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ClimDev-Africa

Climate change, water, agriculture and energy in Africa

Presentation at 4th AWW, May 17, 2012
Cairo, Egypt

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African Climate Policy Centre (ACPC)

Climate Change Meets Policy

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Outline

- Africa Water Resources Base
- Africa's Water Challenges & Water Resources Use
- CC and Africa's Water
- CC -Water, Agriculture-Energy
- Conclusion: meeting the challenge

The African Water Resource

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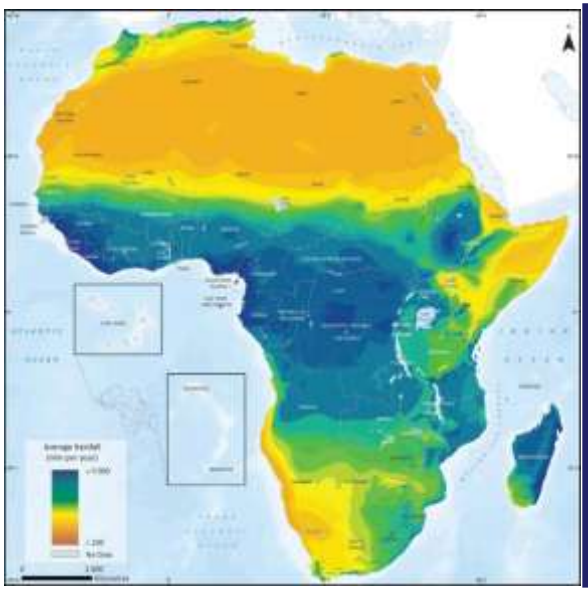
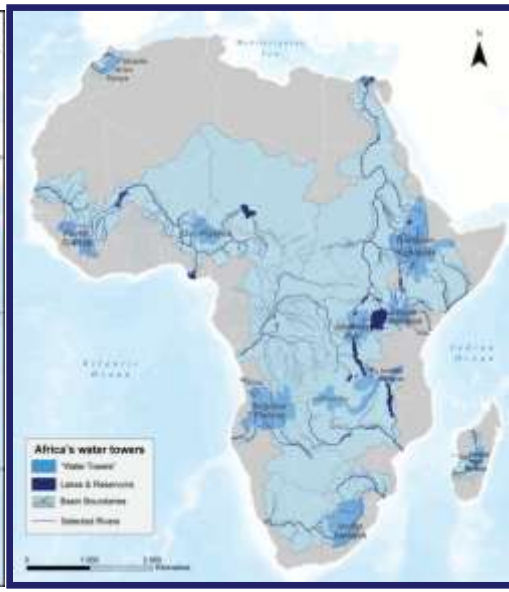
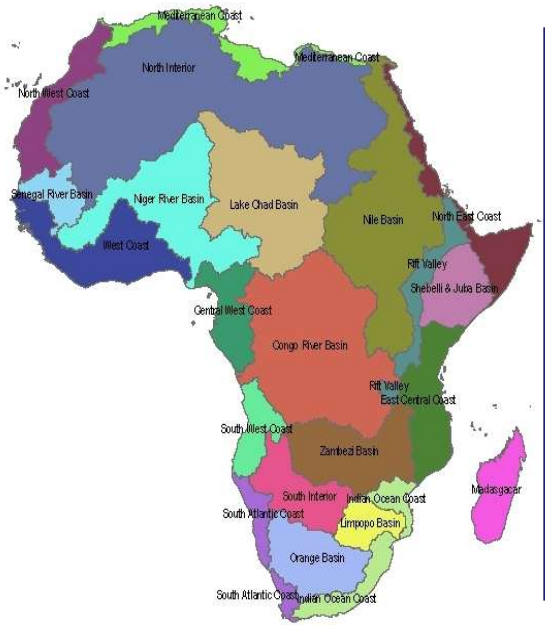
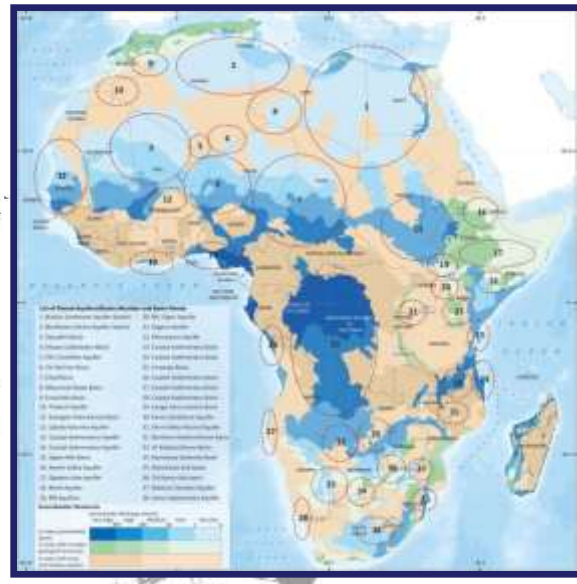
Resources summary

- Rainfall = 670 mm/year providing = 20,000 km^3
- IRW = 3,931km^3 (20% of RF)
- 13 major river basins
- 63 TB, 63% land area, 93% total surface water, home for 77% of population
- GW is 15% of IRW
- 38 major TB aquifers









Africa's Water Challenges

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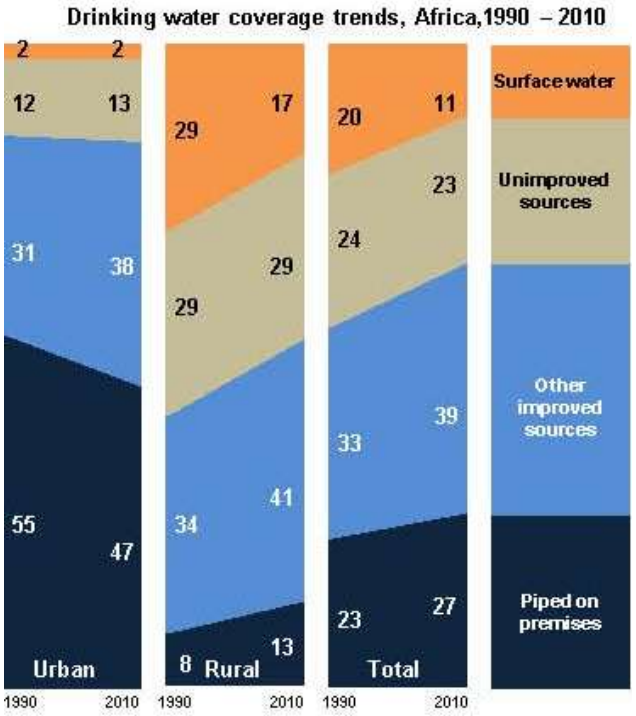
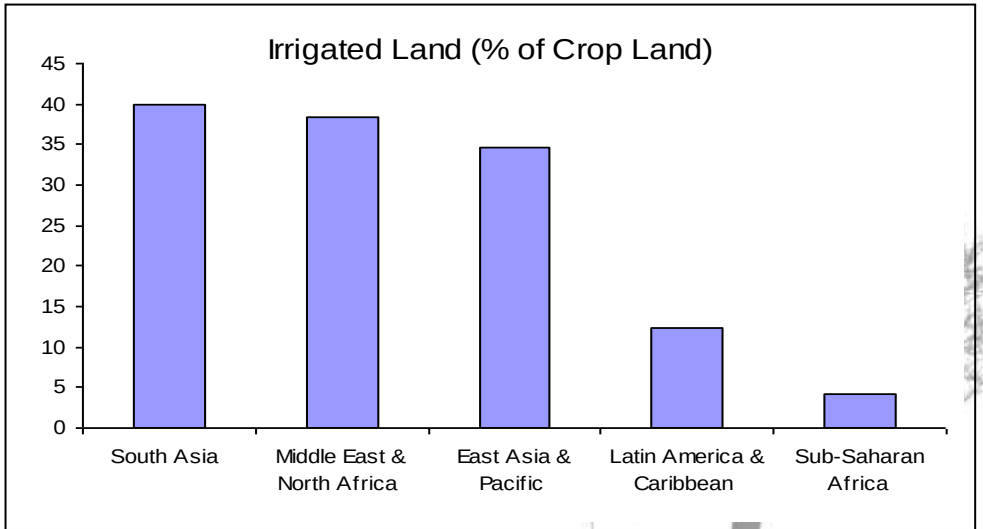
- Low level of use and efficiency
- Competing demands
- Complementary for investment

Water Resources Use Overview

- Water use about 4% IRW
- Water supply– 66%
- Agriculture about 185M ha; 7% irrigation
- Hydropower
  - 283 MW potential
  - 8.3% use (2009)
  - 32% of energy source
- Other uses





CC & Africa's Water

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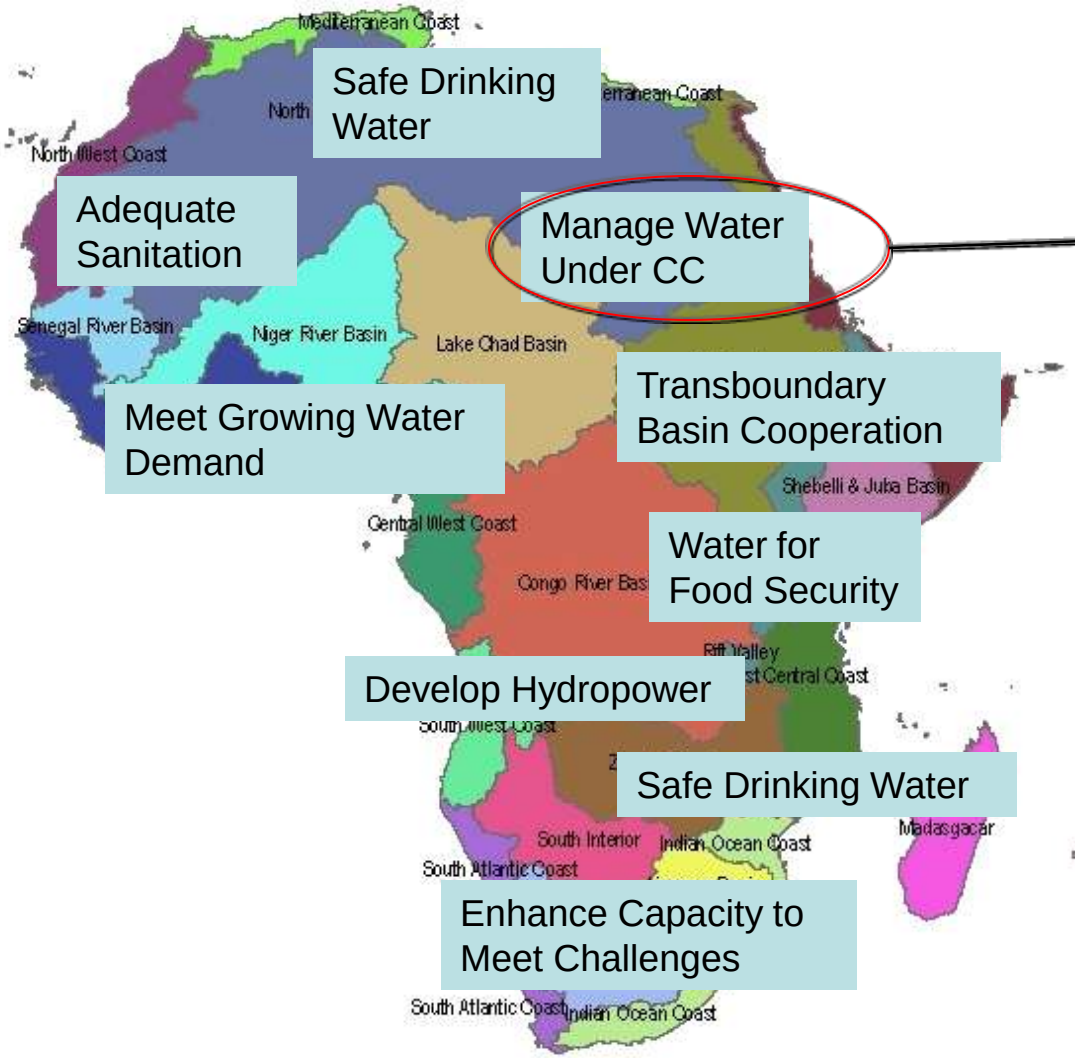

Managing water under climate change/variability

➔ complex problem, gap exists:

-Data, science base and analytical capacity

-Limited development that responds to CV and CC

-Policy and institutional instruments eg. in TB Managment

The Climate System Energy Balance

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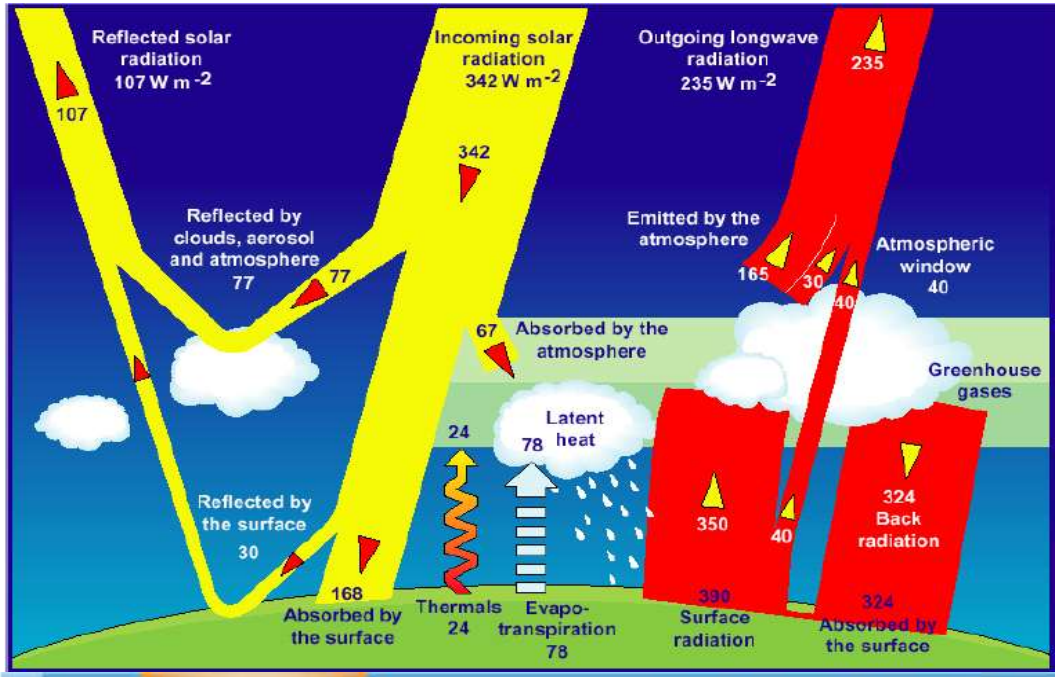
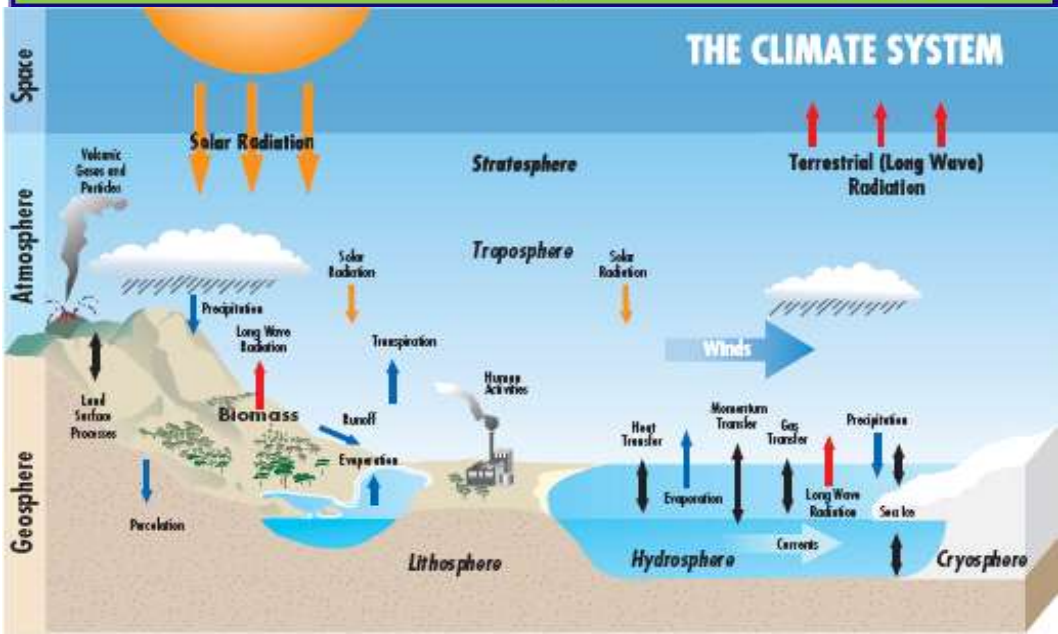
- The climate system is driven by solar radiation from the Sun
- Any phenomena that affect the energy balance of the climate system would ultimately alter the climate





- Earth's climate results from interactions of many processes in the components of the climate system:
  - atmosphere
  - ocean
  - land surface
  - cryosphere
  - biosphere
  - Anthropogenic system (human activities)

Scientific Consensus on Climate Change

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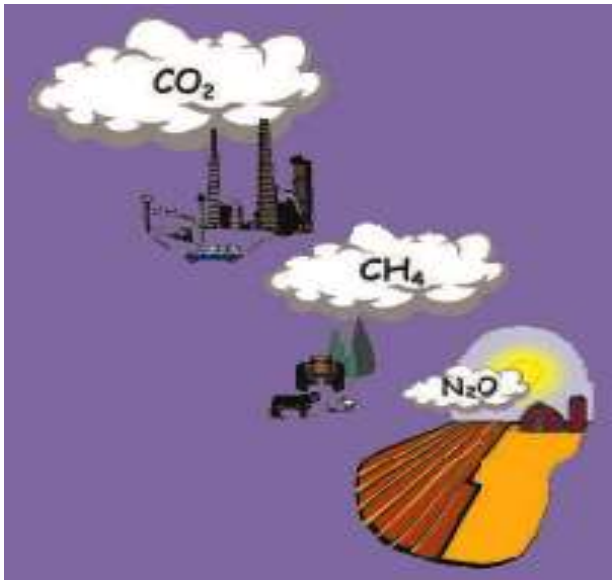
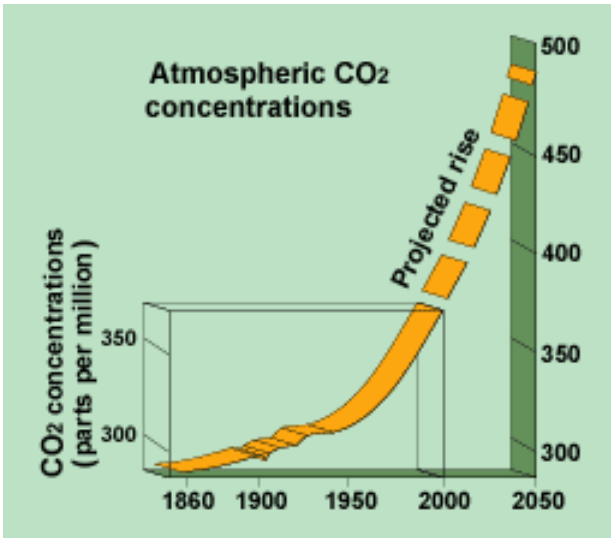
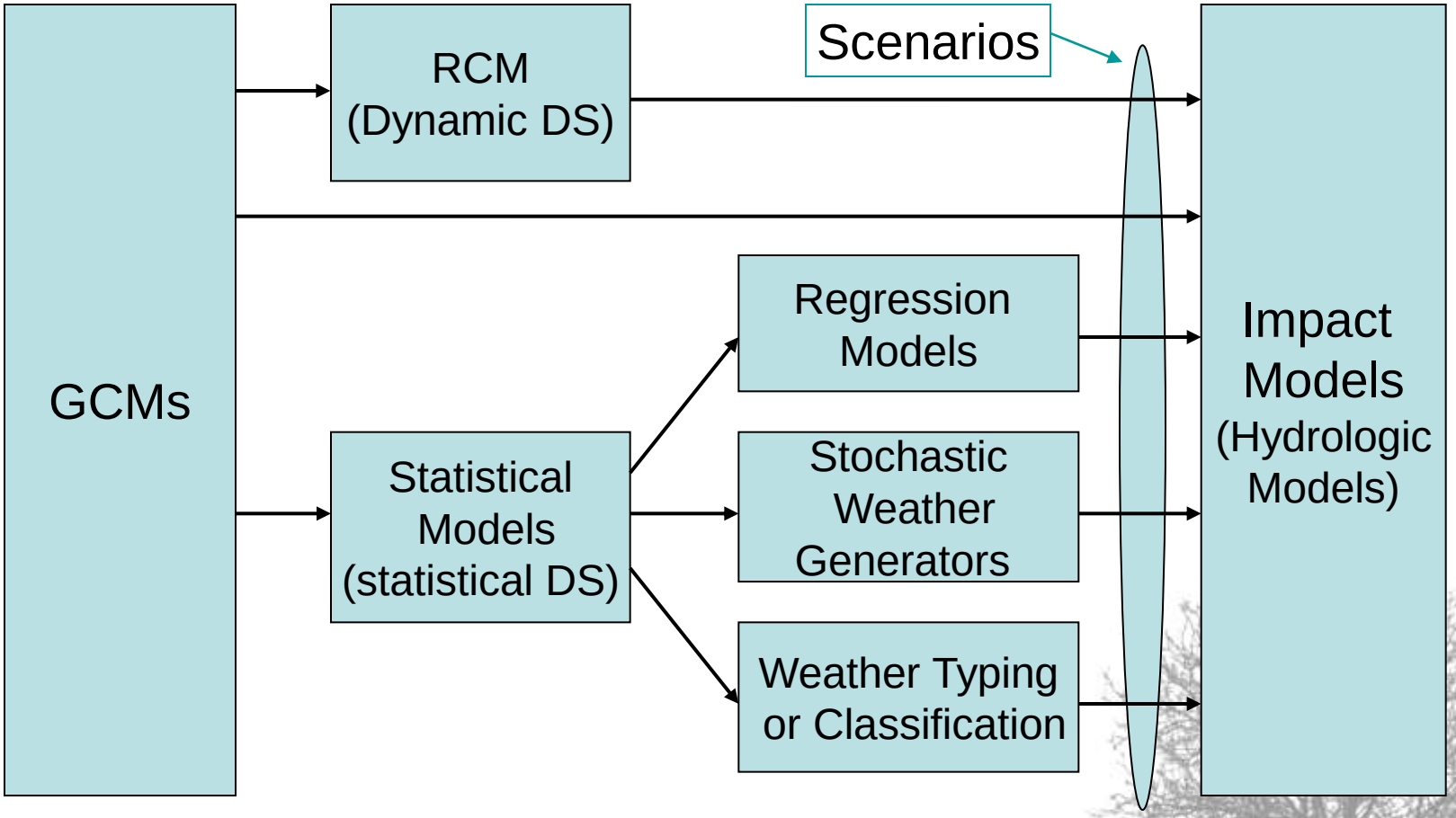
- Global worming is caused by the emission of greenhouse gases and their increasing concentration in the atmosphere
- Human activities have increased the concentration of the major green house gases since 1750
  - Carbon dioxide (CO_2) increased by 32%
  - Methane (CH_4) increased by 150%
  - Nitrous Oxide (N_2O) increased by 17%
- The increase in atmospheric CO_2:- fossil-fuel burning and land use change including deforestation
- The increase in CH_4 & N_2O : emissions from energy use, livestock, rice agriculture, and landfill.





Downscaling Methods



Low Resolution

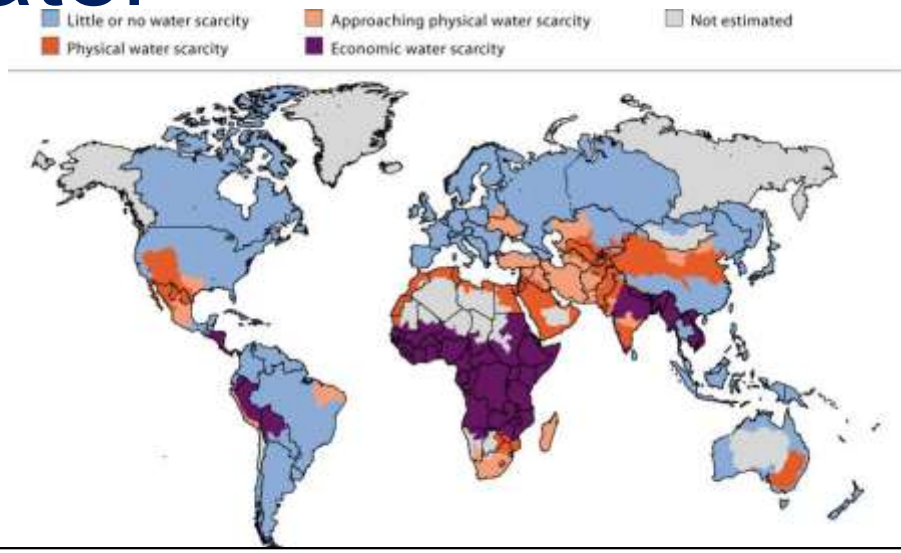
~ 300 km
Month, season, year

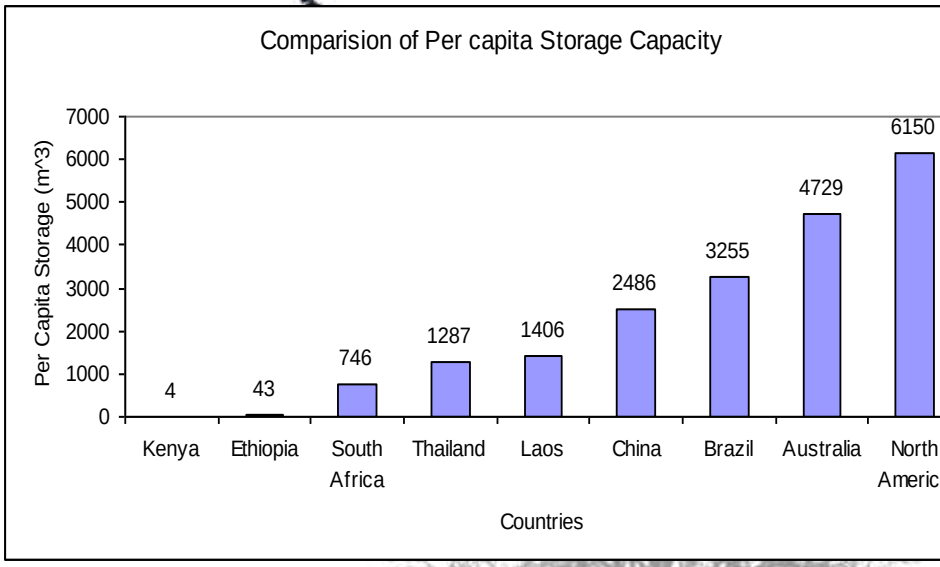
High Resolution

1 Km
Day, hour, minute

CC & Africa's Water

- Resource base related
  - Water scarcity, quality, degradation
- Extreme events & aggravation
  - Flood, drought, variability, health, …
- Use efficiency
  - Inadequate use, low productivity, insufficient MPD thinking
- Lack and inadequacy
  - Capacity, infrastructure, finance, institutions, policy, knowledge base
- Knowledge gaps
  - Uncertainty, knowledge management





Climate - Water-Agriculture-Energy

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- Climate change and nexus thinking:
  - Biofuel
  - Energy intensity of desalination
  - Hydropower
  - Water demands of afforestation for carbon storage
  - Action to avoid or land degradation saves water and energy eg
    - increasing soil water storage and groundwater recharge
    - reducing the use of energy intensive fertiliser
    - green economy (for all ecosystem services and associated jobs and livelihoods)
- Policies
  - climate policies can impact on water, energy and food security
  - adaptation action can in fact be maladaptive if not well aligned in a nexus approach and implemented by appropriately interlinked institutions

Conclusion: Meeting the challenges

Increase water access for productive purposes

- Invest in AWM: irrigation and rainfed, energy, water supply, risk reduction
- Develop more water by increasing storage (surface, underground, …) and diversion facilities

Increase land and water productivity and value per unit of water

- Agriculture – intensification, higher water productivity, higher input use efficiency
- Water supply- meet demand, reduce losses, …

Develop water saving practice

- Recycle & reuse wastewater
- Manage supply and demand
- focus is on system efficiency, including productivity and efficiency of isolated sectors

Integrate multiple uses/purpose development including, eg.:

- Crop, livestock & fisheries (sectoral allocations)
- Hydropower, flood/drought control, irrigation
- Integrate development options eg MUS, MPD, IWRM

Leveraging investment in CC adaptation and mitigation

- Water a crucial resource

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Thank you

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