Interpret climate data

On behalf of
Federal Ministry
for Economic Cooperation
and Development

Imprint

As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Published by
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Dag-Hammarskjöld-Weg 1-5
65760 Eschborn, Germany
T +49 61 96 79-0
F +49 61 96 79-1115

Contact
E climate@giz.de
I www.giz.de

GIZ Climate Protection Programme

On behalf of
Federal Ministry
for Economic Cooperation
and Development

Responsible
Ilona Porsché, GIZ; Michael Scholze, GIZ

Authors
Jennifer Frankel-Reed, Barbara Fröde-Thierfelder, Ilona Porsché

Contributions by
Alfred Eberhardt, Mark Svendsen, Lea Herberg, Martin Baumgart, Udo Höggel, Michael Scholze, Alexander Fröde, Nana Künkel, members of the OECD Task Team on Climate Change and Development Co-operation

Coordination
Ilona Porsché, Barbara Fröde-Thierfelder

Design
Ira Olaleye

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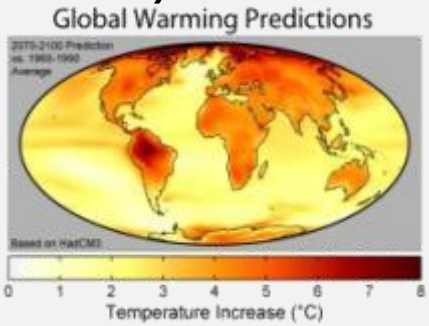
Definitions

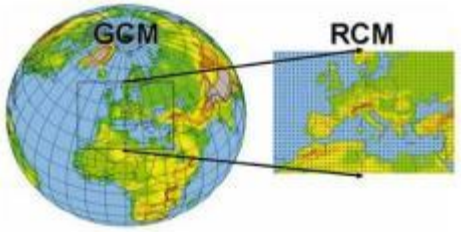
- **Weather: the state of the atmosphere at a given time with regard to temperature, rainfall, wind, etc.**
- **Climate: the average weather over a period of time (e.g. 30 years) in a region**
- **Climate variability: variations in the mean state of the climate, generally natural/historic**
- **Climate change (IPCC): change in climate over time, whether due to natural variability or human activity**
- **Climate Change (UNFCCC): a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.**

Scientific approach

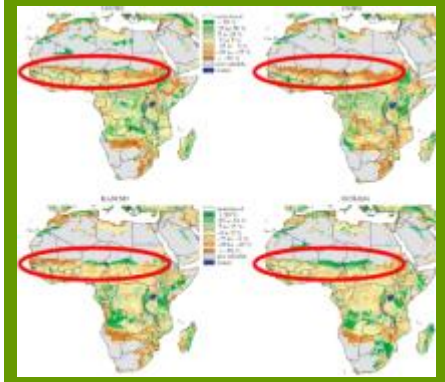
Global emission scenarios

Global climate models (23 in IPCC)





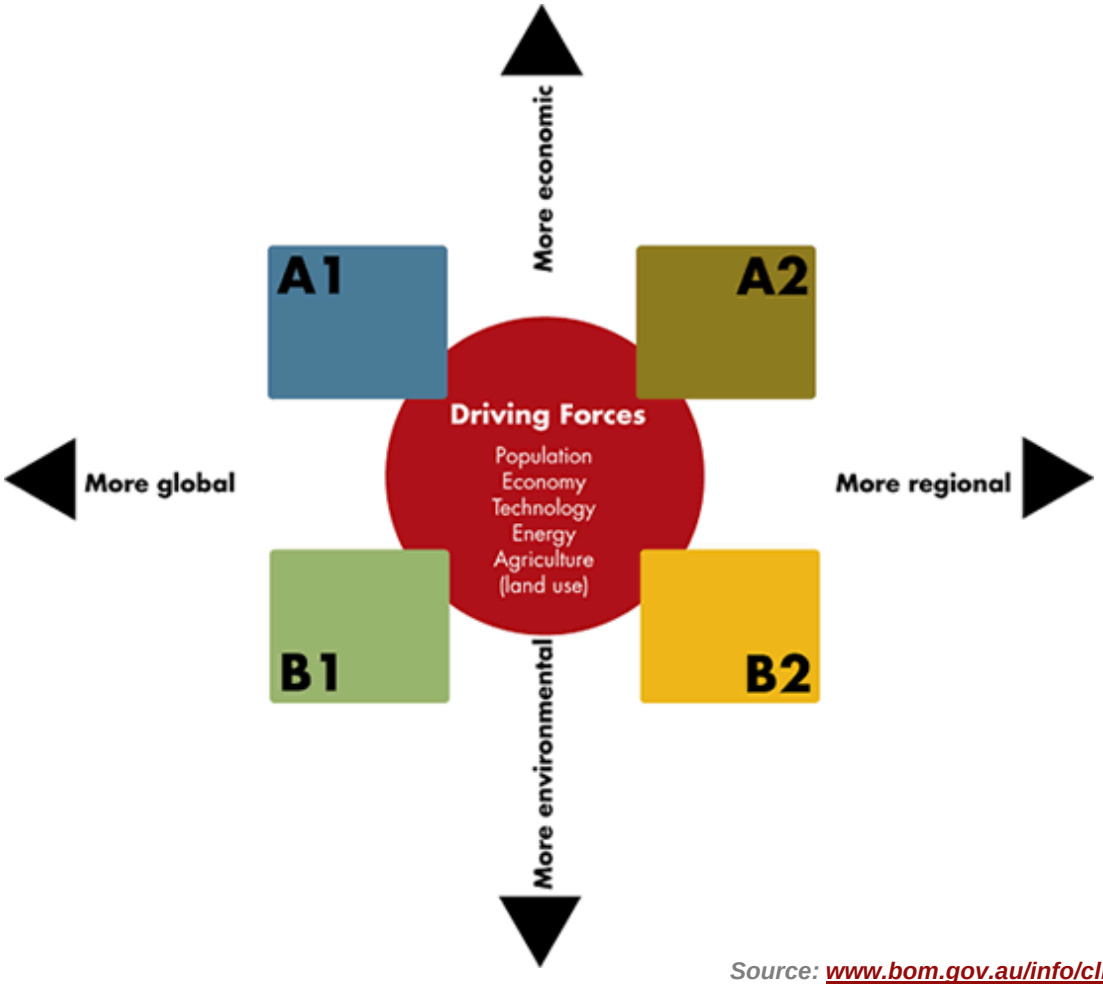
Local knowledge and experience



Impact, vulnerability and adaptation analysis

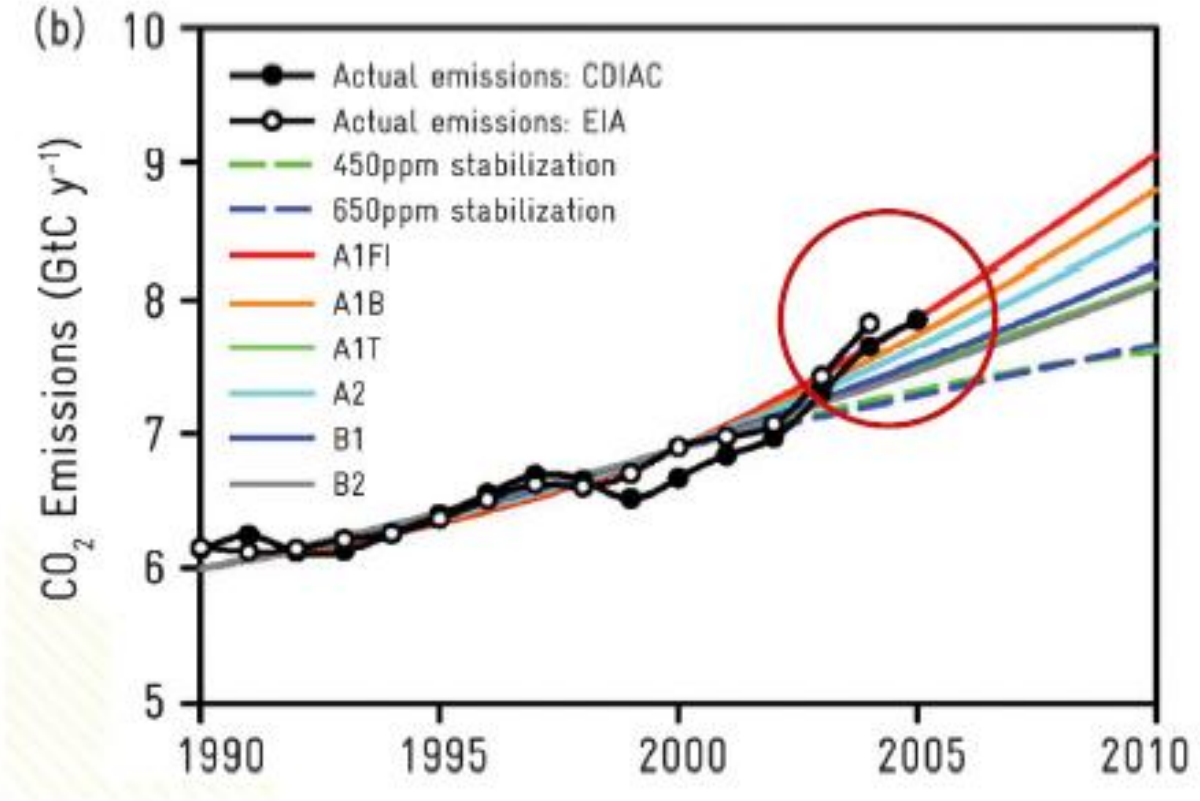
Source: http://en.wikipedia.org/wiki/File:Global_Warming_Predictions_Map.jpg, http://www.wmo.int/pages/themes/climate/images/figures/ClimateModelnesting.jpg

Emissions scenarios – assumptions of future developments

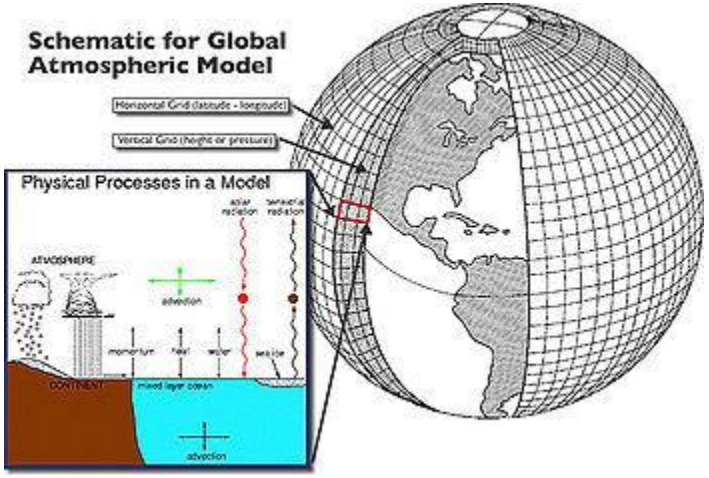


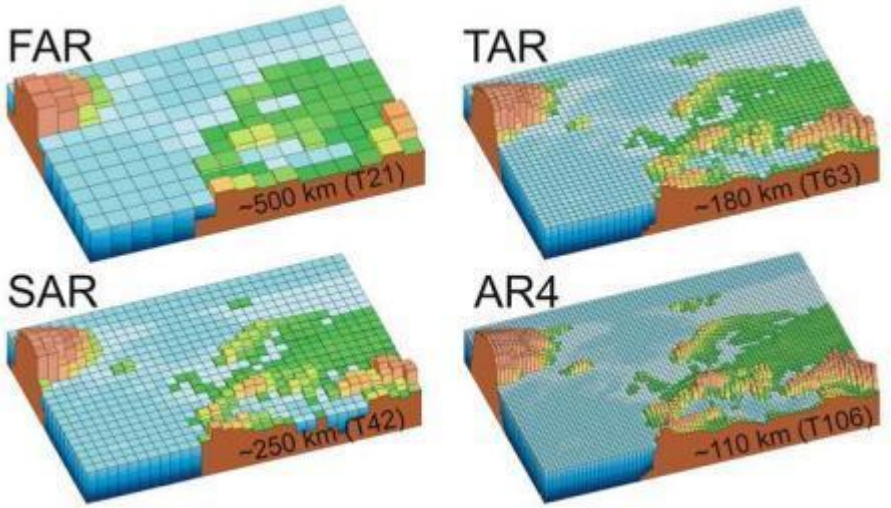
Source: www.bom.gov.au/info/climate/change/gallery/images/74.gif

Emission scenarios versus latest developments



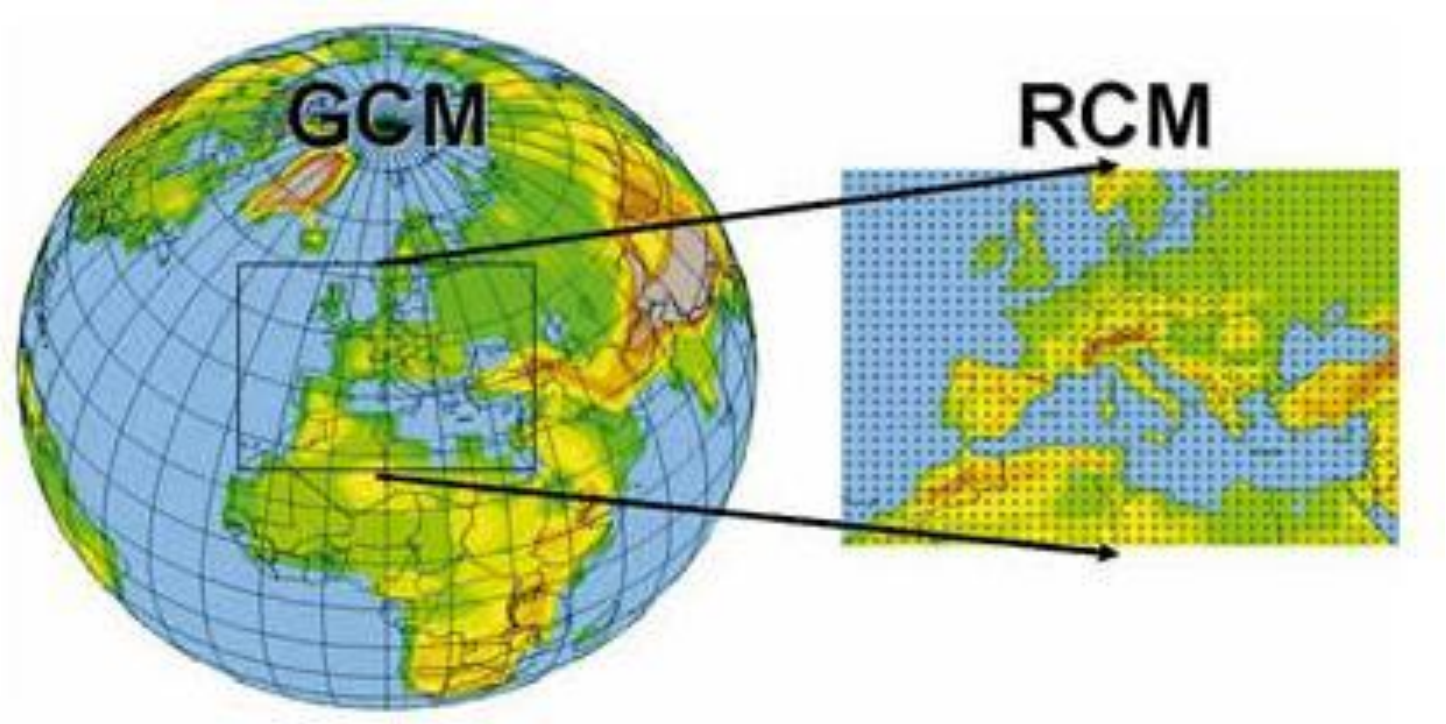
Global climate models





Source: www.wmo.int/pages/themes/climate/images/figures/Climatemodelresolutions.jpg, http://upload.wikimedia.org/wikipedia/commons/thumb/4/4a/Global_Atmospheric_Model.jpg/350px-Global_Atmospheric_Model.jpg

Regional climate models



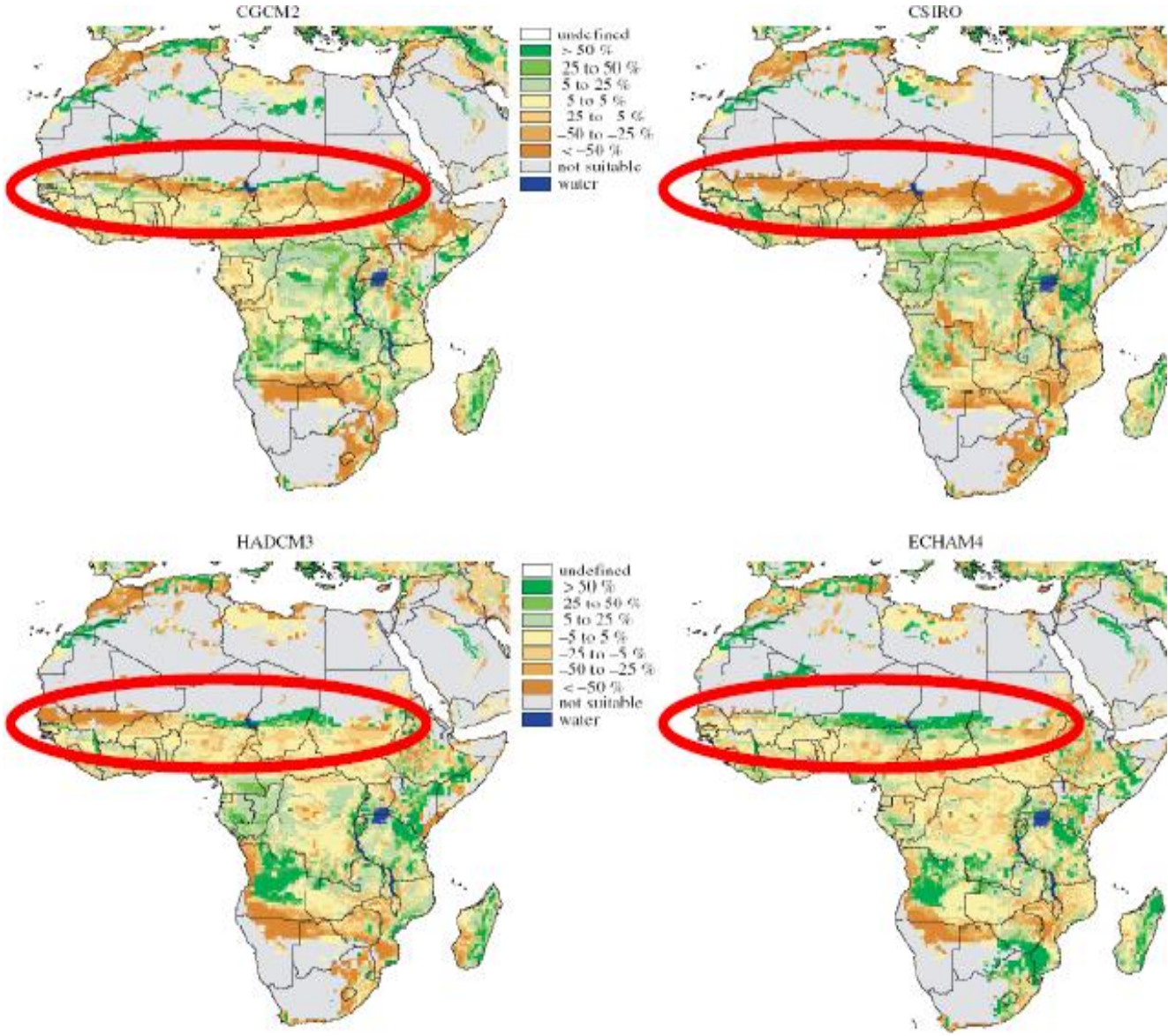
Source: ***http://www.wmo.int/pages/themes/climate/images/figures/ClimateModelnesting.jpg***

Local climate knowledge






Impact models – beware of input



Source: Fischer et al., 2008

Example: climate change in the Sahel

Observations

- **1950 – 1968: Wet period**
- **1968 – 1990: Dry period**
- **1990 – 2010: Period with heavy yearly variability**

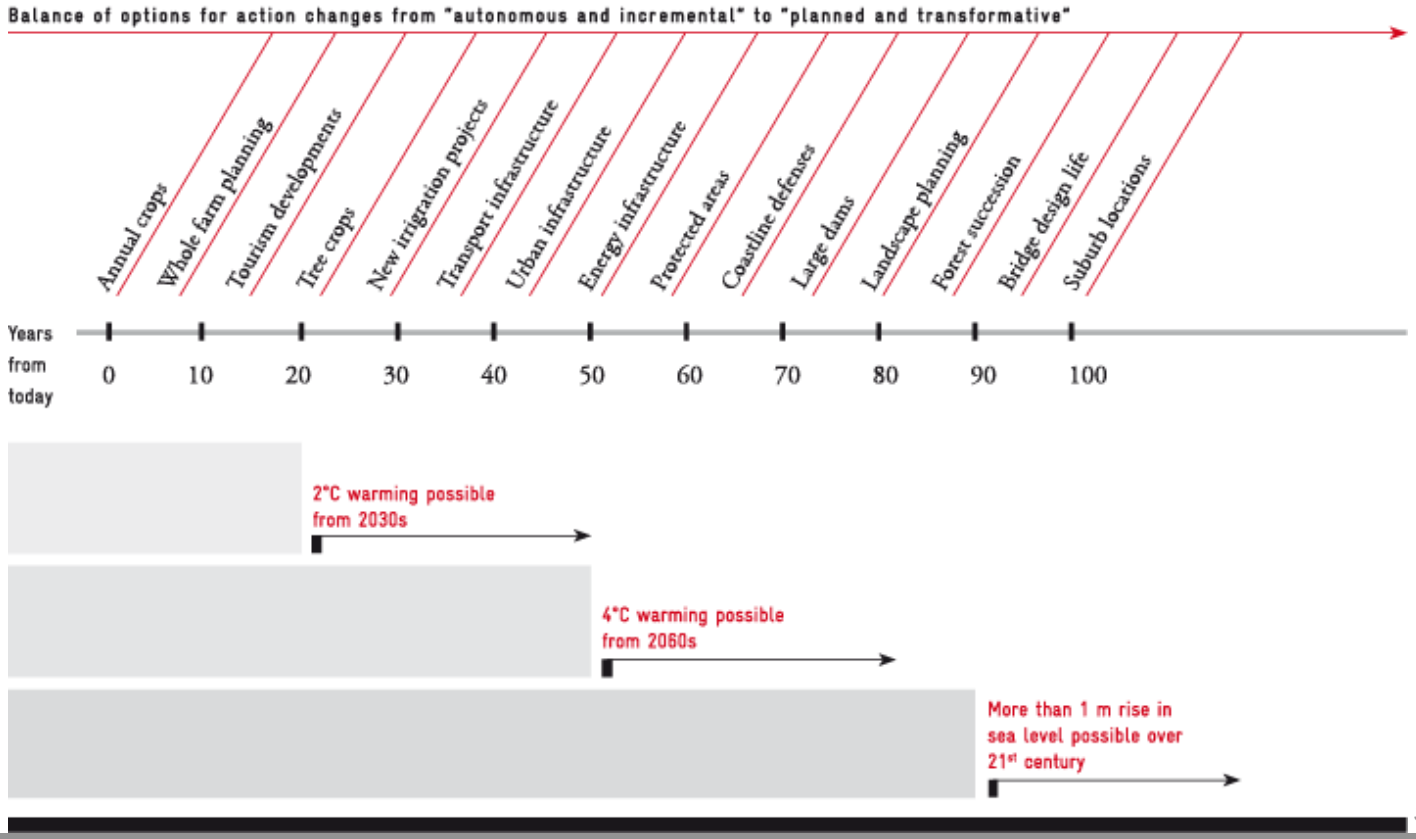
Outlook

- **Tendency that isohyets are moving towards South**
- **Temperature will rise by up to 3.5°C**
- **Increasing pockets of dryness during rain season**

Differing climate change scenarios

- **Optimistic:** rain season from 90 to 120 days
  - Rainfall is abundant but violent.
  - → Better exploitation of rainwater by soil and water conservation measures (CES/DRS).
- **Irregular rain:** rain season about 90 days
  - → Contribution to soil and water conservation measures especially regarding pockets of dryness and preterm stop of rainfalls at the end of the season.
  - → Protection against loss of fertile soil layers.
- **Crisis:** rain season from 60 to 90 days
  - Desertification cannot be counteracted.

Planning horizons: today's decisions shape the future



Source: Stafford Smith et al. (2010)

Climate change knowledge today

Climate change is real

- Mean global temperature rose by +0.74°C over the 20th century
- Most warming occurred in recent decades following increased emission of greenhouse gases since the 1950s
- Loss of snow and ice cover, decreasing extent of permafrost
- Sea level rise (+18 to +59cm)
- Ocean acidification

Information needs

Policy makers need to know…	Which helps us choose the necessary…
What will happen?	climate variables
Where?	geographic extent and resolution
When?	time frame
How sure?	confidence level

Scepticism remains (1)

- **Myth: The warming trend is a consequence of changes in measurement instruments**
  - The global climate observing system uses rigorous climate monitoring principles to remove systematic errors
- **Myth: Temperatures fluctuate naturally over time**
  - Records over the past 1000 years show that the temperature has varied in the last millennium, but never as high as current levels
- **Myth: No one can predict the climate into the future**
  - We know models can predict average weather because of comparison of the modelled climate with measurements

Source: NERC ***http://www.nerc.ac.uk/about/consult/debate/climatechange/summary.asp***

Scepticism remains (2)

- **Myth: Recent local and/or brief cool periods are evidence against climate change**
  - Trends at individual locations do not represent the trend of a larger region
- **Myth: There is no consensus about climate change**
  - More than 1000 of the leading climate scientists from around the world agree on IPCC findings
- **Myth: Scientists are downplaying the uncertainty**
  - There is little uncertainty about an increase in global temperature caused by greenhouse gases, though many uncertainties remain

Source: NERC ***http://www.nerc.ac.uk/about/consult/debate/climatechange/summary.asp***