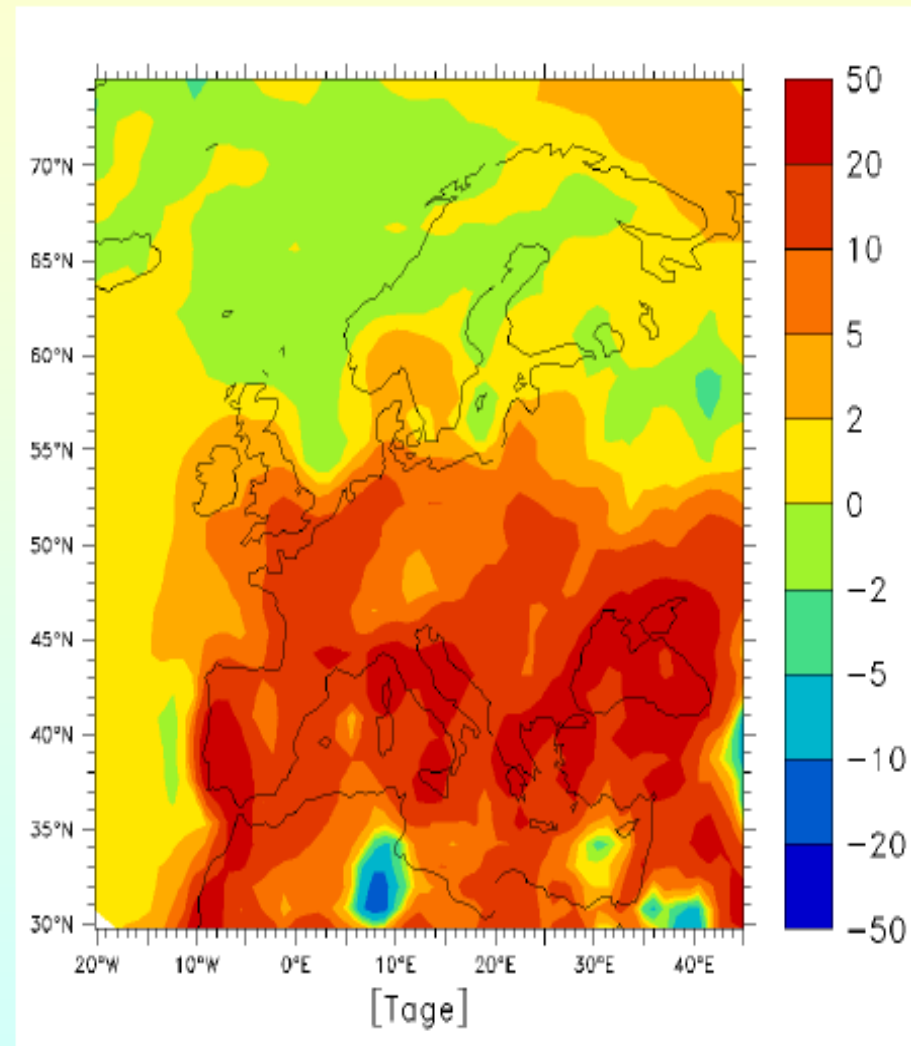
Boundary changes for productivity of irrigated wheat



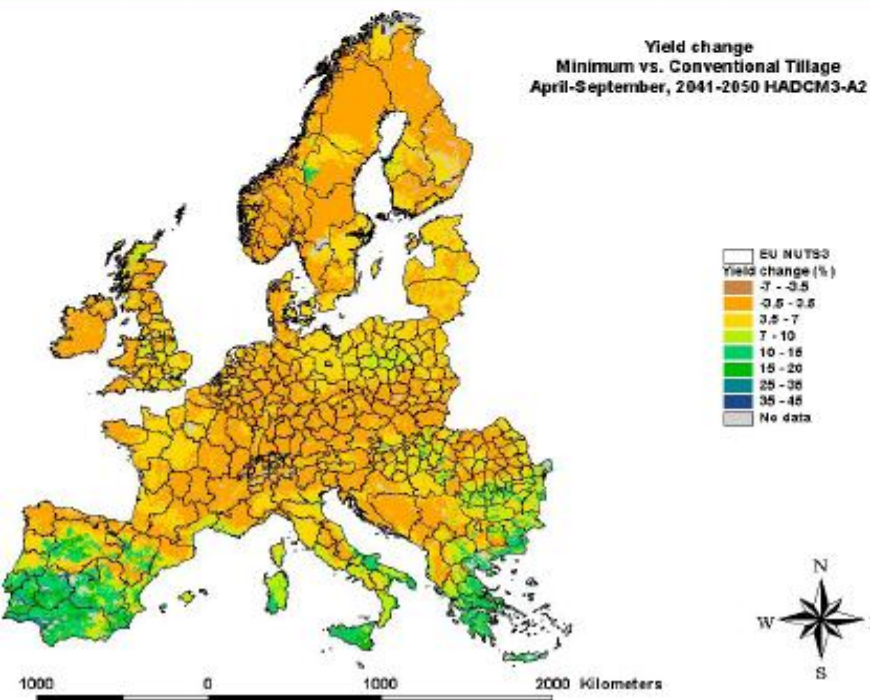
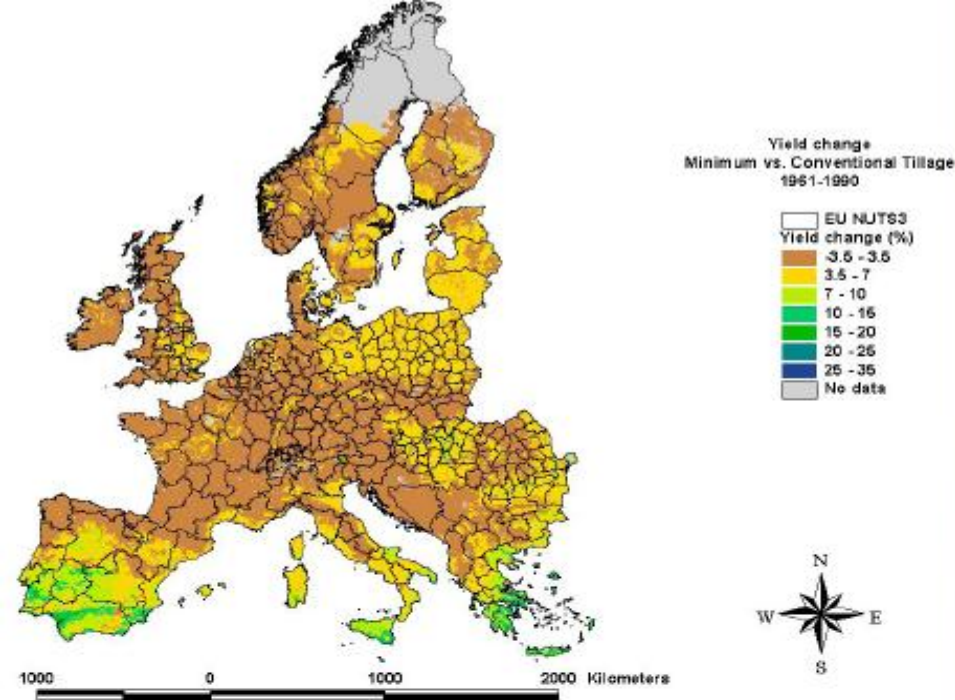
Increase of extremes



Days over 30°C in 2100 (Projekt ACACIA)



Duration of droughts in 2100 (Projekt ACACIA)



**Spring wheat yield change (%)
between minimum and
conventional tillage for baseline
(1961-1990)
and climate change scenario
(2041-2050 HADCM3-A2)
(Simota, 2009)**

Mitigation Strategies

- Drought proofing by mixed cropping
- Tolerant crops
- Resource conservation
- Frost management by irrigation
- Heat stress alleviation by frequent irrigation
- Shelter-belts

- ❑ Invent short varieties/crops
- ❑ Altering fertiliser rates to maintain grain or fruit quality and be more suited to the prevailing climate
- ❑ Altering amounts and timing of irrigation
- ❑ Conserve soil moisture (e.g. crop residue retention)
- ❑ Altering the timing or location of cropping activities
 - **Reduce GHG emissions through all means**
 - Replace intensive development with sustainable development
 - Integrated, collaborative & effective approach to address the problem of GW, CC & CV at all levels

Possible short term adaptations at farm level

- a shift of average sowing dates
- a replacement of ploughing by minimum tillage and direct drilling
 - leads to an increase of plant available field capacity
 - better water supply for the cereal crops
 - decrease of unproductive water losses
- Surface mulch (reduction of evaporation)
- Introduce Hedgerows (reduction of evaporation)
- crop rotation (less summer crops)
- Support irrigation and improved irrigation efficiency

High ^{Now} Time



Find Solutions



rather

Cataloguing



I wish to thank

