MAKERERE UNIVERSITY

We Build For The Future

Climate change, the science, impacts and response

Climate Justice, Climate Litigation and Climate Action: A global perspective, 10th September2020 at the Speke Resort Hotel Muyonyo

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Outline of presentation

- IPCC and its role
- Climate Change Science
- Impacts and Response
- Conclusion

IPCC

Creation

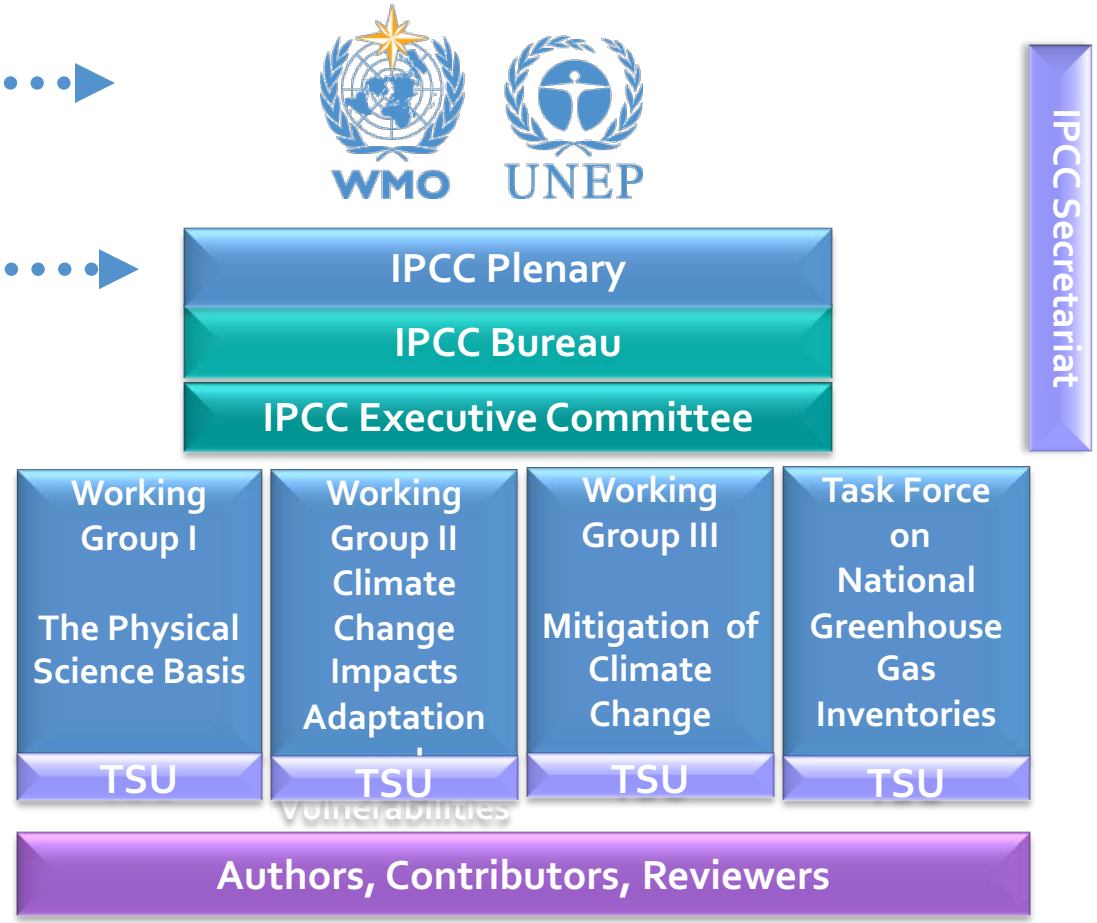
1988: UN GENERAL ASSEMBLY ENDORSED
THE ACTION BY UNEP AND WMO IN JOINTLY **ESTABLISHING** THE IPCC

Today

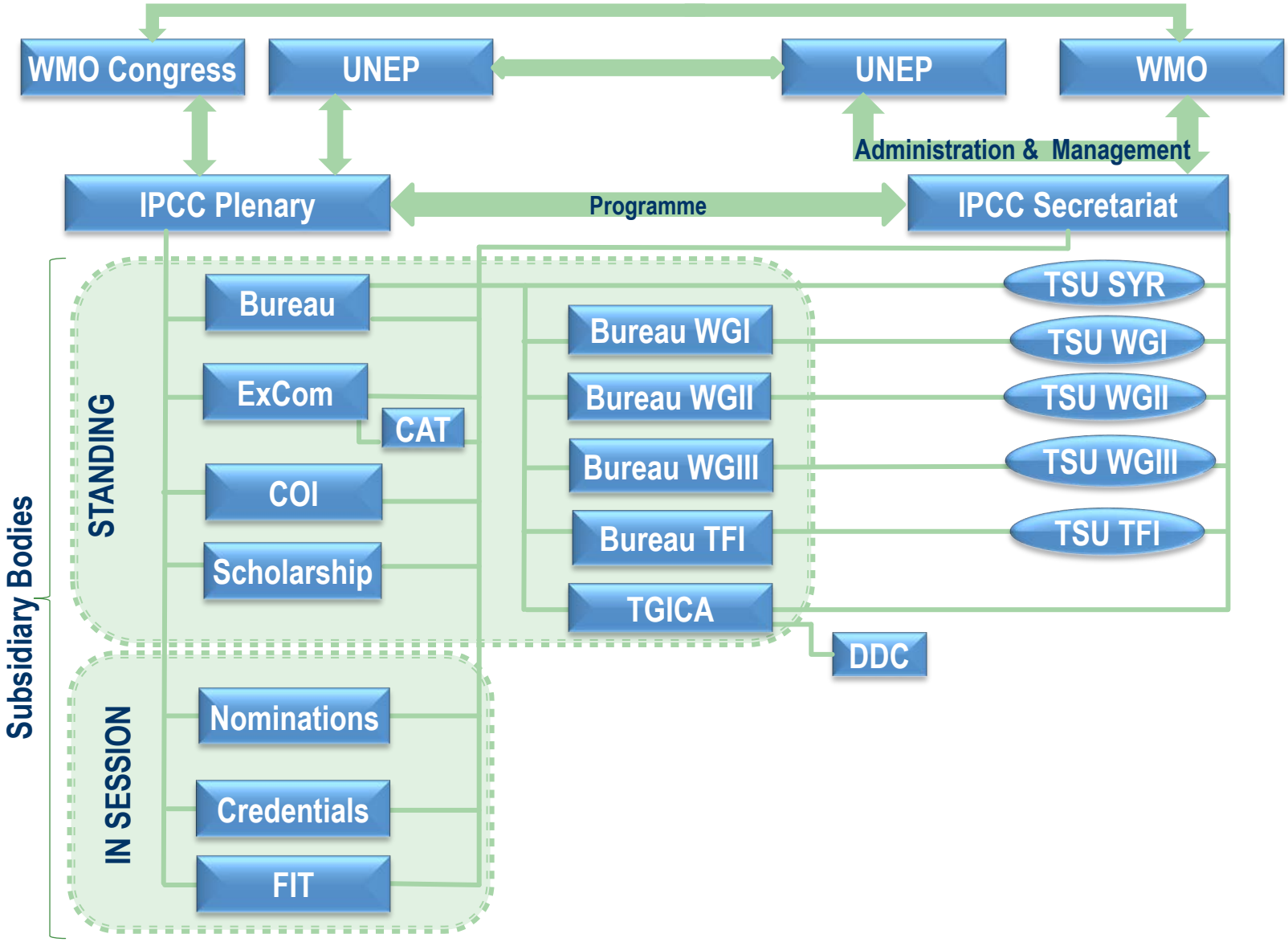
OCT. **2015**: IPCC ELECTED **NEW BUREAU** IN CHARGE OF THE **SIXTH ASSESSMENT CYCLE,**
APRIL 2016: FIRST **SESSION** SINCE

Policy/Science Interface

- UN body
- Intergovernmental Panel (195 member States)
- International scientists and experts



IPCC Structure



The role of the IPCC is …

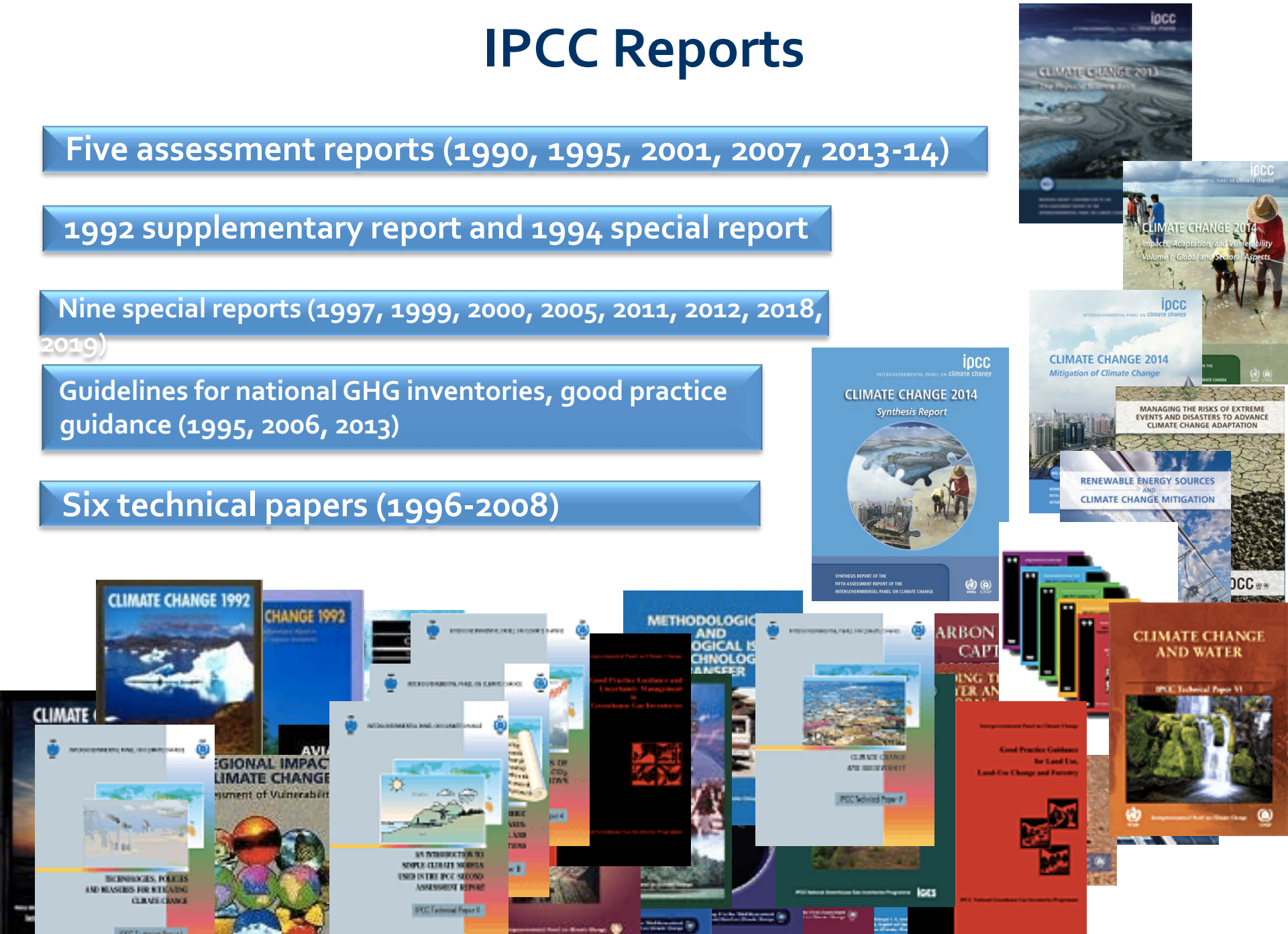
"… to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation."

"IPCC reports should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies."

Principles Governing IPCC Work, paragraph 2
Source: http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf

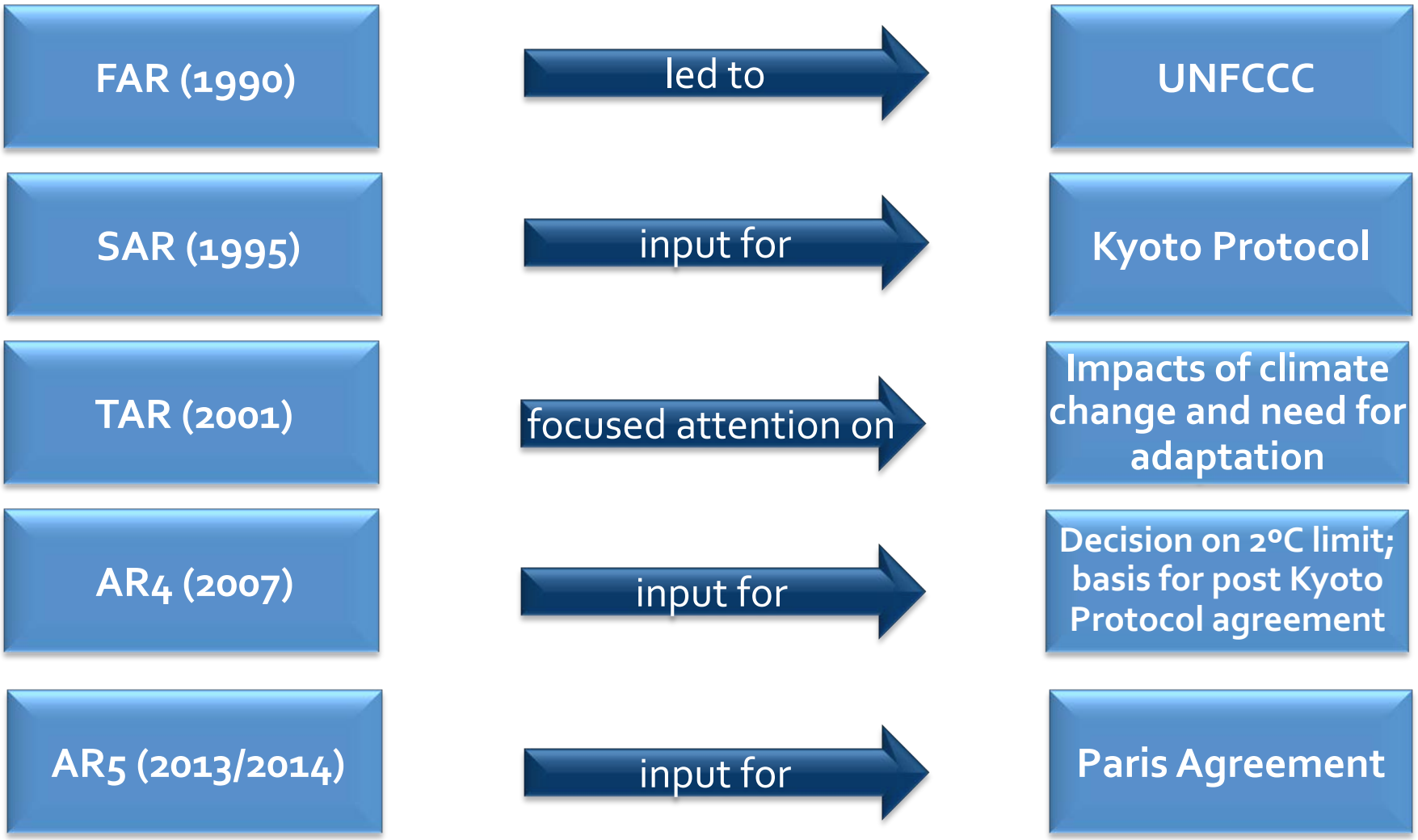
IPCC Reports

- Five assessment reports (1990, 1995, 2001, 2007, 2013-14)
- 1992 supplementary report and 1994 special report
- Nine special reports (1997, 1999, 2000, 2005, 2011, 2012, 2018, 2019)
- Guidelines for national GHG inventories, good practice guidance (1995, 2006, 2013)
- Six technical papers (1996-2008)



What are IPCC reports used for?

Achievements: The Assessment Reports



Other Activities and Achievements

National Greenhouse Gas Inventories
(Publication of IPCC Methodology Reports)

Task Group on Data and Scenario Support for Impact and Climate Analysis (TGICA):
facilitates distribution and application of climate change related data and scenarios)

Organizing expert meetings and workshops to facilitate discussion on topics relevant to the Assessment process

Some IPCC Outreach Activities

Argentina, September 2015

Mexico, August 2015

Thailand, August 2015

Kenya, February 2015

Russia, September 2015

Paris, December 2015

Turkey, September 2015

Nicaragua, August 2015

Tanzania, February 2015

What is next for the IPCC?

IPCC Decision XLIII-5

"To take the outcomes of the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) into consideration when determining the IPCC programme of work and products for the sixth IPCC assessment cycle"

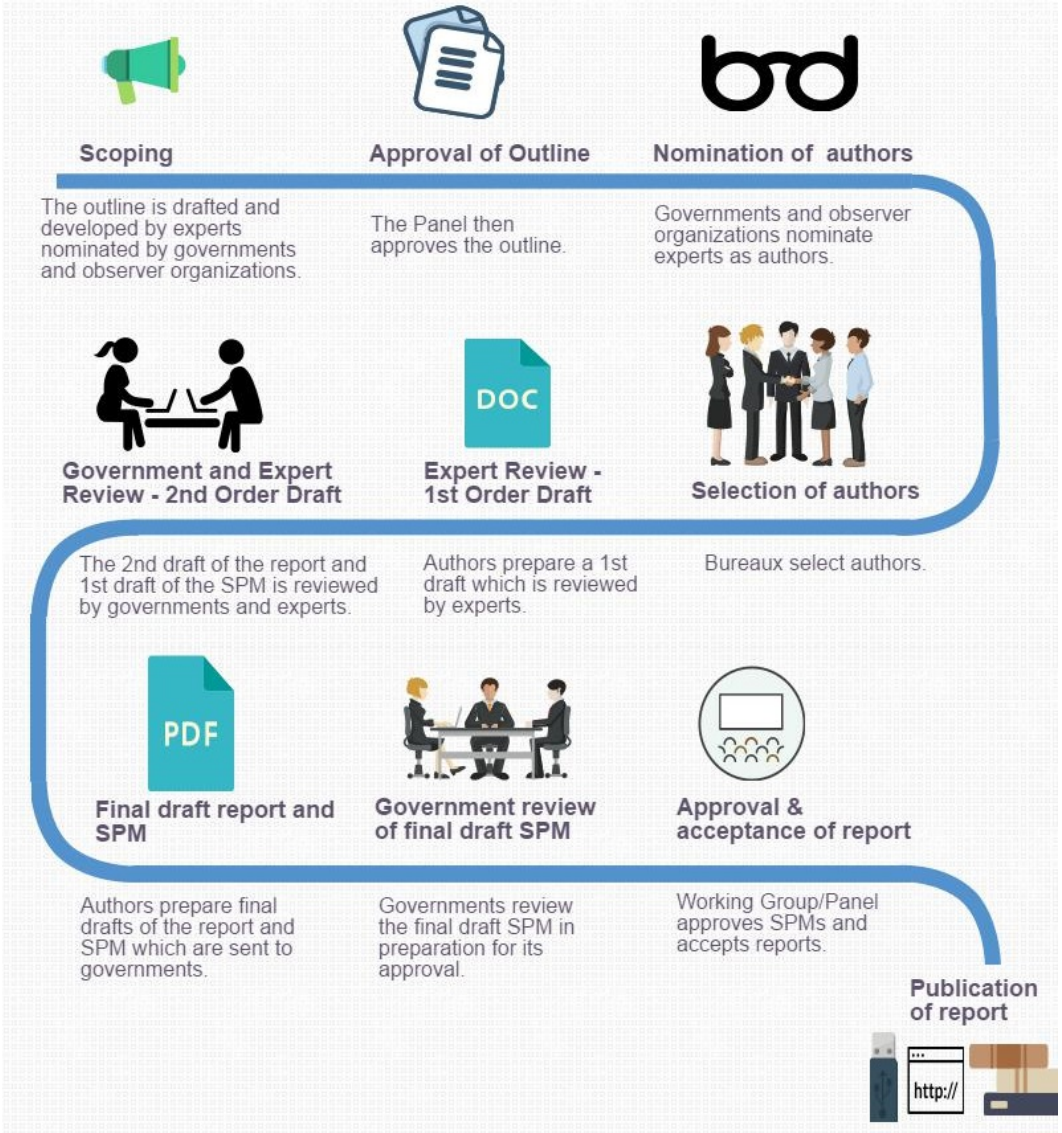
AR6 cycle Special Reports on

impacts of global warming of **1.5 ºC** above pre-industrial levels and related global greenhouse gas emission pathways by 2018

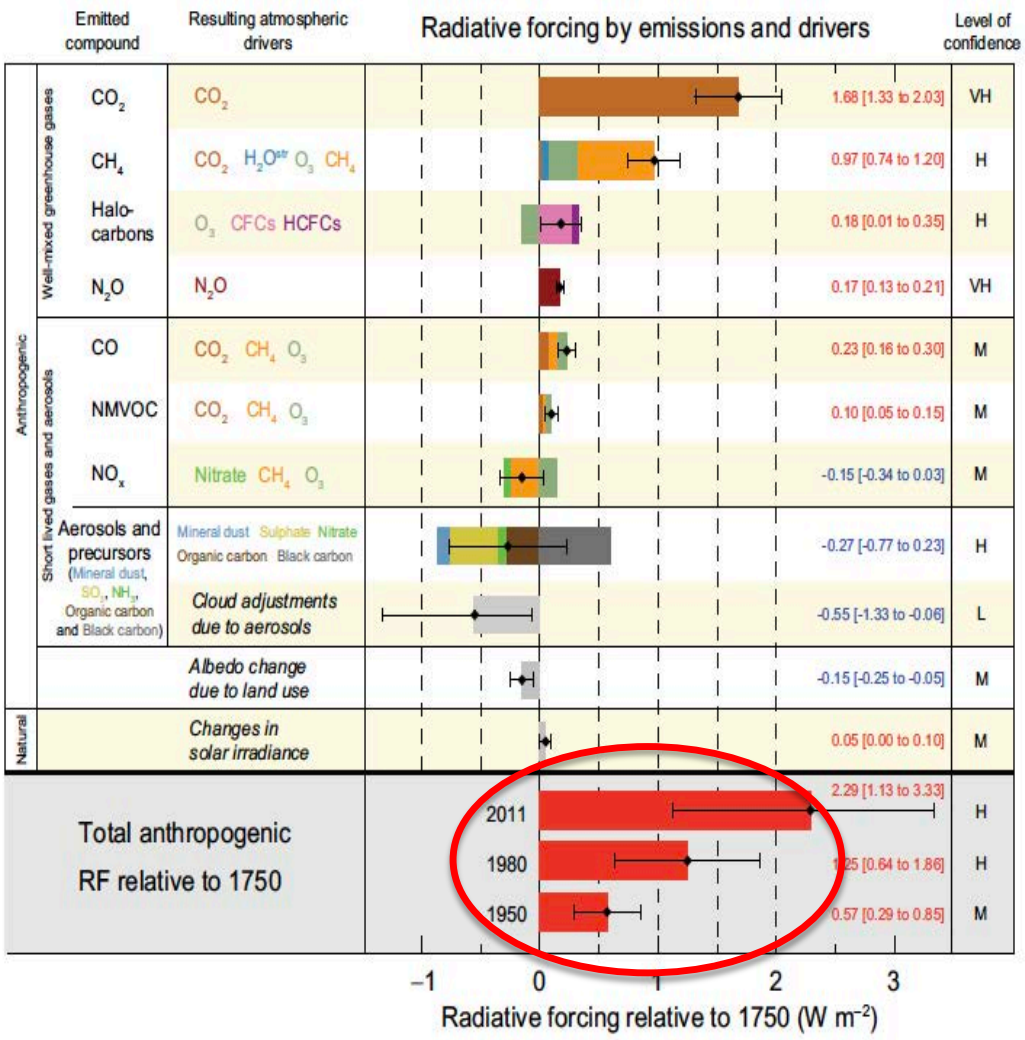
Climate change and **oceans** and the **cryosphere**

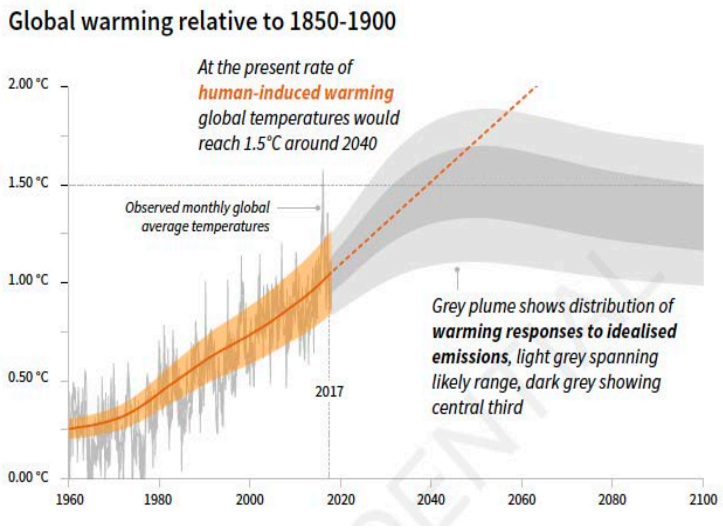
Climate change, **desertification**, **land degradation**, **sustainable land management**, **food security**, and **greenhouse gas fluxes in terrestrial ecosystems**

How the IPCC produces its reports?



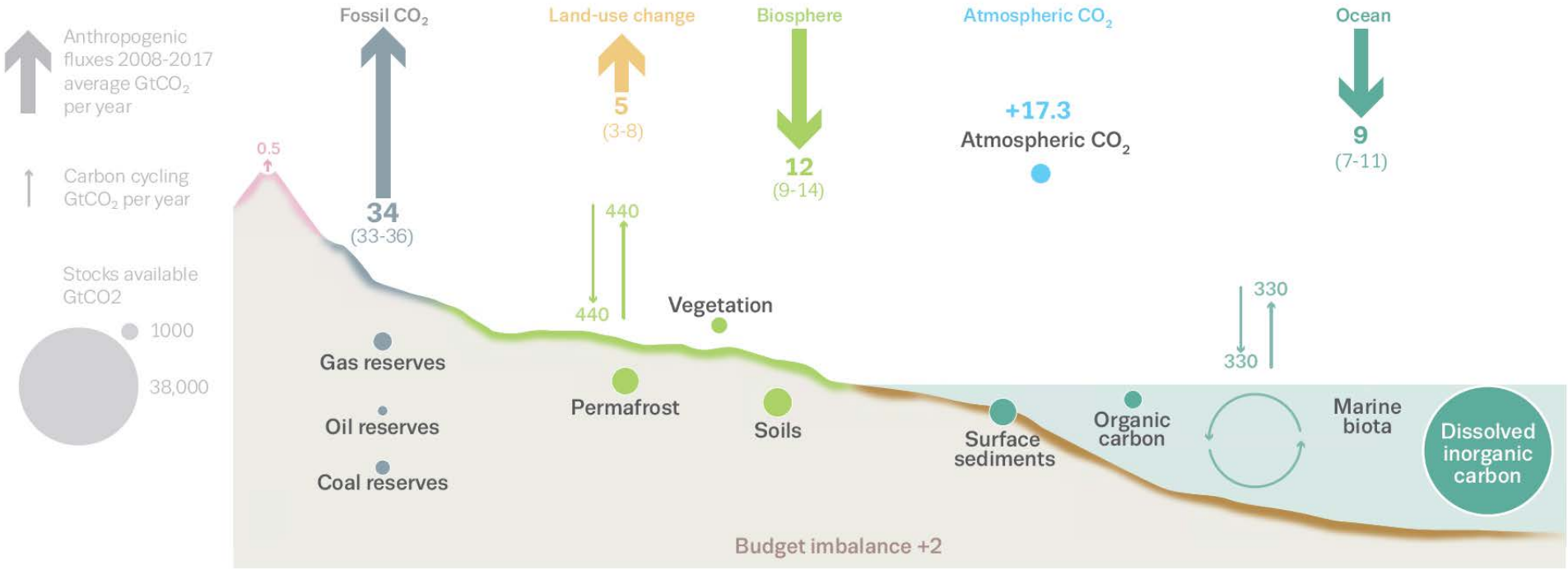
Physical Science Basis





Anthropogenic perturbation of the global carbon cycle

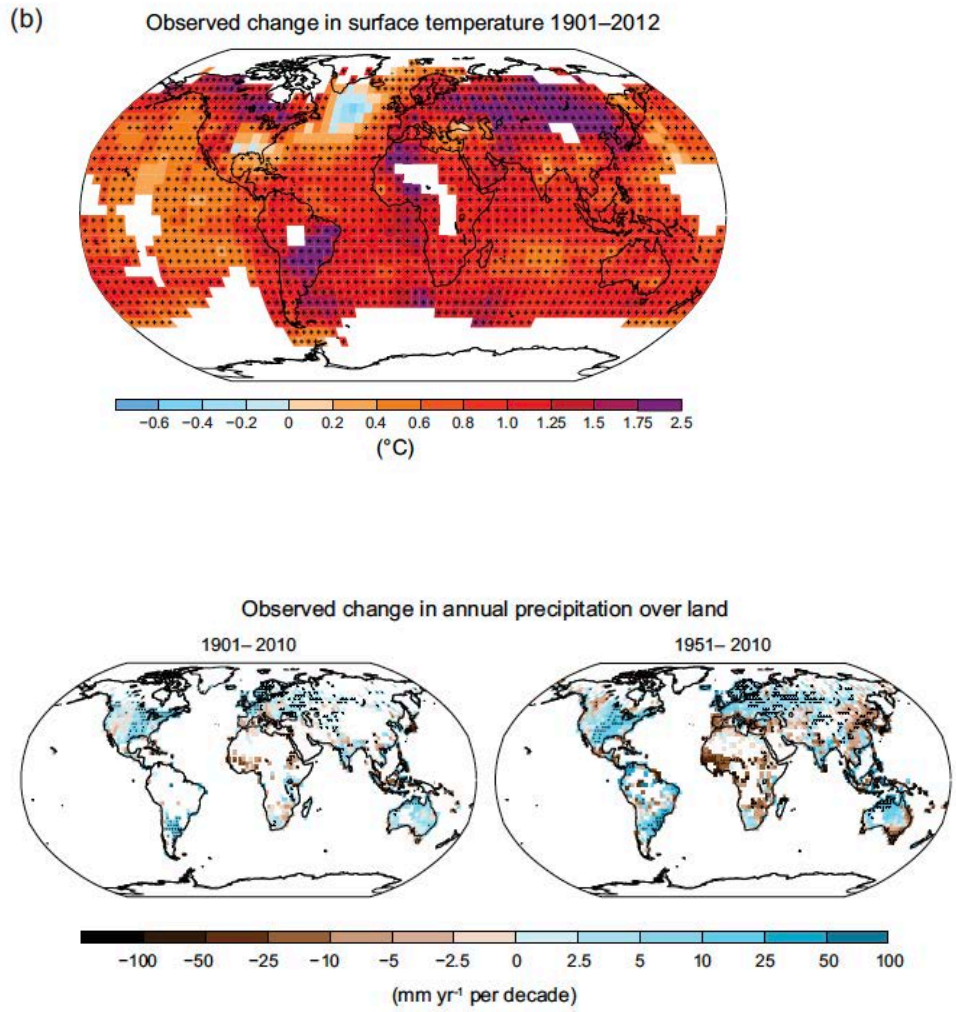
Perturbation of the global carbon cycle caused by anthropogenic activities, averaged globally for the decade 2008–2017 ($GtCO_2$/yr)

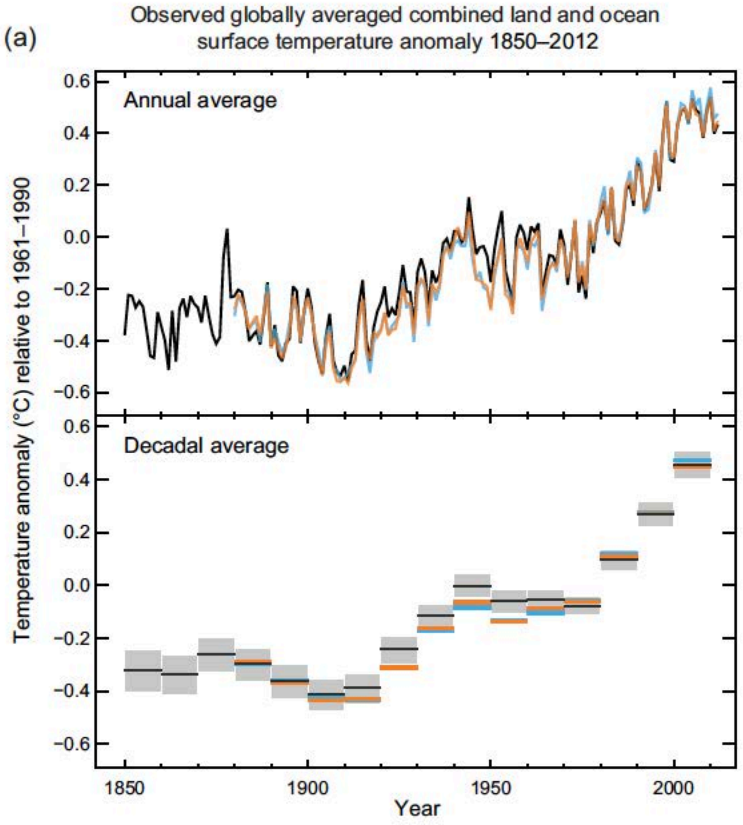


The budget imbalance is the difference between the estimated emissions and sinks.

Source: CDIAC; NOAA-ESRL; Le Quéré et al 2018; Ciais et al. 2013; Global Carbon Budget 2018

Physical Science Basis





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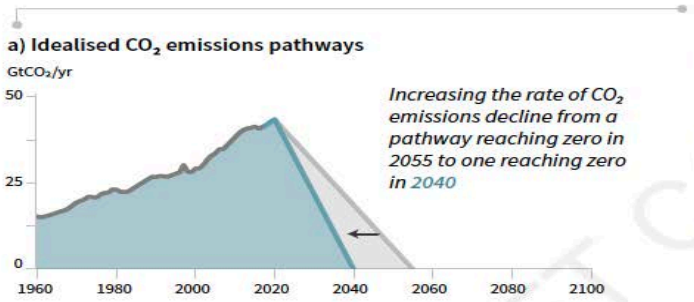
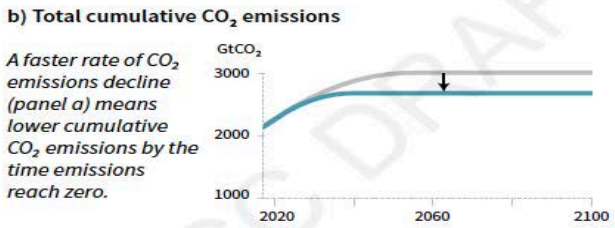
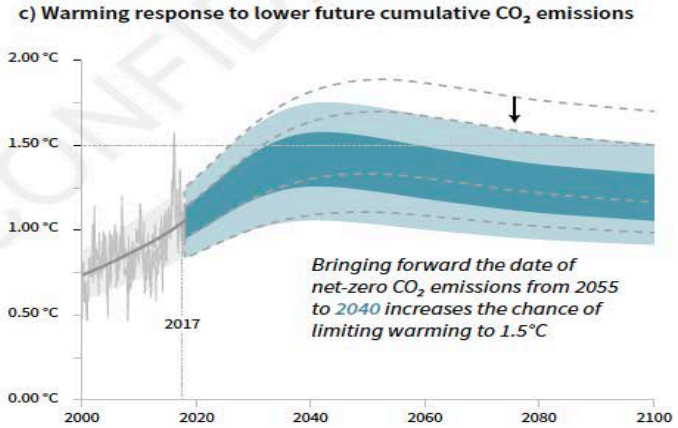
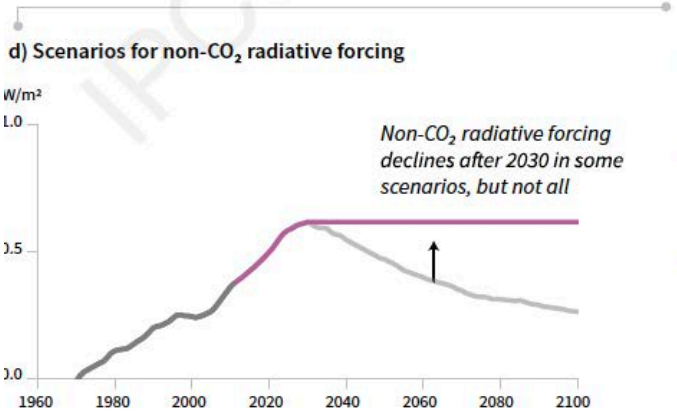
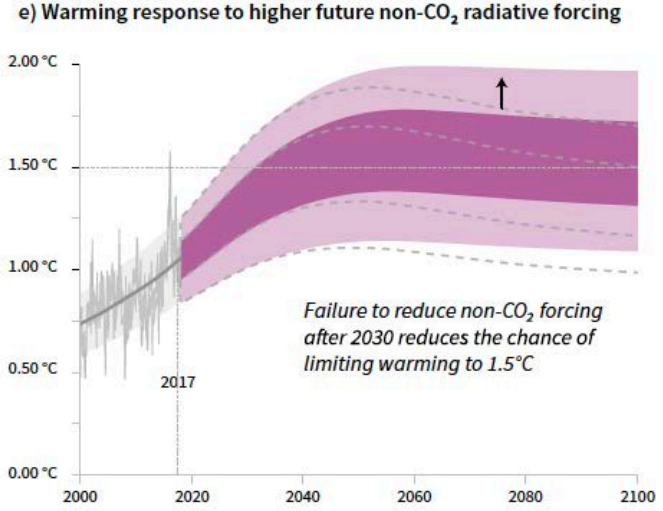




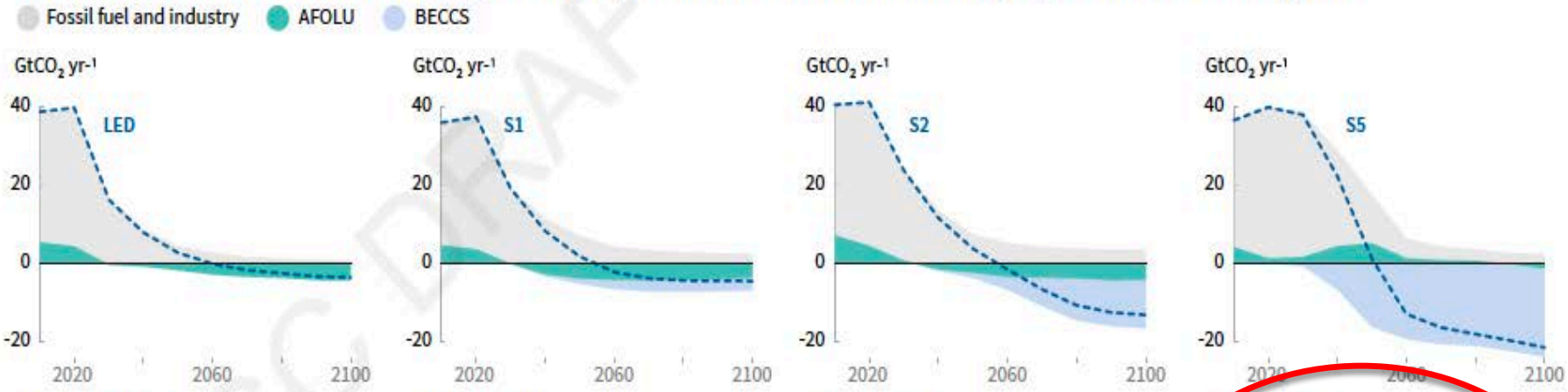






Physical Science Basis

Breakdown of contributions to global CO_2 emissions in four archetype pathways [$GtCO_2$ yr^{-1}]



Pathway LED

A scenario in which social, business, and technological innovations lead to dramatic reductions in the energy needed to provide useful services, resulting in lower energy demand to 2050 while living standards rise, particularly in the global South. A down-sized energy system enables rapid decarbonisation of energy supply. Afforestation is the only CDR option considered; neither fossil CCS nor BECCS are used.

Pathway S1

A scenario with a broad focus on sustainability and a shift towards energy intensity improvements, human development, economic convergence and international cooperation, sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems with limited societal acceptability for BECCS.

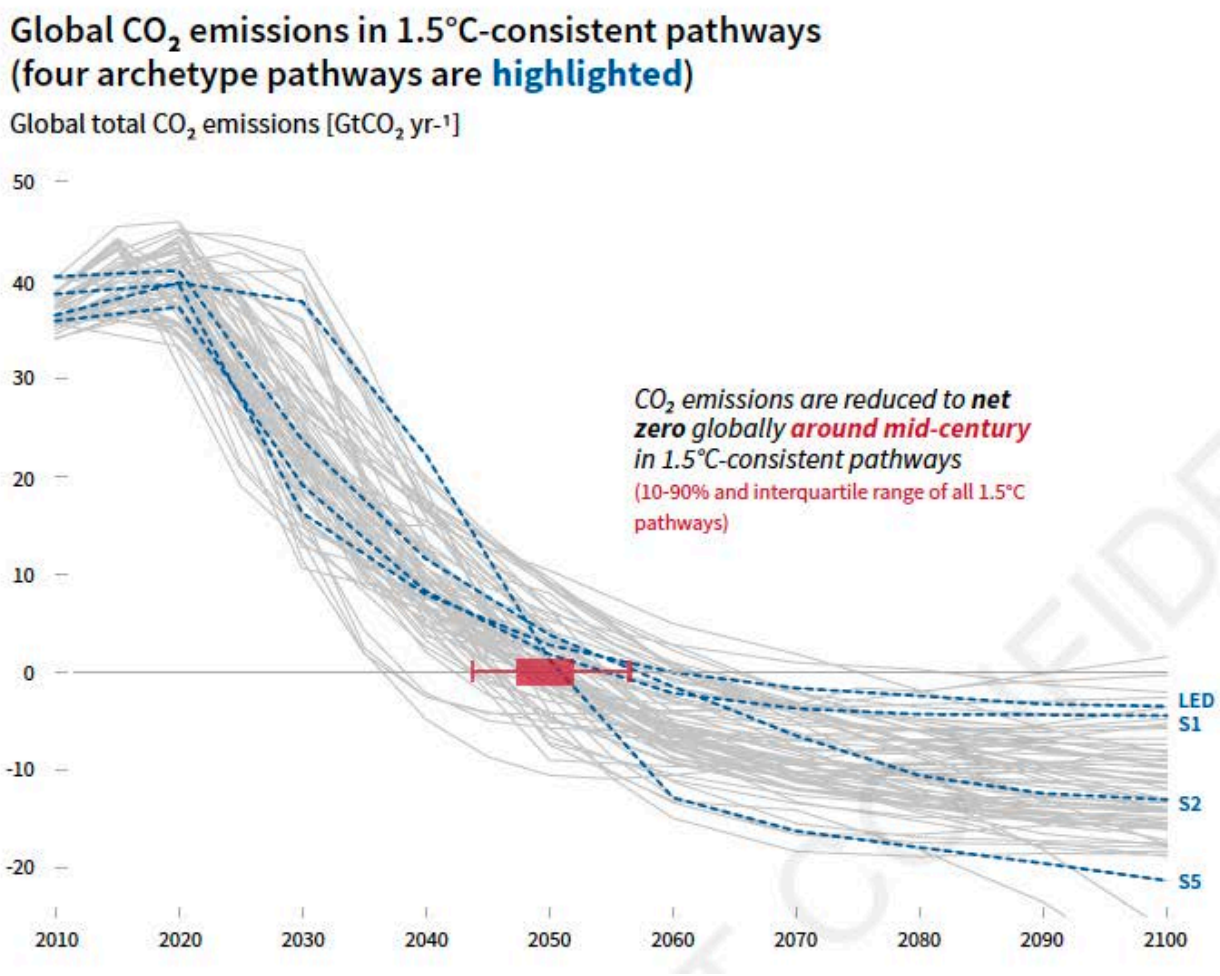
Pathway S2

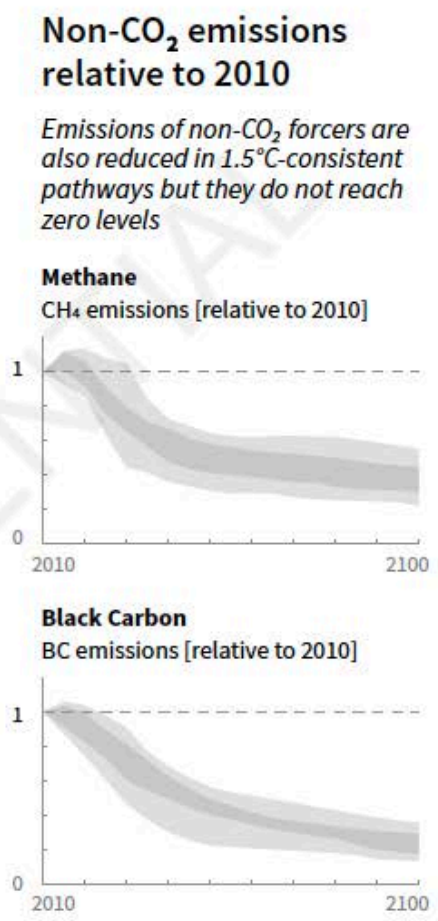
A middle-of-the-road scenario in which societal as well as technological development follows historical patterns. Emissions reductions are mainly achieved by changing the way in which energy and products are produced, and to a lesser degree by demand reductions.

Pathway S5

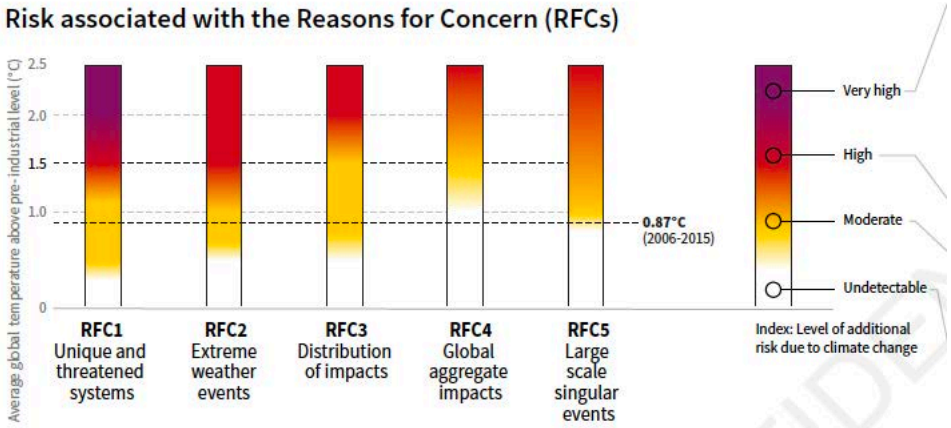
A resource and energy-intensive scenario in which rapid economic growth and globalization lead to widespread adoption of greenhouse-gas intensive lifestyles, including high demand for transportation fuels and livestock products. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

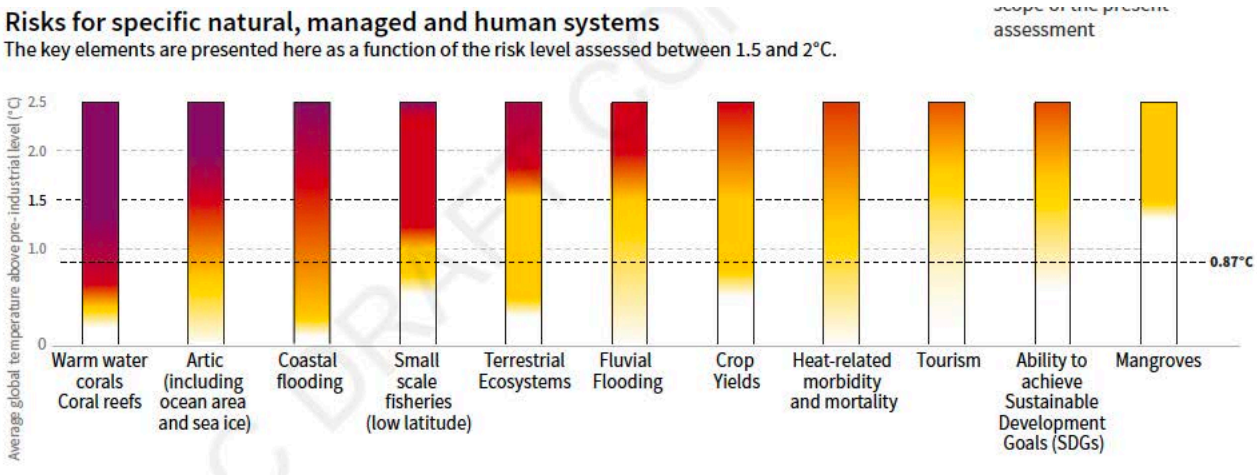
Physical Science Basis





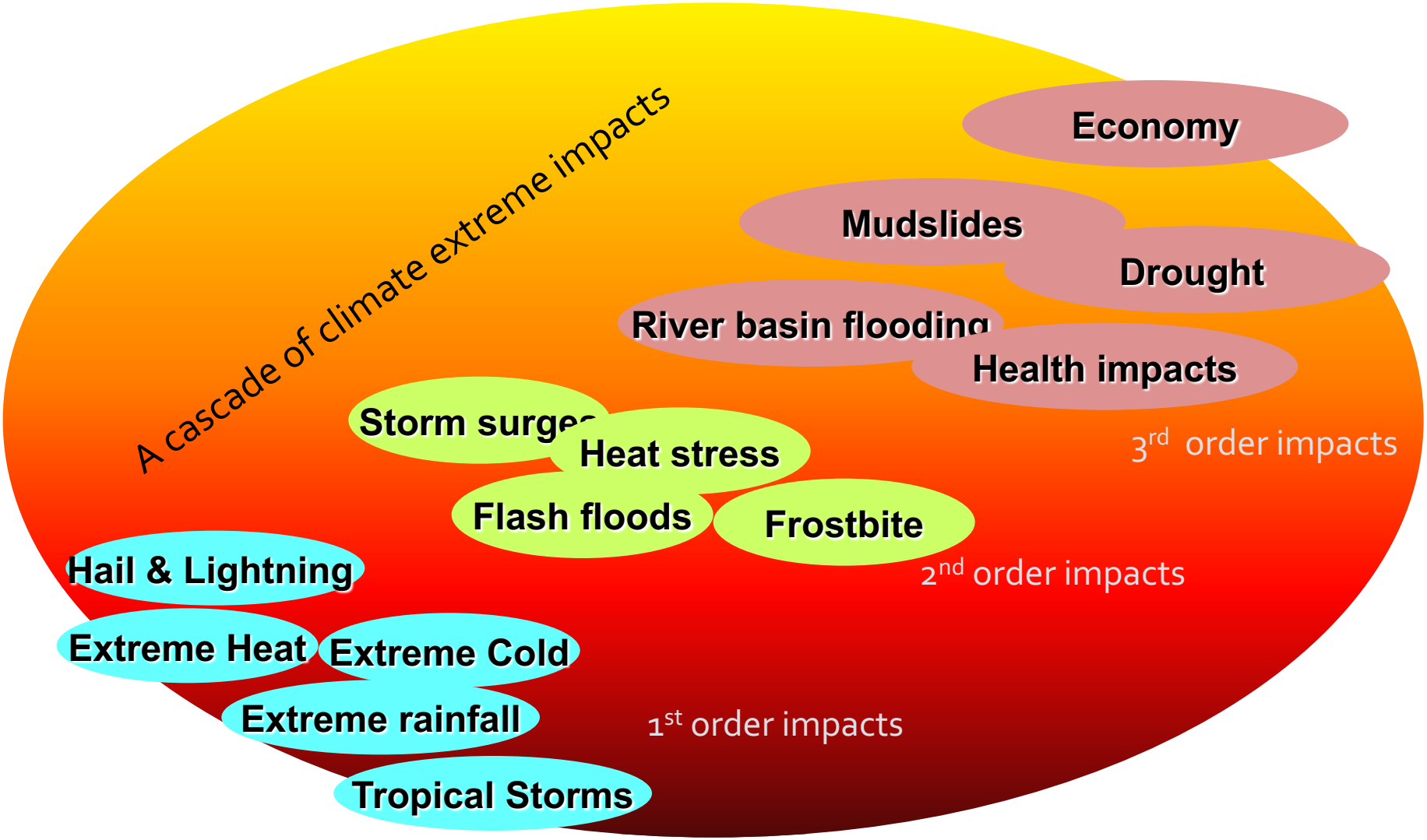
Risks for Concern and Risks tos pecific natural human and managed systems



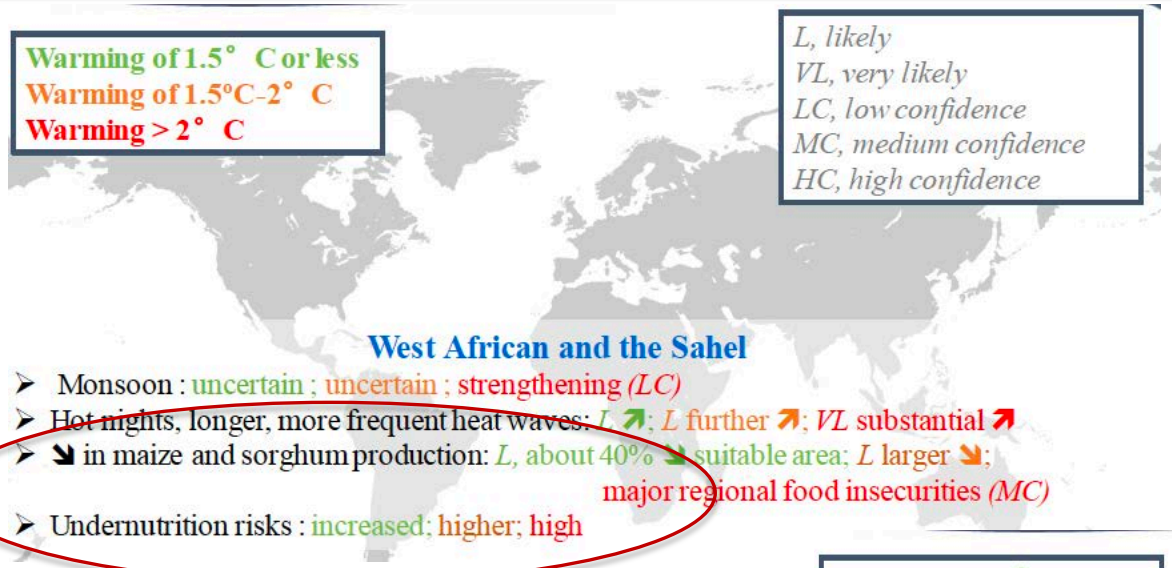


Climate Extremes and Impacts

High frequent hydroclimatological hazards becoming common in Africa

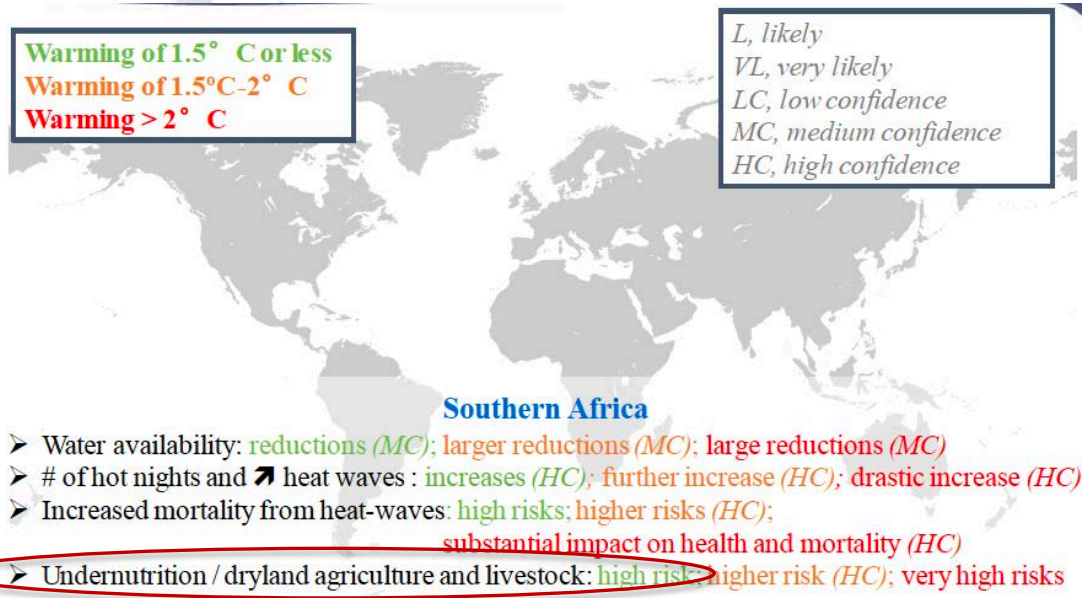


SR 1.5 Degrees and SRCCLM global and regional impacts



West African and the Sahel

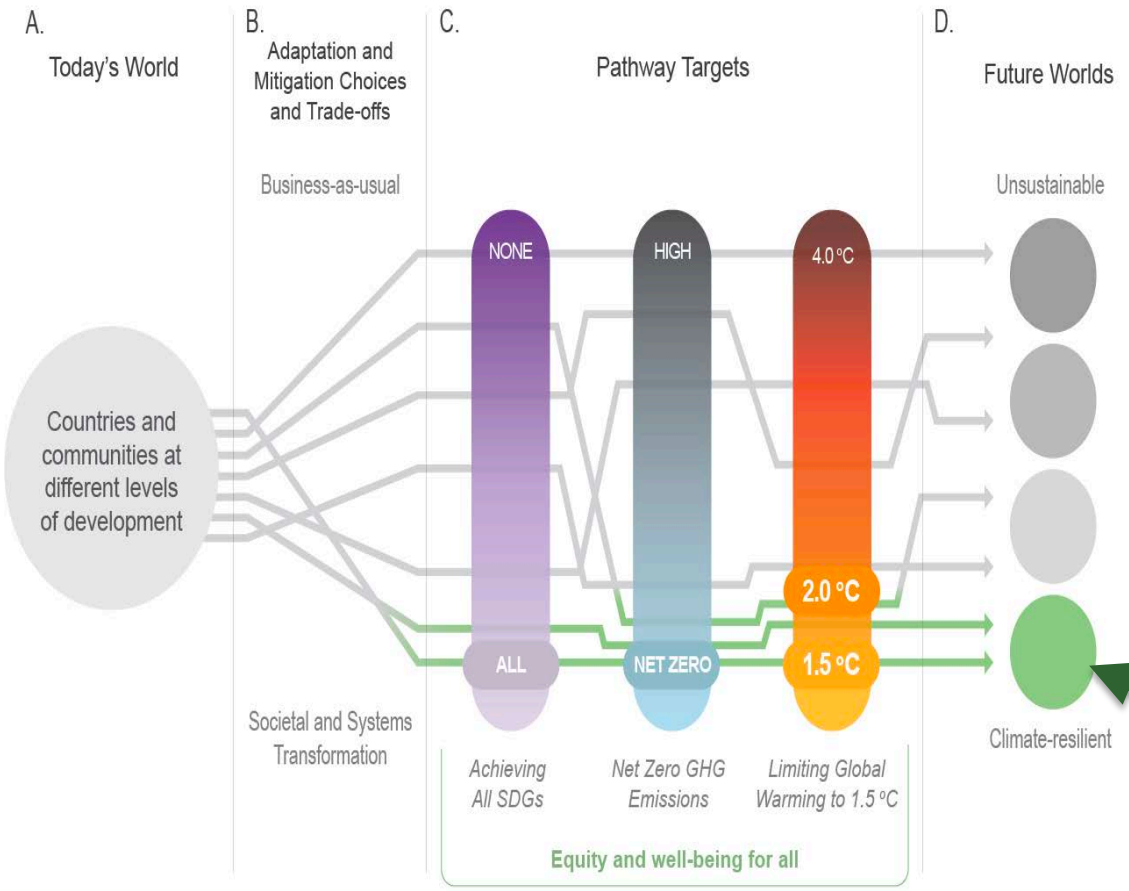
- Monsoon : uncertain ; uncertain ; strengthening *(LC)*
- Hot nights, longer, more frequent heat waves: *L* ↗; *L* further ↗; *VL* substantial ↗
- ↘ in maize and sorghum production: *L*, about 40% ↘ suitable area; *L* larger ↘; major regional food insecurities *(MC)*
- Undernutrition risks : increased; higher; high



Southern Africa

- Water availability: reductions *(MC)*; larger reductions *(MC)*; large reductions *(MC)*
- # of hot nights and ↗ heat waves : increases *(HC)*; further increase *(HC)*; drastic increase *(HC)*
- Increased mortality from heat-waves: high risks; higher risks *(HC)*; substantial impact on health and mortality *(HC)*
- Undernutrition / dryland agriculture and livestock: high risks; higher risk *(HC)*; very high risks

Response options to limit warming to 1.5 and under 2.0 degrees



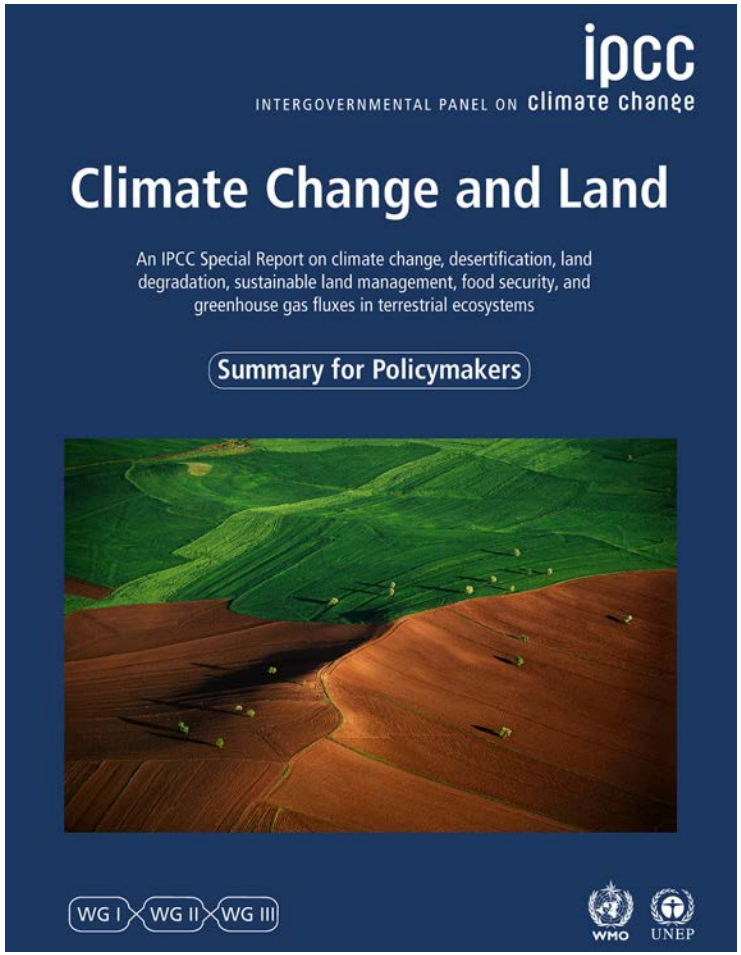
Accelerated radical changes needed in four systems;

- energy,
- land use and ecosystems,
- urban infrastructure,
- industry

CLIMATE CHANGE AND LAND

An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.

REPORT COVER IMAGE:
Agricultural landscape between Ankara and Hattusha, Anatolia, Turkey (40° 00' N – 33° 35' E)
©Yann Arthus-Bertrand | **www.yannarthusbertrand.org** | **www.goodplanet.org**

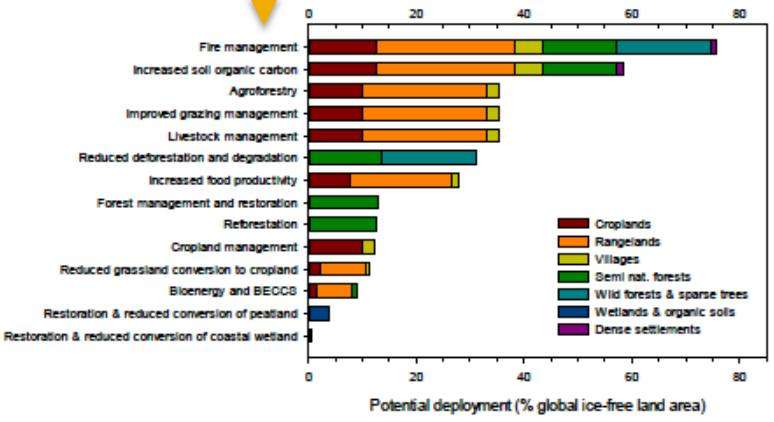


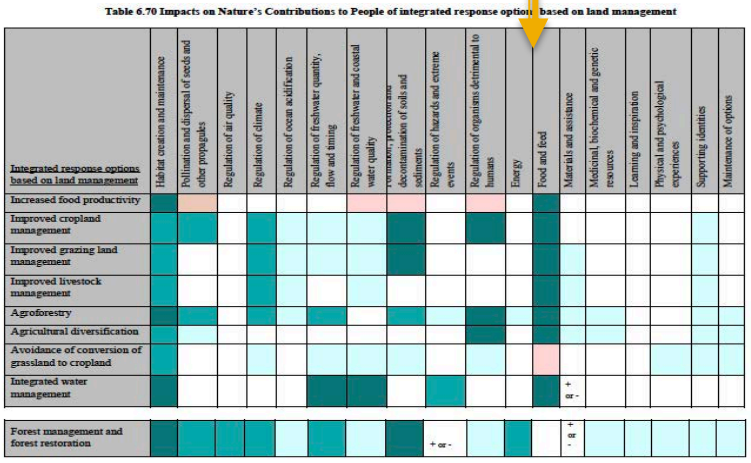
Land is where we live

Land is under growing human pressure

Land is a part of the solution

But land can't do it all





Land is a critical resource –
we rely on it for food, water, health and wellbeing – but it is already under growing human pressure.

Climate change is adding to these pressures

A challenging situation which is worse and undermining food security

27

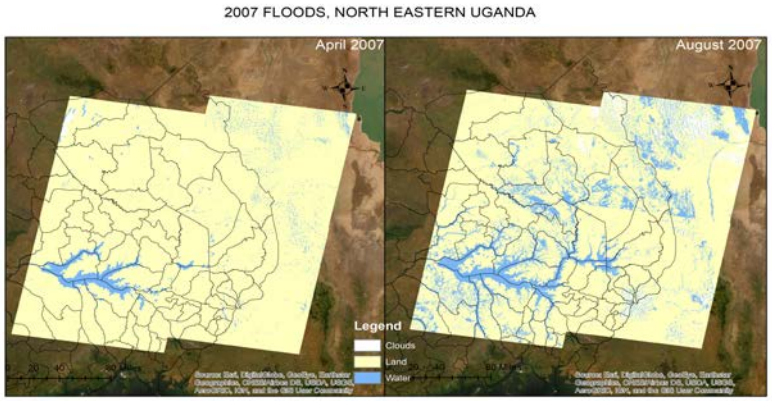
Agriculture, food production, and deforestation are major drivers of climate change.

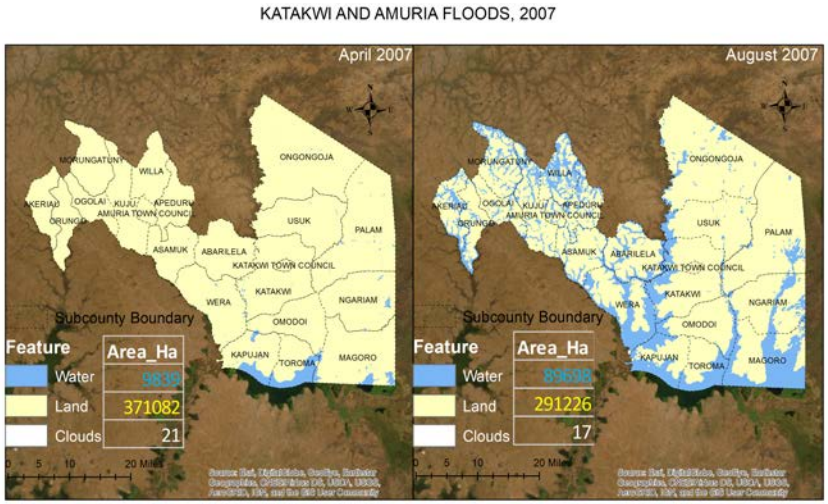
“Coordinated action to tackle climate change can simultaneously improve land, food security and nutrition, and help to end hunger.

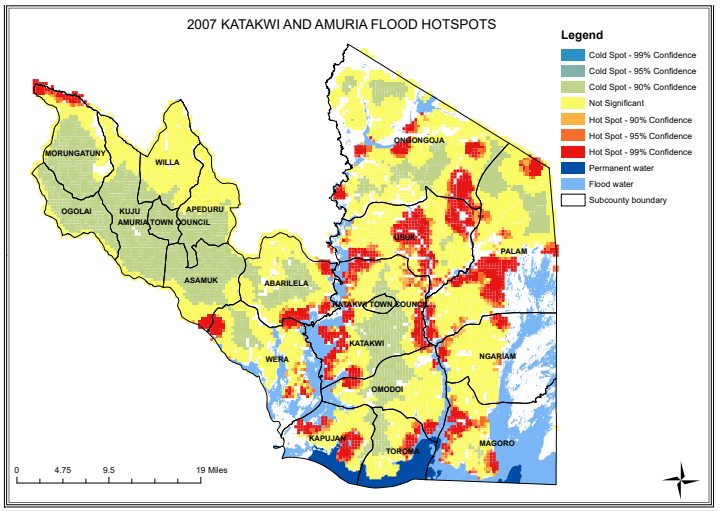
There are actions available to us that can simultaneously improve land, enhance food security and improve nutrition.

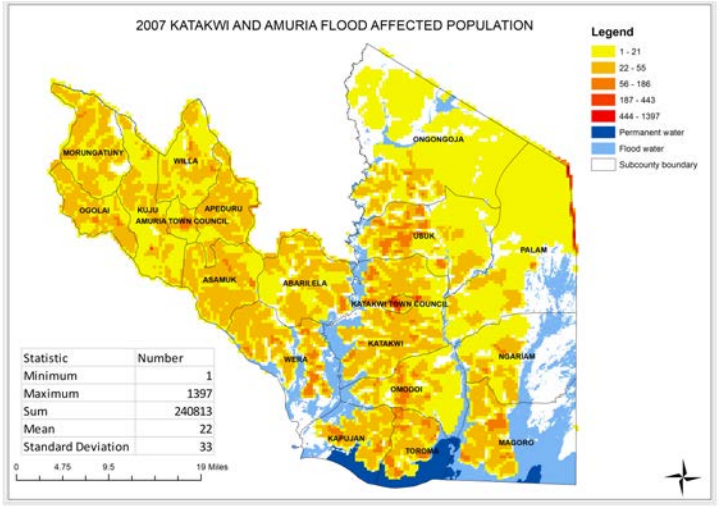
Localizing the land-based responses in Uganda

A case study of Karamoja-Teso region

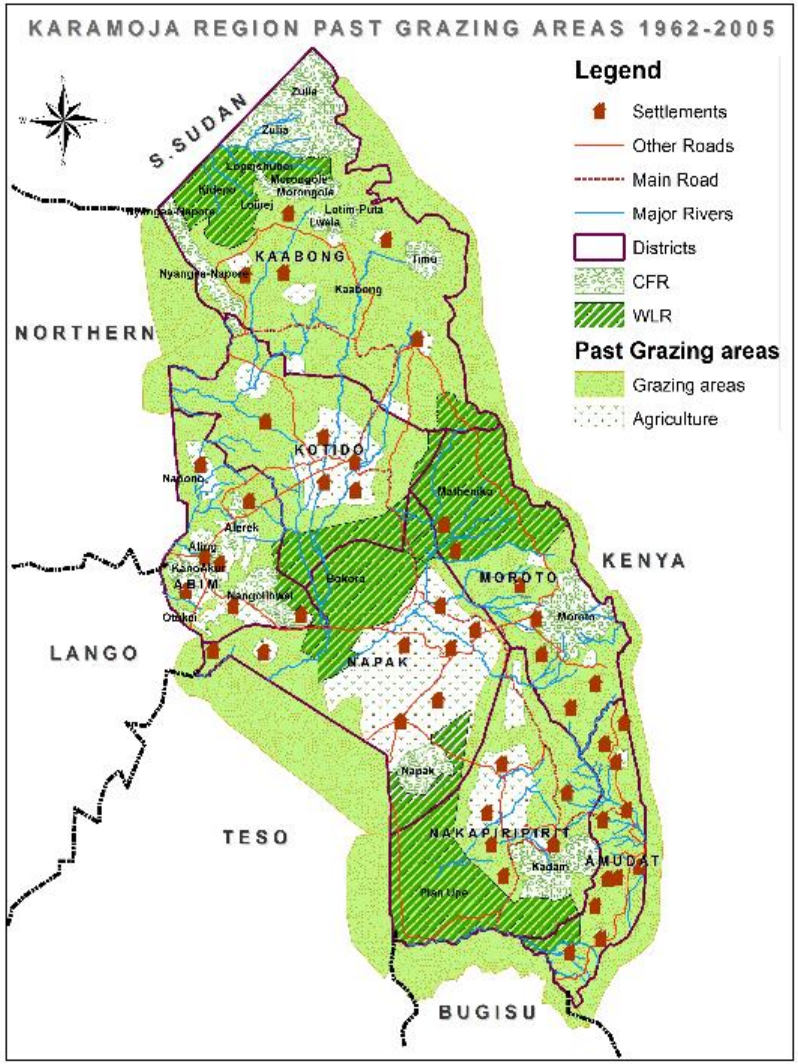


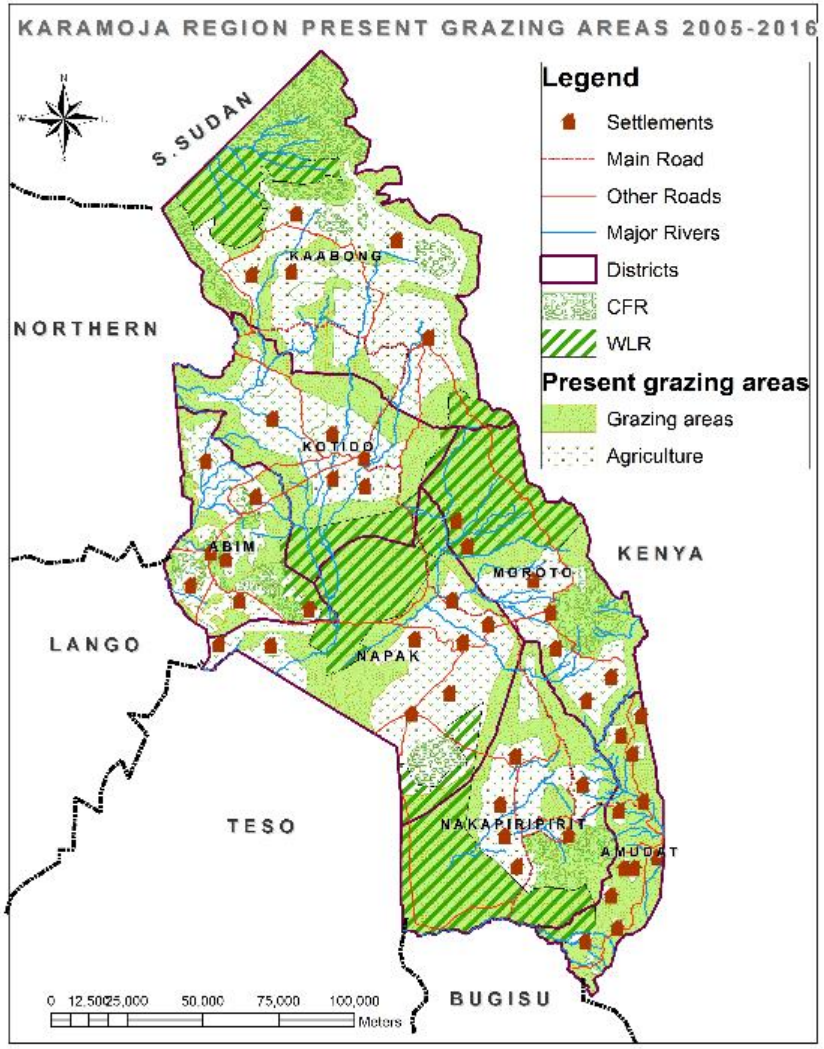




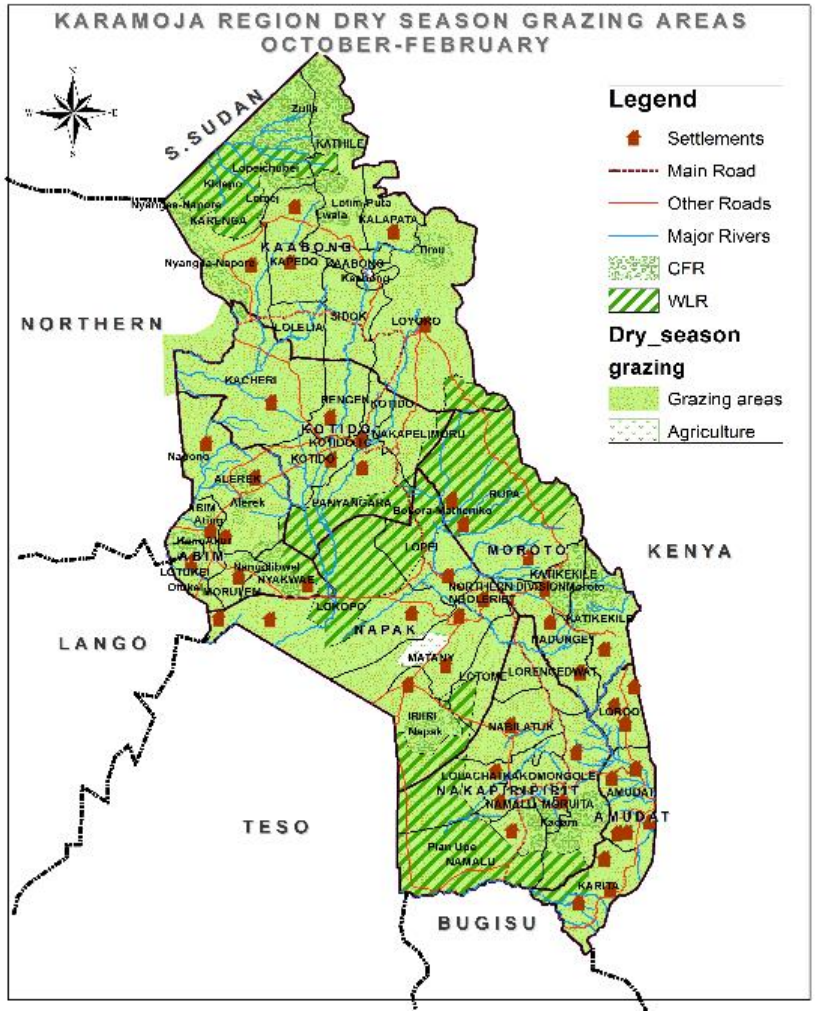


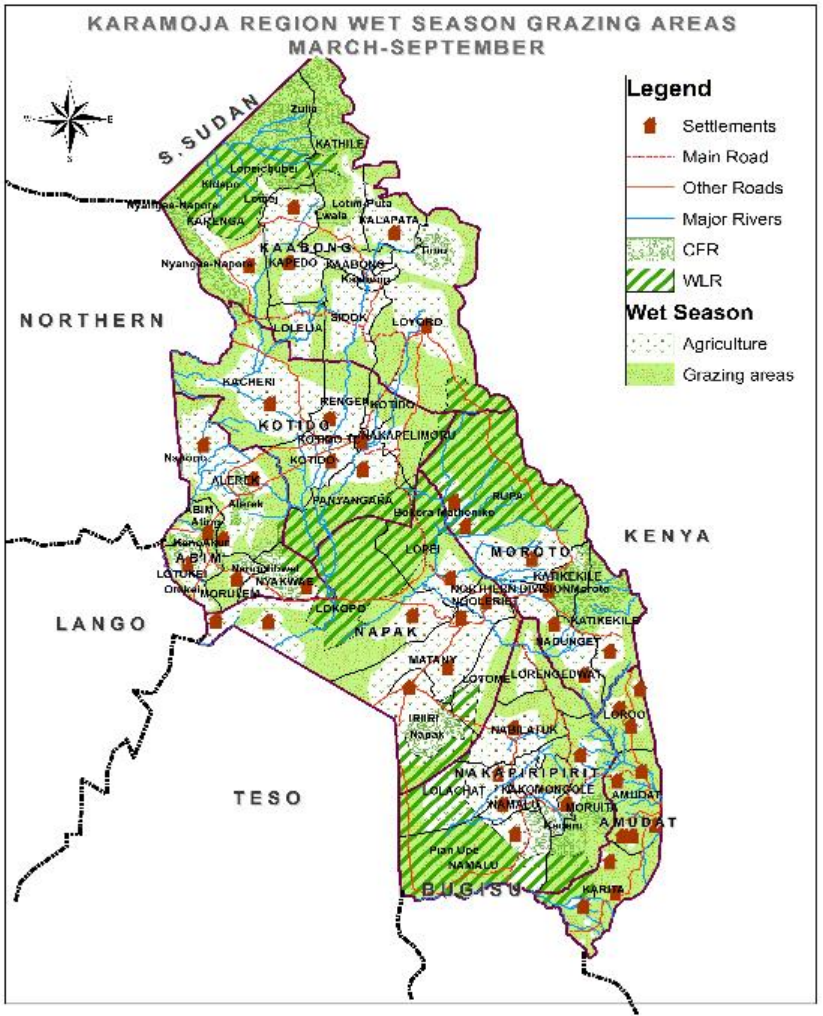
A case study of Karamoja
Grazing Areas, Past and Present



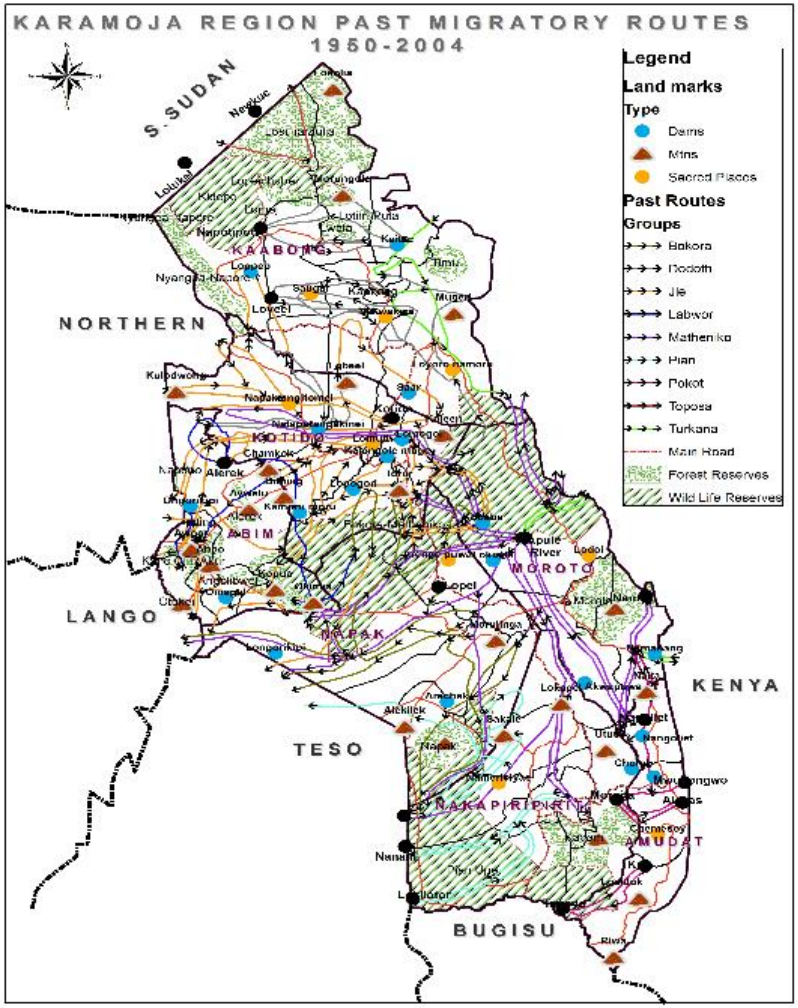


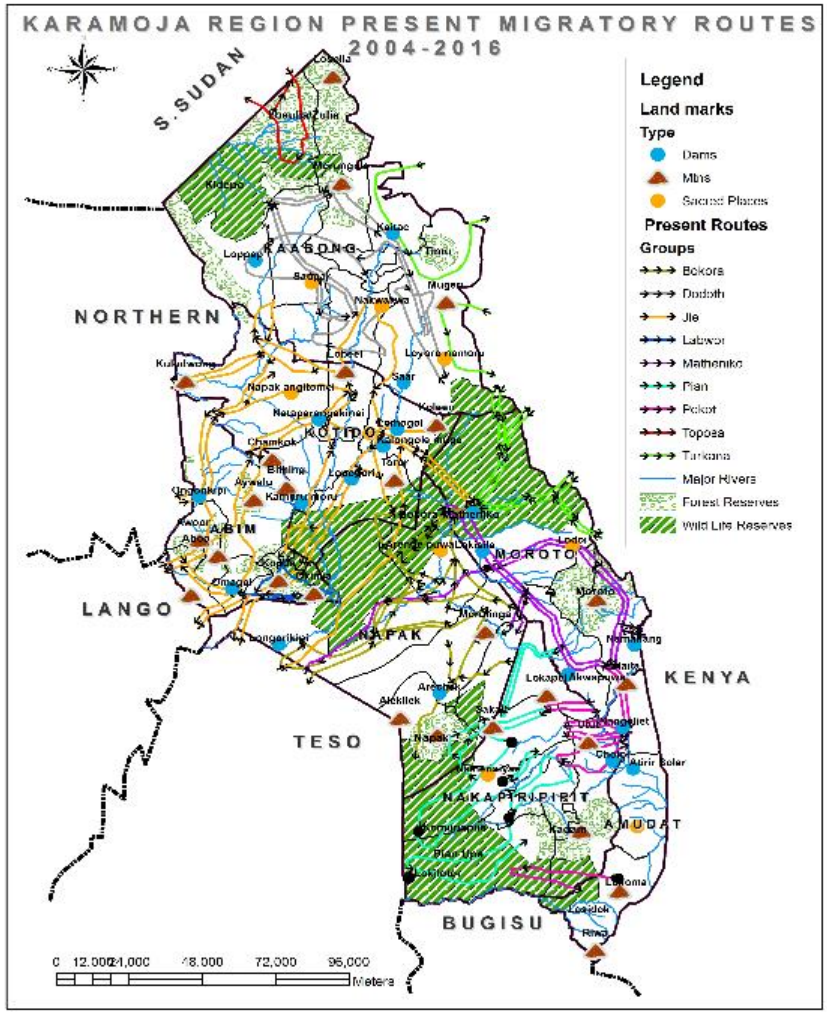
Seasonality, Dry and Wet





Livestock Migratory Routes, Past & Present





Conclusion

- Urgency of climate action
- **Importance of institutional transformation (judiciary, finance, governance, administration) at all levels**
- Reducing emissions is for all countries INDC's, Paris Agreement
- There are known and practiced response actions that can address impacts of climate change
- Transition to LED
- Low hanging, low cost nature-based solutions

- Thanks!