

Climate Change, the IPCC, and Opportunities and Limits of Adaptation

Jean-Pascal van Ypersele

IPCC Vice-Chair, Candidate Chair

Twitter: @JPvanYpersele

**International Conference on Community-Based
Adaptation (IIED, BCAS, ACTS), Nairobi,
27 April 2015**

**Thanks to the Belgian Federal Science Policy Office (BELSPO)
and Ministry of Foreign Affairs, and to my team at the
Université catholique de Louvain for their support**

Let us think about the future of these children from Machakos in a warming climate



Why the IPCC ?

Established by WMO and UNEP in 1988

to provide **policy-makers** with an **objective source of information** about

- causes of climate change,
- potential environmental and socio-economic impacts,
- possible response options (adaptation & mitigation).

WMO=World Meteorological Organization

UNEP= United Nations Environment Programme

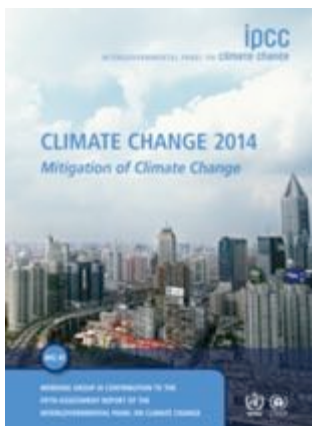




What is happening in the climate system?



What are the risks?



What can be done?

Key messages from IPCC AR5

- **Human influence on the climate system is clear**
- **Continued emissions of greenhouse gases will increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems**
- **While climate change is a threat to sustainable development, there are many opportunities to integrate mitigation, adaptation, and the pursuit of other societal objectives**
- **Humanity has the means to limit climate change and build a more sustainable and resilient future**

Since 1950, extreme hot days and heavy precipitation have become more common



There is evidence that anthropogenic influences, including increasing atmospheric greenhouse gas concentrations, have changed these extremes

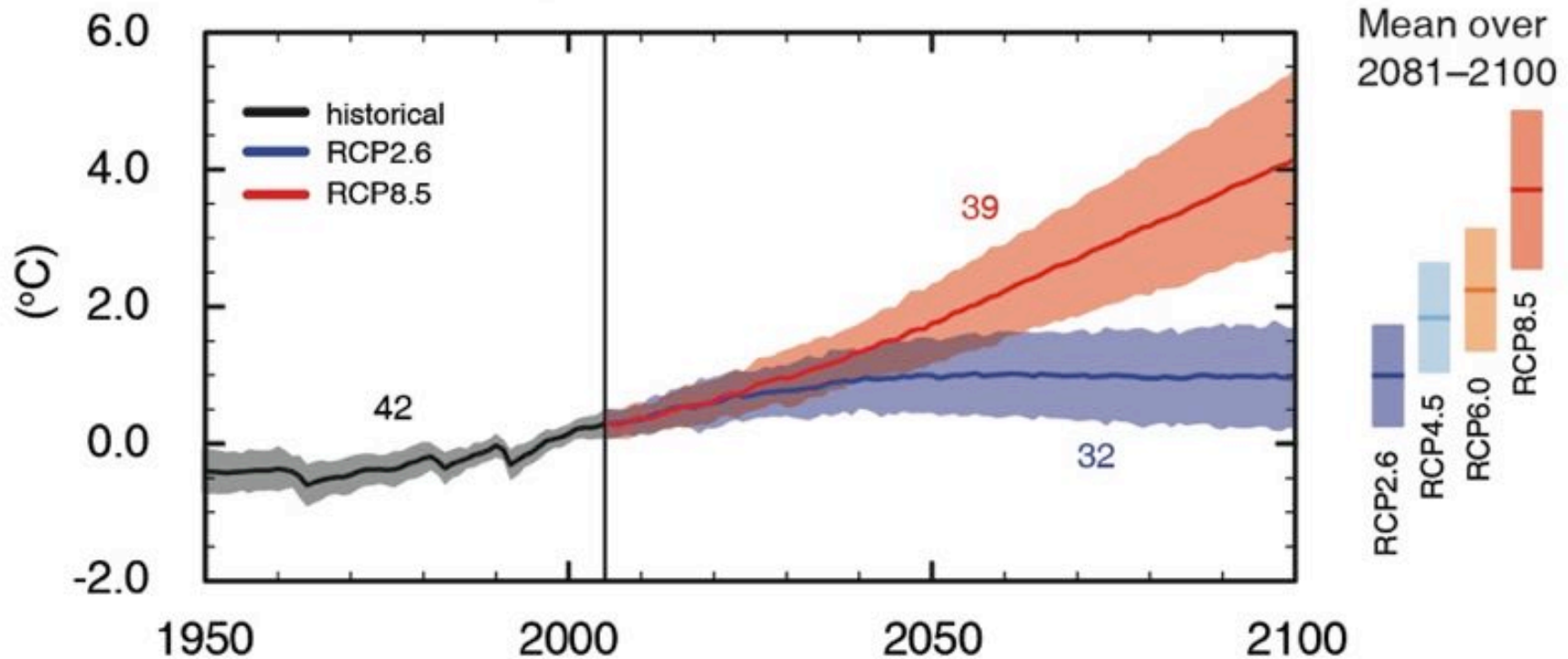
Impacts are already underway

- **Tropics to the poles**
- **On all continents and in the ocean**
- **Affecting rich and poor countries (but the poor are more vulnerable everywhere)**



AR5 WGII SPM

Global average surface temperature change



(IPCC 2013, Fig. SPM.7a)

Only the lowest (RCP2.6) scenario maintains the global surface temperature increase above the pre-industrial level to less than 2°C with at least 66% probability

18-20000 years ago (Last Glacial Maximum)

With permission from Dr. S. Joussaume, in « Climat d'hier à demain », CNRS éditions.

Ice sheets up to 3 km thick



Sea level 120 m lower than today

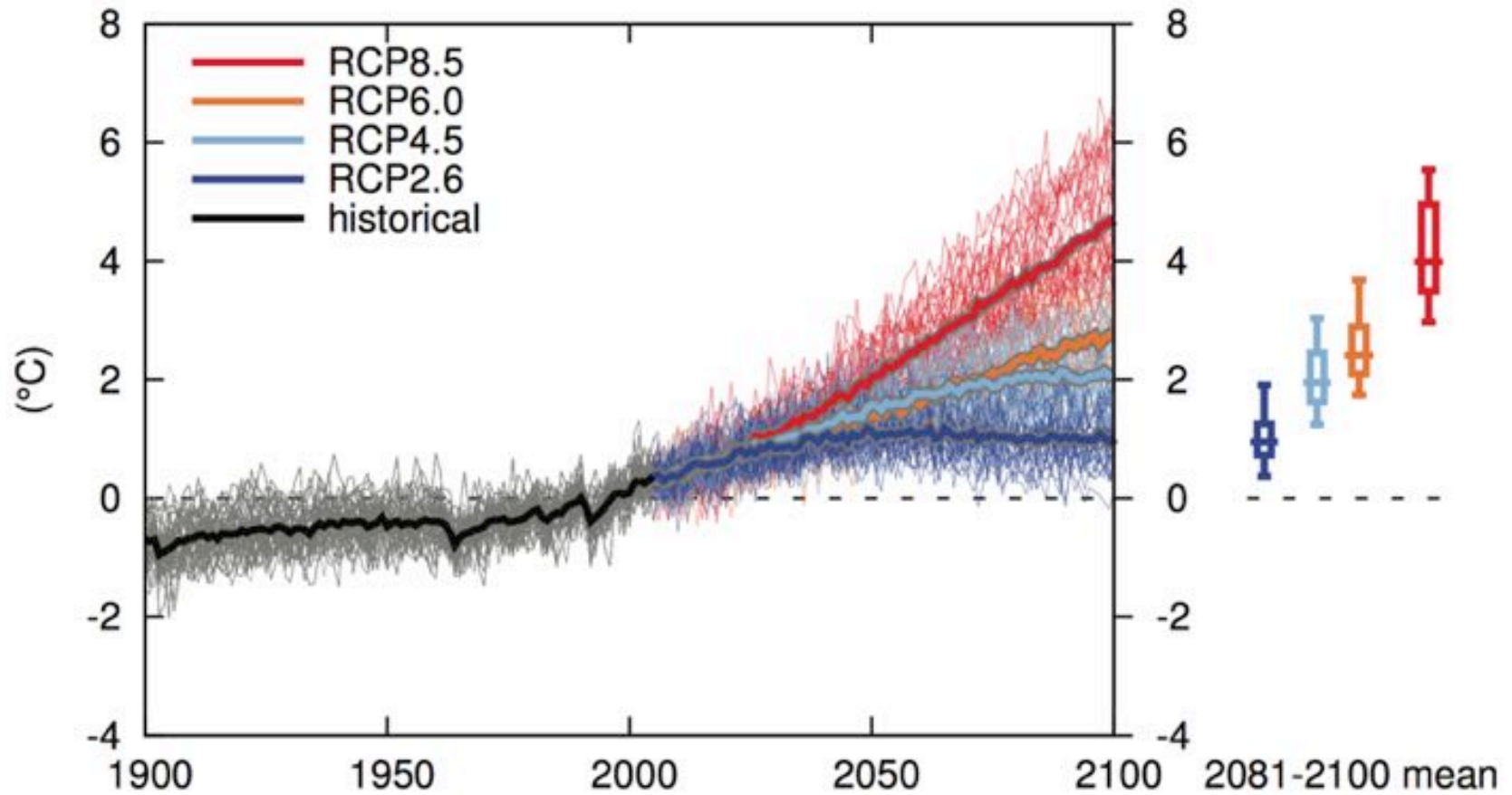
Il y a
18000 ans

Today, with +4-5°C globally

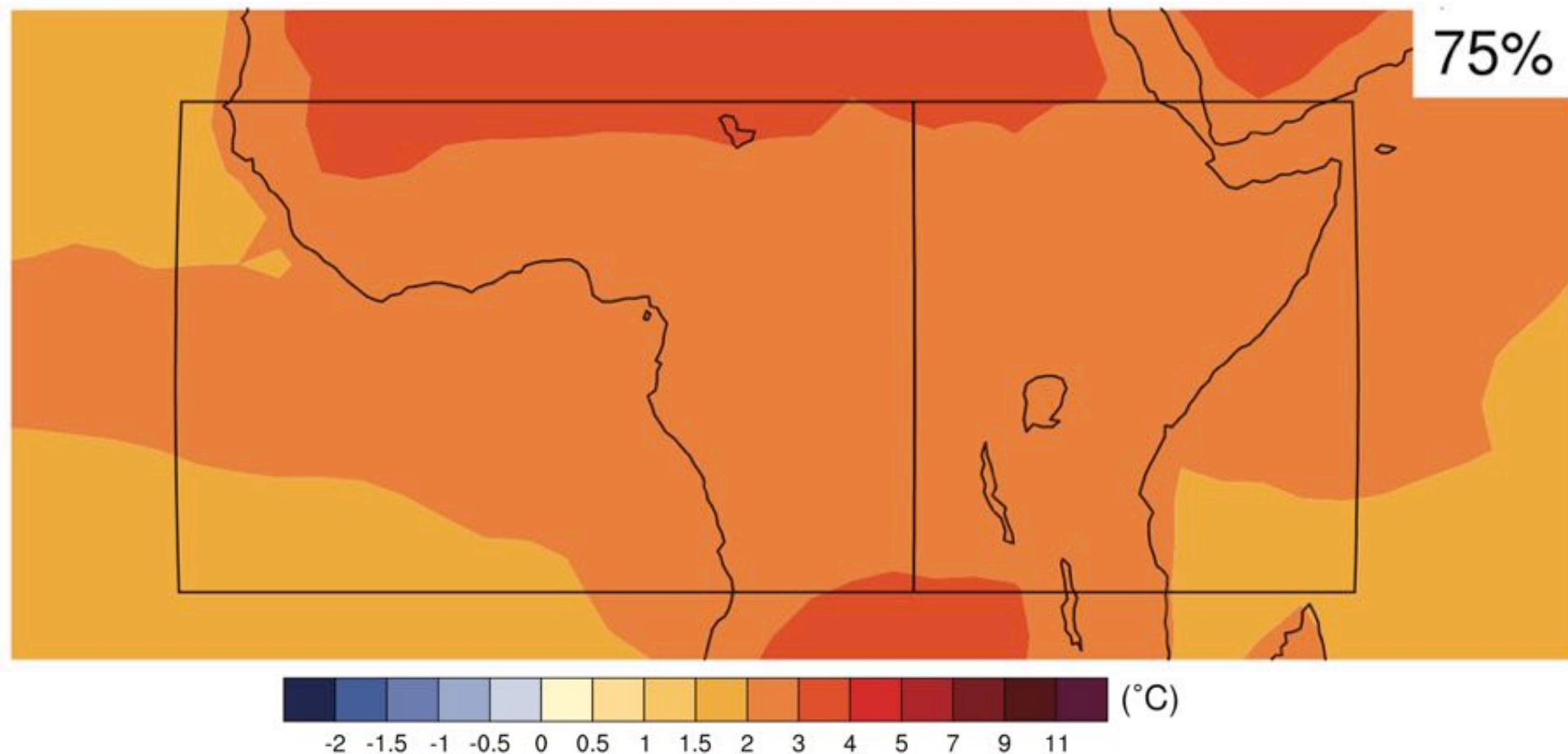
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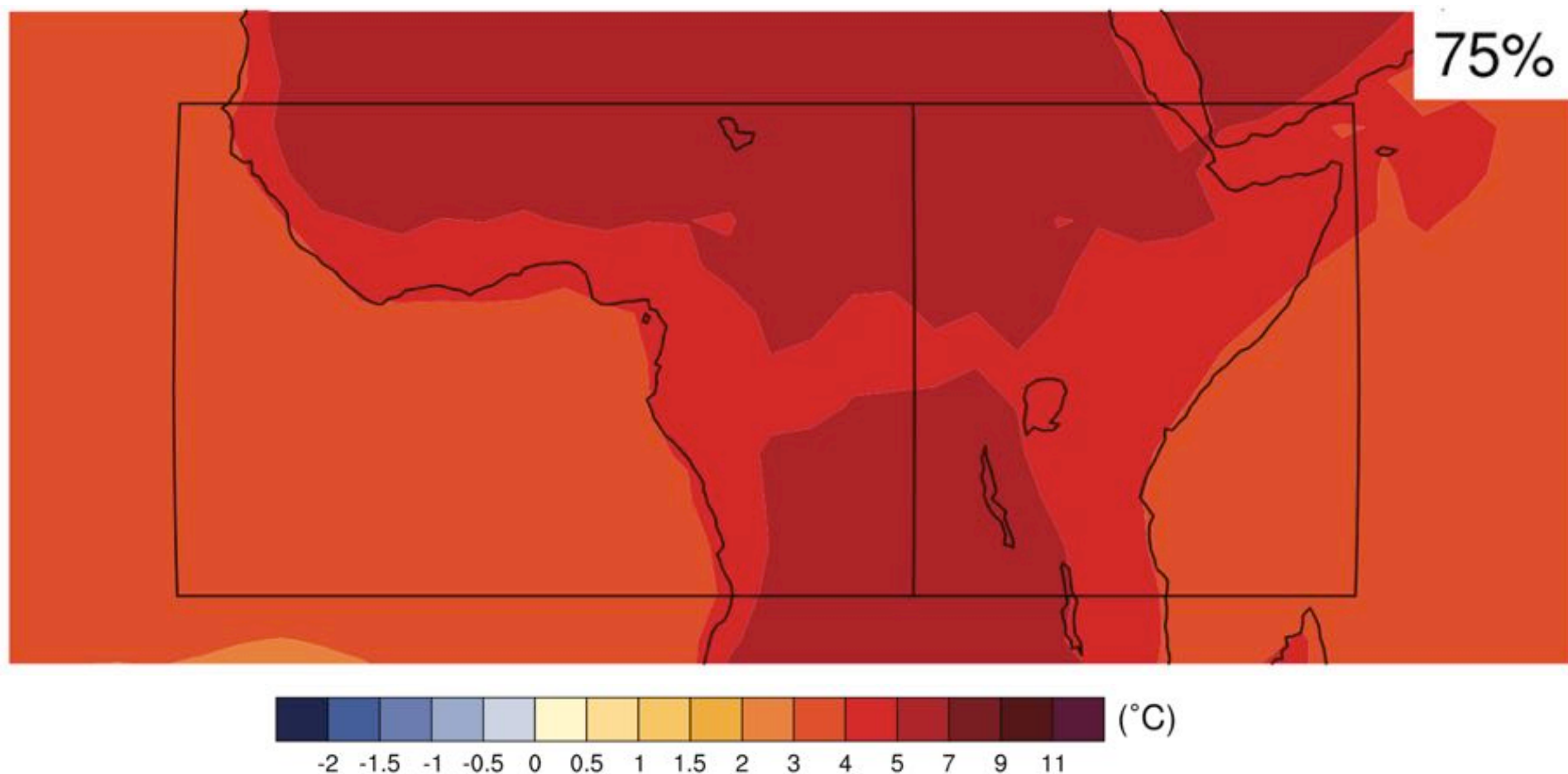
Temperature change East Africa annual



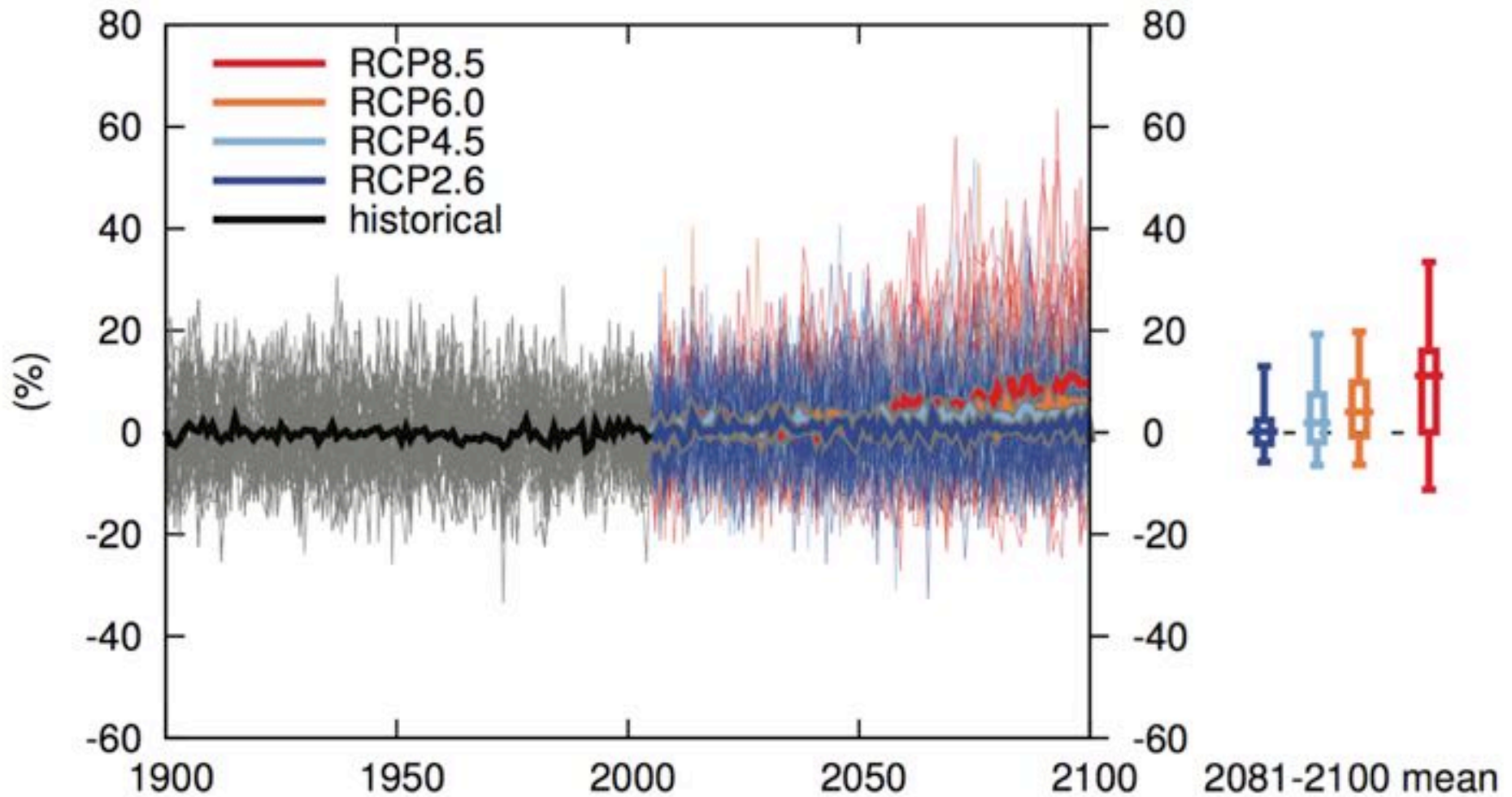
Maps of temperature changes in 2046–2065 with respect to 1986–2005 in the RCP8.5 scenario



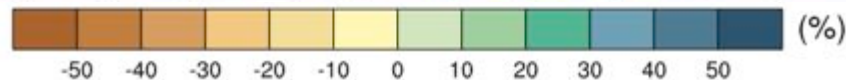
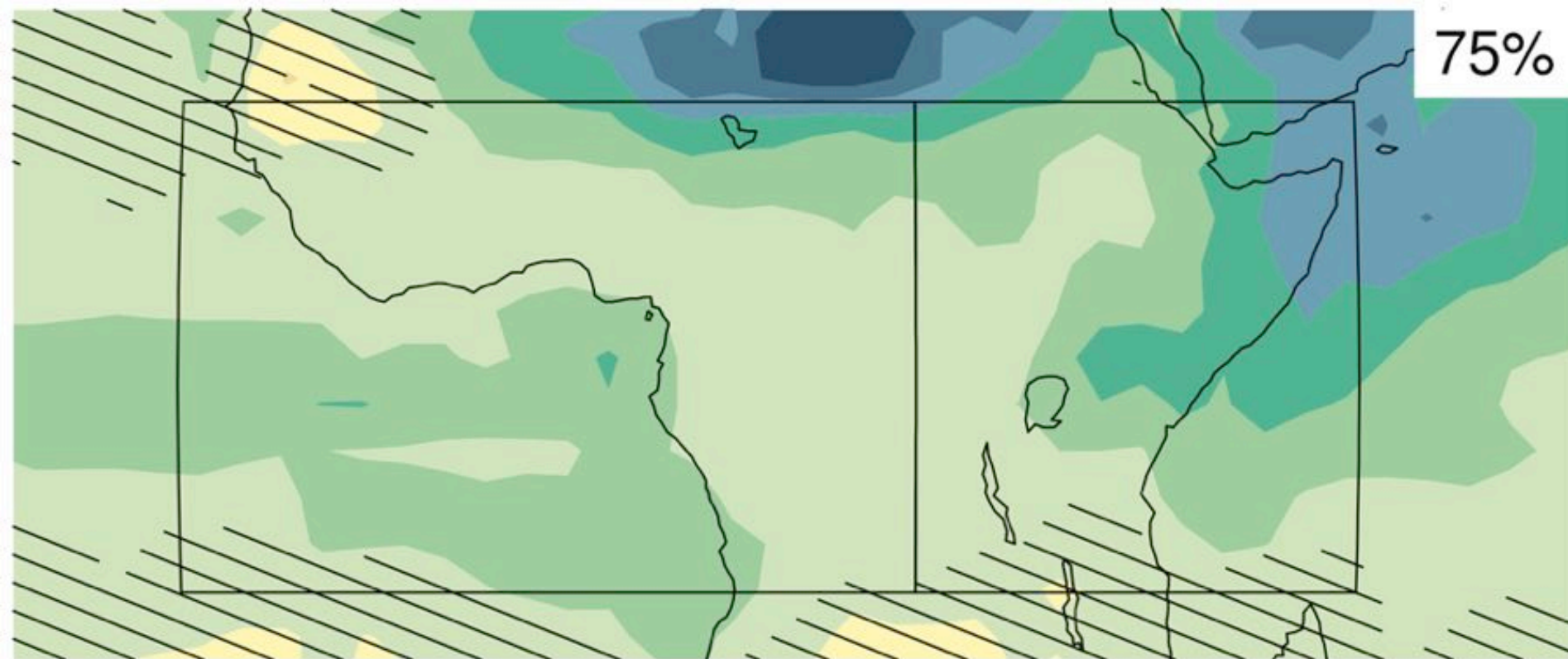
Maps of temperature changes in 2081–2100 with respect to 1986–2005 in the RCP8.5 scenario



Precipitation change East Africa annual



Maps of precipitation changes in 2046–2065, with respect to 1986–2005 in the RCP8.5 scenario



Regions where the projected change is less than one standard deviation of the natural internal variability

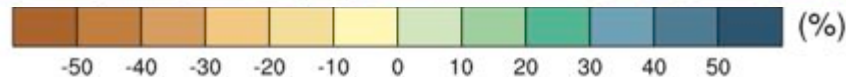
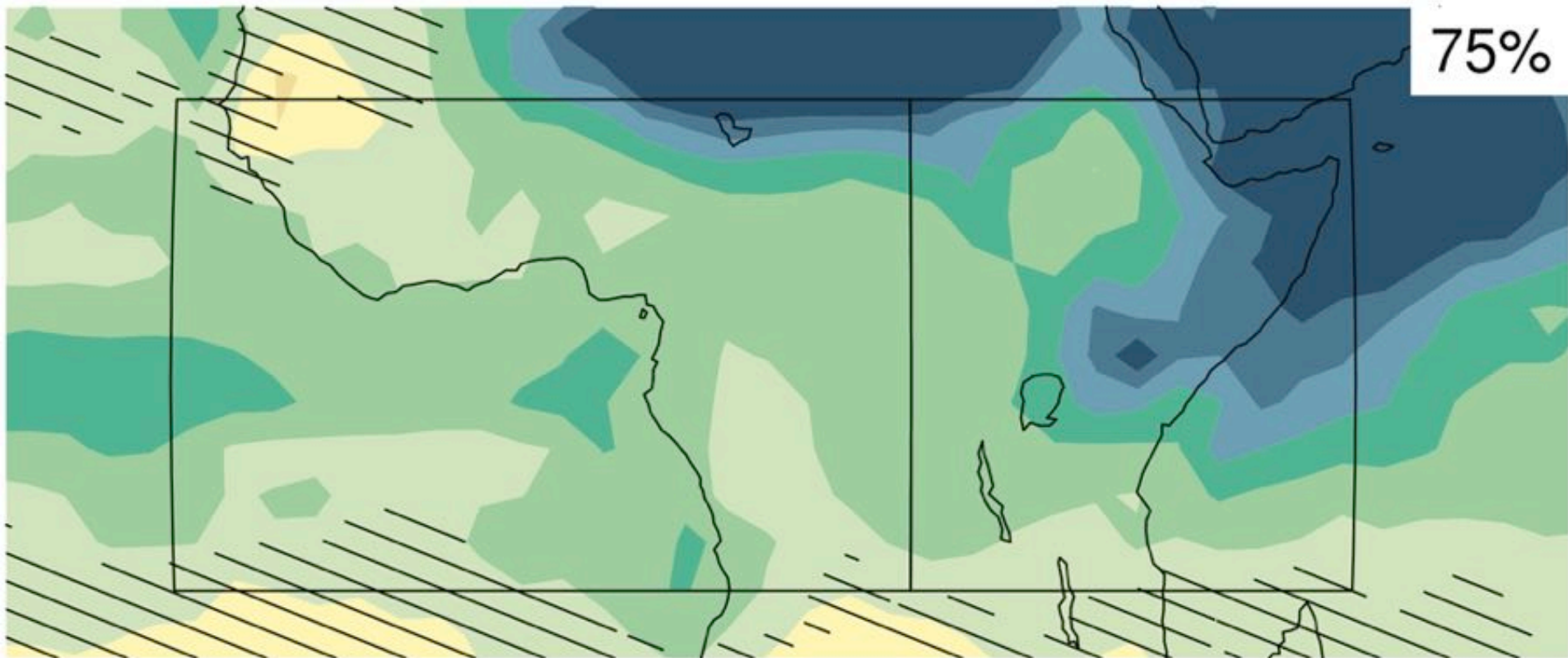


Regions where the projected change is large compared to natural internal variability, and where at least 90% of models agree on a sign of change

National Assessments

In Kenya, a study by the Stockholm Environment Institute (SEI) estimated the economics of climate change under a range of scenarios and estimated that, **by 2050, more than 300,000 people could be flooded per year under a high-emissions scenario.**

Maps of precipitation changes in 2081–2100, with respect to 1986–2005 in the RCP8.5 scenario



Regions where the projected change is less than one standard deviation of the natural internal variability



Regions where the projected change is large compared to natural internal variability, and where at least 90% of models agree on a sign of change

Potential Impacts of Climate Change



Food and water shortages



Increased displacement of people



Increased poverty



Coastal flooding

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Impacts of Climate Change on Tropical Beverage Crops

Jaramillo et al. (2011) conclude that Coffee Berry Borer **distribution in East Africa has expanded as a result of rising temperatures**, and predicts, based on A2A and B2B scenarios of Met Office Hadley Centre climate prediction model 3 (HadCM3), that **it will spread to affect the main coffee producing areas of Ethiopia, Kenya, Uganda, Rwanda, and Burundi by 2050.**



ADAPTATION IS ALREADY OCCURRING

Community-Based Adaptation and Local Institutions

Since AR4, there has been progress in Africa in **implementing and researching community-based adaptation** (high *confidence*), with broad agreement that **support to local-level adaptation** is best achieved by starting with existing local adaptive capacity, and incorporating and building upon present coping strategies and norms, including indigenous practices (*Dube and Sekhwela, 2007; Archer et al., 2008; Huq, 2011*). **Community-based adaptation is community initiated, and/or draws upon community knowledge or resources.**

Community-Based Adaptation and Local Institutions

Some relevant initiatives include the **Community-Based Adaptation in Africa (CBAA) project**, which implemented community-level pilot projects in eight African countries (Sudan, Tanzania, Uganda, Zambia, Malawi, **Kenya**, Zimbabwe, South Africa) through a **learning-by-doing approach**; the **Adaptation Learning Program**, implemented in Ghana, Niger, **Kenya**, and Mozambique (*CARE International, 2012b*); and **UNESCO Biosphere Reserves**, where good practices were developed in Ethiopia, **Kenya**, South Africa, and Senegal (*German Commission for UNESCO, 2011*).

Ensuring Effective Institutions in Developing, Implementing, and Sustaining Resilient Strategies

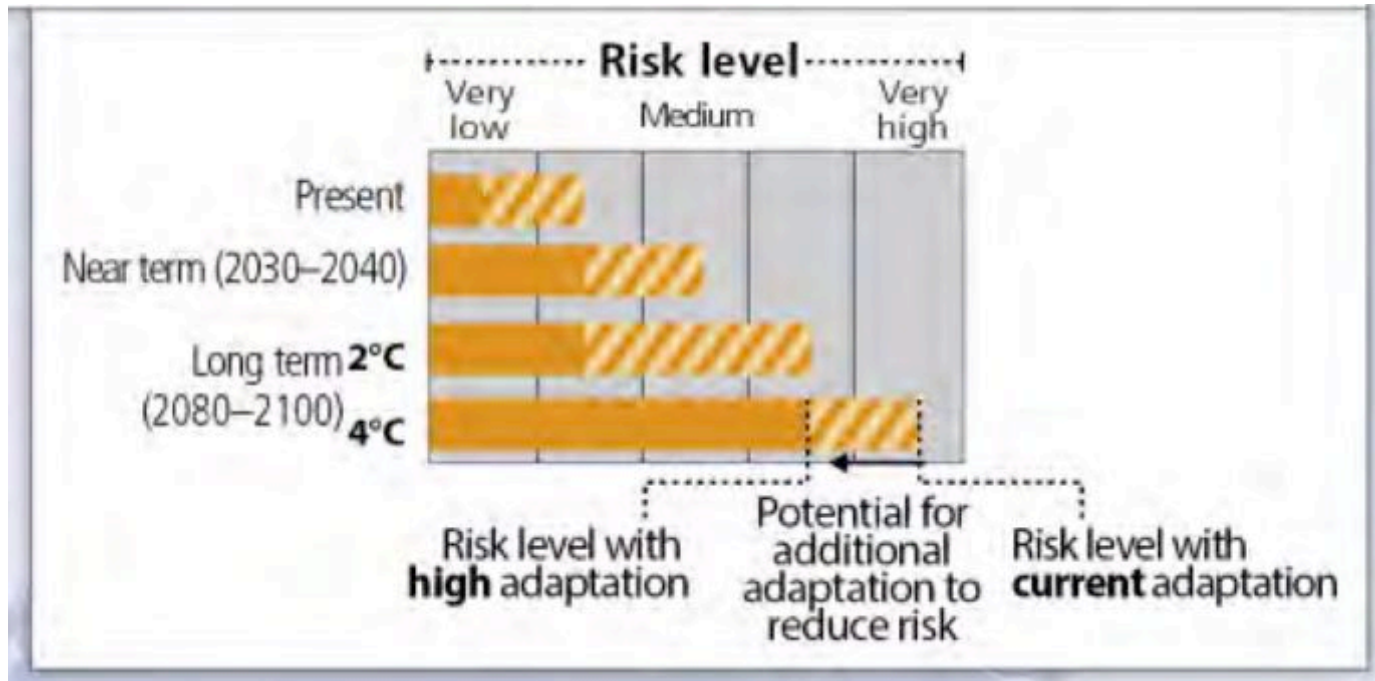
In **Kenya**, the importance of **indigenous knowledge**, given increased uncertainty and climate-related risks, has compelled **national agencies** such as the **Kenyan Meteorological Agencies** and **vulnerable groups** such as the **indigenous communities** commonly known as **rainmakers** to form strategic reciprocal links.

Regional key risks and potential for risk reduction through adaptation

Representative key risks for each region for



Concept:



Regional key risks and risk reduction through adaptation

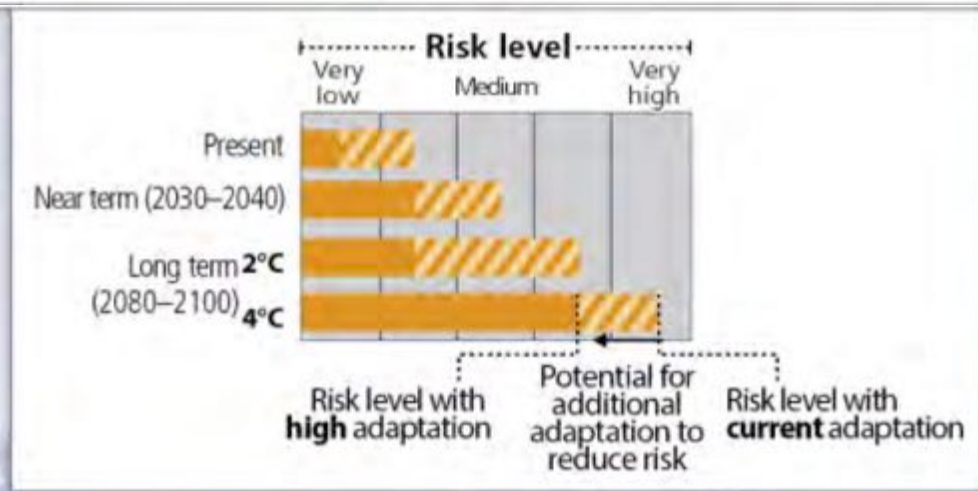
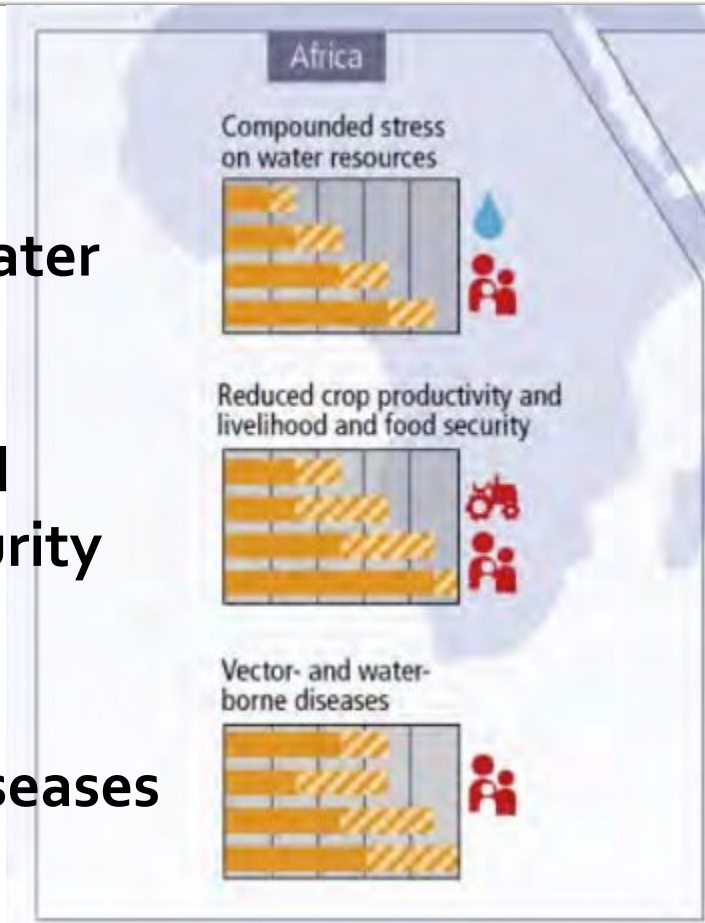
Representative key risks for each region for



Water

Food security

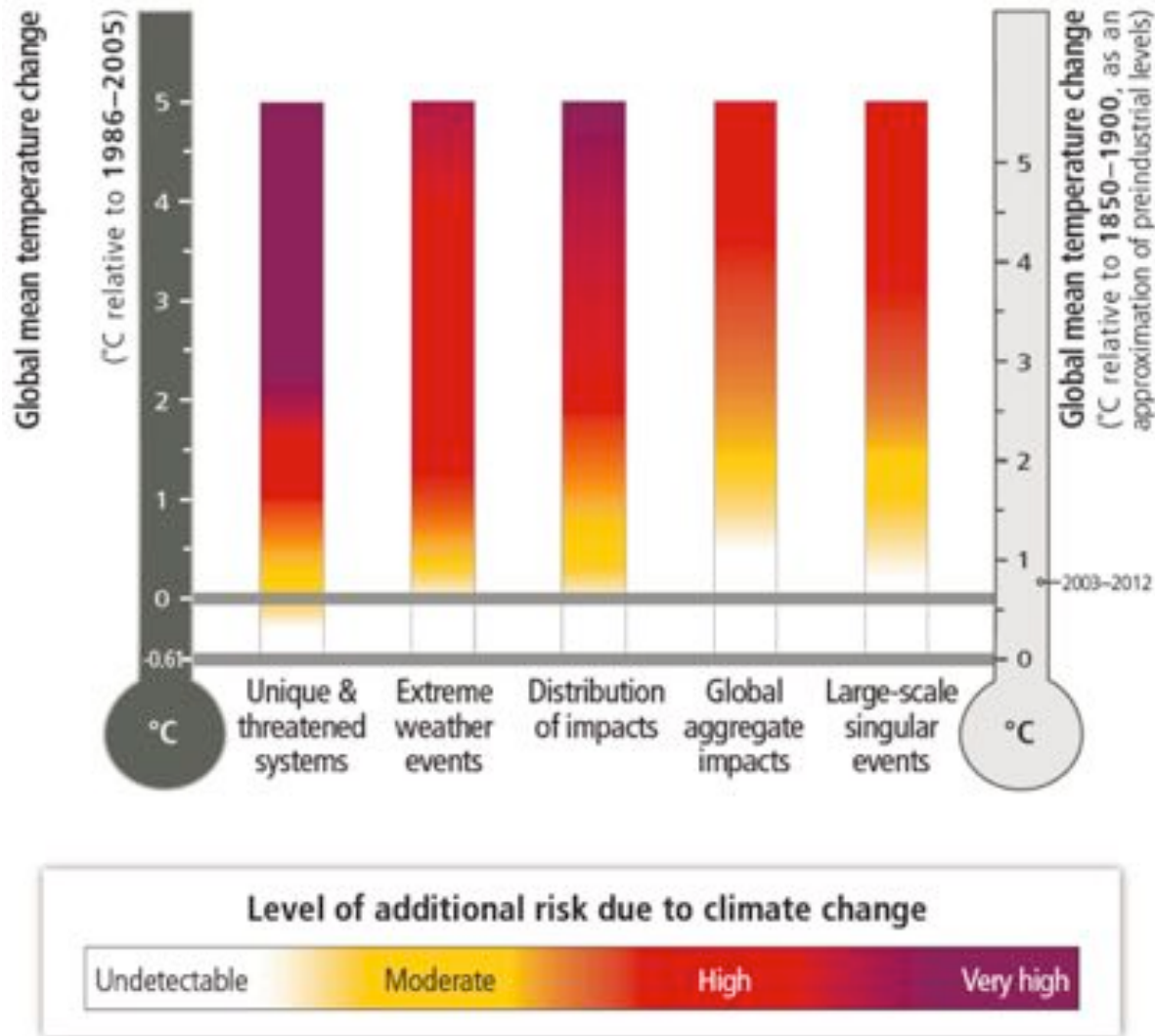
Diseases

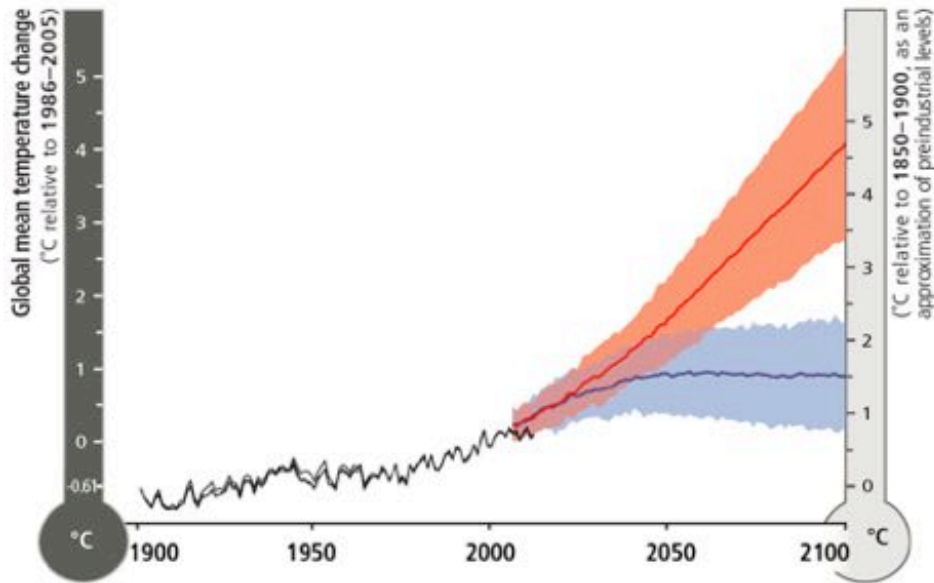




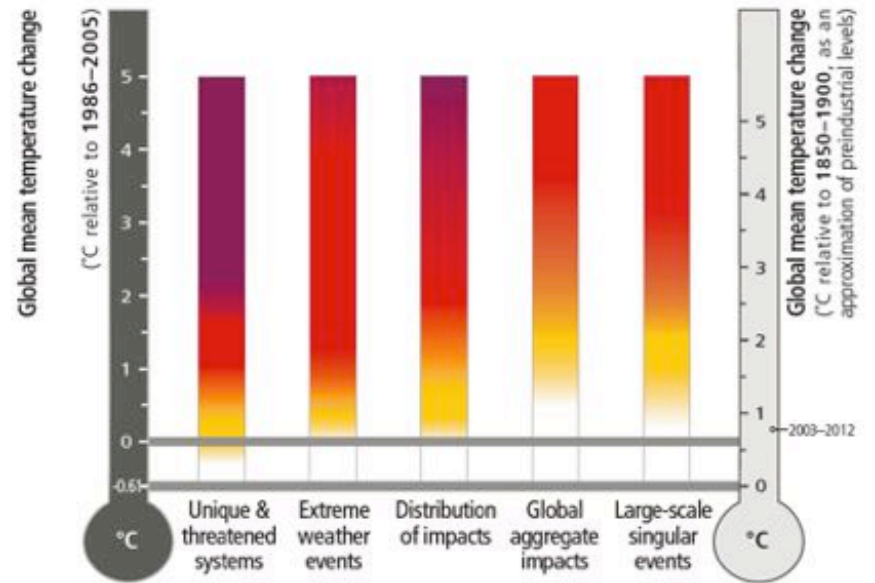
RISKS OF
CLIMATE CHANGE
INCREASE
WITH CONTINUED
HIGH EMISSIONS

Five global « Reasons for Concern »





- Observed
- RCP8.5 (a high-emission scenario)
- Overlap
- RCP2.6 (a low-emission mitigation scenario)

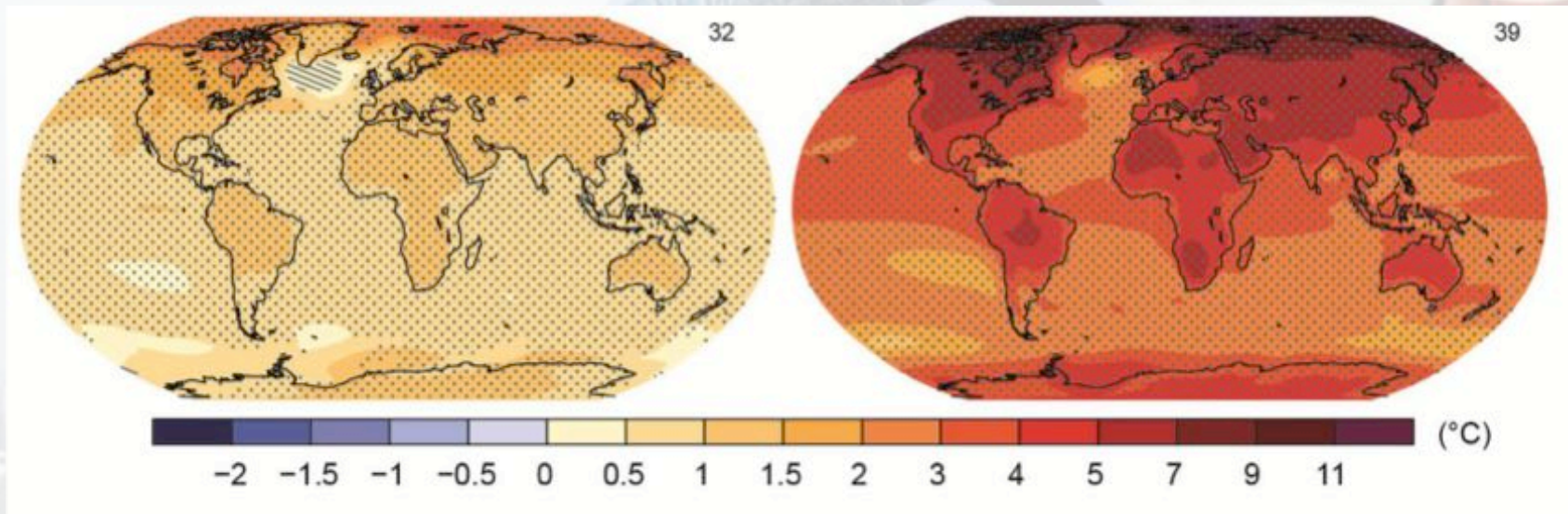


- **Sustainable development and equity provide a basis for assessing climate policies and highlight the need for addressing the risks of climate change**
- **Issues of equity, justice, and fairness arise with respect to mitigation and adaptation**

The Choices Humanity Makes Will Create Different Outcomes & increase prospects for effective adaptation

With substantial mitigation

Without additional mitigation



Change in average surface temperature (1986–2005 to 2081–2100)

AR5 WGI SPM

Please...



- **Participate to the next IPCC Assessment (as authors or expert reviewers)(Tip: know your IPCC Focal point)**
- **Think about the children and their future in a warming climate**

Let us think about the future of these children from Machakos in a warming climate



Useful links:



- www.ipcc.ch : IPCC (reports and videos)
- www.climate.be/vanyp : my slides my platform as candidate IPCC Chair
- **On Twitter: @JPvanYpersele
and @IPCC_CH**