



**4<sup>th</sup> AFRICA CLIMATE TALKS**  
**Setting the scene:**  
**Ensuring better Climate Information**  
**services for enhanced resilience and**  
**improved livelihood in the Sahel**

**By ACMAD**

**February 27 2023**  
**Niamey-Niger**

1. User Interface \*
  2. Observations networks, stations and data management
  3. Research, Modelling and Prediction
  4. **Climate Services Information System \***
  5. Capacity Development<sup>8</sup>\*
- \* priorities

# MOVE FROM CONVENTIONAL TO EMERGING FUNDING PRIORITIZATION

## Towards new approach

### Conventional Approach



Focus on the NMHS system / the public sector



**Modernization of infrastructure**  
Institutional Strengthening  
Service Delivery



Predominantly national projects

### Emerging Approach



Focus on national hydromet value chain - Public, Private and Academic Sectors as well as NGOs/CSOs



**Service Delivery by integrating with sectoral solutions**  
Institutional Strengthening  
Fit-for-purpose infrastructure Development



National projects + regional approach



## 1. USER INTERFACE AND KNOWLEDGE MANAGEMENT

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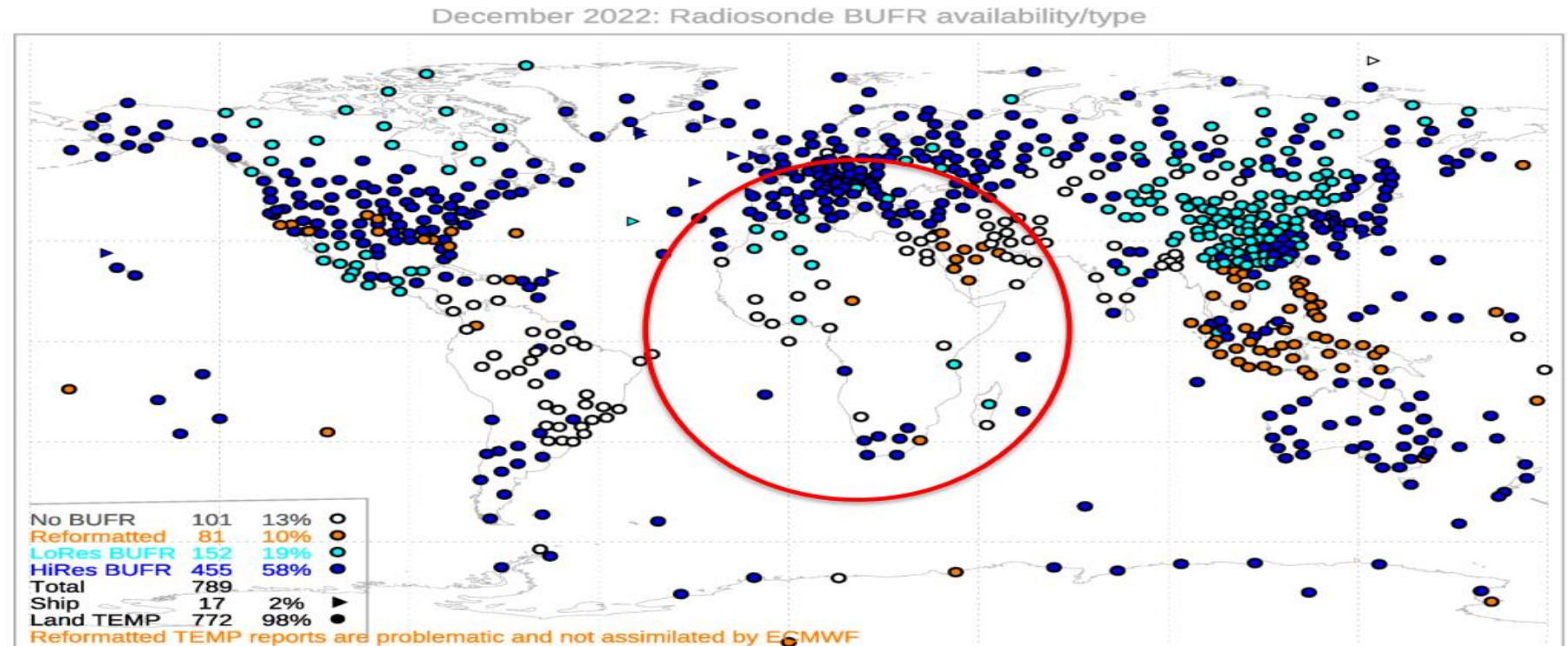
- Identify climate sensitive sectors through experience and surveys
- Assess sector climate vulnerability, impacts and risks
- Discuss vulnerability, impacts and risk reduction options
- Co-design and co-develop required climate services for vulnerability , impacts and risk reduction
- Deliver climate service and collect feedbacks for improvements
- Intermediation between service providers and seekers
- Internalization and externalization of climate information
- Using climate information and knowledge and derive sector climate resilient decisions, plans and actions
- Assess benefits to build trust and sustainability



# OBSERVATION STATIONS, NETWORKS AND DATA MANAGEMENT

- Surface Observing networks, Upper Air Networks, Remote sensing, Aircraft Based Observations to take advantage of digital transformation for monitoring, collecting, exchanging and processing data

## Upper Air Observing Networks



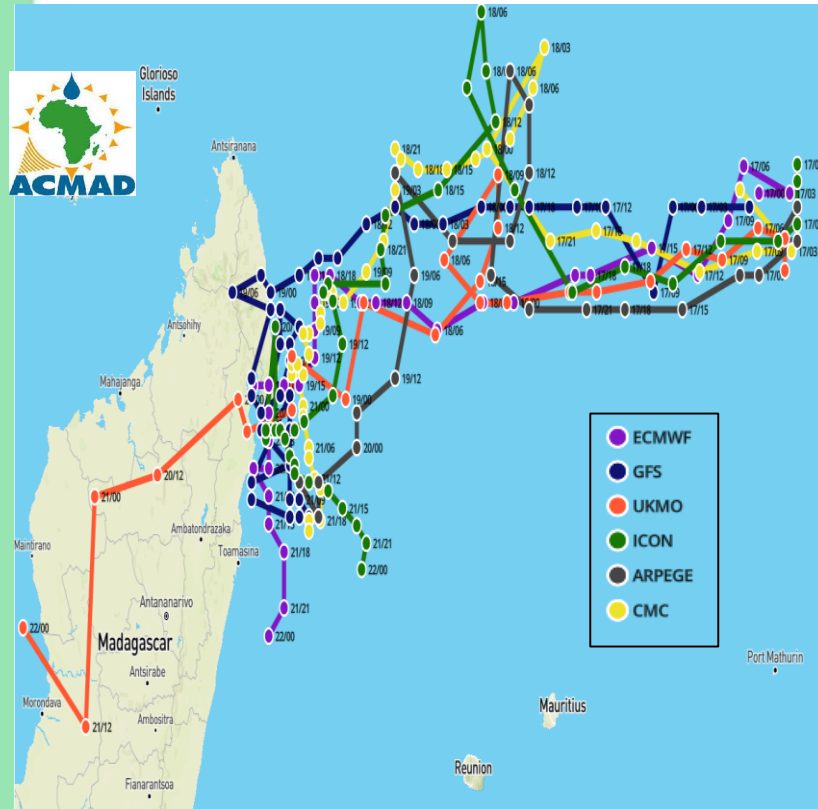


## 1. RESEARCH, MODELING AND PREDICTION

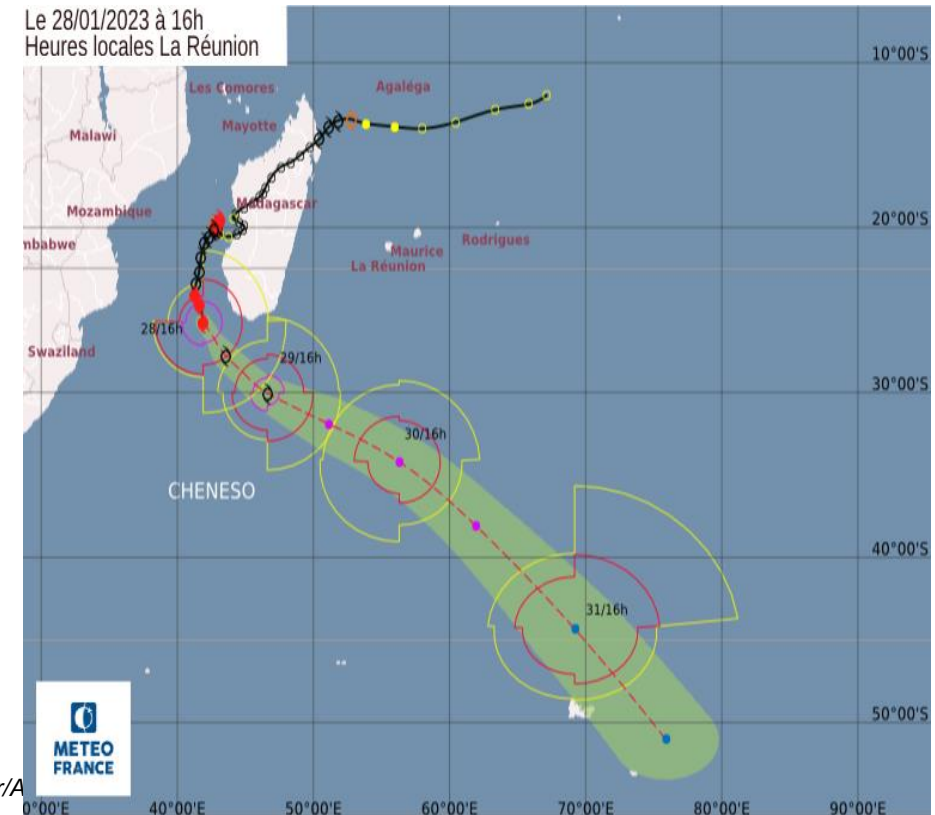
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- Organize targeted field campaigns based on needs (e.g collect observations for research to understand processes and phenomena related to extremes – heat-rains-drought....)
- Undertake research to better understand relationships between hazards and impacts, build impact models ( e.g rainfall and water levels in dams and rivers, flood severity)
- Develop, validate and verify hazards and impacts forecasting models
- Develop benefits assessment tools to support sustainability
- Demonstrate climate impact based development planning
- Develop tools generating actionable indicators ( e.g start of agriculture season, water levels in reservoirs) ( Uclip, CLIMTAG, MyDewetra...)

**Cyclone tracks from: 17-01-2023, 00UTC to 22-01-2023, 00UTC / Possibility to prepare for cyclone impacts up to 5 days ahead for cyclone Cheneso**



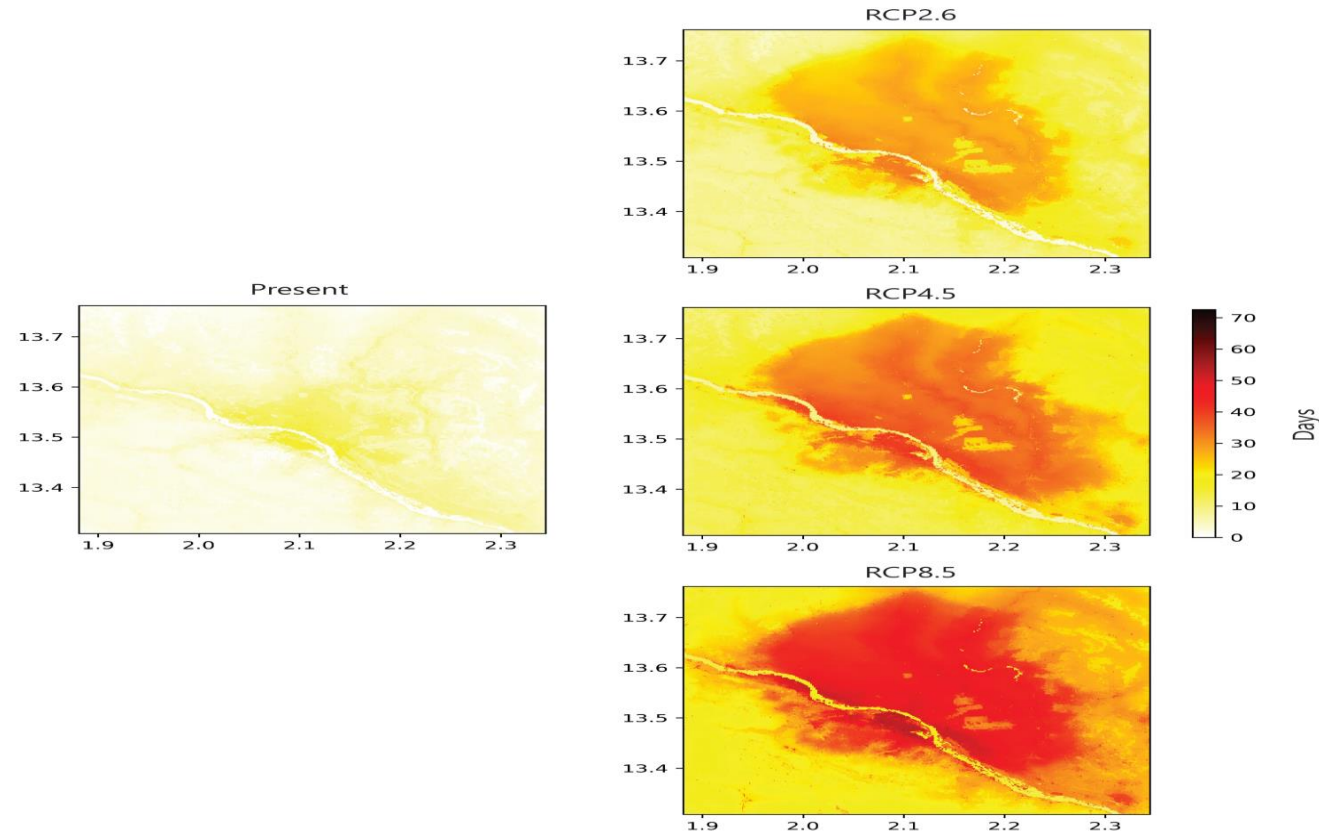
Le 28/01/2023 à 16h  
Heures locales La Réunion



<http://sgbd.acmad.org:8080/thredds/fileServer/Amml>

Example of Research, development, Experimentation, pilot demonstration of products at local level to be transfer trough capacity Development in NMHSs for supporting adaptation and resilience to heat related disasters in cities.

## The Urban Climate Information Platform (UCLIP) Outputs



**FIGURE 9** Number of heatwave days per year over Niamey in a present (2001-2020) and future scenarios (2041-2060).

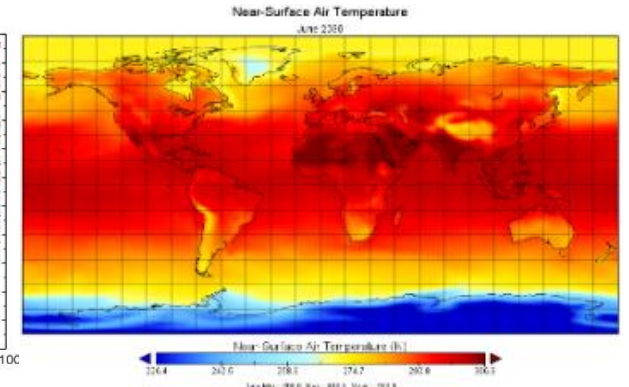
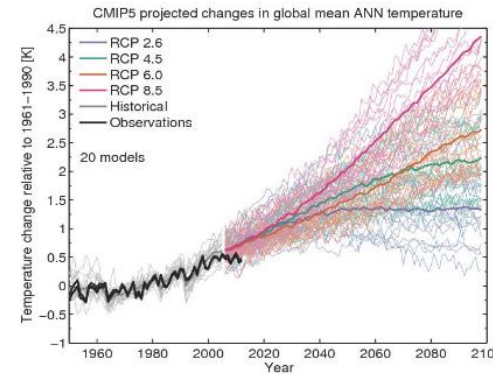
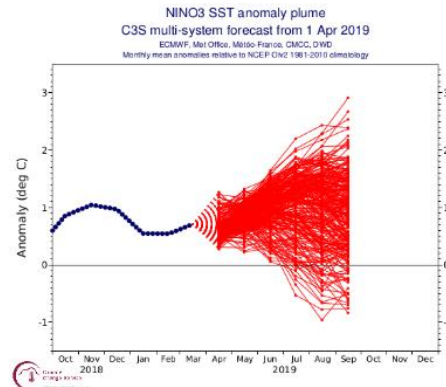
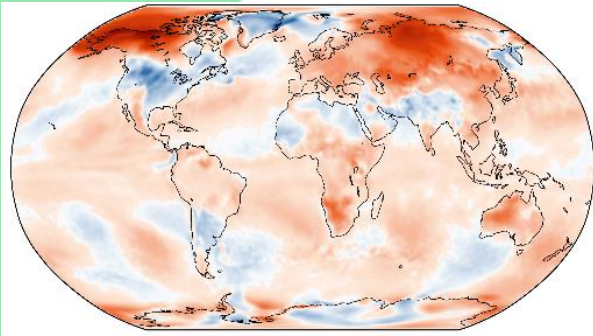


ACMAD

REFLECT

RESPOND

ADAPT



1981

now

2100

Historic climate data  
1981-2010

Seasonal forecasts  
the next 1 to 6 months

Future climate projections  
2011-2040, 2041-2070, 2071-2100

**Historical agro-  
climate  
indicators**

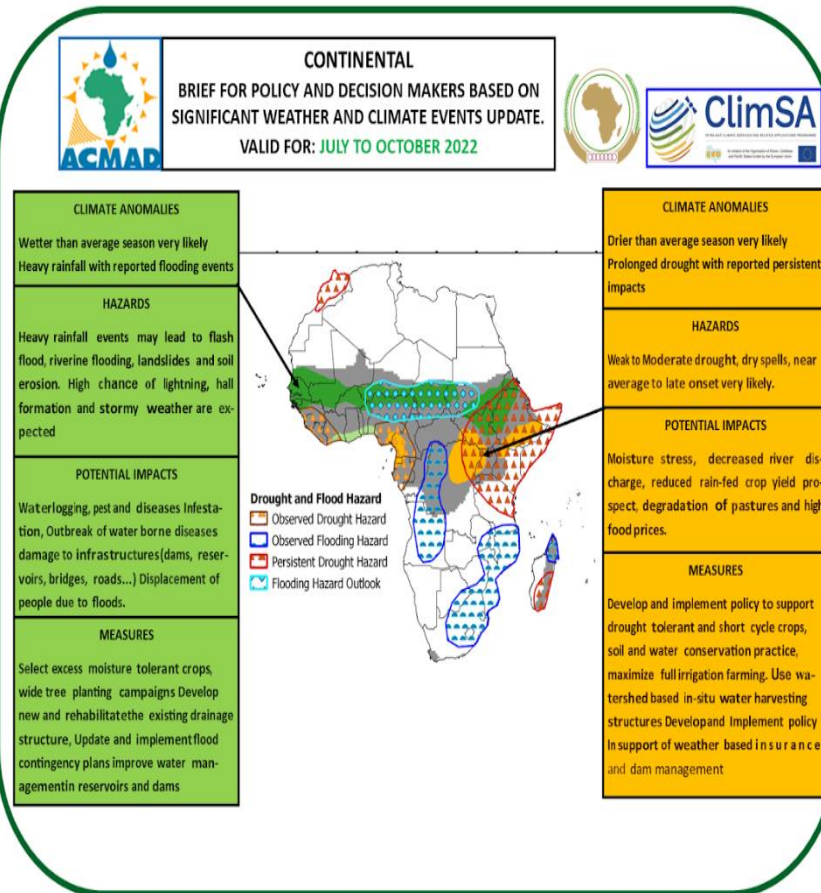
**Agro-seasonal indicators**

**Future agro-climate  
indicators**

# •IMPACT BASED FORECAST-ACTIONABLE INDICATORS

## •ACMAD-UNOCHA West and Central Africa office

### INTERACTION WITH HUMANITARIAN



### WEST AND CENTRAL AFRICA Flooding Situation: Hotspot Countries

As of 9 September 2022

#### OUTLOOK

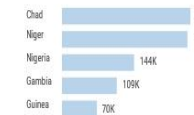
Countries with the highest risks of floodings based on the rainfall forecast for July to October 2022 include Chad, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Mali, Niger, Nigeria, Senegal, and Sierra Leone<sup>1</sup>. Hotspot countries have a significant number of people residing in areas with high floods exposure and are thus expected to receive "normal to above average rainfall" or "above average rainfall" during the 2022 rainy season<sup>2</sup>.

<sup>1</sup> Analysis was carried out by OCHA

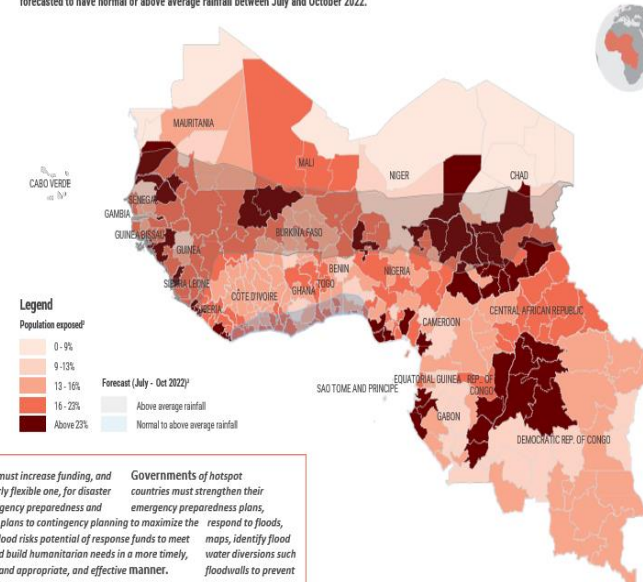
<sup>2</sup> Flood risk exposure map was created by World Bank (<https://www.nature.com/articles/d41467-022-38722-4>)

<sup>3</sup> Forecast was done by according to African Centre of Meteorological Application for Development (ACMAD)

#### Countries most affected by floods between July and October 2021



#### Percentage of populations exposed to high flood risks overlaid with regions forecasted to have normal or above average rainfall between July and October 2022.



Humanitarian and development organizations must develop and implement emergency preparedness and contingency plans as these are critical to mitigate the risk of humanitarian impact of floods in "at-risk" countries.

Donors must increase funding, and particularly flexible one, for disaster and emergency preparedness and including plans to contingency planning to maximize the response to floods, develop flood risks potential of response funds to meet zones, and build humanitarian needs in a more timely, as dams, and appropriate, and effective manner.

Governments of hotspot countries must strengthen their emergency preparedness plans, respond to floods, maps, identify flood water diversions such floodwalls to prevent floods.

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Sources: Media, UN reports, Red Cross and Red Crescent Movement and NGO reports, Government data. Data on displacement was provided by IOM. Source of data available upon request.

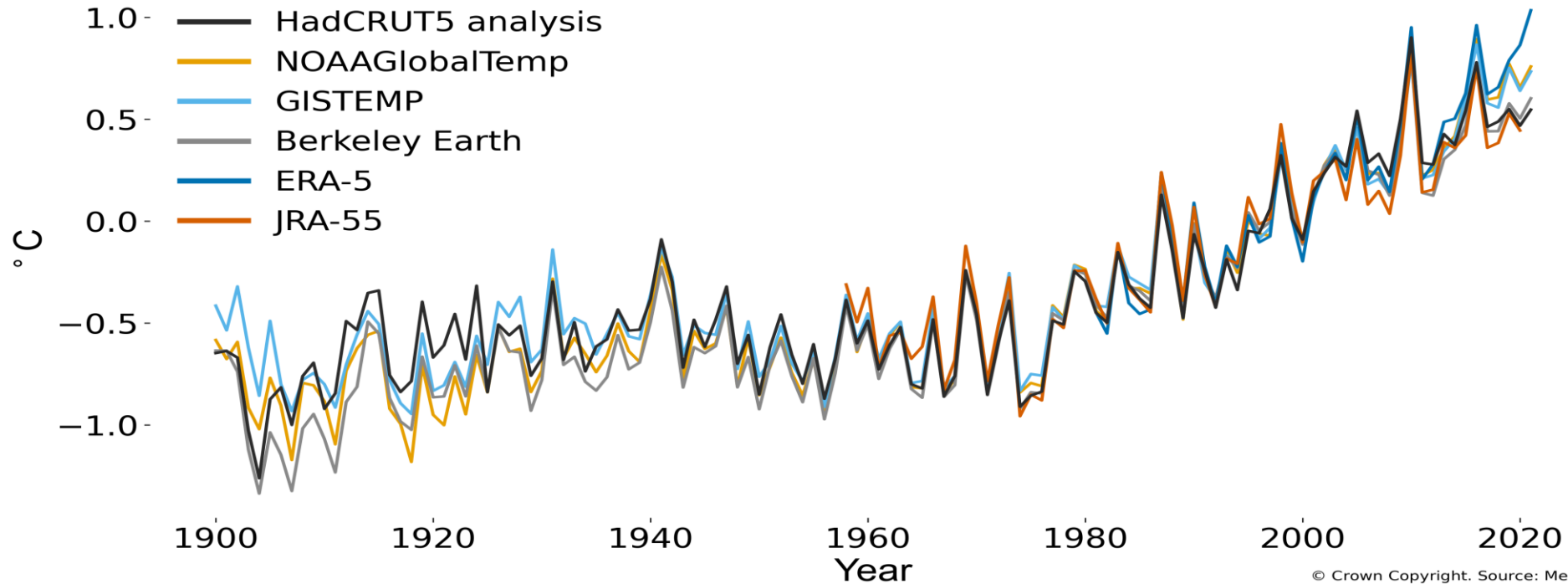
N.B.: This document contains evolving data which will be continuously updated.

# Warming in Africa

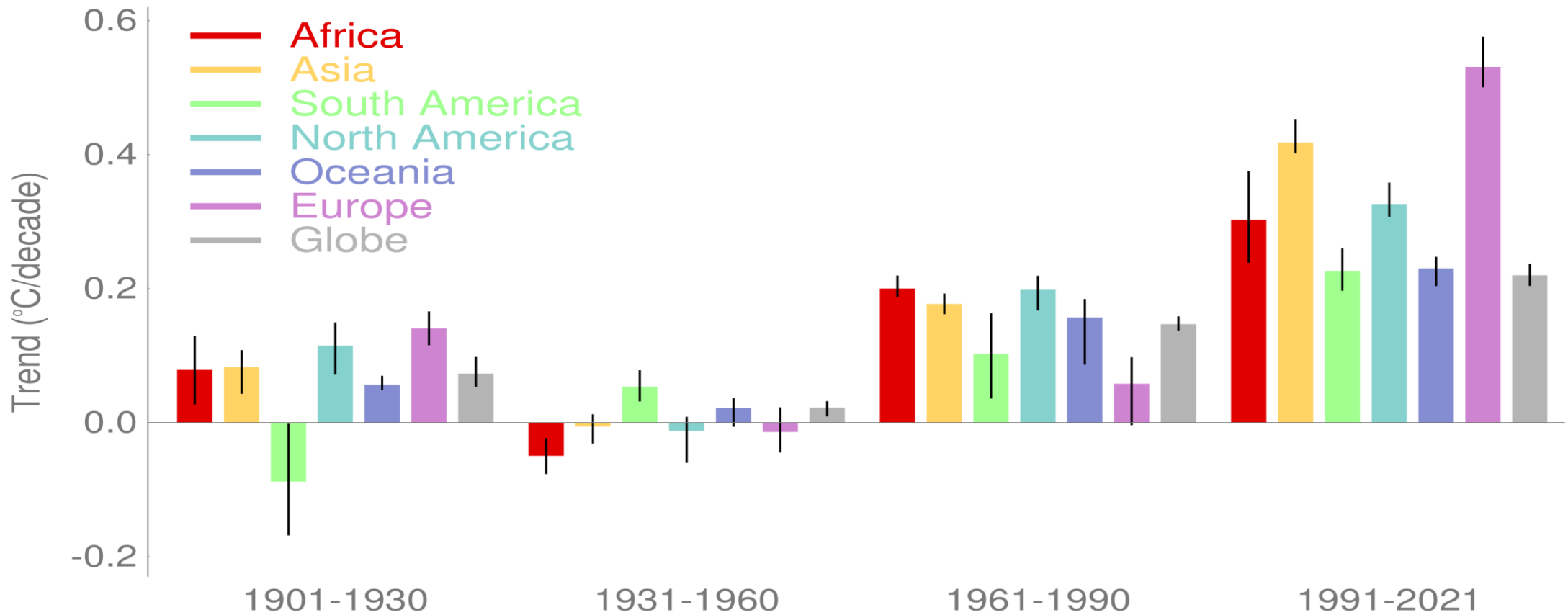


Met Office

WMO RA I Africa difference from 1981-2010 ( ° C)



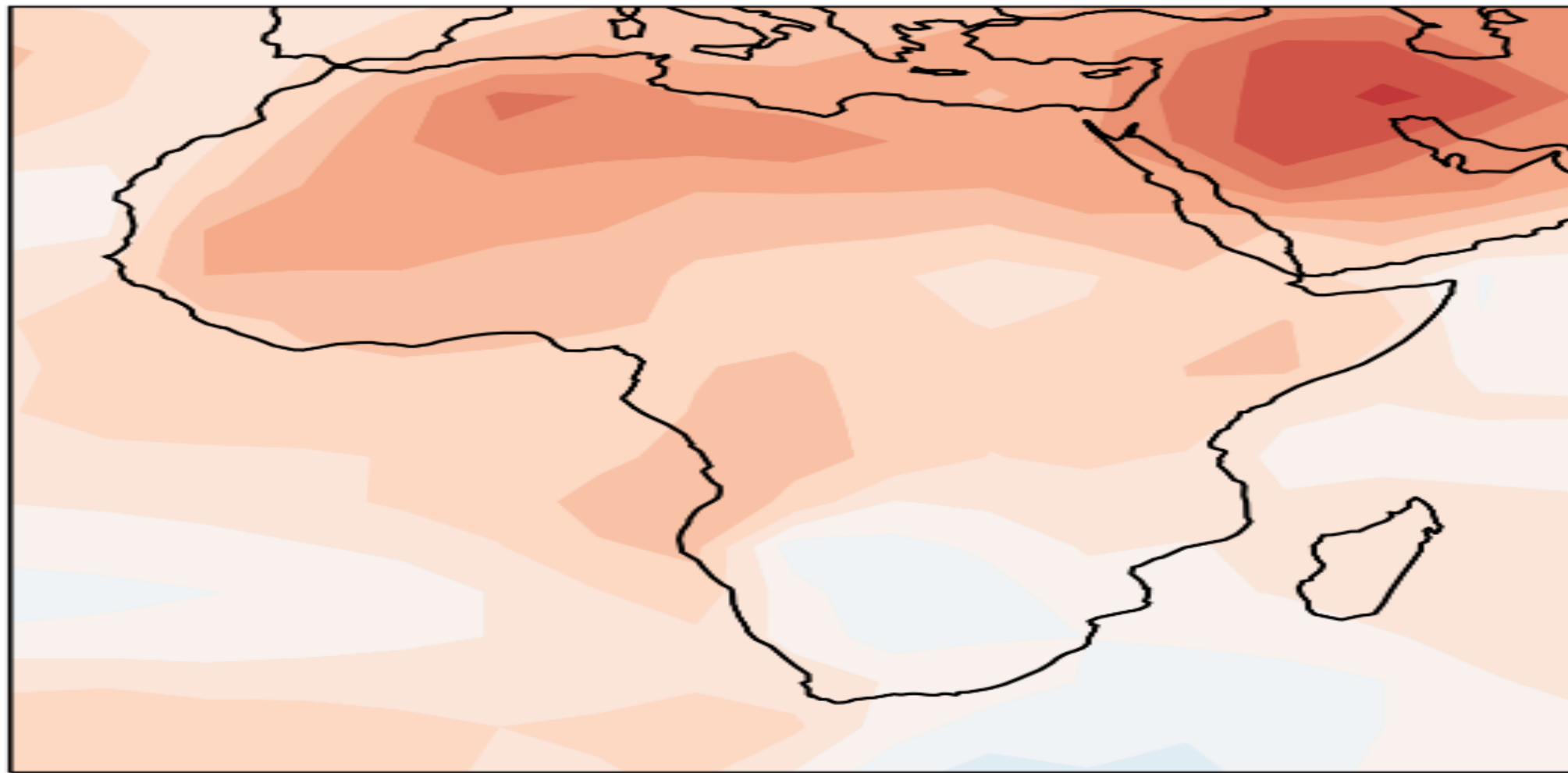
# • Warming trends for continents





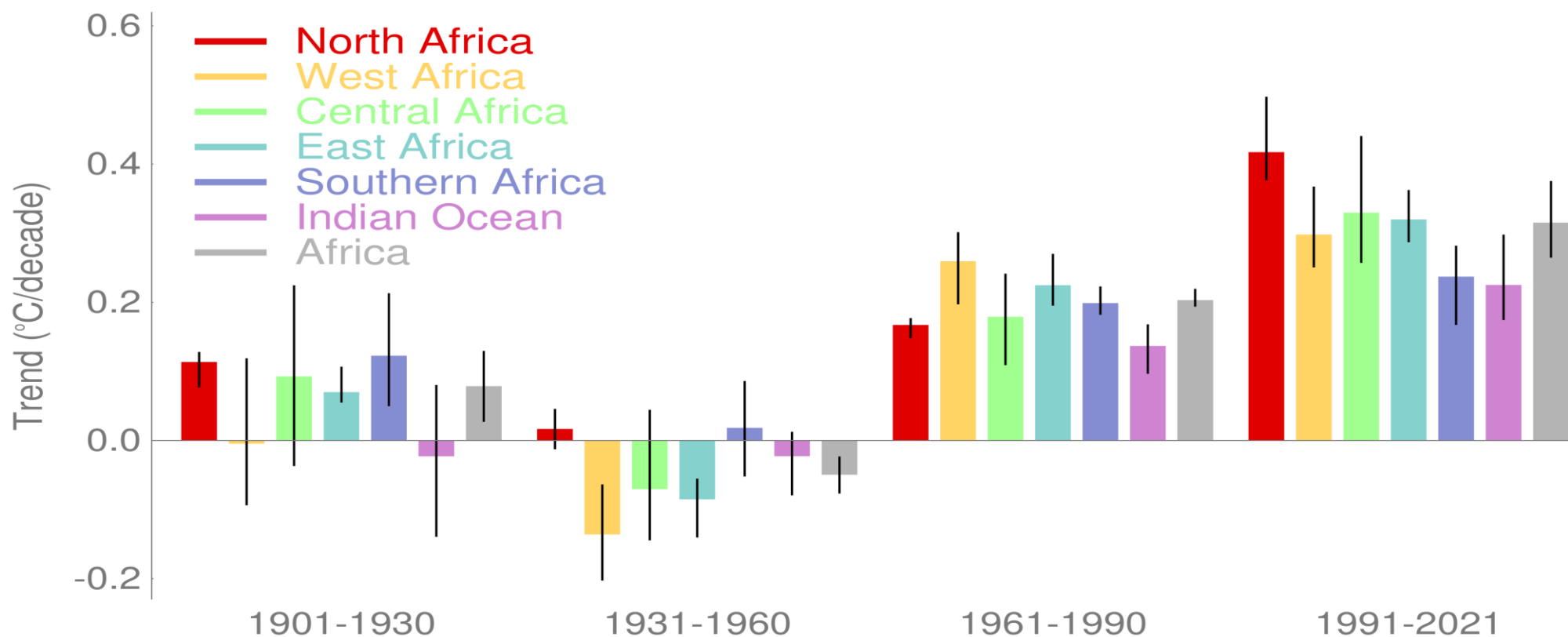


Annual mean temperature anomaly, 2021

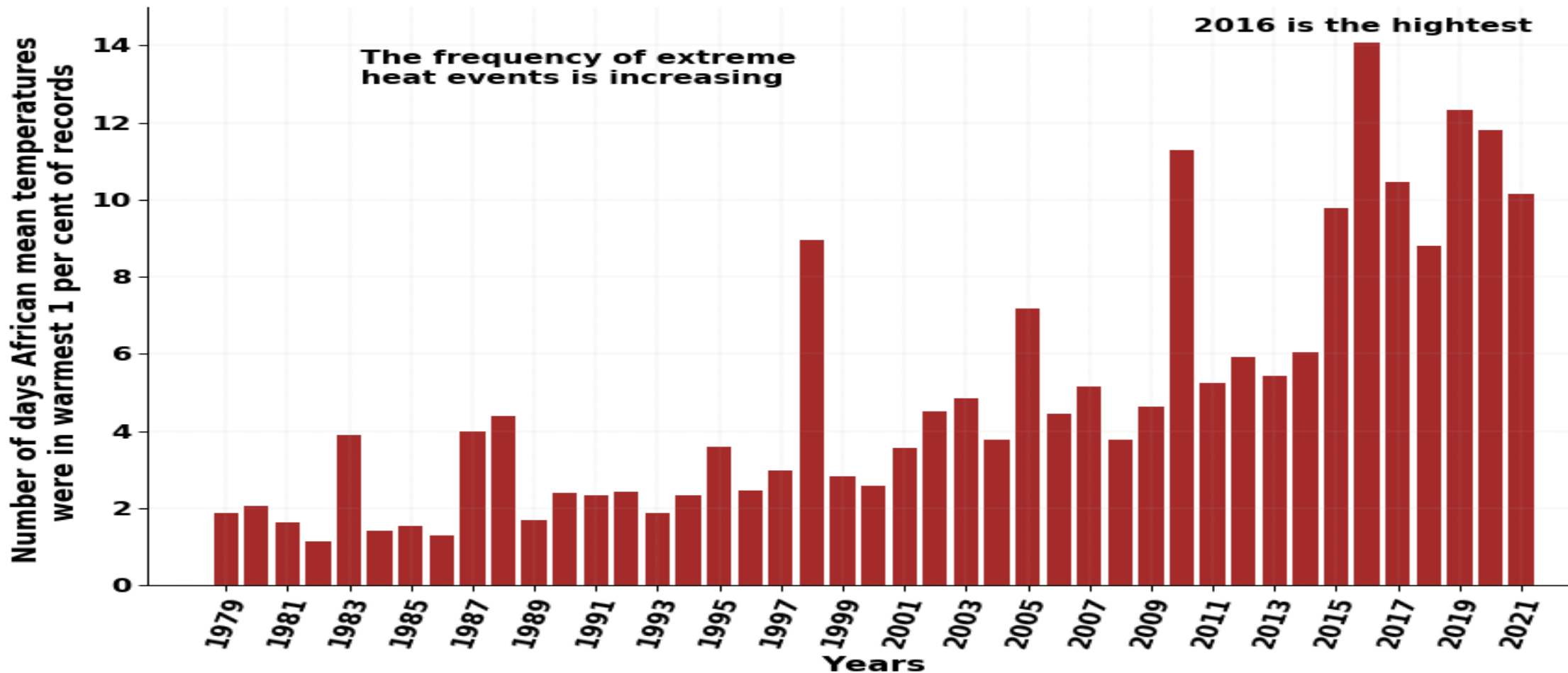


Anomaly relative to 1981-2010 (degC)

# • 1.1.Warming trends across Africa



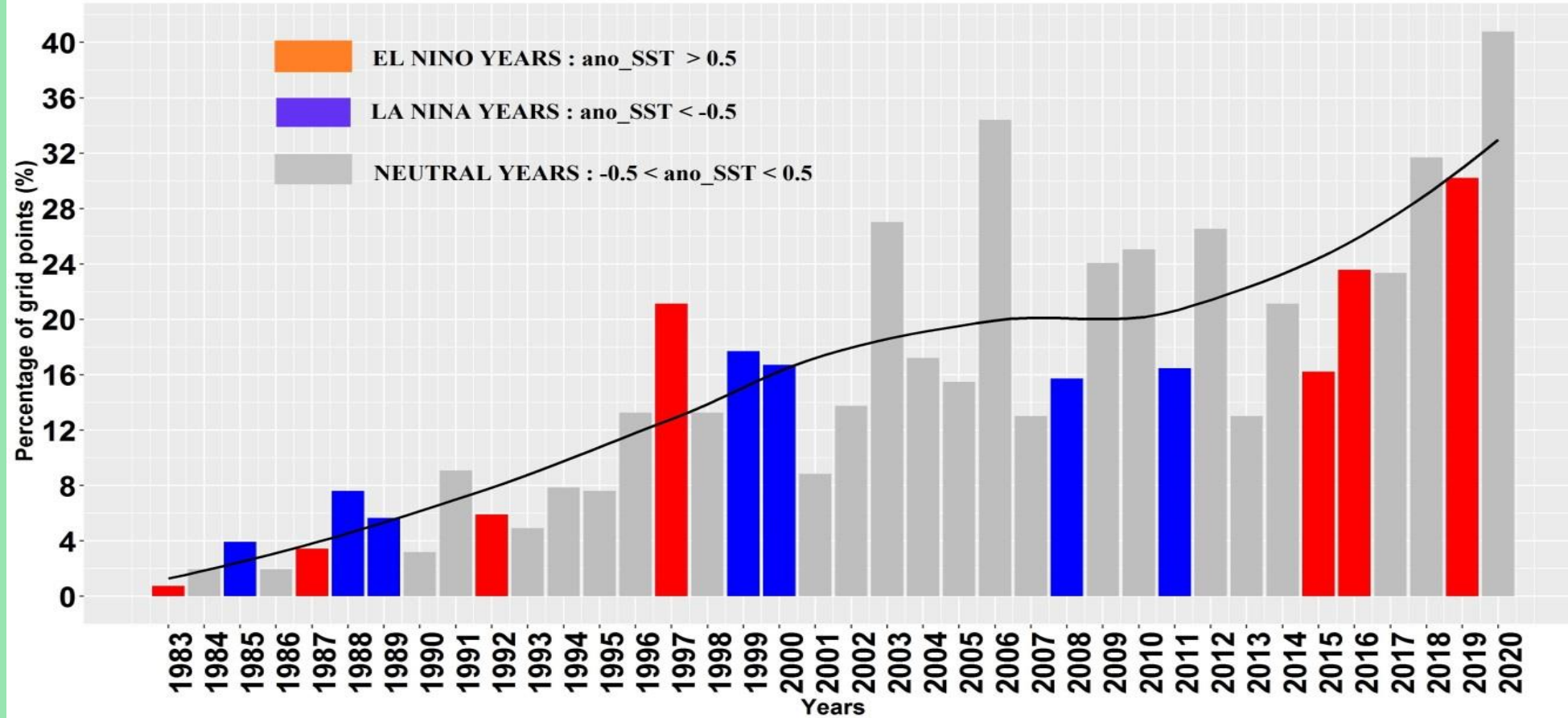
# Trends on number of extreme hot days across Africa



# • Trends on the surface hit by heavy rainfall

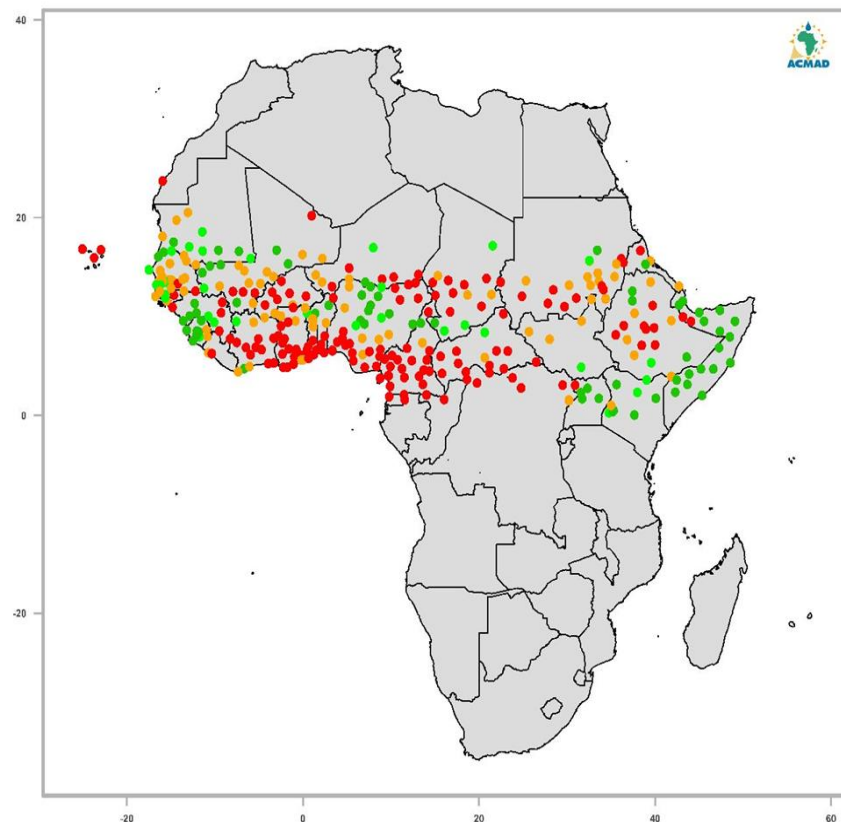


Percentage of grid points over African land masses with daily rainfall above the 90th percentile  
For the period 1981-2020, from January to December





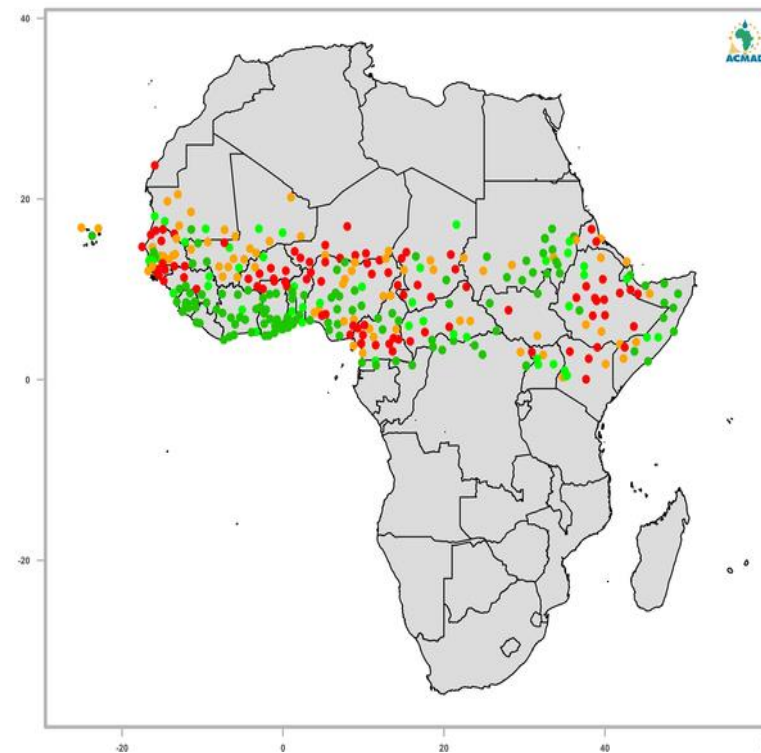
START OF THE AGRICULTURE SEASON FROM JANUARY TO JULY IN 2020  
OVER SUB-SAHARAN AFRICA.



Observed start of the Agriculture  
Season departure from Average.

- LATE
- NEAR AVERAGE TO LATE
- NEAR AVERAGE TO EARLY
- EARLY

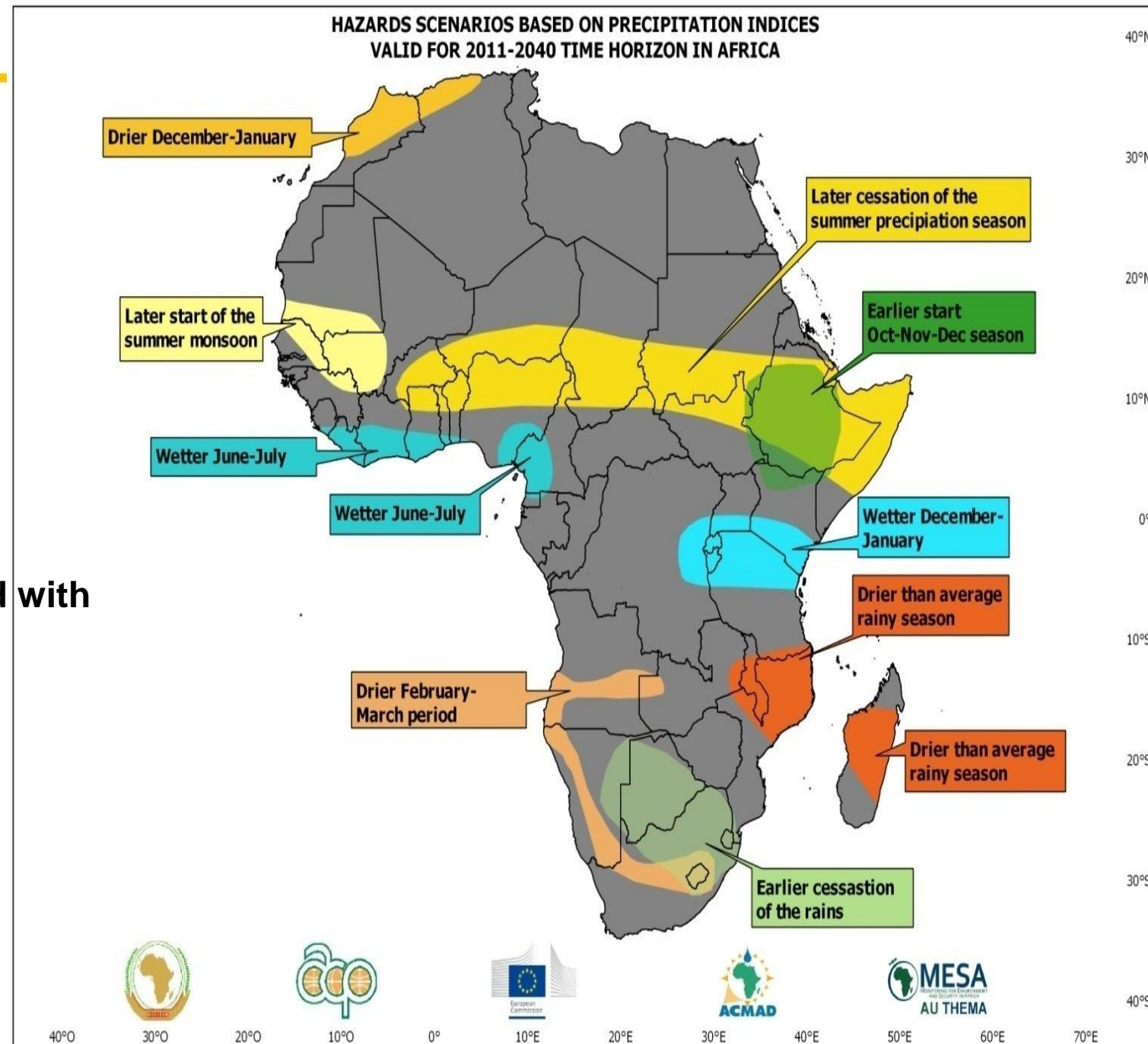
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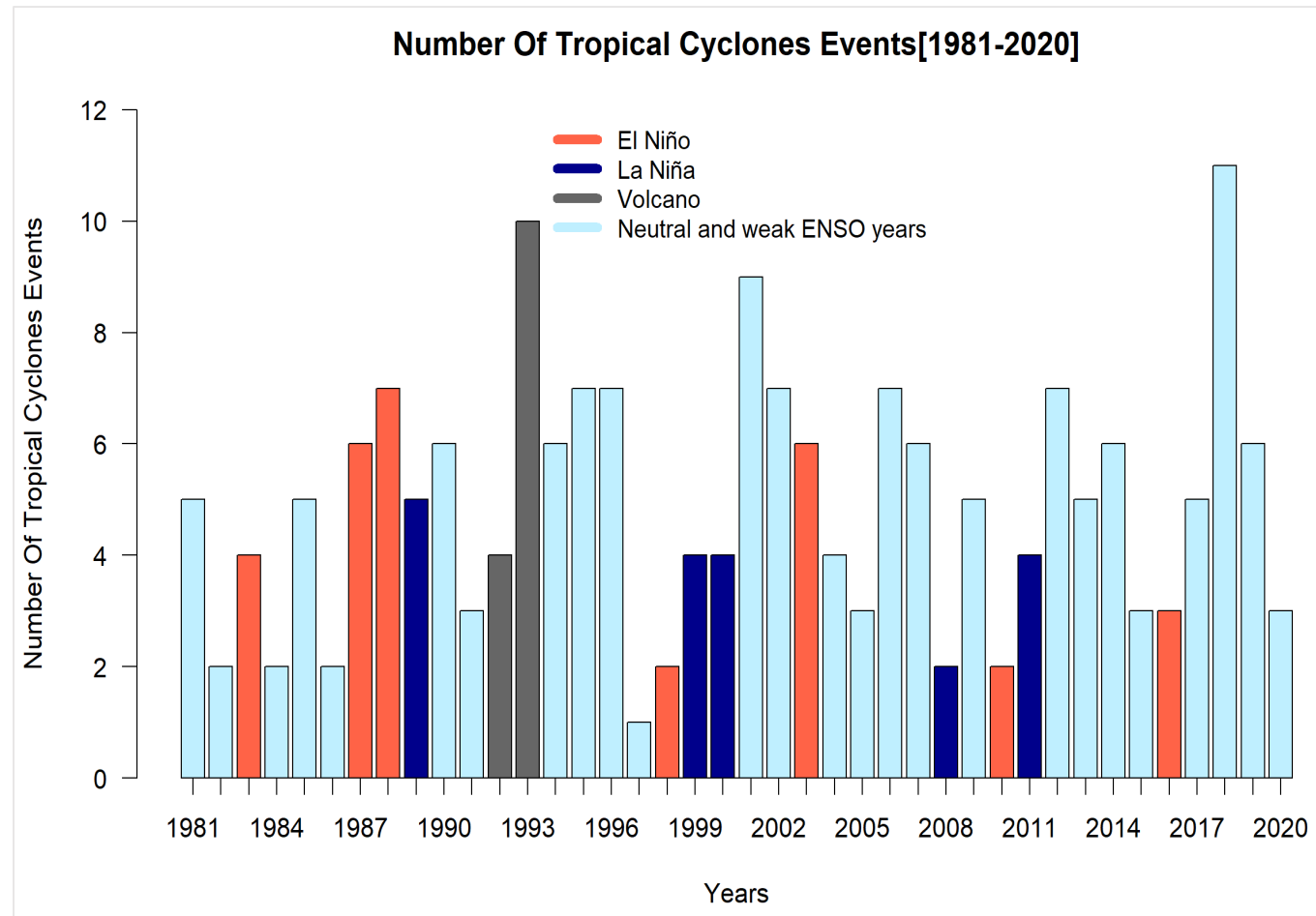
Observed start of the Agriculture  
Season departure from Average.

- LATE
- NEAR AVERAGE TO LATE
- NEAR AVERAGE TO EARLY
- EARLY

To be regularly updated with WCRP/CMIPs datasets



## Tropical cyclones from 1981 to 2020 in South west Indian ocean



Tropical cyclones vary from year to year.

Year 2018 and 1993 recorded the highest cyclones activities.

Figure 29: Tropical cyclones from 1981 to 2020 in *the SWIO region*?. The dark-grey colour are largest tropical volcanic eruptions years and are associated with cooler global temperatures. El Niño is a strong El Niño–Southern Oscillation (ENSO) event typically warmer than usual and cooler with a La Niña. Neutral and weak ENSO years are those events with neither El Niño, or La Niña characteristic; or are years with no moderate or strong El Niño or La Niña events. Data from World Meteorological Organization.

## CHALLENGES/GAPS FOR CAPACITY DEVELOPMENT FOR CLIMATE RESILIENCE

- Progress has been made but the following challenges came from surveys, briefings/debriefings discussions, testbeds, outlook fora, workshops...
- Impact based forecasting capacity is low with historical impact data not interoperable with met data
- **Partnerships with Universities and research institutes is weak**
- Risk assessments including risk profiling need upscaling
- Documentation on capacity (institutional, organizational, human resources, technical, operational...) gaps dimensions is fragmented
- Infrastructure ( energy, internet, data, tools...) is usually sub standards or under utilized
- Operating procedures or instruction manuals accompanying guidance material are often lacking
- Programs and training materials for specific competency areas not well organized
- **Online material and blended training integrating On the Job, secondment, internships, fellowships, testbeds, briefings/debriefings available in video, audio, text needed**
- **Cloud storage, processing services and partnerships for sharing digital resources are to be upscaled (e.g sharing HPC and cloud resources)**
- Young scientists are to be attracted, motivated and maintained in research&innovation program



# CAPACITY BUILDING ON FOR Example Impact based forecasting with

Climate phenomenon – Hazards (location, severity) – potential impacts – consequences-  
preparation and response- BAMS June 2021

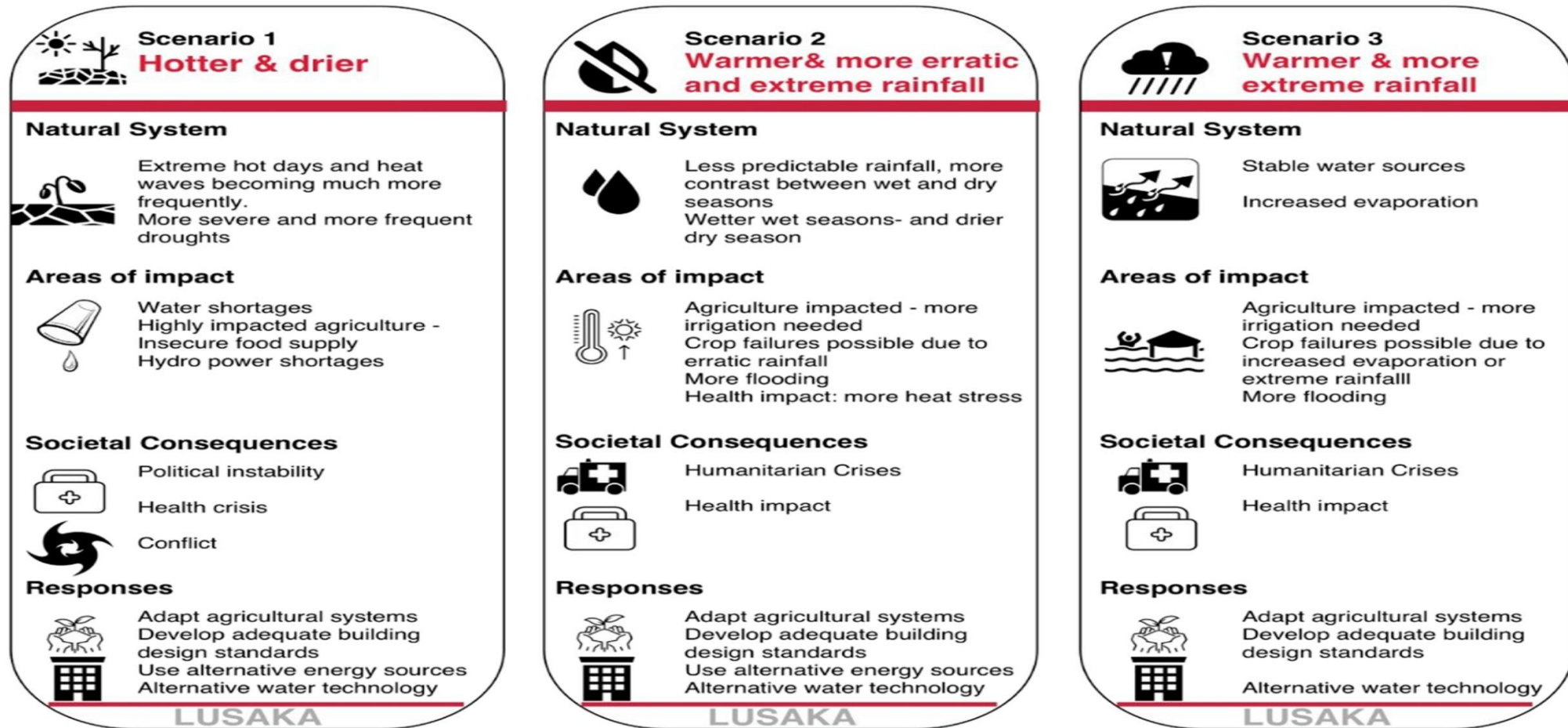
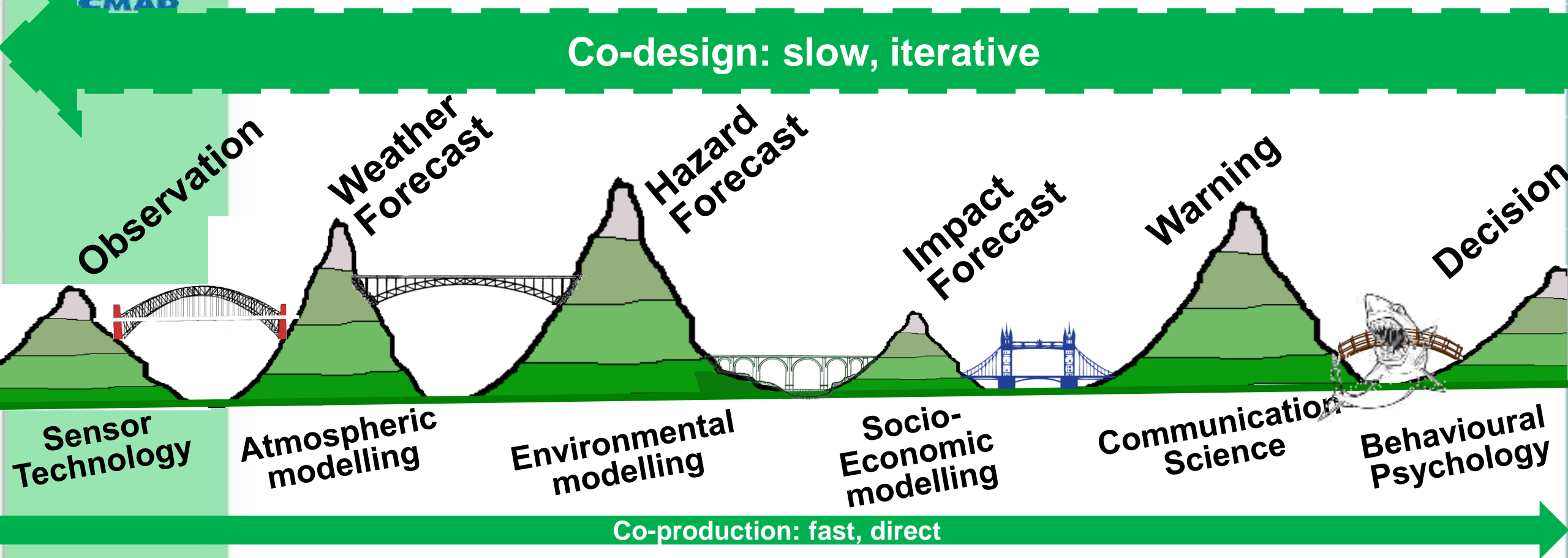


Fig. 5. Infographic summarizing three plausible future climate scenarios for Lusaka along with some key impacts, possible societal consequences, and responses.



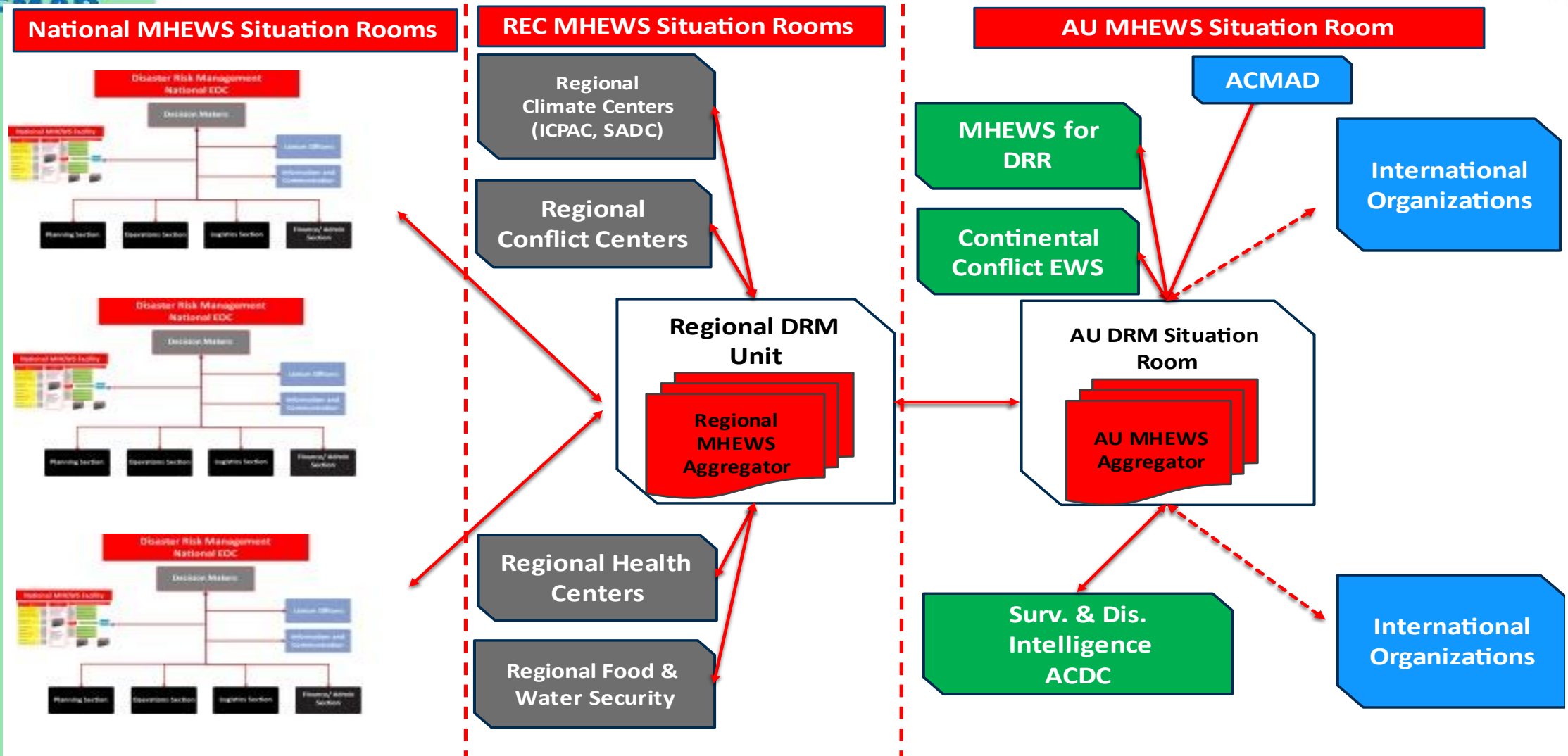
# Capacity building along the warning value chain



**Mountains represent expertise**

**Bridges represent effective partnership**

# INSTITUTIONAL CAPACITY FOR AMHEWAS



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