PEACE, PROSPERITY AND
REGIONAL INTEGRATION

CLIMATE SERVICES AND PRODUCTS PROVIDED BY IGAD CLIMATE PREDICTION AND APPLICATIONS CENTRE (ICPAC)

By Abebe Tadege, ICPAC

Inception workshop on delivering climate resilient development policies in Africa, 21-22 Nov. 2019, Addis Ababa, Ethiopia

1. ABOUT IGAD

IGAD REGION: its members

- Established in 1986 to address drought and development-IGADD
- IGAD: Revitalized in 1996 and expanded its mandate to include three priority areas:
  - *Agriculture & Environment*
  - *Economic Cooperation &Social Development*
  - *Peace & Security*

1. ABOUT IGAD

IGAD REGION: its members

- The **IGAD region stretches** over 5.2 million sq km, some 80% is ASAL
- **Population of over 200 million, characterised by high growth (3%) rate and rapid urbanisation**
- highly vulnerable to climatic variability and change (recurrent droughts and floods)
- Severe land degradation & advances in desertification
- History of long and protracted conflicts causing huge number of refugees and displacement and migration
- High level of **poverty**
- **Economic mainstay:** agriculture (crop and livestock)

1. ABOUT IGAD

IGAD REGION: its members

- The region is reach in natural resources (Biodiversity, Water, Land, Climate, Soil, Wildlife)
- Diverse in culture
- Fast growing economies
- Un taped mineral resources

1. ABOUT IGAD

IGAD's Vision

IGAD to be the premier Regional Economic Community (REC) for achieving peace and sustainable development in the region.

IGAD's Mission

Promote regional cooperation and integration to add value to Member States' efforts in achieving peace, security and prosperity.

1. ABOUT IGAD

Governance

- The Assembly of Heads of State and Government
- The Secretariat
- The Council of Ministers
- The Committee of Ambassadors

Divisions

- Agriculture and environment protection
- Economic cooperation and social development
- Peace and security
- Social

Specialized Institutes

- Conflict Early Warning and Response Mechanism (CWARN)
- IGAD Climate Prediction and Application Center (ICPAC)
- IGAD Centre for Pastoral Areas and Livestock Development (ICPALD)
- IGAD Sheikh Technical Veterinary School
- IGAD Centre of Excellence in Preventing and Countering Violent Extremism

Programs

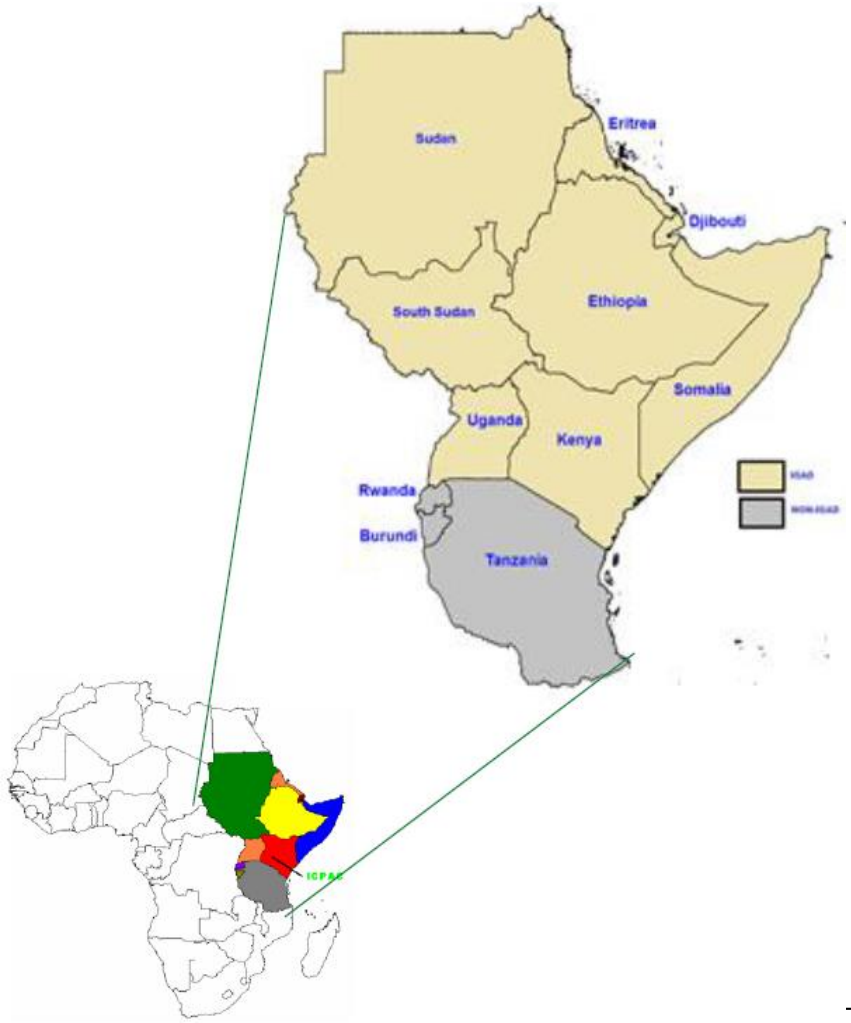
- IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI)
- Migration Program
- Health Program
- IGAD Security Sector Program
- Land Governance Programl

1. WHY WE NEED CLIMATE INFORMATION

Global, regional, national and local initiatives and strategies require enhanced climate data sharing and exchange

- Sustainable development goals (SDG)
- The Paris Agreement on climate change
- Sendai Framework for Disaster Risk Reduction
  - It calls for understanding weather and climate risks
  - It calls for substantially increase the availability of and access to early warning systems
- Agenda 2063
- Regional and national development plans
- There is a growing demand for user tailored climate information in the areas of natural resource management, disaster risk management and human-induced climate change. **WMO GFCS program**

3. ABOUT ICPAC

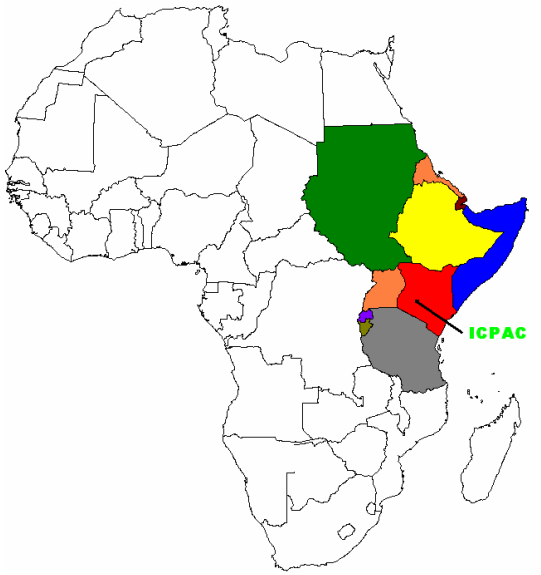


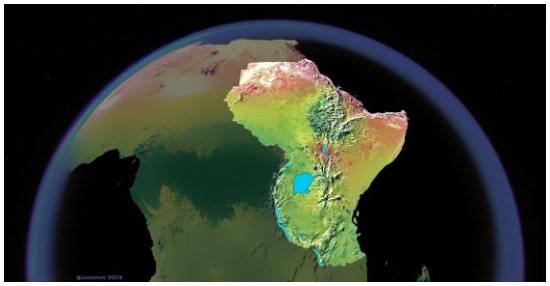
ICPAC Member Countries

- **BACKGROUND**: Established in 1988 as the Drought Monitoring Centre, Nairobi (DMCN);
- 2007, the **Protocol** establishing the Centre signed by IGAD heads of states & the name changed to: ***IGAD Climate Prediction and Applications Centre (ICPAC)***
- ICPAC is a WMO Regional Climate Centre (WMO-RCC) for Eastern Africa.
- ICPAC is a member of AUC/NEPAD Network for Water Centres of Excellence.
- ICPAC has an Observer Status with the UNFCCC

MISSION: Foster climate services and knowledge to enhance community resilience for prosperity in the Greater Horn of Africa

3. ABOUT ICPAC





VISION

- To be a world-class centre of excellence in climate services for sustainable development in the Greater Horn of Africa

MISSION

- Foster climate services and knowledge to enhance community resilience for prosperity in the Greater Horn of Africa

3. ABOUT ICPAC

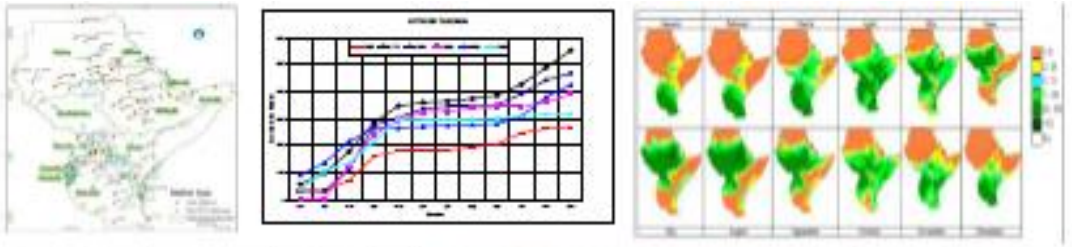
ICPAC Head Quarter

Key Areas of Work & Mandates of ICPAC

1. Climate Data Management, Climatology & Climate Monitoring
2. Climate Diagnostics, Prediction and Early warning
3. Sectoral applications of climate information
4. Disaster Risk Management (DRM)
5. Climate Change
6. Climate Research and modeling
7. Capacity building
8. Climate Outlook Forums (COFs)

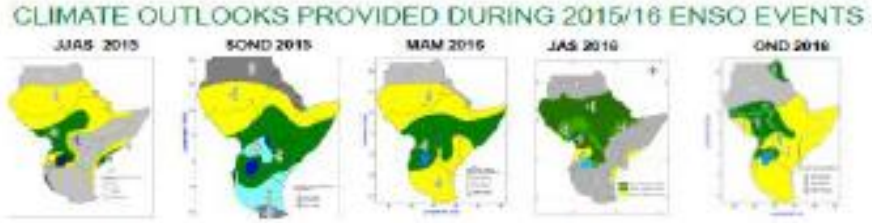
4. ICPAC-PRODUCTS & SERVICES

Baseline climatology

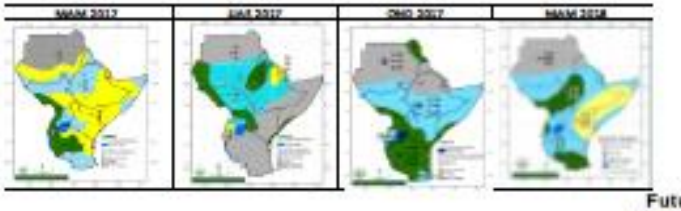


Climate monitoring

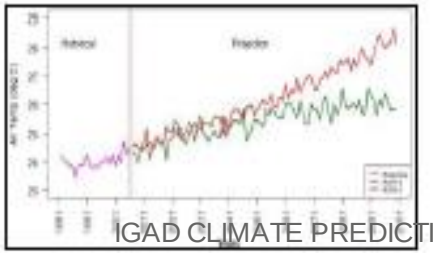
Predictions

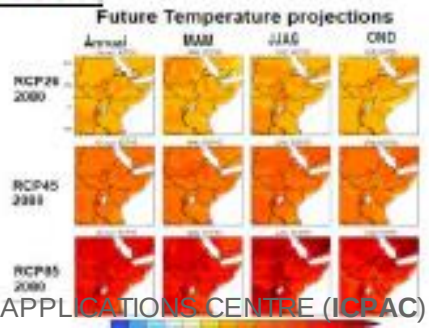


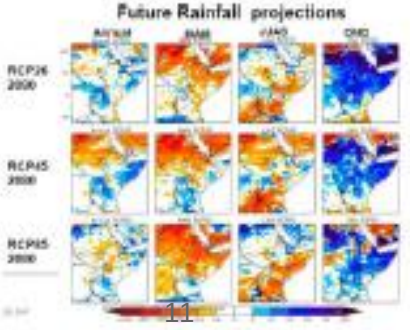
Sectoral Applications



Climate change







5. CAPABILITY AT ICPAC

- ICPAC is a designated WMO Regional Climate Centre (RCC) for Eastern Africa
- Data and Infrastructure: ICPAC receives over 120 met station data from its member states and satellite data receiving station
- ICPAC runs two cluster nodes with a capacity of 30 and 100 tera flops for running regional climate models (WRF)
- ICPAC has currently about 63 staff with various disciplinary back grounds
- ICPAC currently runs about 15 projects
- Runs several partnerships

5. CAPABILITY AT ICPAC

SEVERAL TOOLS ARE BEING USED AT ICPAC

USE OF GEO-TOOLS

GeoCLIM

GeoCOF

GEOWRSI

GeoMOD

WRF

CORDEX

OUTCOME

- Increased availability and access to climate data
- Improved monitoring of climate extremes (floods and droughts)
- Improved forecast and early warning
- Improved climate services
- Reduction in human life lose and economic damage
- Recognition of ICPAC as WMO Regional Climate Center (RCC)

Products are available at the following links :

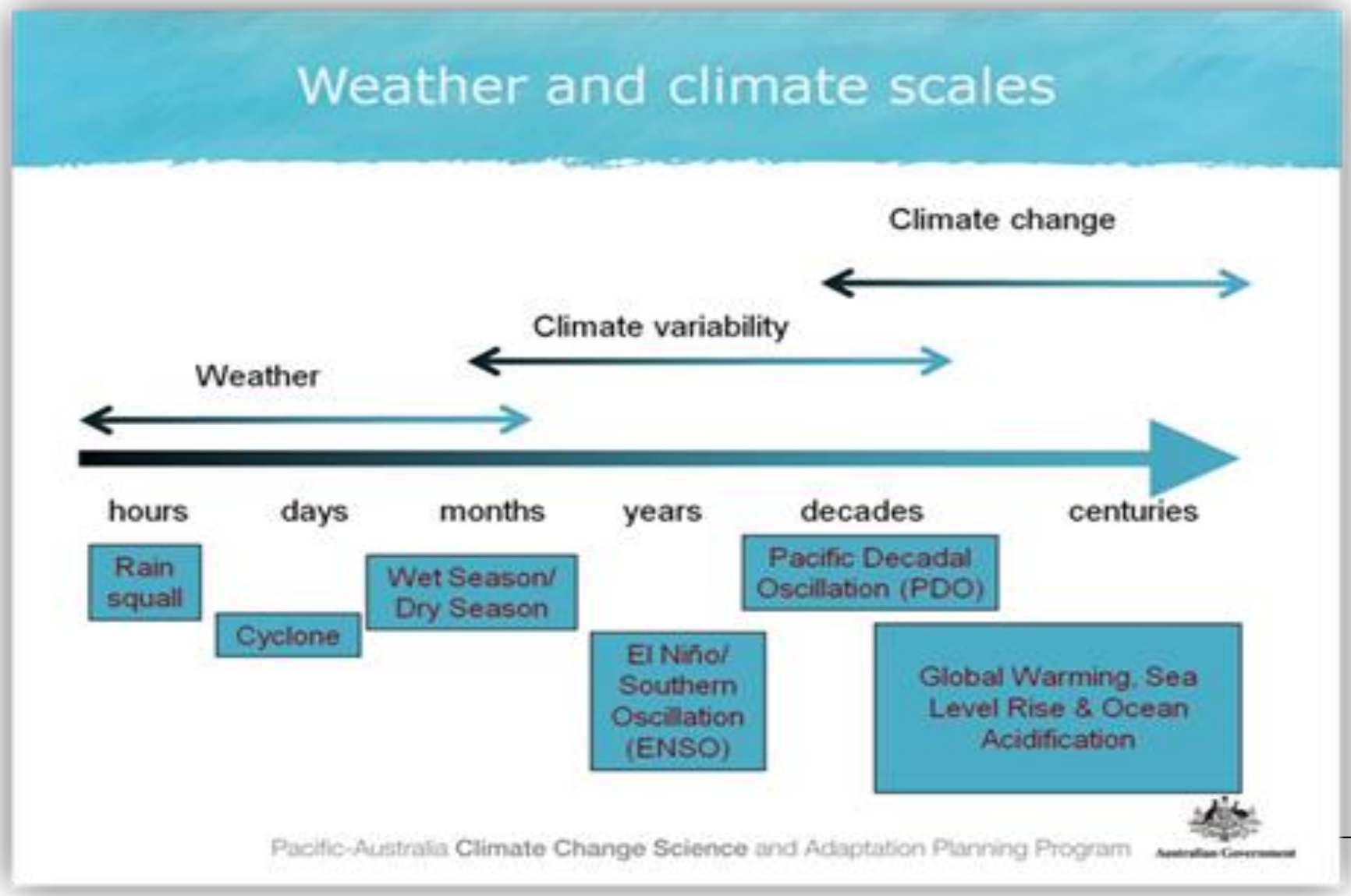
Apps Portal: http://geoportal.icpac.net/appsportal/

Geoportal: http://geoportal.icpac.net/

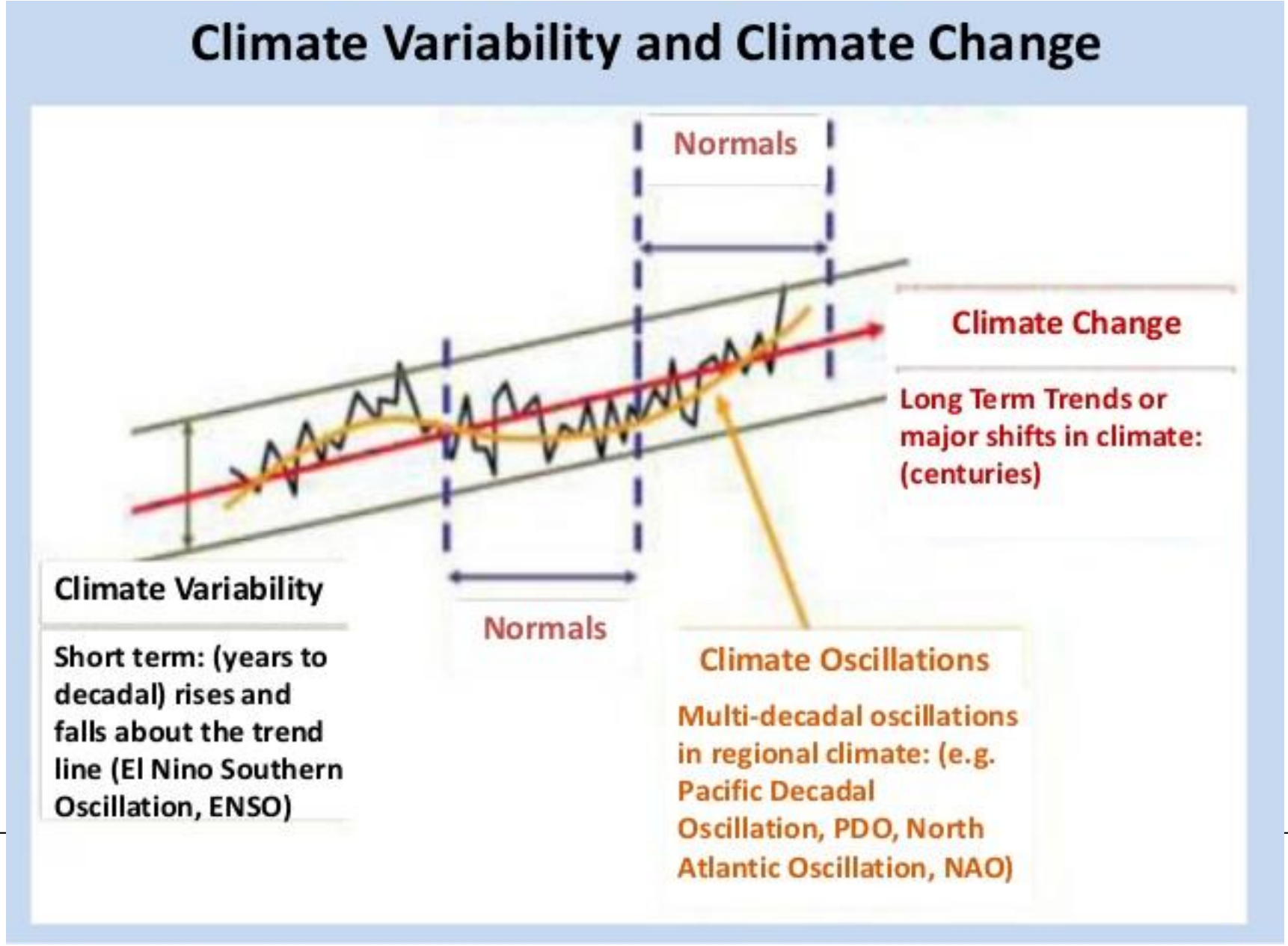
ICPAC website: www.icpac.net

INTERGOVERNMENTAL AUTHORITY ON

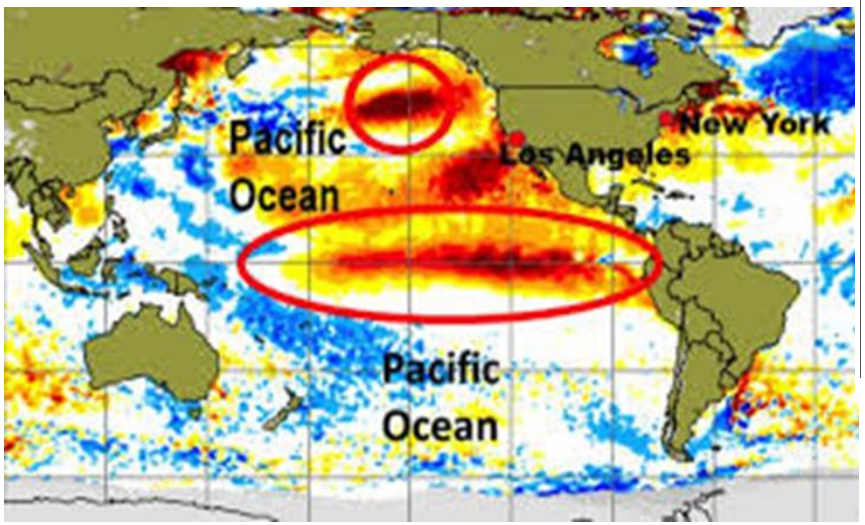
CLIMATE VARIABILITY AND CLIMATE CHANGE

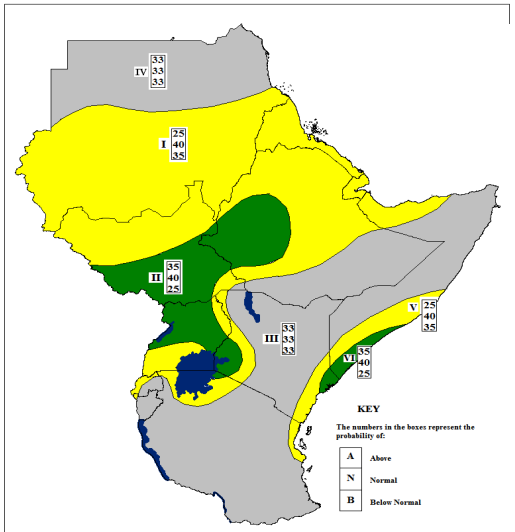


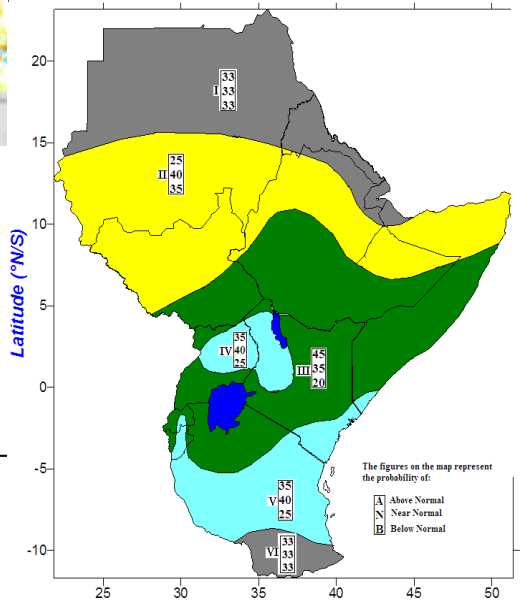
CLIMATE VARIABILITY AND CLIMATE CHANGE

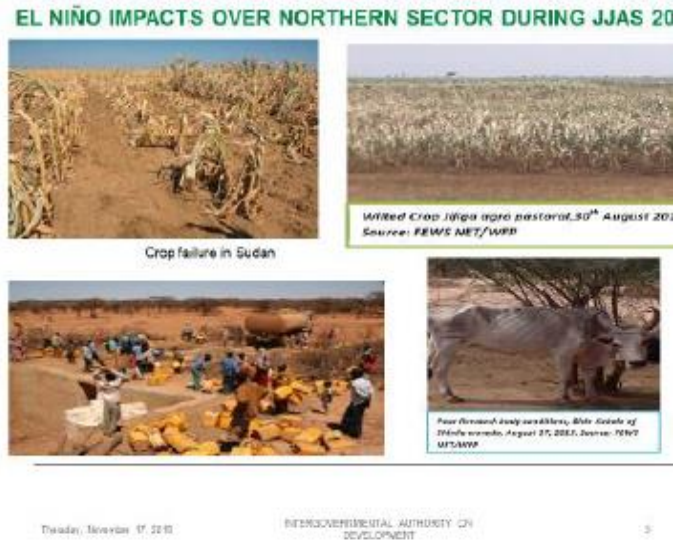


CLIMATE VARIABILITY (2015/16 EL NIÑO)









6. WAY FORWARD

Strengthen meteorological infrastructure

- Data Observational systems and networks
- Data telecommunication systems
- Data procession, analysis and forecasting systems
- Product and information dissemination systems
- Human resource capital

Improve Climate literacy at all levels

Downscaled climate information using RCMs

Improve effectiveness of Climate Information Systems (CIS)

by putting in place appropriate institutional, technological, organizational, legal and finacial arrangements to generate, exchange and disseminate information nationally, regionally and globally.

THANK YOU VERY MUCH!

FINDINGS OF THE 5TH ASSESSMENT REPORT OF THE IPCC

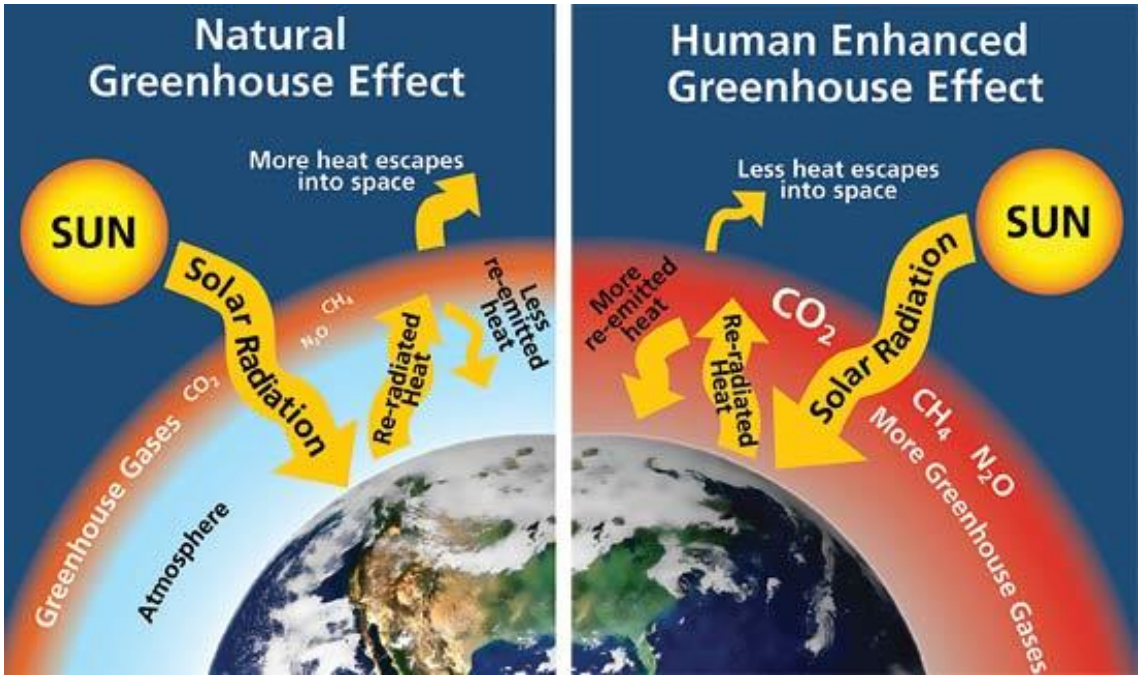
WORKING GROUP I FINDINGS

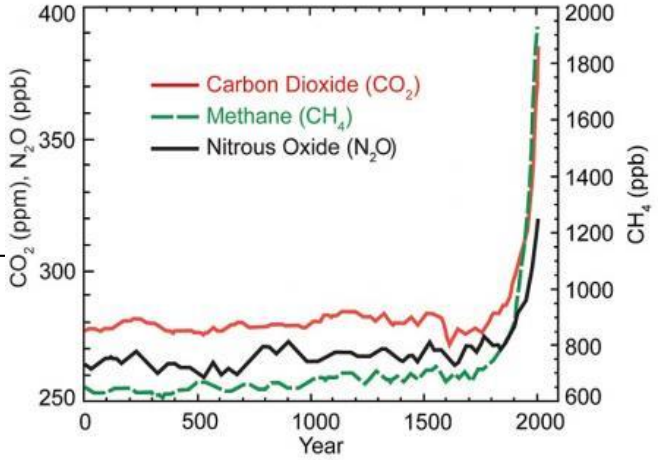
- **Humans are largely responsible for rising global temperatures. IPCC is 95% (extremely likely) sure that humans causing global warming**
- **Many observed impacts are happening more quickly than previously predicted**
- **Climate change is creating more frequent and more intense extreme weather events.**
- **Business-as-usual will lead us far beyond 2 degrees Celsius of warming (dangerous levels of climate change)**

- **Cutting carbon dioxide (CO2) emissions is the most urgent imperative for global climate action**

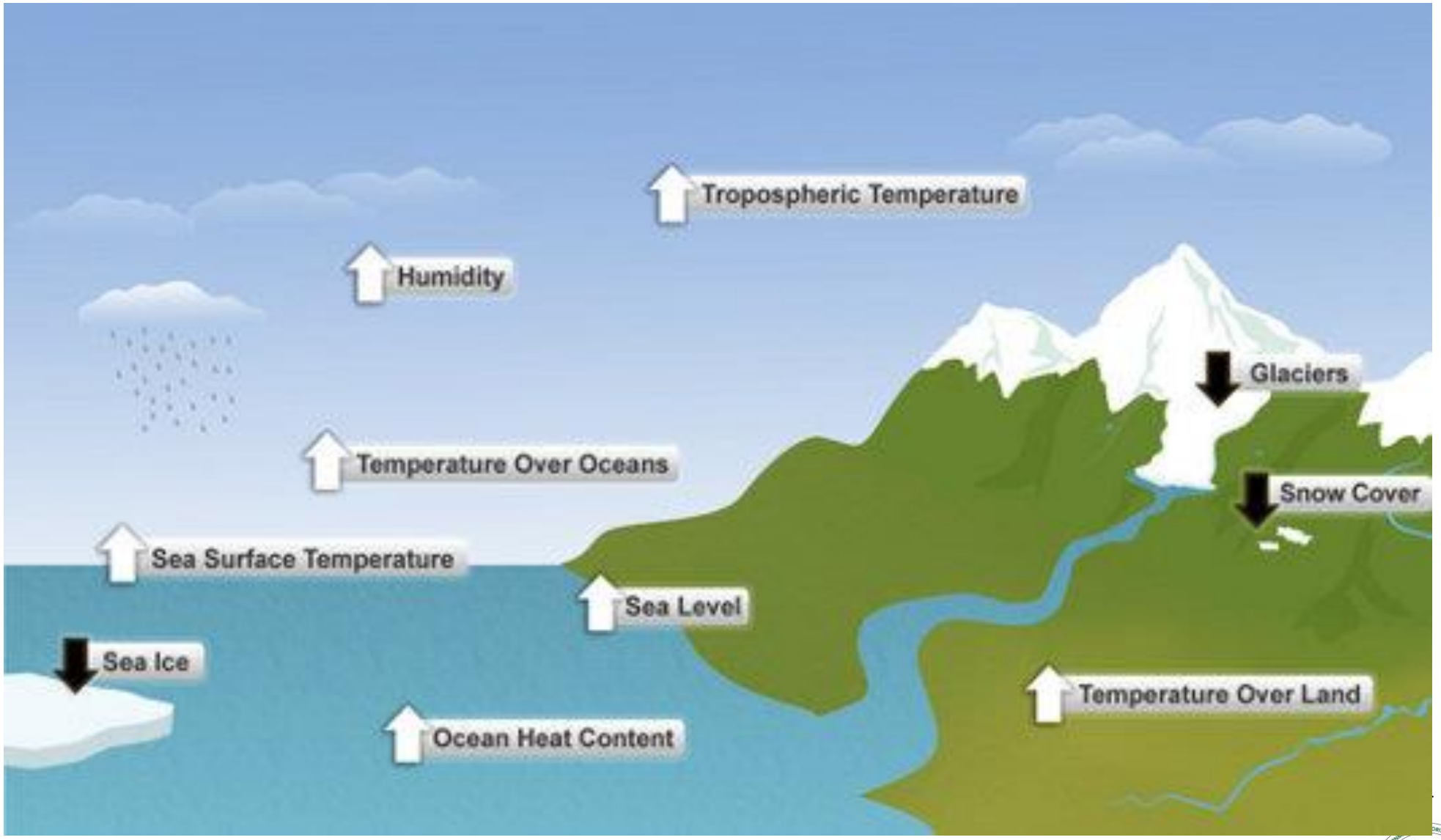
HUMAN INDUCED CLIMATE CHANGE

Theory of the greenhouse effect





CLIMATE CHANGE INDICATORS



CLIMATE CHANGE IMPACTS

Climate Change is already having a wide range of adverse impacts around the world in general and Africa in particular. These impacts include

- Changes in climate patters and increase in frequency and intensity of climate extremes including droughts, floods and heat waves
- Sea-level rise
- Environmental degradation and desertification
- Melting of glaciers
- Reduction in water availability and higher water stress
- Increased health risks
- Increased food insecurity because of reduced crop productivity
- Changes in ecosystems

FINDINGS OF THE 5TH ASSESSMENT REPORT OF THE IPCC

WORKING GROUP II FINDINGS

- **Climate change now affects every part of the planet.**
- **Climate change will increase the frequency and severity of extreme weather.**
- **Meeting the scale of the challenge requires adaptation *and* mitigation.**
- **Rapid and steep reductions in greenhouse gas emissions can reduce risks and costs—and the timing matters.**

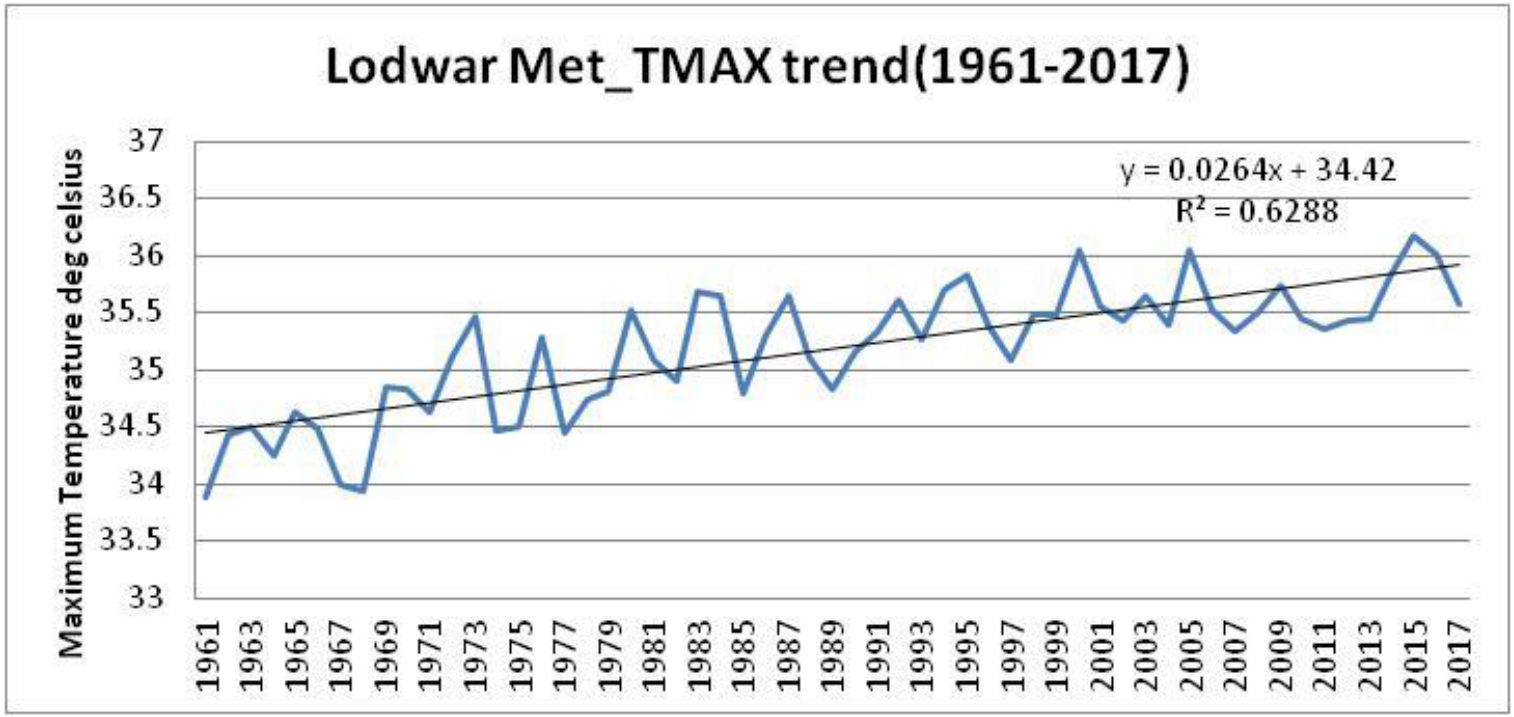
FINDINGS OF THE 5TH ASSESSMENT REPORT OF THE IPCC WORKING GROUP III FINDINGS.

- **Without Explicit Action, We Could See More than 4° C of Warming**
- **Limiting Warming to 2° C Is Still Possible**
- **Staying Within the Carbon Budget Requires Immediate Action**
- **We'll Need to Phase Out Emissions Entirely in the Long-Term**
- **We'll Need Action from All Regions of the World**
- **Shifting to a Low-Emissions Pathway Requires a Large-Scale Transformation**

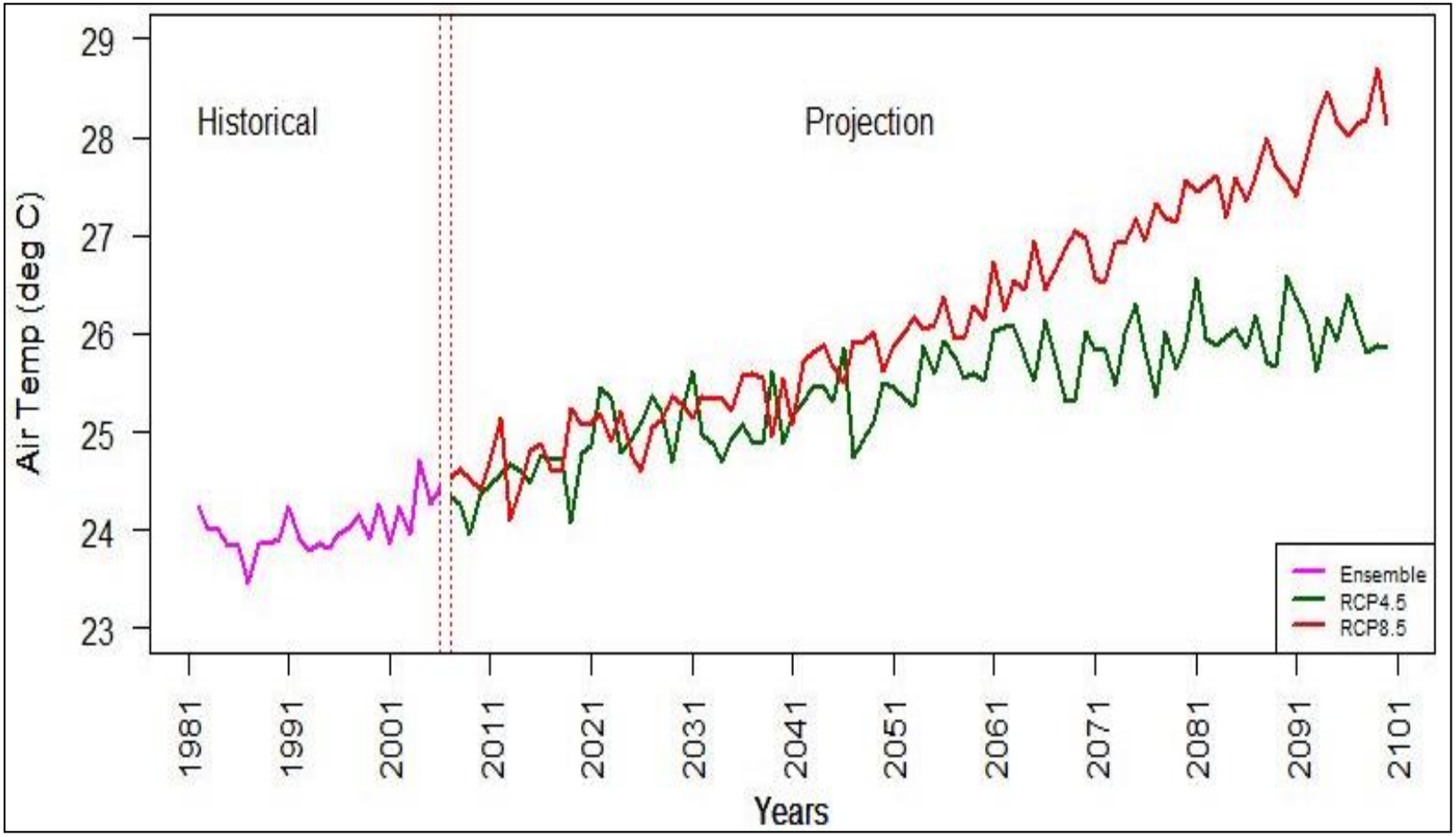
CONCEPTS AND DEFINITIONS

- **Q1. Why climate is important? Why we are concerned about climate?**
- **Q2. From where do we get climate information?**
- **Q3. What do you understand by weather and climate?**
- **Q4. What do you understand by climate variability verses climate change?**
- **Q5. What do you understand by vulnerability and what are vulnerability indictors?**
- **Q6. What do you understand by Adaptation? How many types of adaptation are there?**
- **Q7. Why we are concerned about climate change adaptation in Africa?**
- **Q8. What are the causes of climate change?**
- **Q9. Dou you know how much carbon dioxide (CO2) is being pumped into the atmosphere currently as a result of energy use (get the figures)?**

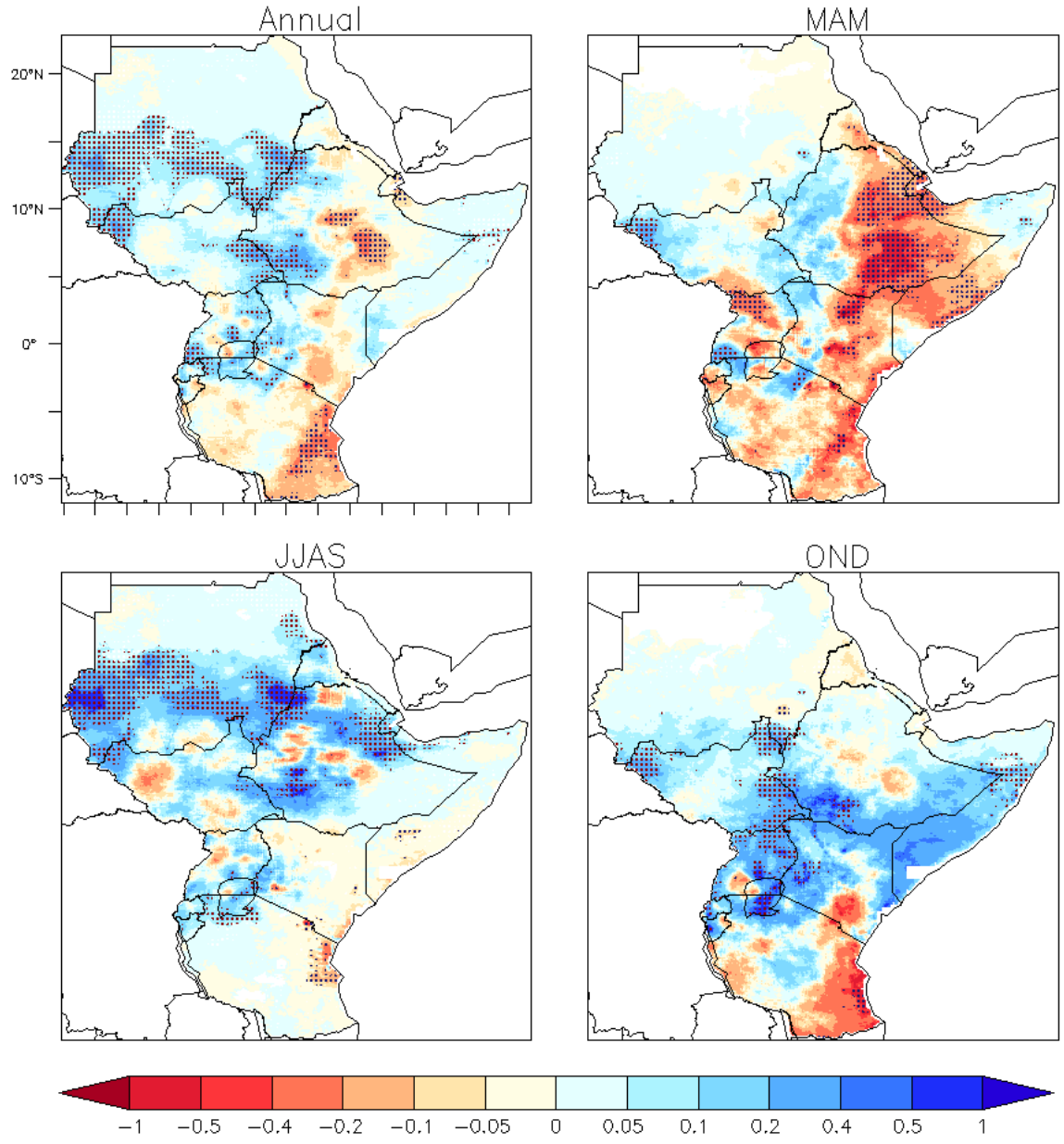
EVIDENCES OF CLIMATE CHANGE



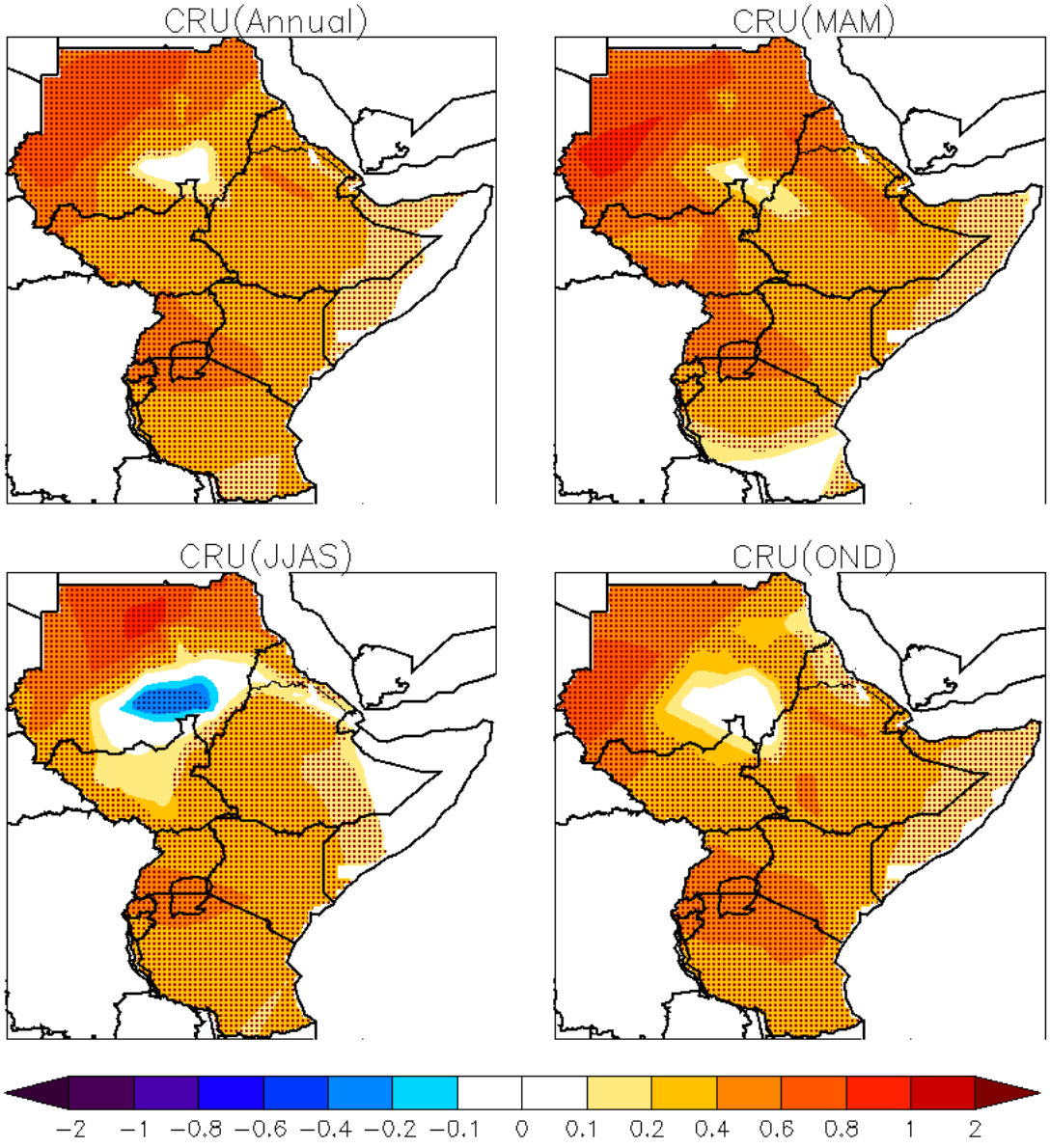
EVIDENCES OF CLIMATE CHANGE AND PROJECTIONS



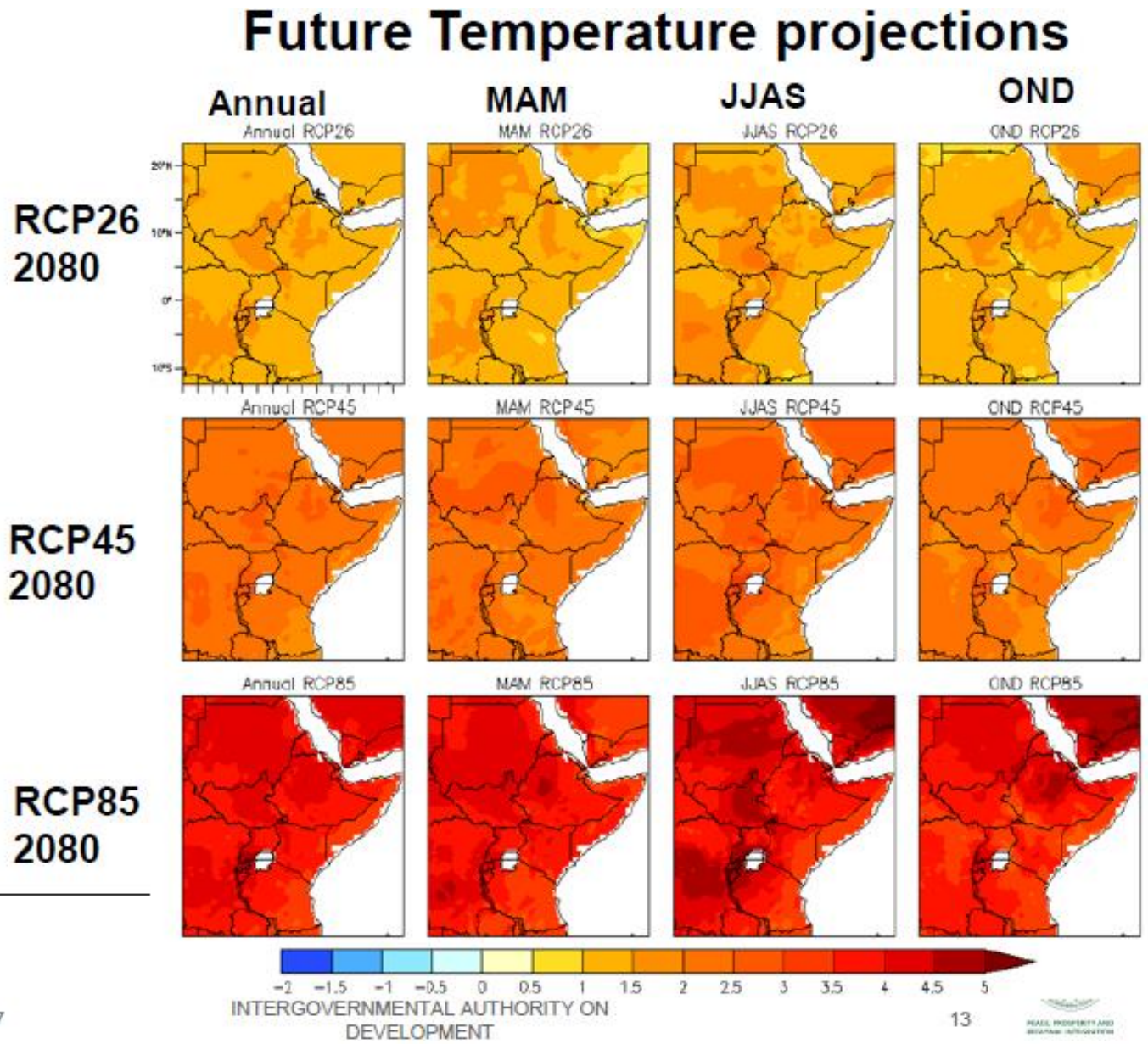
OBSERVERED RAINFALL TRENDS



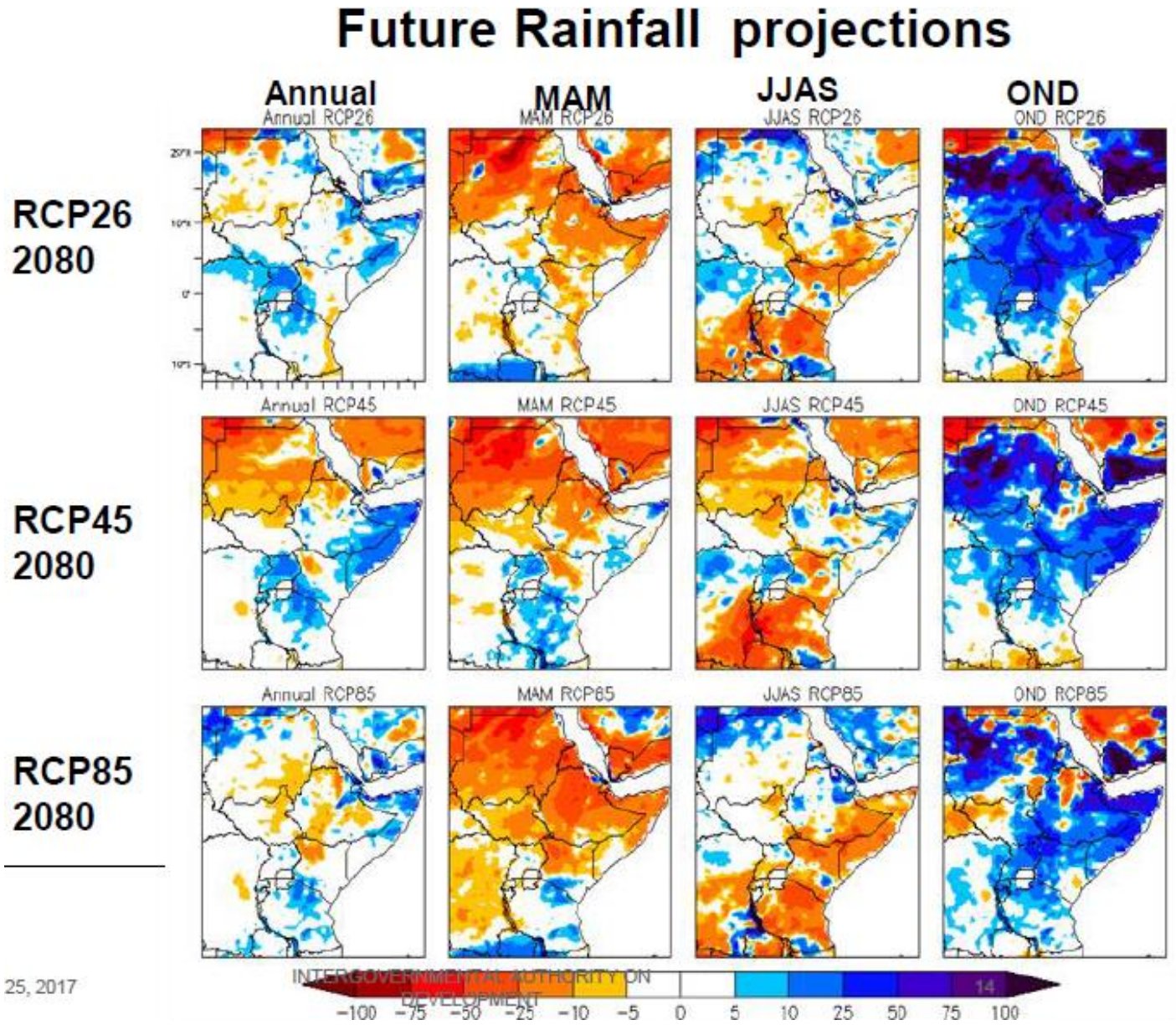
OBSERVED TEMPERATURE TRENDS



FUTURE TEMPERATURE PROJECTIONS



FUTURE RAINFALL PROJECTIONS



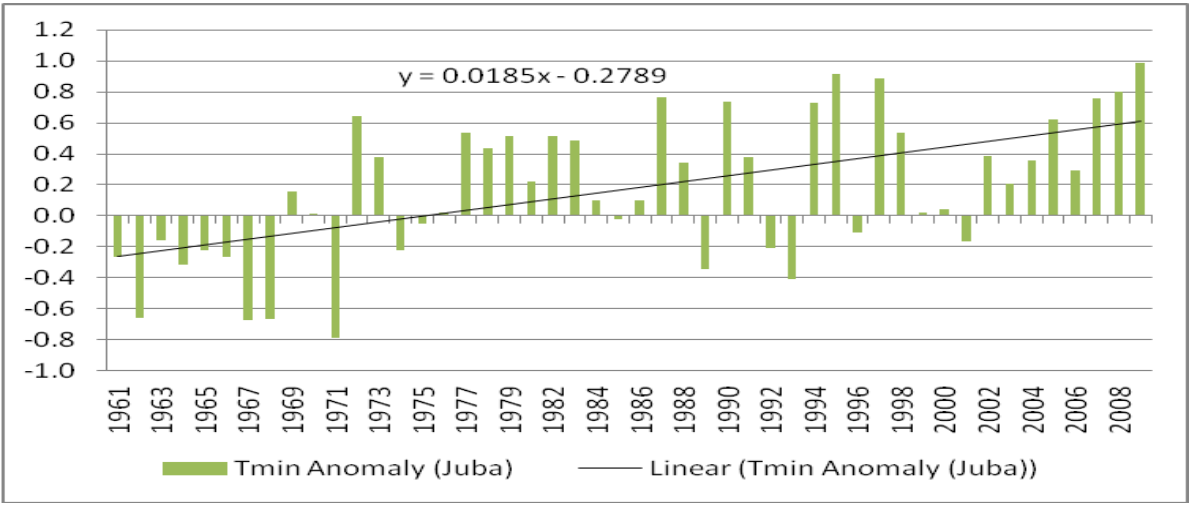
RESPONSE TO CLIMATE CHANGE

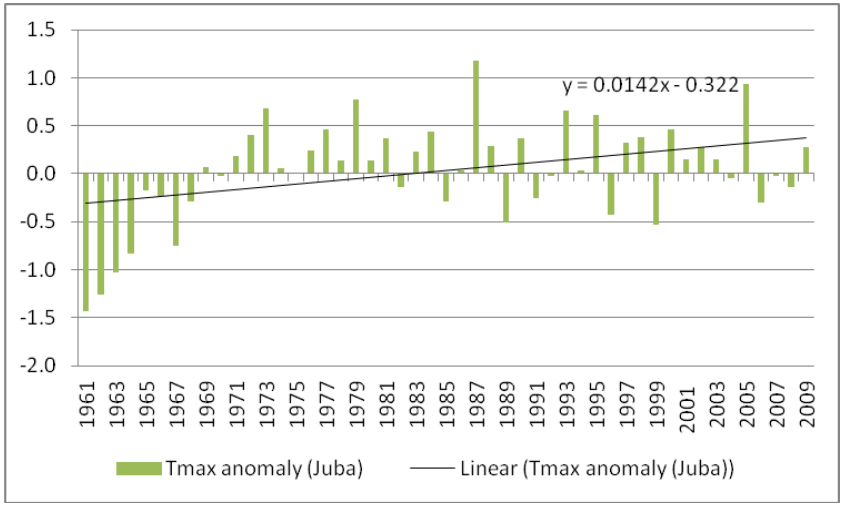
Climate change is a global challenge affecting all countries around the world. The international community has recognized the climate change problem and has determined to address it

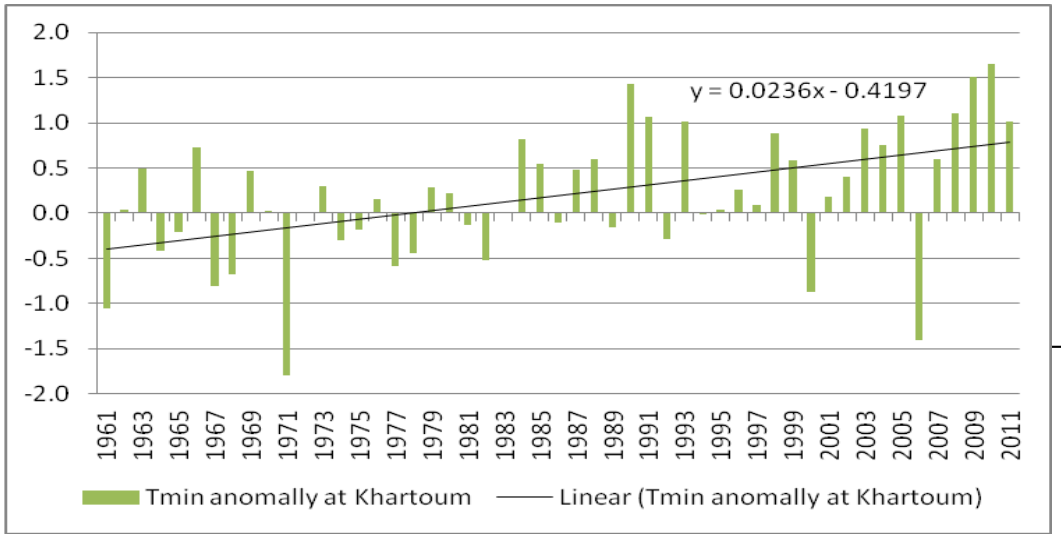
- UNFCCC
- Kyoto Protocol
- Paris Agreement on climate change

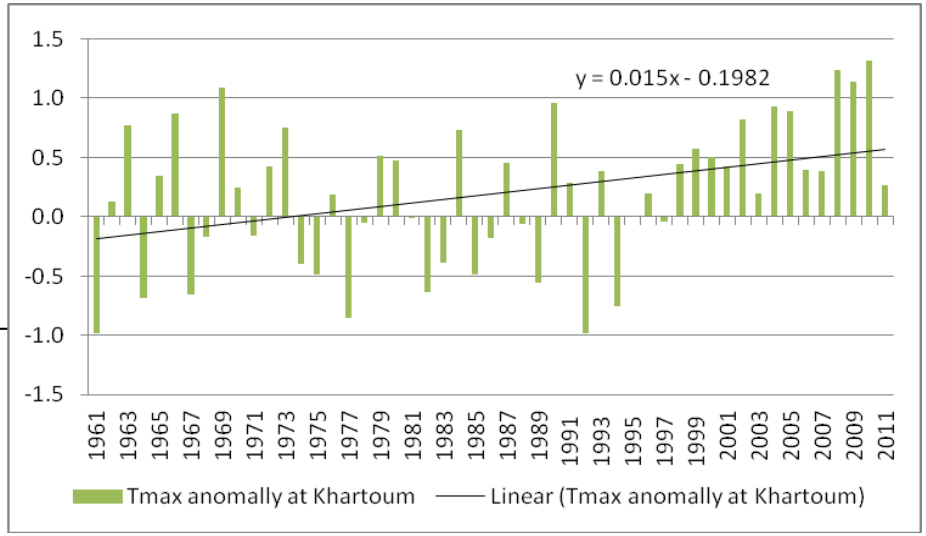
EVIDENCES OF CLIMATE CHANGE

Annual temperature variability and trends









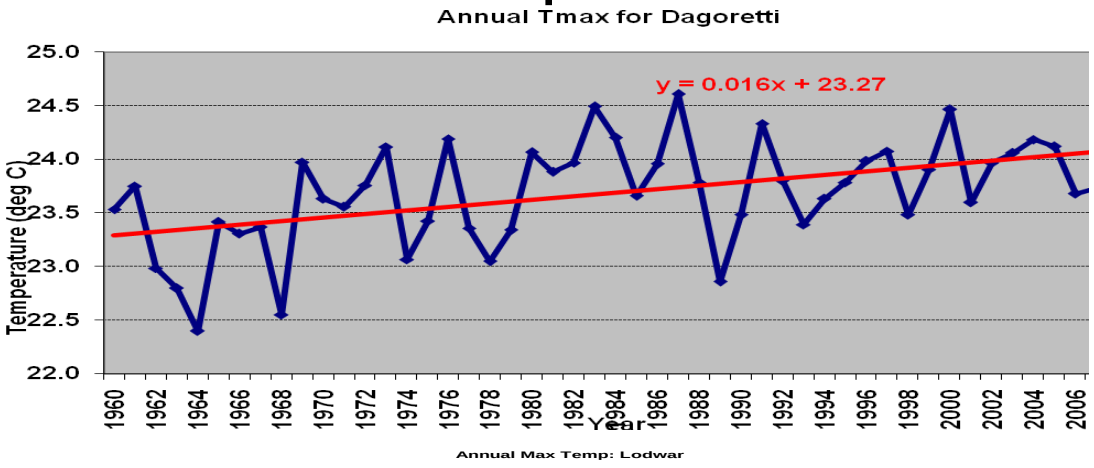
HUMAN INDUCED CLIMATE CHANGE

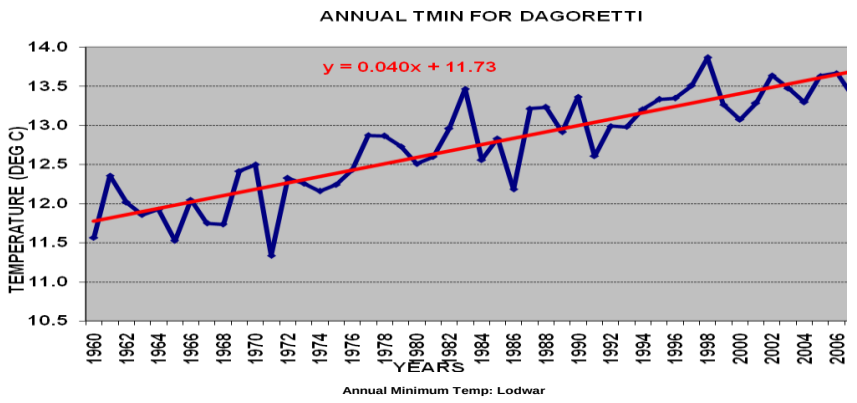
Information and Knowledge requirements for climate change

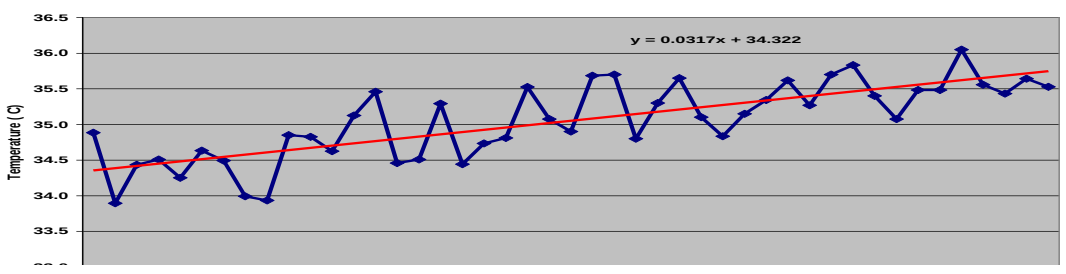
- What has been observed so far (Climate trends)?
- How is the future climate look like (climate projections)?
- What are the impacts of Climate change?
- What are the responses to climate change at the international and national level?

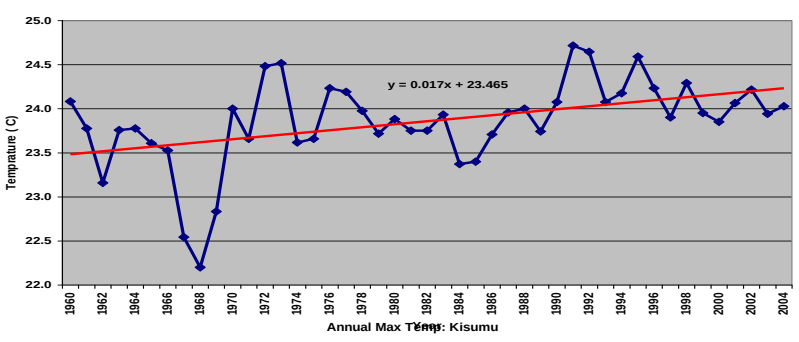
EVIDENCES OF CLIMATE CHANGE

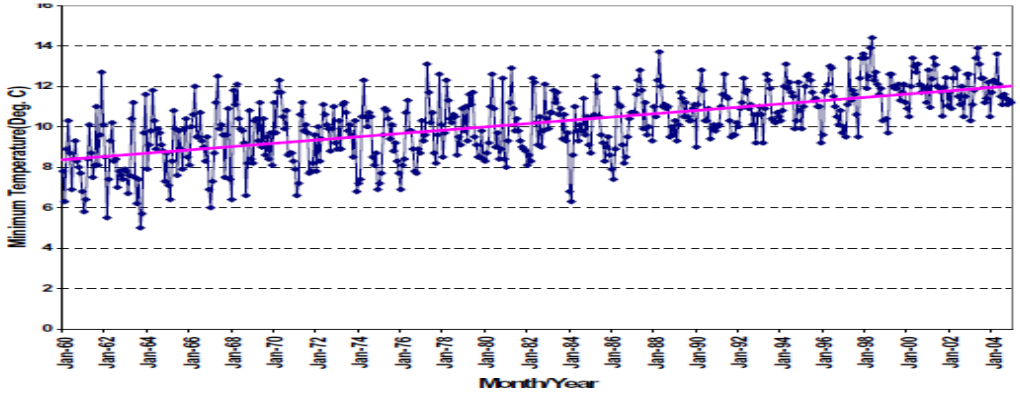
Annual temperature variability and trends

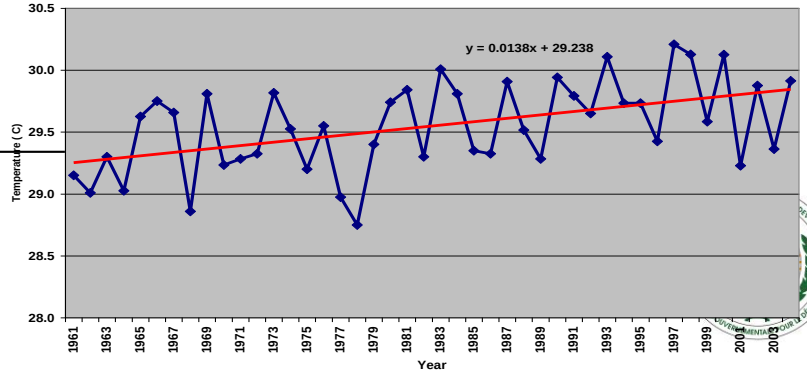






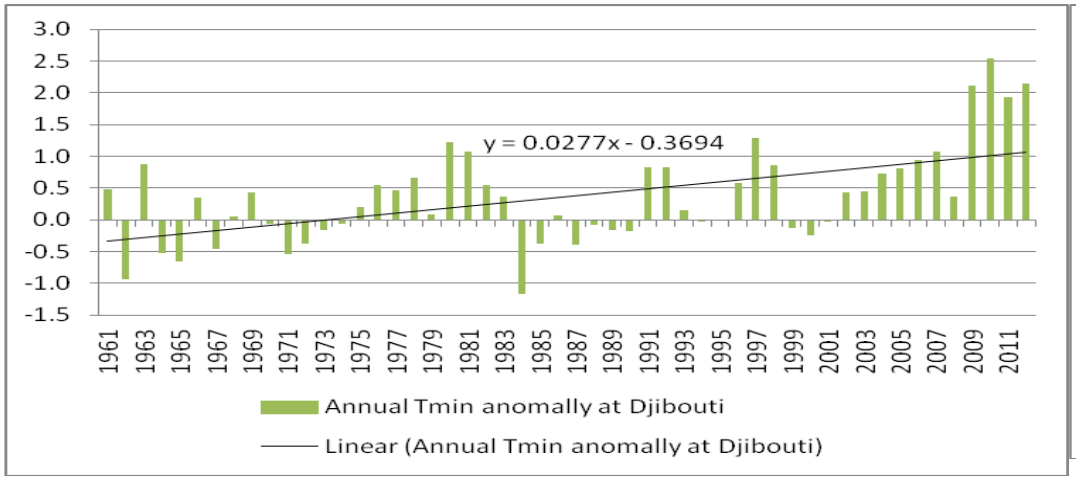


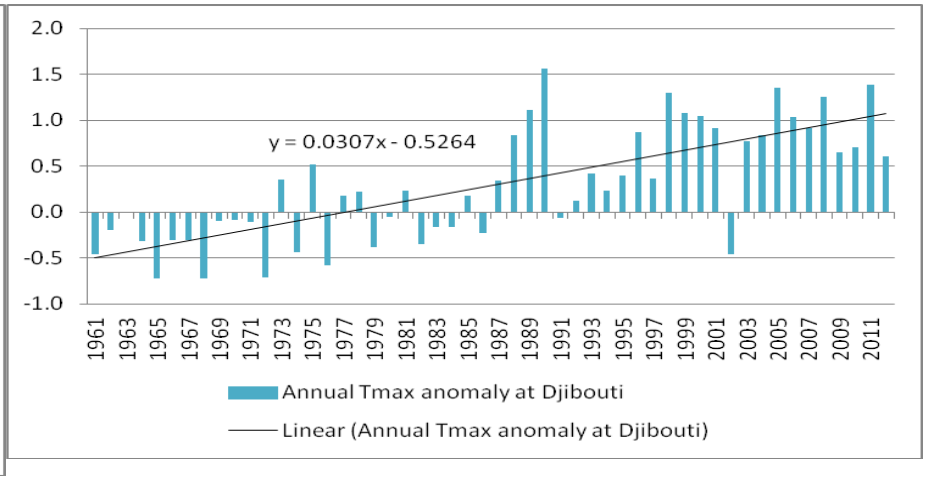


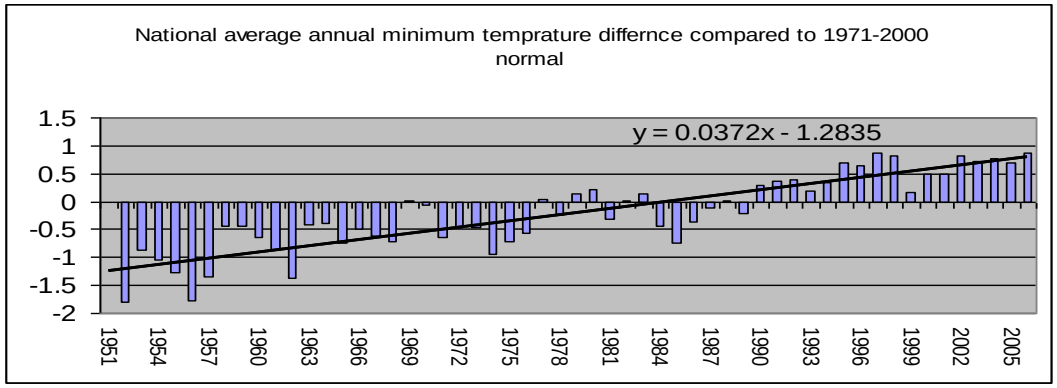


EVIDENCES OF CLIMATE CHANGE

Annual temperature variability trends

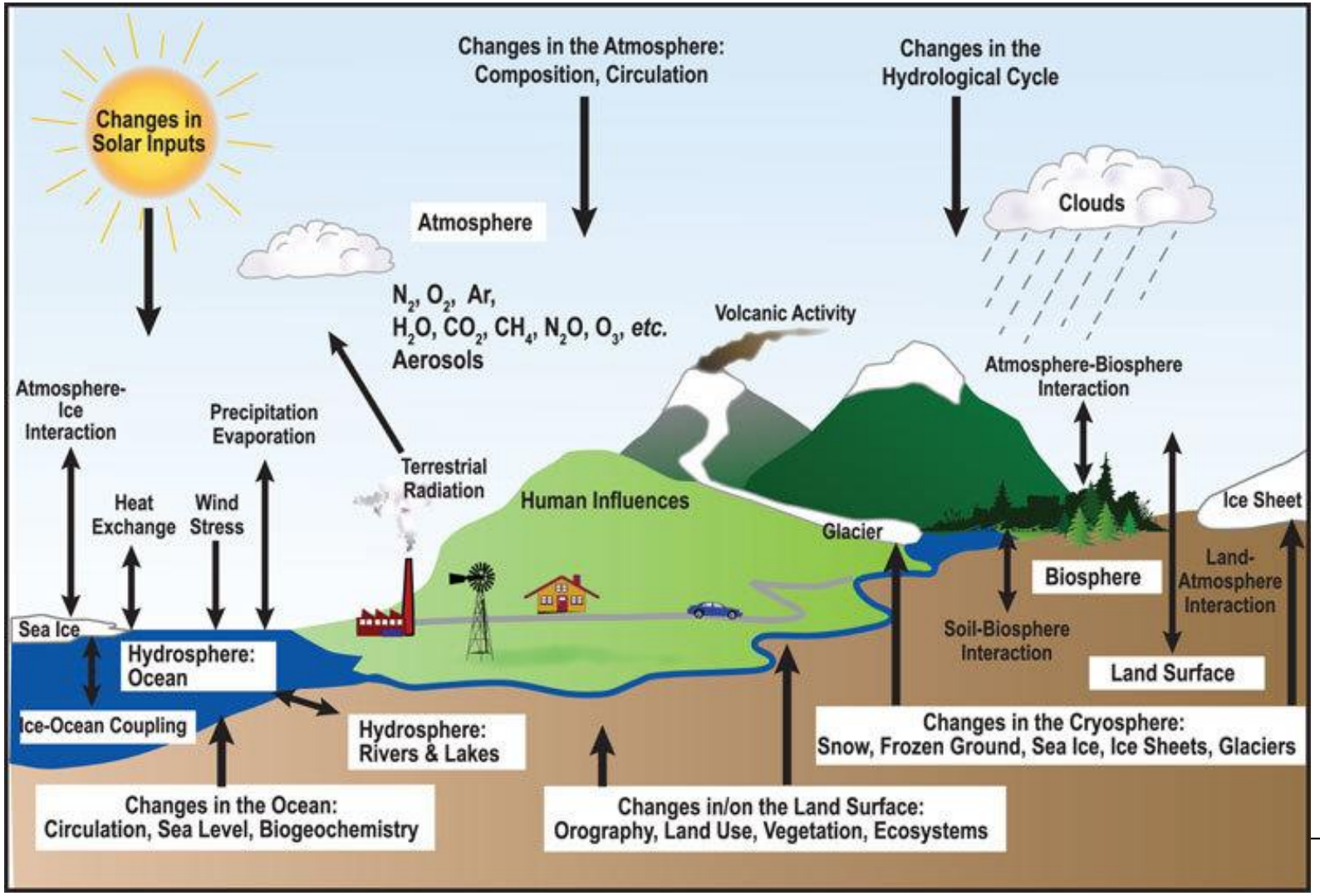




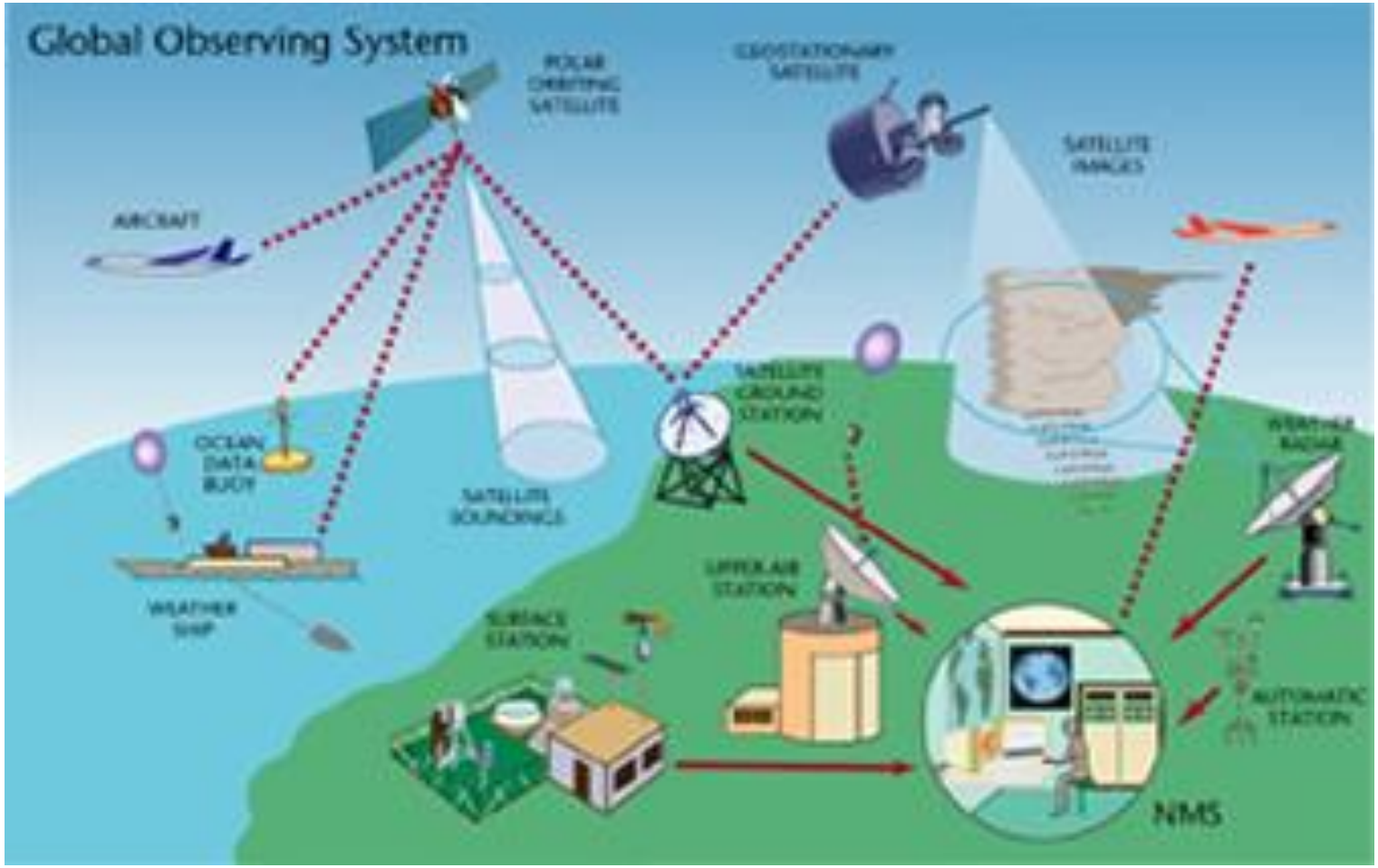


Variability and trend of annual mean minimum temperature annual mean maximum temperature at Djibouti (Authors own analysis).

THE EARTH'S CLIMATE SYSTEM



OBSERVATION



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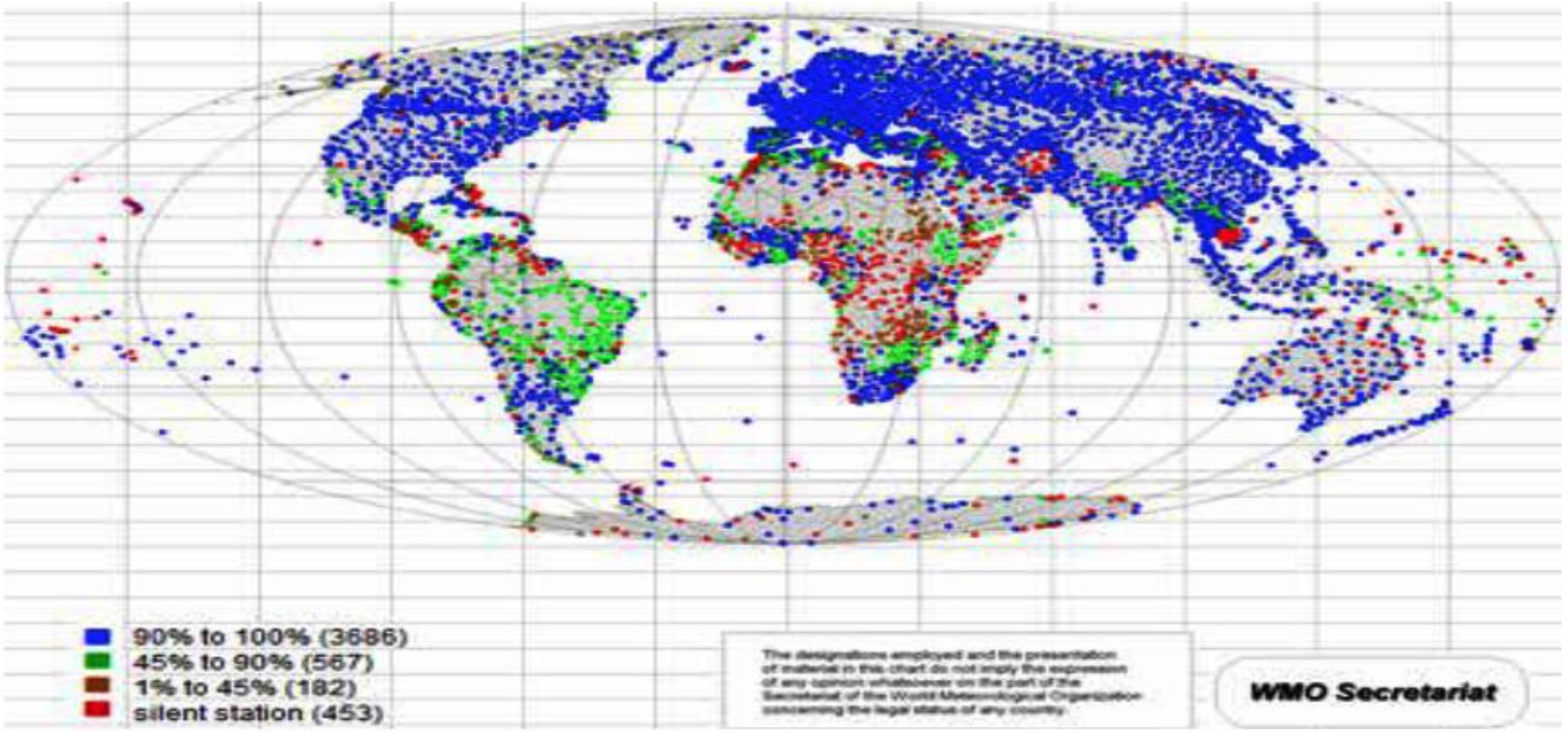

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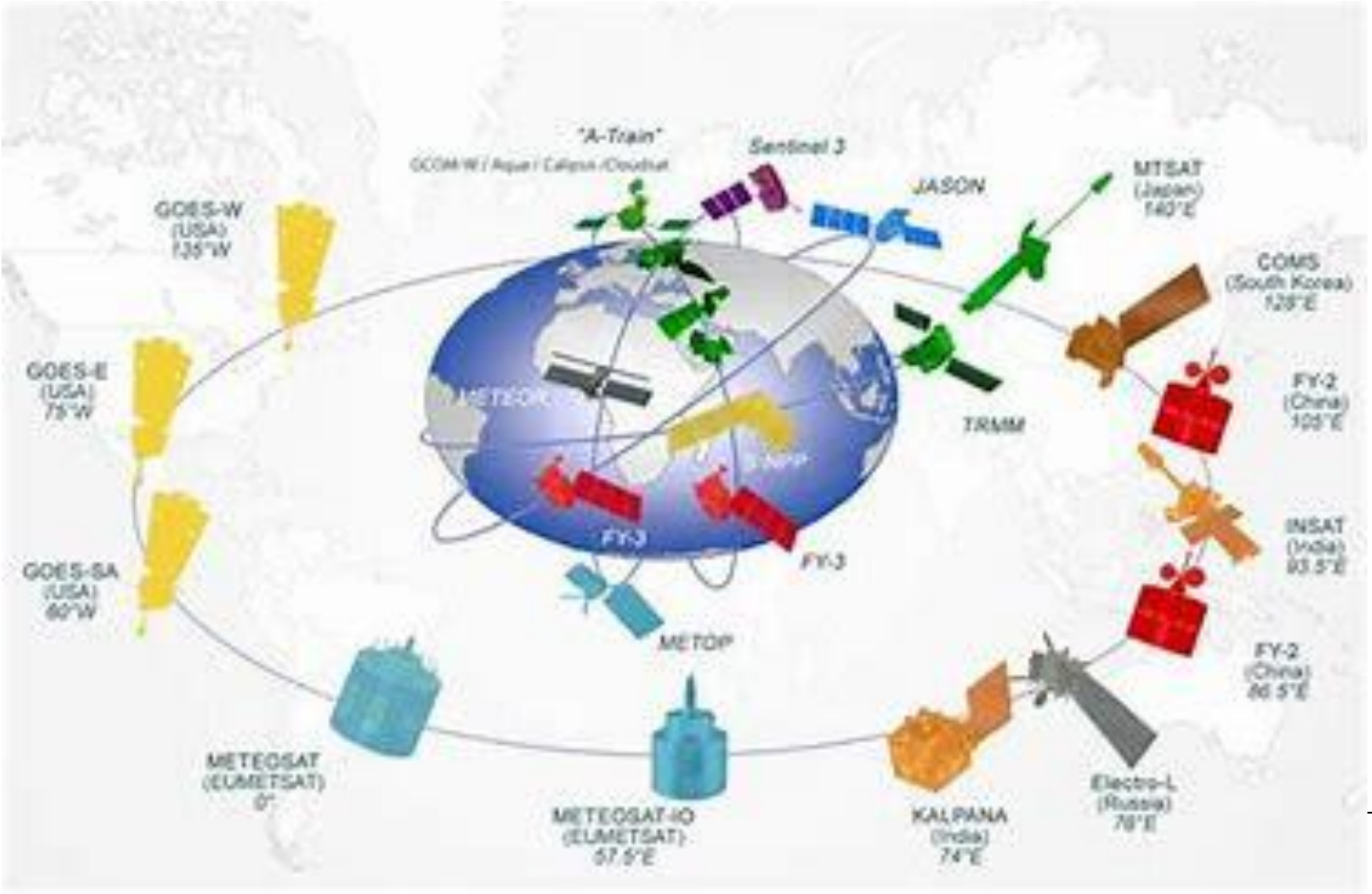
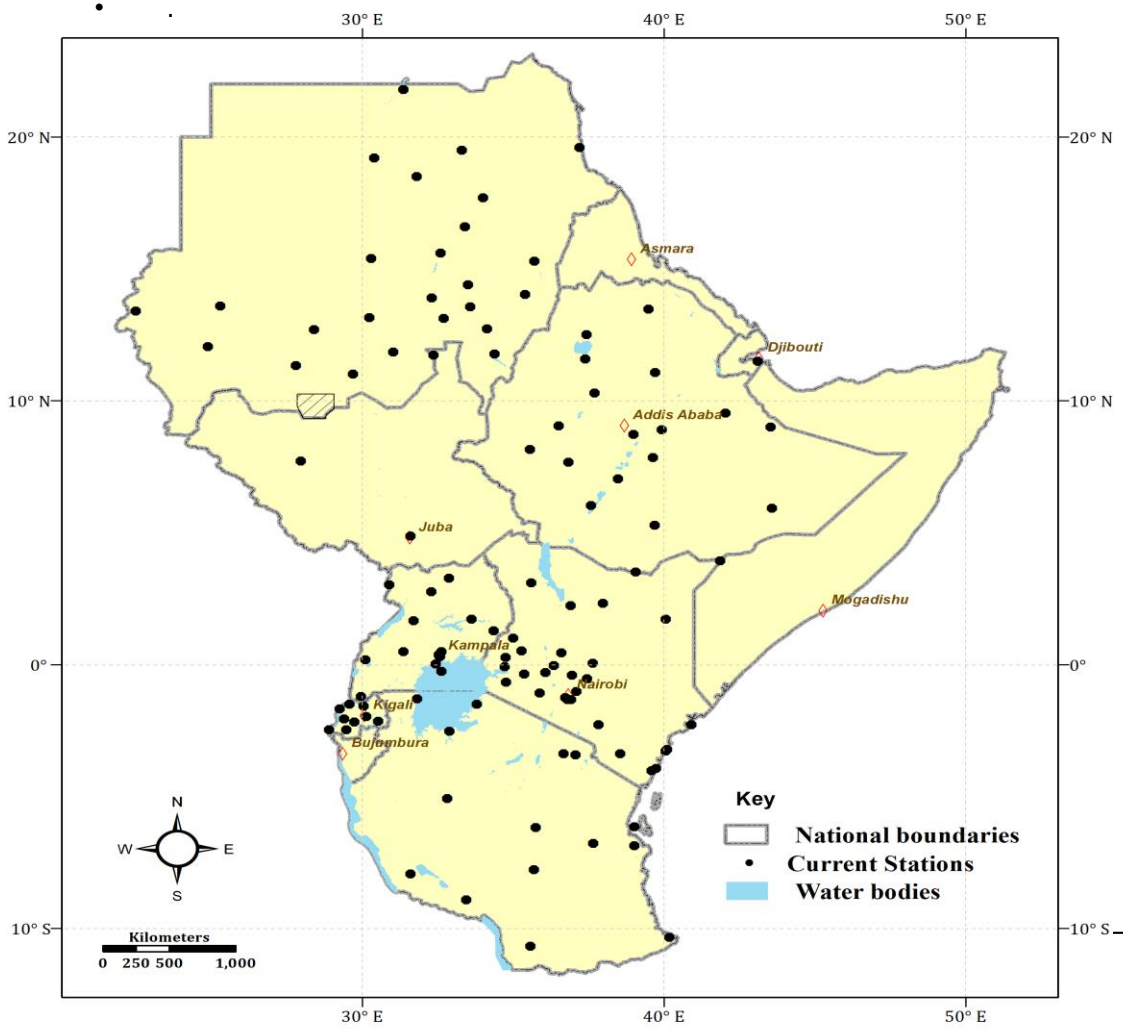


OBSERVATION

OBSERVED DATA - STATIONS



OBSERVATION

CHALLENGES

Diversity of climate information needs

- Short term climate information
- Long term climate information

Diversity of climate information users and providers

Players and stockholders are many

- National governments (Met services, Environment ministries
- NGOs
- UN organization (WMO, UNEP, UNDP, World Bank)
- Researchers
- NGOs
- Universities
- Professional associations

- Banks
- Private sector