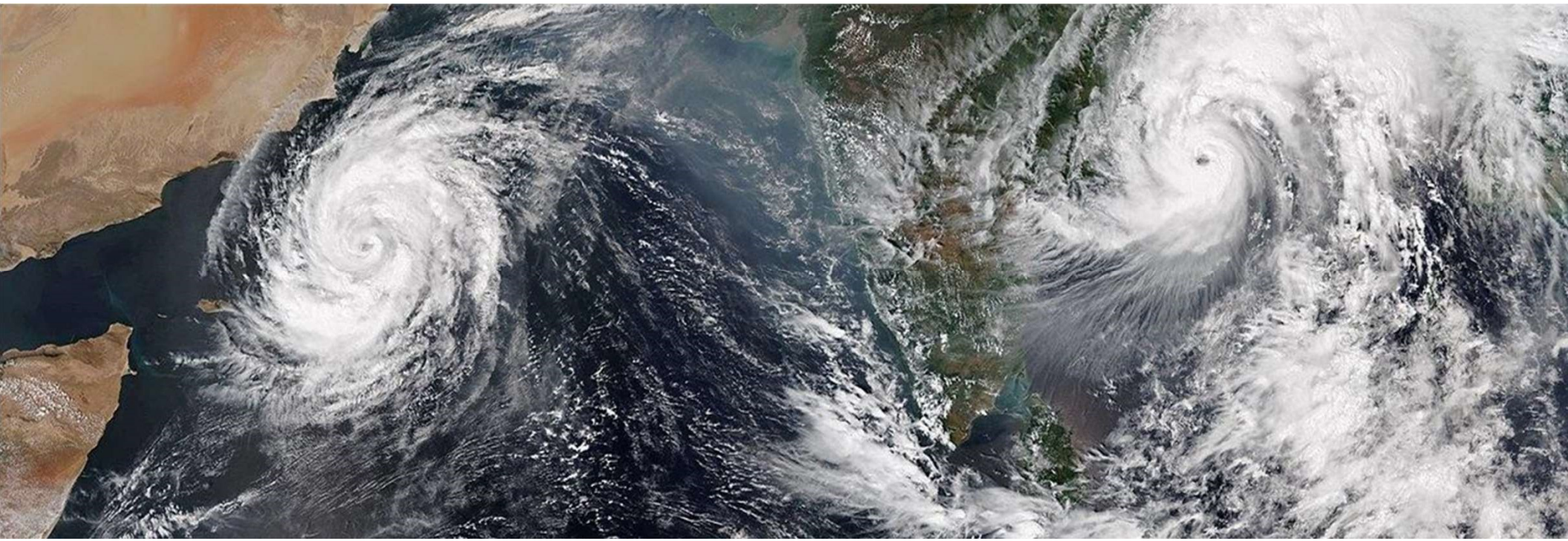
CLIMATE CHANGE IN EASTERN AFRICA

ABUBAKR SALIH BABIKER, ICPAC

IGAD CLIMATE PREDICTIONS AND APPLICATION CENTER



OUTLINES

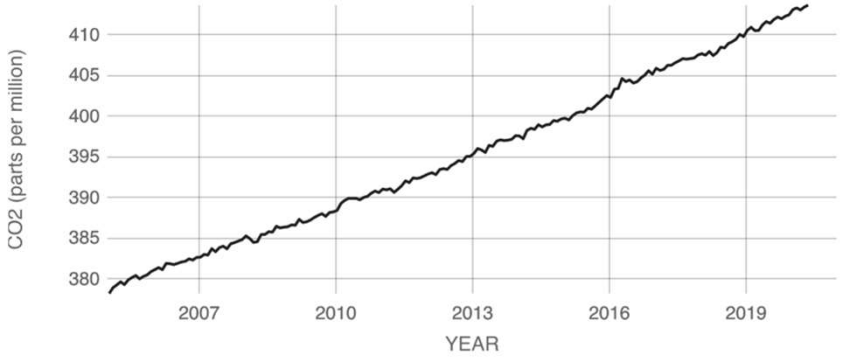
- Explainer for a few climate change concepts
- Climate change evidence: CO2 and temperature increase
- Impacts and projections
- The role of African governments, journalists and media

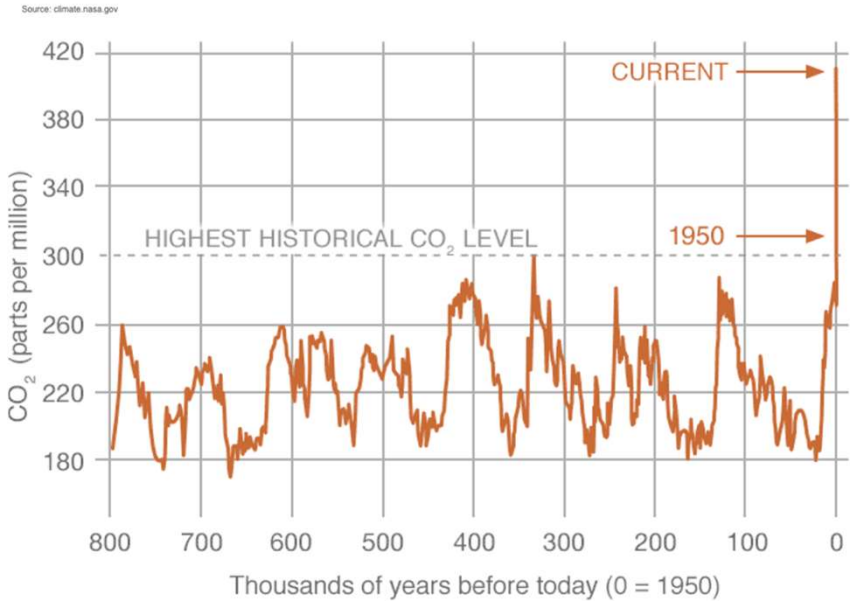
MAJOR GREENHOUSE GASES AND THEIR SOURCES

- **Carbon dioxide**: produced by burning of fossil fuels like oil solid waste, wood and wood products and, natural gas and coal
- **Methane**: emitted by chemical decomposition in wetland and rice fields, livestock digestive system, or by the of organic wastes in municipal and solid waste landfills
- **Nitrous oxide**: generated by the combustion of fossil fuels and solid waste, and fertilizers
- **Chlorofluorocarbons**: manufactured by industry for use in coolants and insulation

INCREASE IN CARBON DIOXIDE CONCENTRATION

- Pre-industrial, Carbon dioxide exhibits modest variation (cycle) between 180 to 300 ppm
- In the beginning of the industrial era it was 260 – 280 ppm
- The current measurement started in March 1958 316 ppm and now reached 413 ppm.





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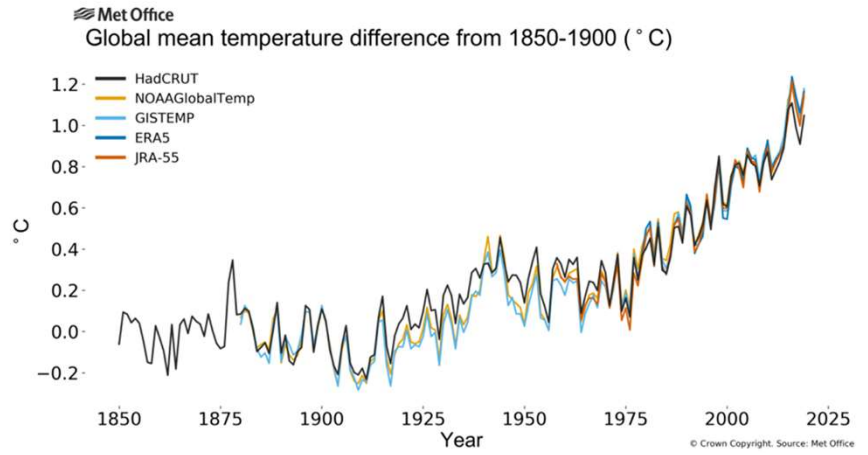
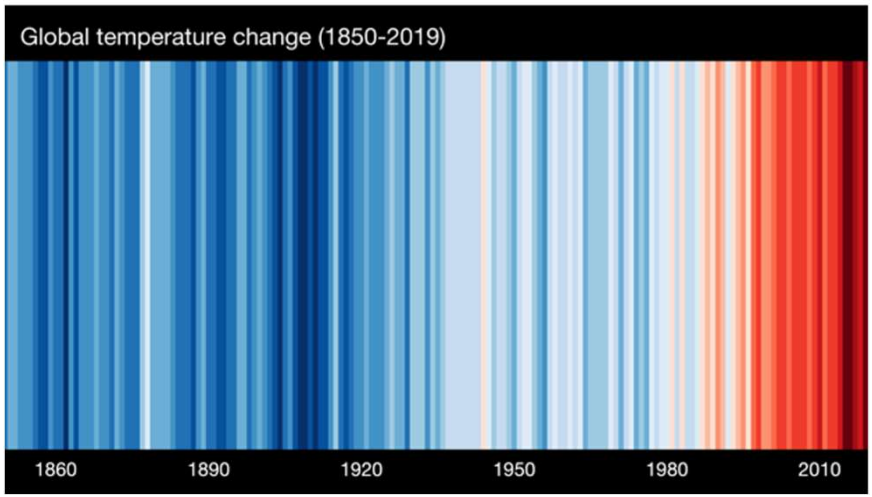
INCREASE IN CARBON DIOXIDE CONCENTRATION

- 1.1 ° C rise above pre-industrial levels
- This January, May, August, and September 2020 and May 2020 are the hottest in history,
- The last decade has been the hottest since we have records.





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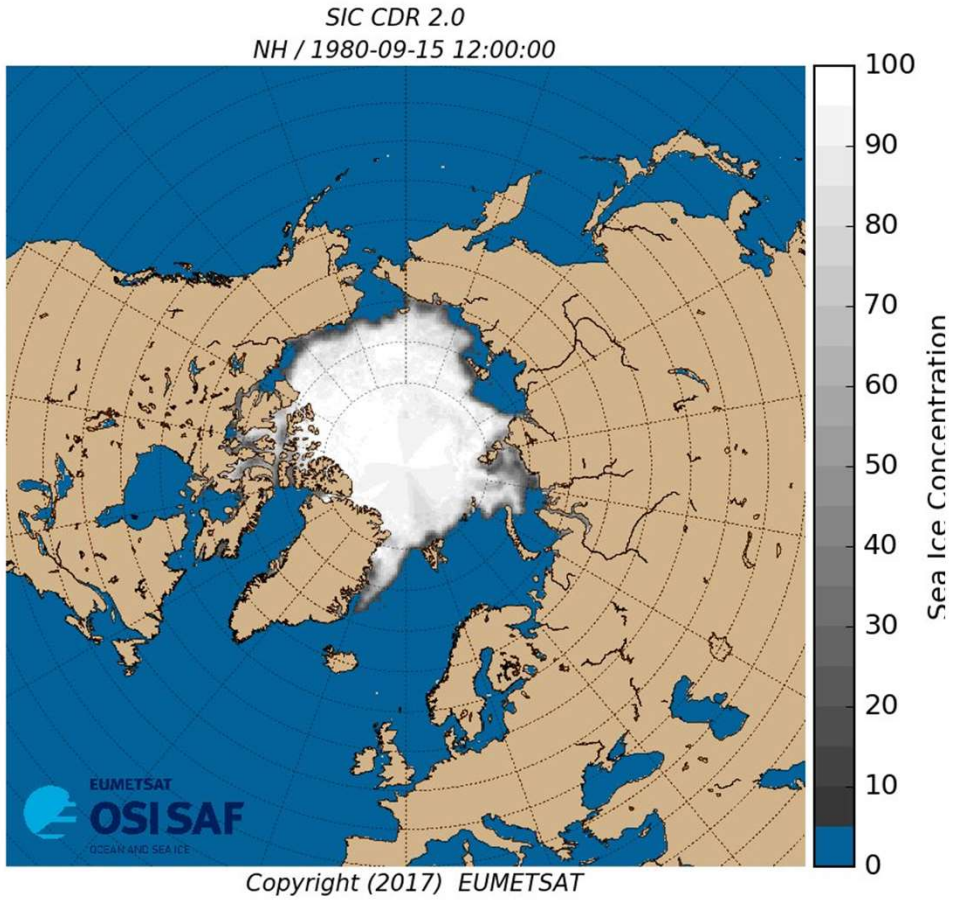
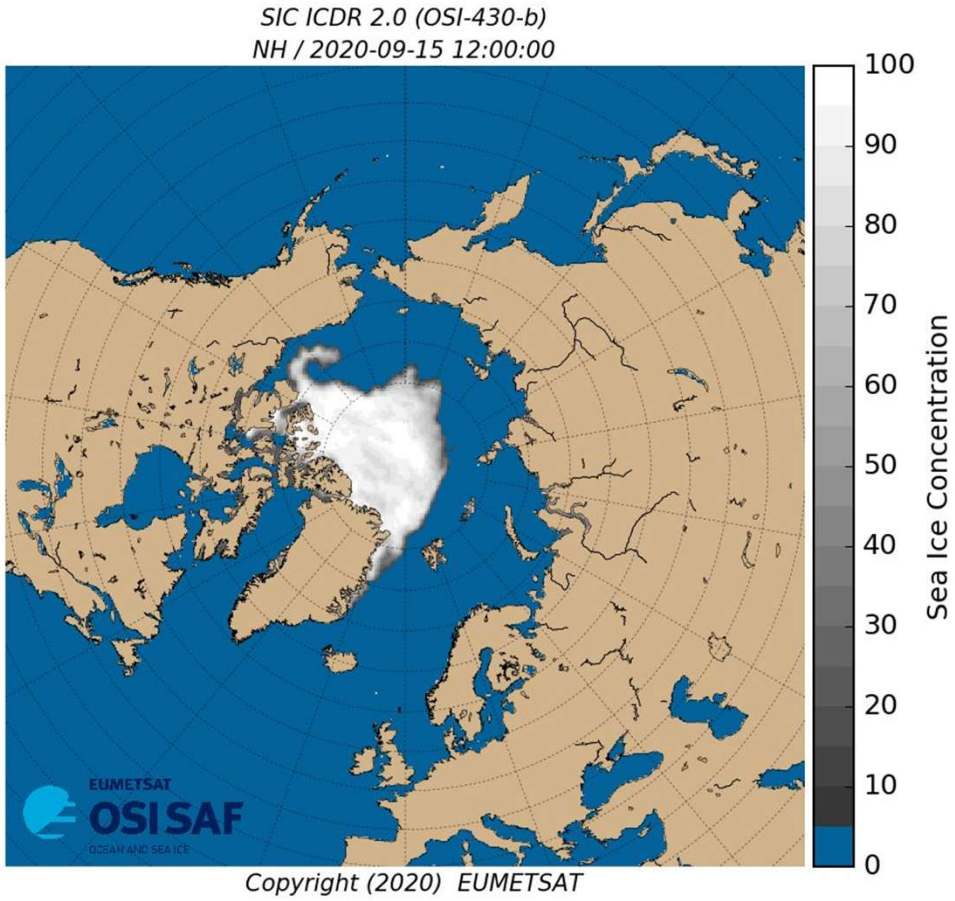
THE ARCTIC ICE IS MELTING





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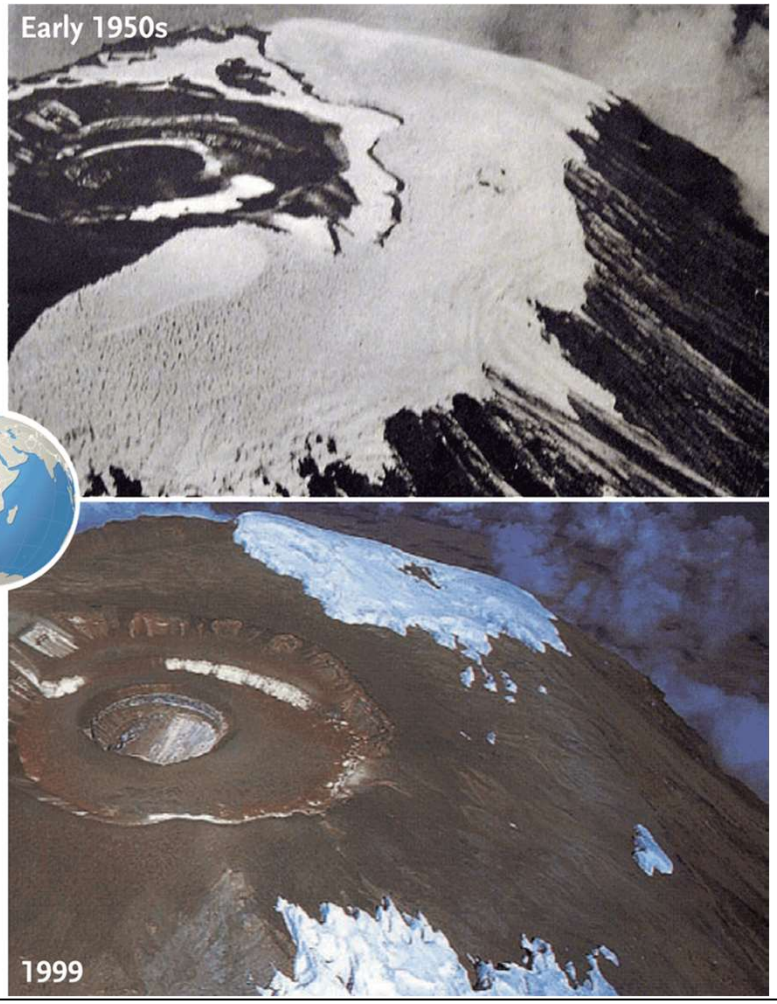
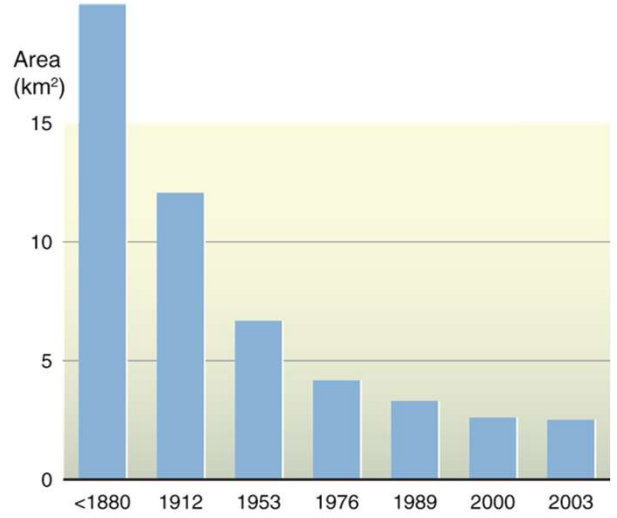
ICE MELTING OF MOUNT KILIMANJARO





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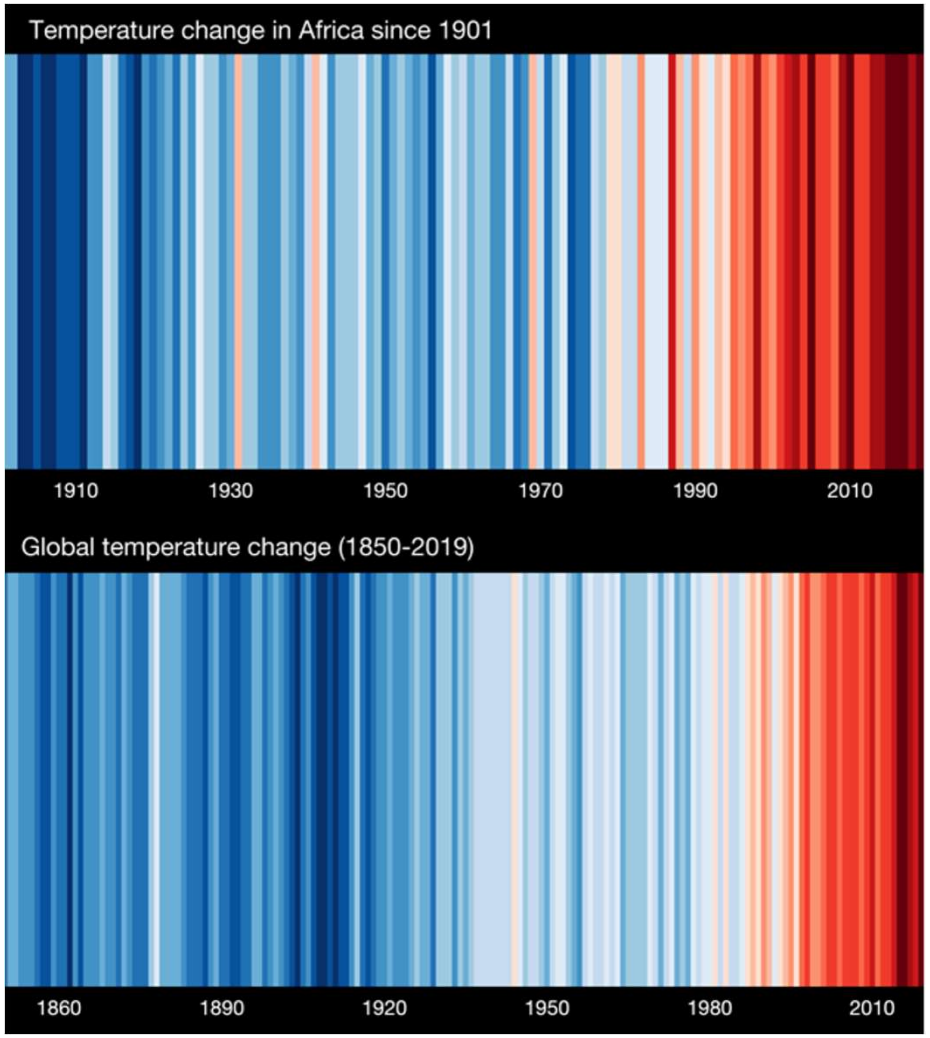
AFRICA IS WARMING FASTER

- Temperatures in Africa are increasing faster than the global average and projected to do so
- This is especially in the most arid areas of Africa (e.g. the Sahel)
- Many of the recent developments in Africa have been in climate-sensitive sectors



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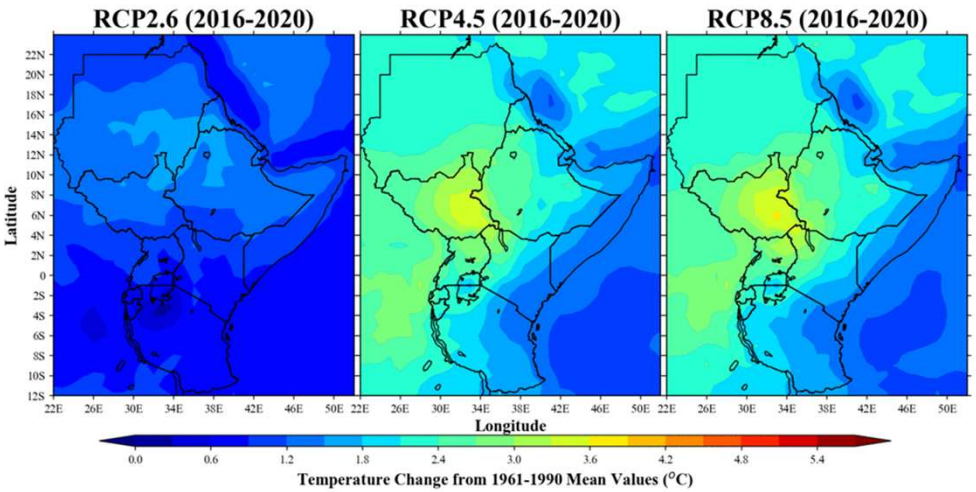
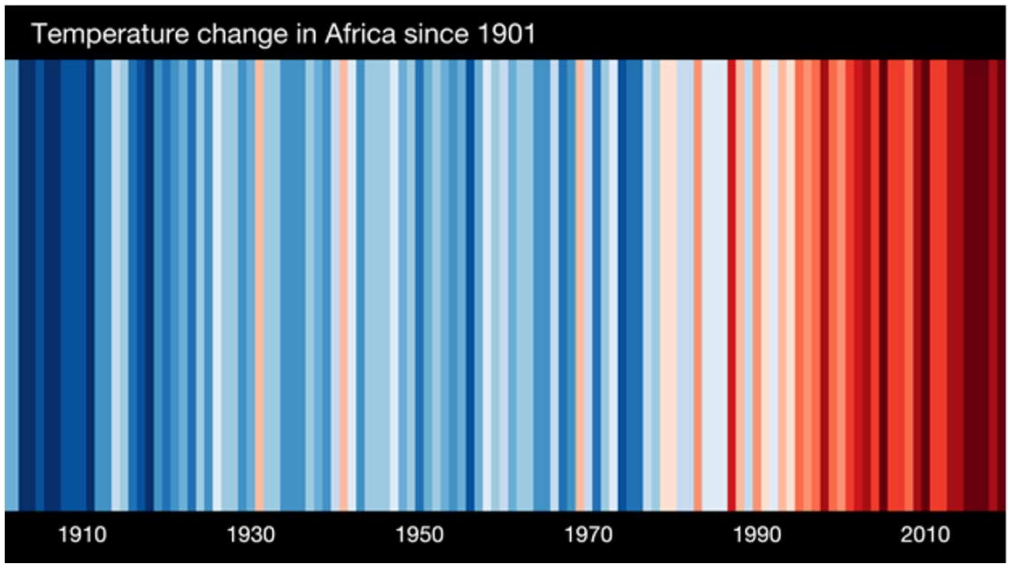
SOME PARTS OF EAST AFRICA HAVE ALREADY WARMED OVER 2.5 C

- **Some parts of East Africa have already seen a temperature increase of 2.5 degrees C**
- **All models show that most parts of Africa will reach the 1.5 degree C limit by 2023**
- The timing for 2 degrees warming is ranging from 2030 to 2040
- All models also agree that the number of warmest days in Eastern Africa are increasing

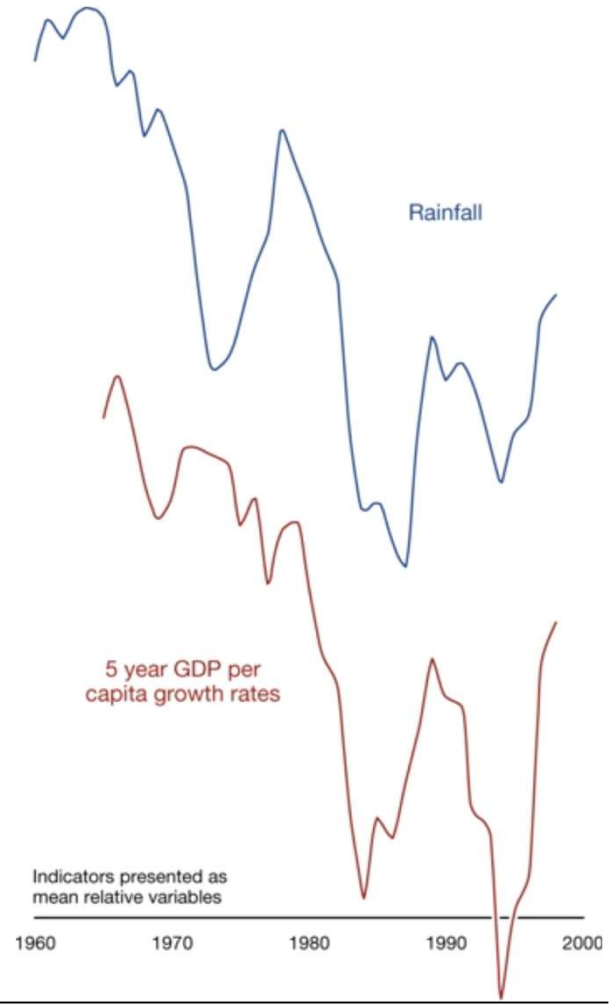


Climate Stripes of Temperature change in Africa since 1901



AFRICAN ECONOMIES ARE SENSITIVE TO CLIMATE

- Economic growth is closely linked to rain.
- Many studies have linked rain and extreme weather events with the reduction of GDP, due to the reduction of agricultural production.
- Kenya suffered a GDP loss of 10% due to floods in 1997-1998 and 16% due to drought 1998-2000



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INCREASING CLIMATE EXTREMES

- **The year 2019 concluded a decade of exceptional global heat**, retreating ice and record sea levels
- COVID19 came at a time when we were already facing an unprecedented desert locust invasion and widespread floods.
- In some countries outbreaks of desert locust like this, hadn't been seen in over 70 years.

AP: Sunday, May 17, 2020 / Beledweyne, central Somalia


FAO: Desert Locust

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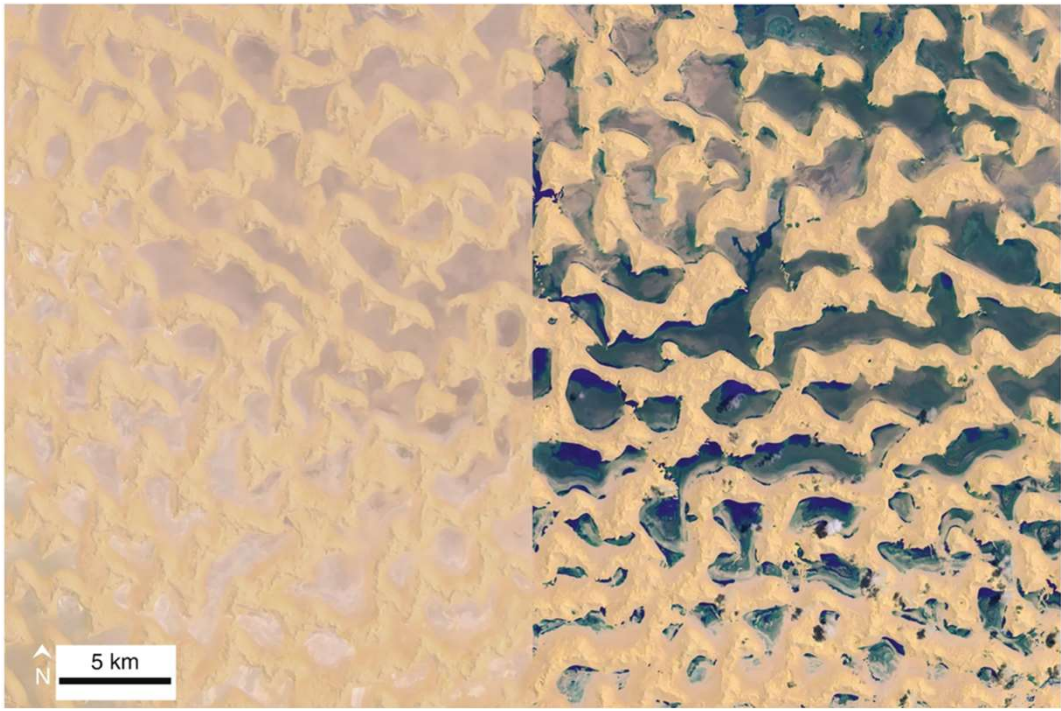


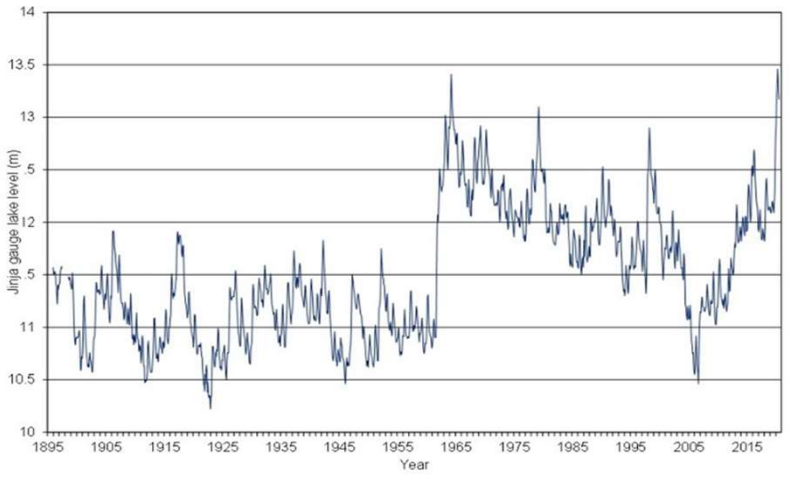

FAO: Desert Locust

INCREASING CLIMATE EXTREMES

- **The March to May season was the wettest on record** in many parts of the region
- There was a **record breaking increase in the water levels of Lake Victoria**, which rose to levels beyond those seen in 1964.
- **Floods due to heavy rainfall are still ongoing across the region (Tanzania yesterday)**

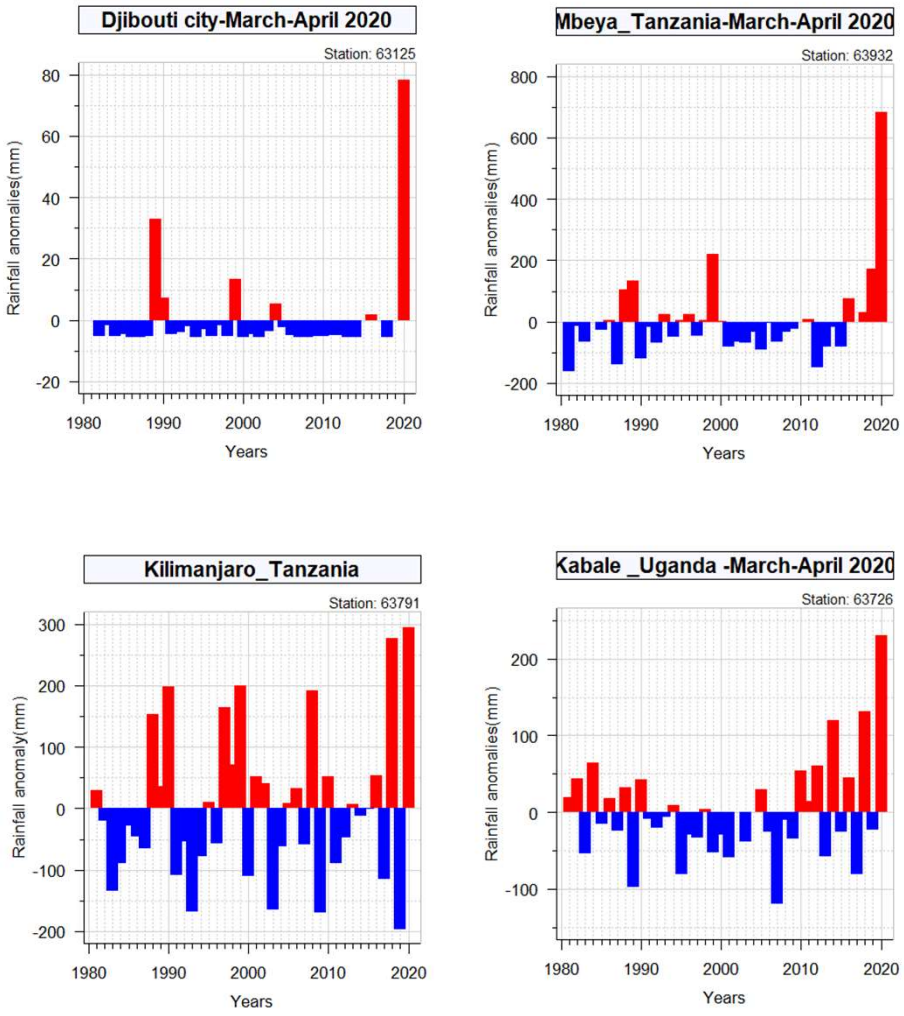

NECJOGHA: Water levels Lake Victoria

Lake Victoria water levels

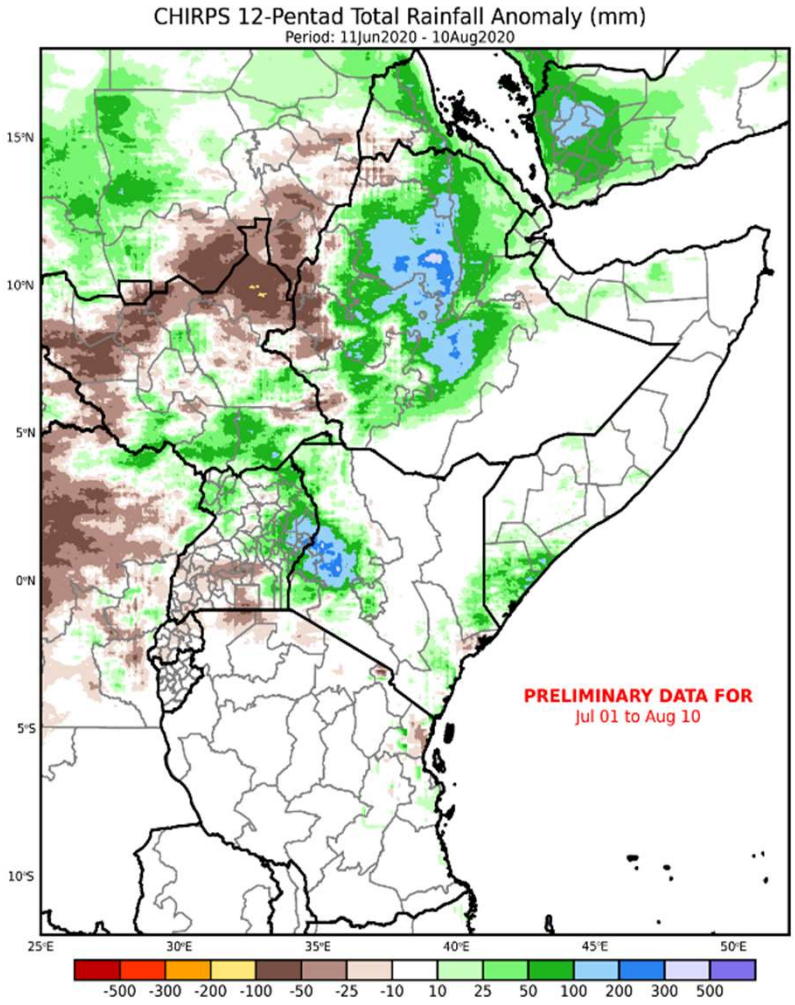


INCREASING CLIMATE EXTREMES

Rainfall anomalies March – April 2020 (ICPAC)



Rainfall anomalies 11 June 2020 – 10 August 2020



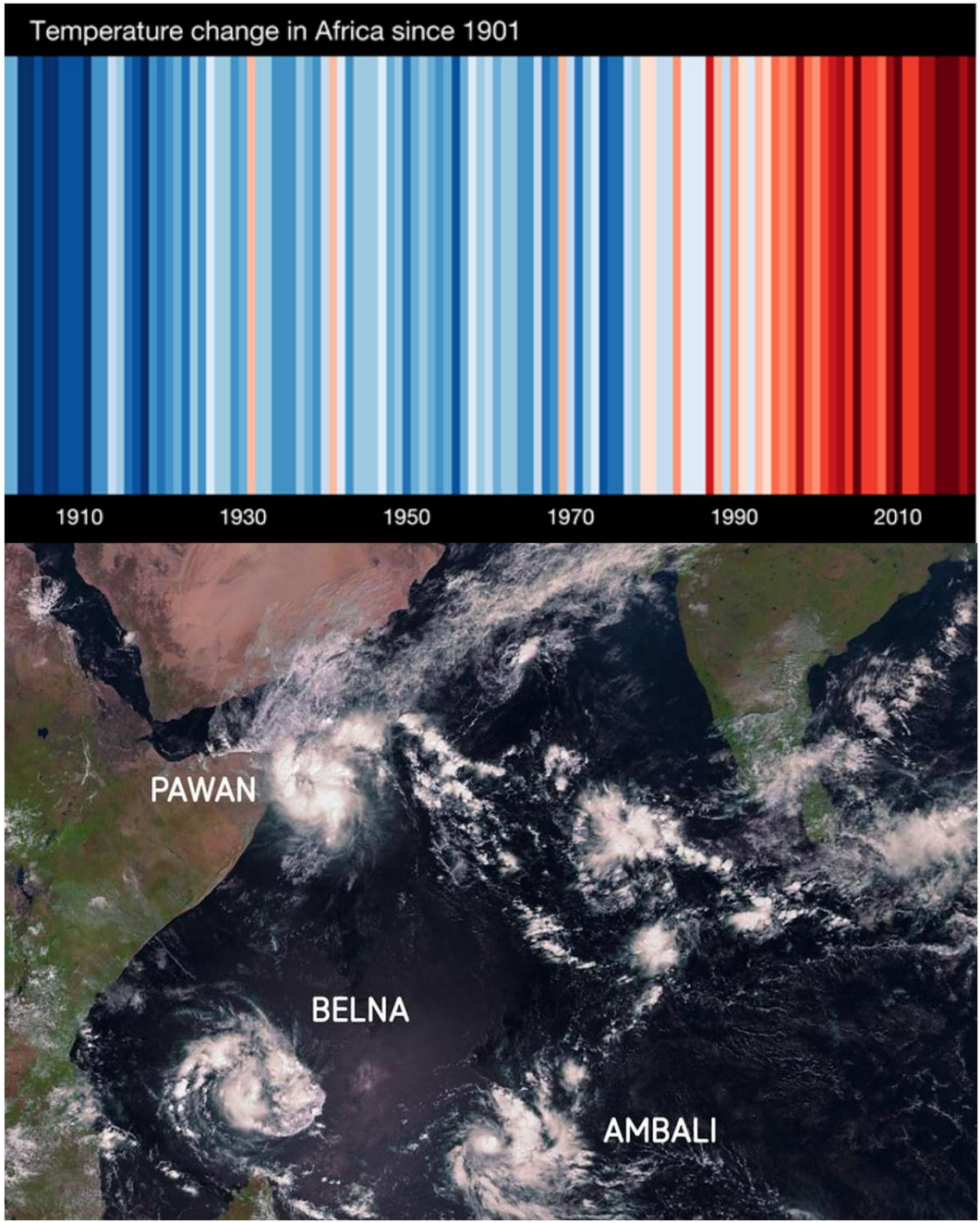
May - August 2020: **Lake Bogoria and Baringo,** thousands displaced

August 2020: South Sudan, White Nile flooding, media suggests 200 000 displaced (*linked to Lake Victoria outflow*)

INCREASING NUMBER OF TROPICAL CYCLONES

- The **first six months of 2020 were the second warmest of any January-June period**, trailing only 2016 in records dating to 1880, with **the year being on track to be one of the top five warmest years on record.**
- During 2019, **8 cyclones developed over the Indian Ocean**, the highest amount since we have records.

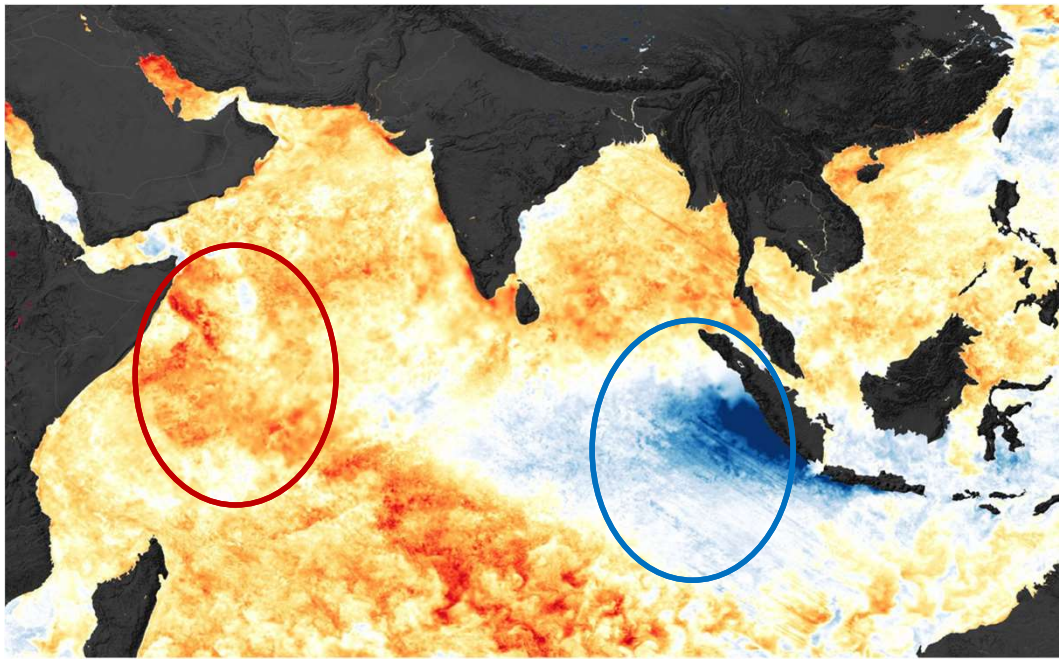
Climate Stripes of Temperature change in Africa since 1901

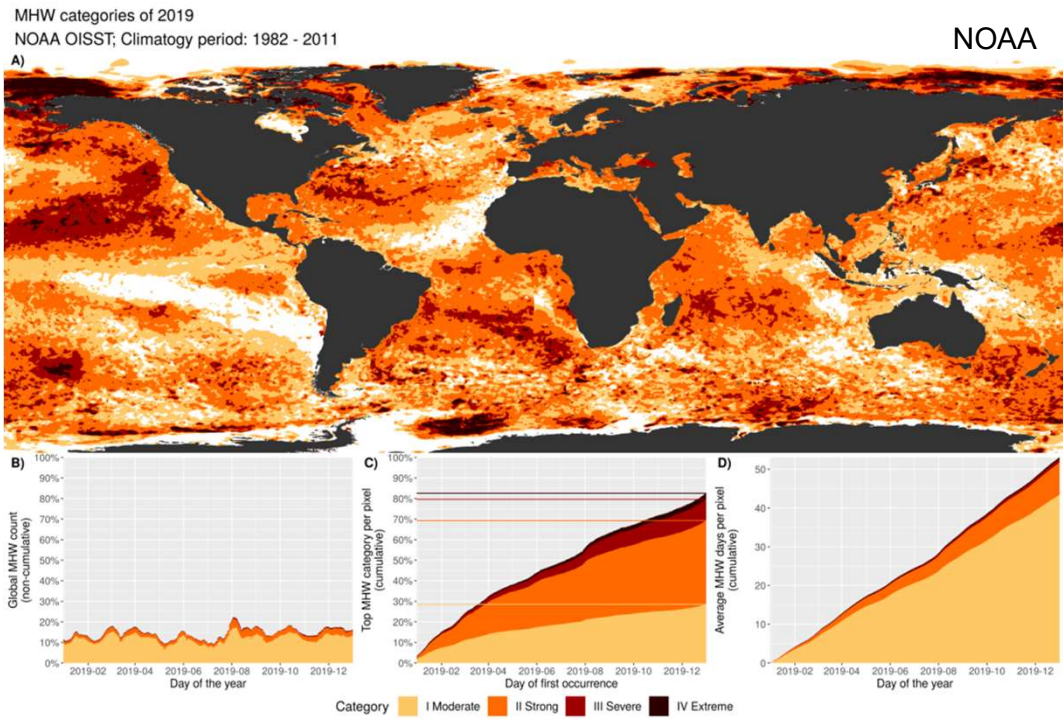


THE INDIAN OCEAN IS WARMING FAST

- The **western part of the Indian Ocean has been warming rapidly during the past 100 years and it is affecting the frequency of extreme weather events like cyclones**
- The rate of warming is 1.2 C compared to 0.7 in the eastern part of the Indian Ocean (and 0.95 warming of the global surface temperature).

NASA: warming over the Indian Ocean

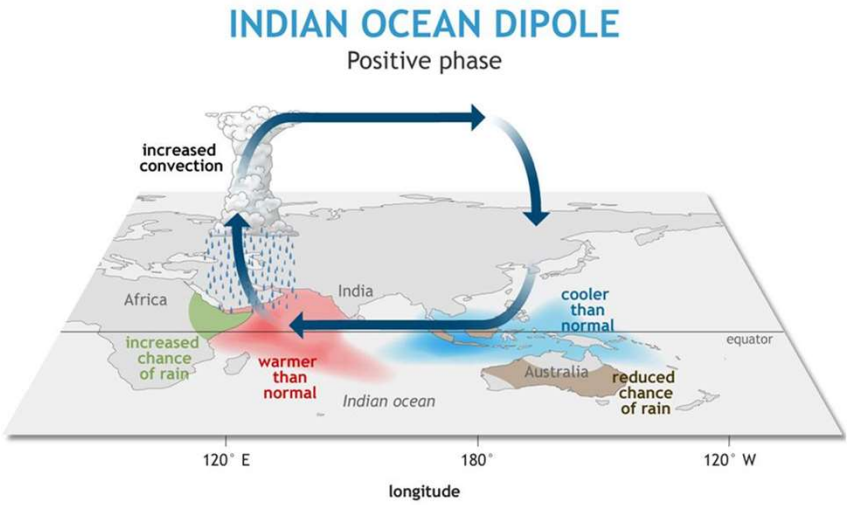


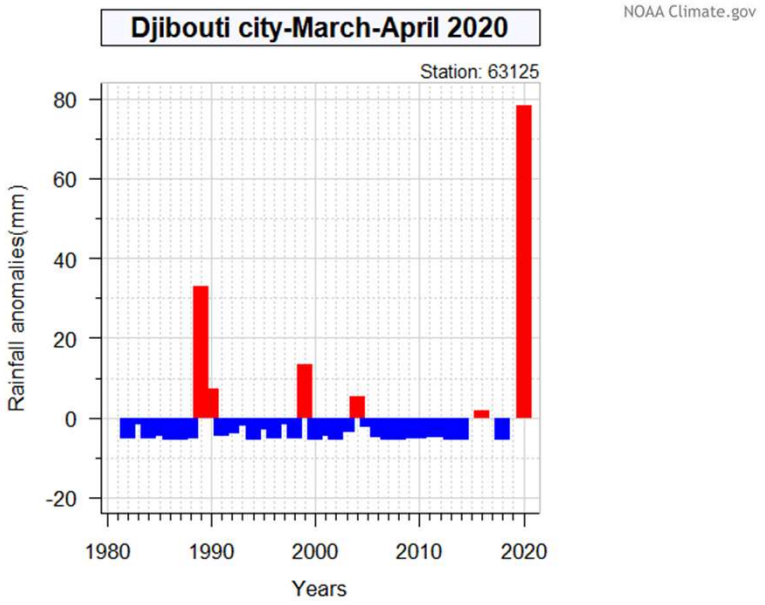


NOAA

MORE FREQUENT EXTREME POSITIVE INDIAN OCEAN DIPOLE

- **In October- December 2019, the Indian Ocean Dipole was in one of the highest positive states** since there are records (1961), bringing floods to Eastern Africa and fires to Australia.
- Last October, **Djibouti received in 4 days** 338 mm of rainfall, **the amount they normally receive in 2 years** (or double of the annual rainfall, which is 163 mm).
- Research shows **that under a warming scenario of 1.5 degrees C**, these extreme positive Indian ocean dipoles could happen **twice as often**.

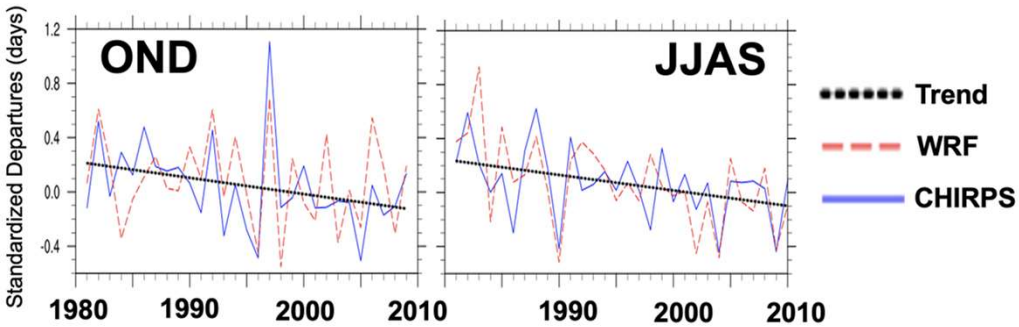




NOAA Climate.gov

RECURRENT SHOCKS AND CHANGING SEASONS

- The **flooding experienced came on the heels of drought** in some parts of the region
- **The durations of the three seasons are getting shorter** due to **late onset and early withdrawal of the rains**.
- The decline in the length of the seasons has been found in observations and model simulations.



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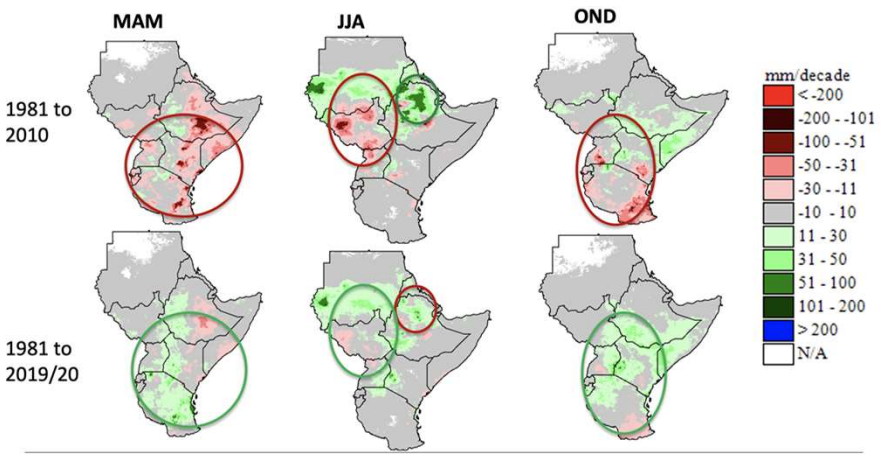
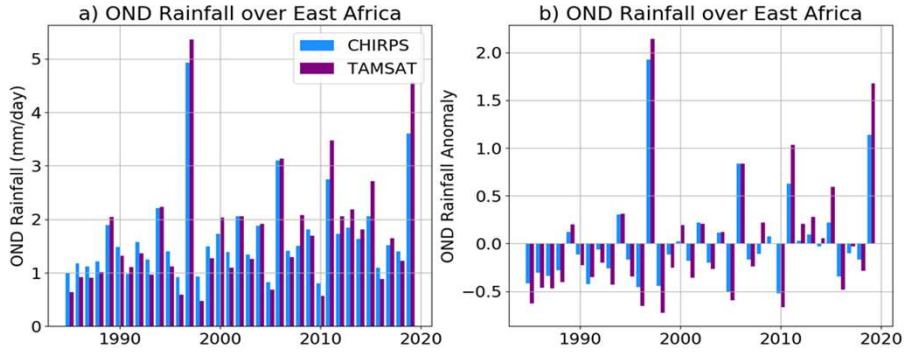
EASTERN AFRICA IS GETTING WETTER

- **Current records show that Eastern Africa is getting wetter**

- **The region needs to get ready for more surprises of climate extremes,** return periods, threshold exceedance which are Poverty Multipliers.





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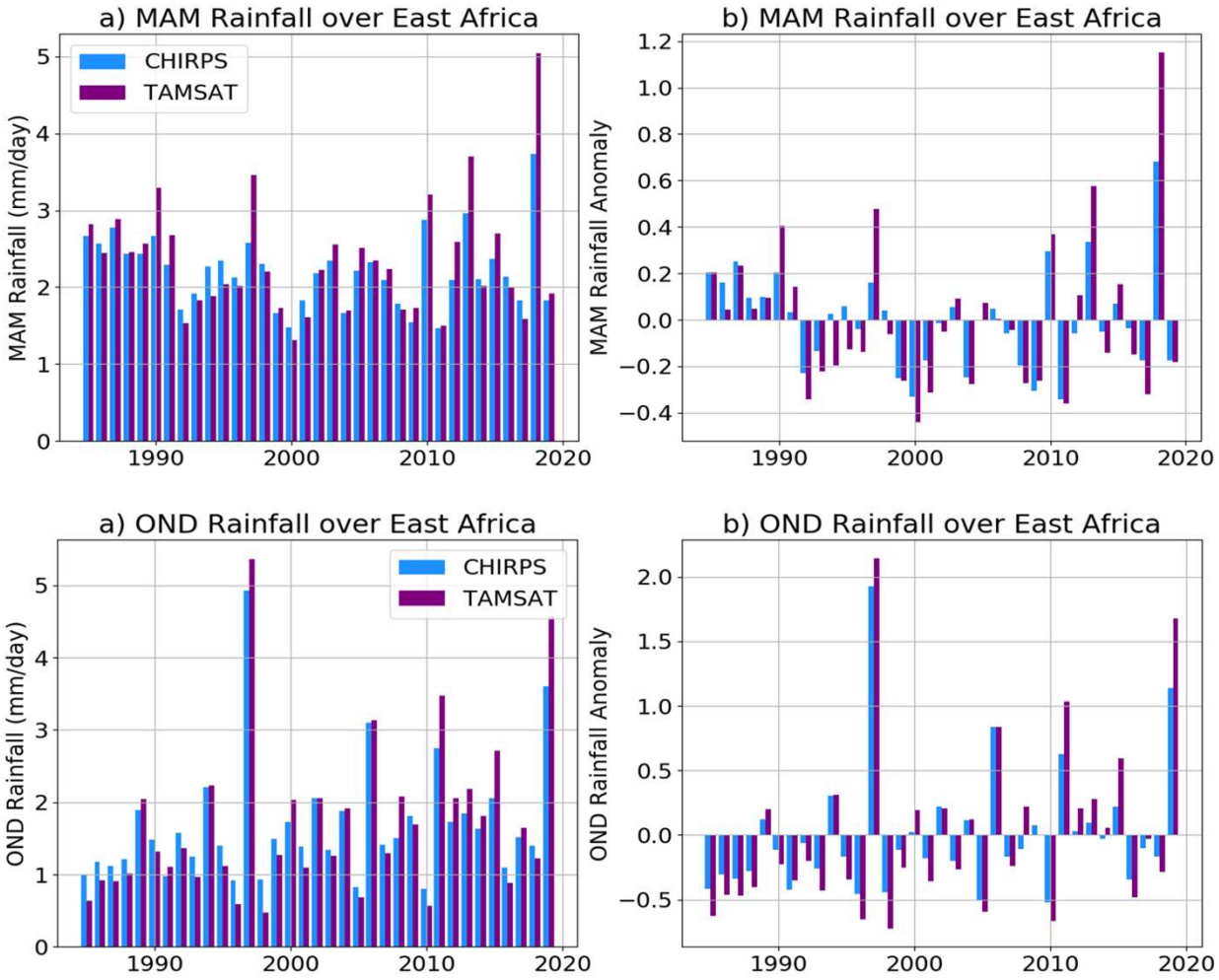
OND RAINY SEASON IS GETTING WETTER

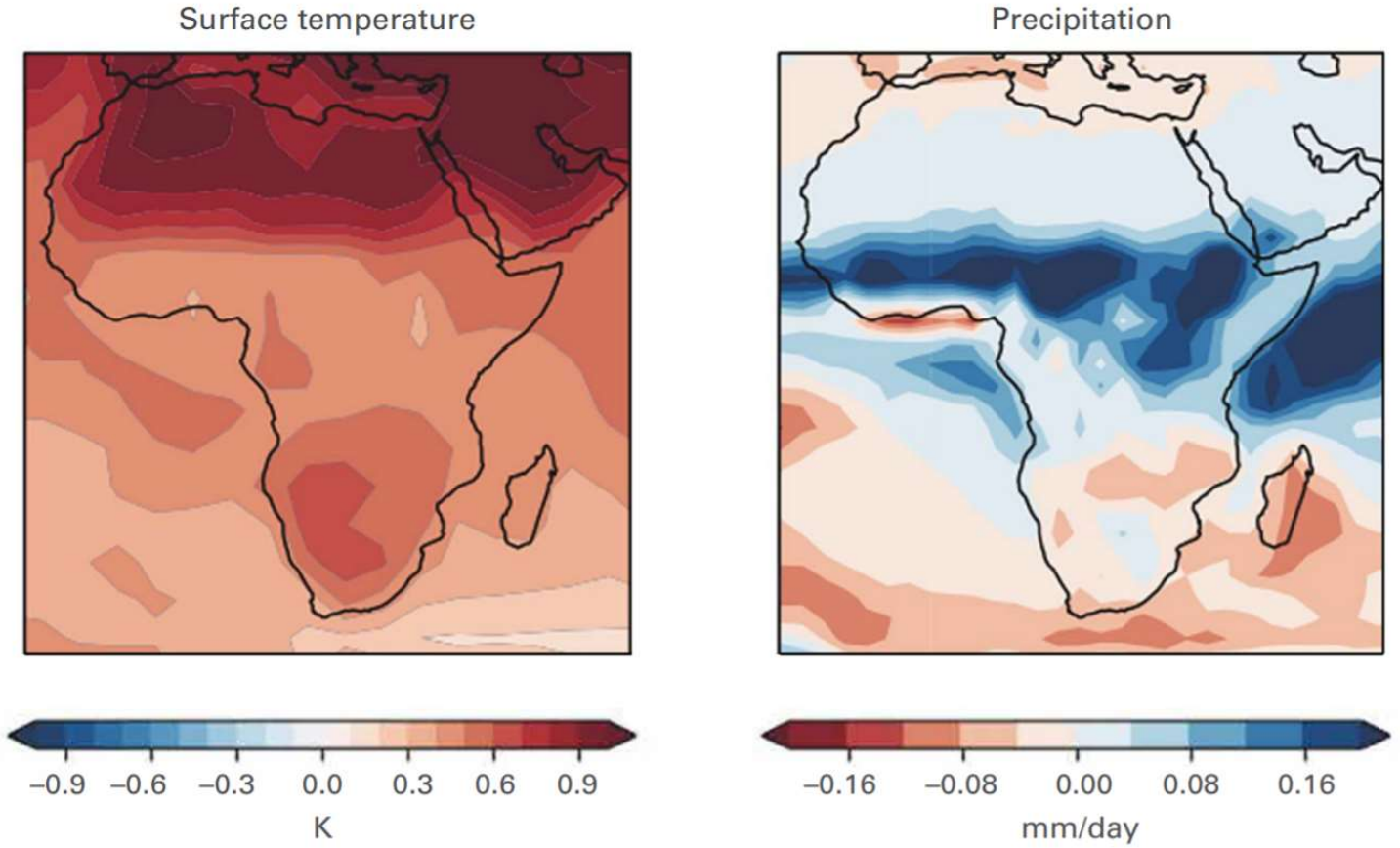


The projected increase in extreme IODs with 1.5 & 2 degree warming, **will make ONDs like 2019 more frequent.**

WARMER AND WETTER YEARS 2020 - 2024

Source: African Centre of Meteorological Applications for Development (ACMAD)

Figure 8. Multi-model average forecasts of near surface temperature and precipitation for the five-year period 2020–2024. Colours show anomalies relative to the period 1981–2010 for the average of several international forecasts contributing to the WMO Lead Centre for ADCP (https://hadleyserver.metoffice.gov.uk/wmolc/). Forecasts are initialized with observations and start on or after 1 November 2019. *Source:* Met Office,



Source: WMO

HIGH VULNERABILITY

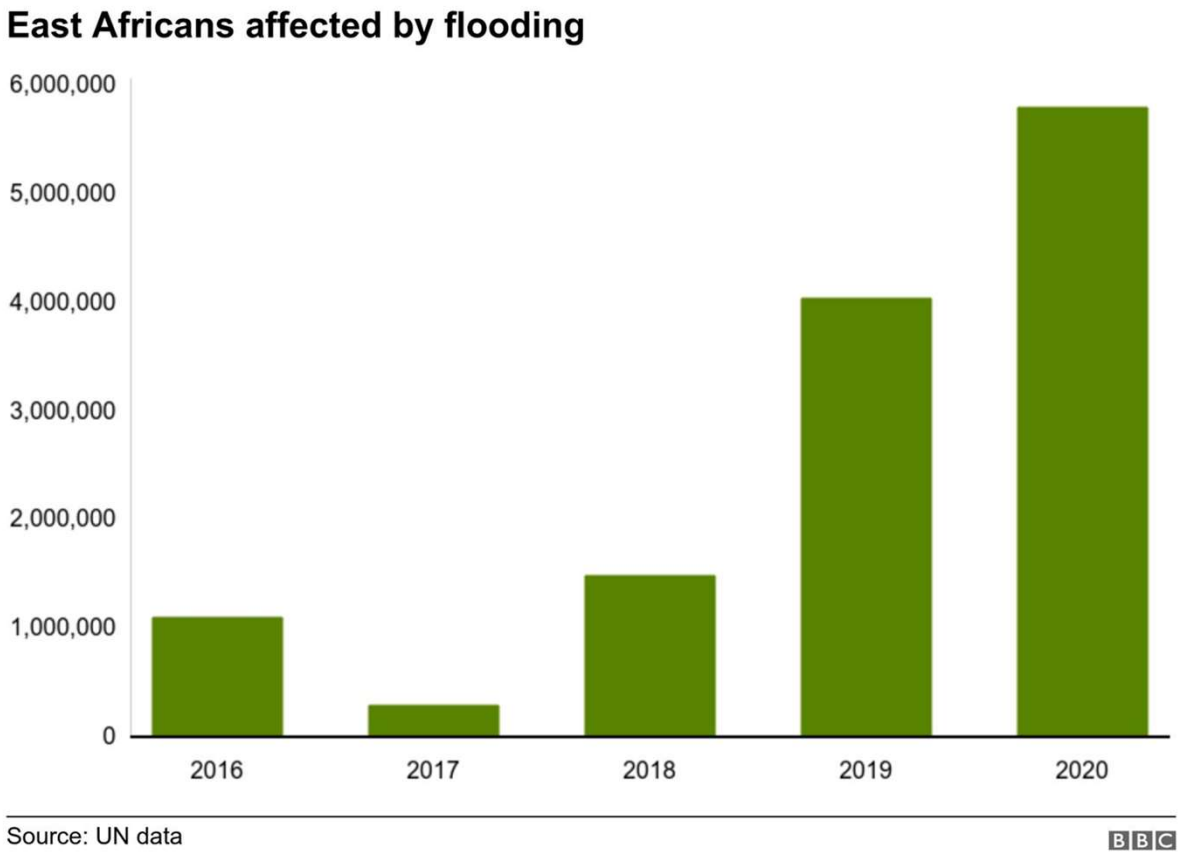
- **Communities are having very little time to recover between extreme climatic events**.
- Climate change presents a new challenge to already vulnerable communities and threatens to undo the developmental gains made in the region.
- Climate Services and Early Warning Systems are key to build resilience

EXPECTED IMPACTS

- Increase in floods and droughts leading to:
  - Water shortage
  - Pollution (fisheries)
  - Poor power supply
- Reduction in agricultural productivity in some areas (changing crop suitability)
- Fluctuation in pasture supply
- Vector born diseases
- Damage on infrastructure (eg. transport systems)

NUMBER OF PEOPLE AFFECTED BY FLOODS: EAST AFRICA

- Six times increase on the number of affected people between 2016 and 2020



Source: UN data visualized by BBC

INCREASE IN HYDRO-MET DISASTERS IN THE PAST 20 YEARS

Source: UNDRR

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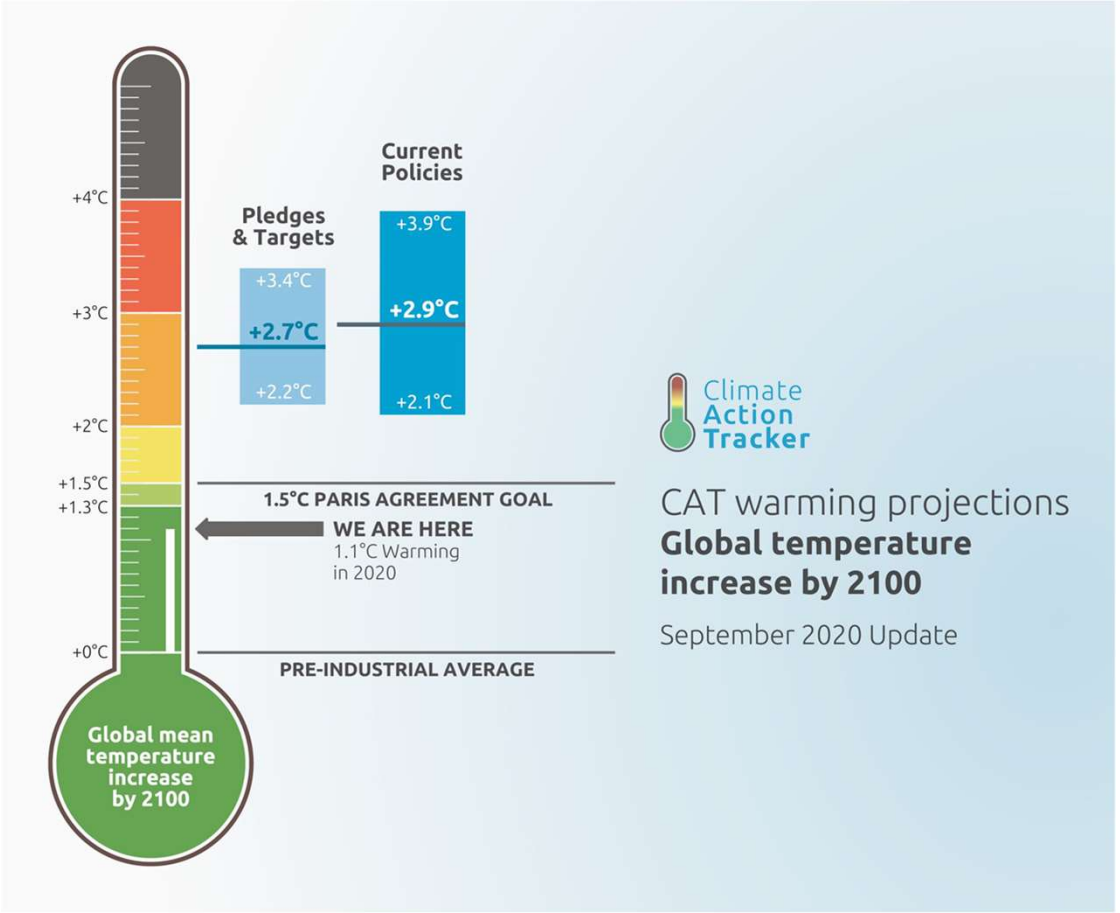
ICPAC: WEATHER, HYDROLOGICAL, AND CLIMATE SERVICES

- We are close to Paris Agreement target of 1.5 C, likely to reach it by 2023
- Current pledges and targets put us on a range of 2.2 – 3.4 by 2100
- Current policies: 2.1 – 3.9 C by 2100



Source: Climate tracker

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WHAT SHOULD AFRICAN GOVERNMENTS DO?

- **Implement:** Multilateral agreements (eg. Paris Agreement, Sendai Framework) and National Plans (eg. NAPA, NDCs etc.). Allocate real budget for these activities.
- **Improve:** their observational network and empower their national meteorological services
- **Develop:** Early Warning systems for Hydro-Meteorological Hazards
- **Disseminate:** climate information to users for them to take early action

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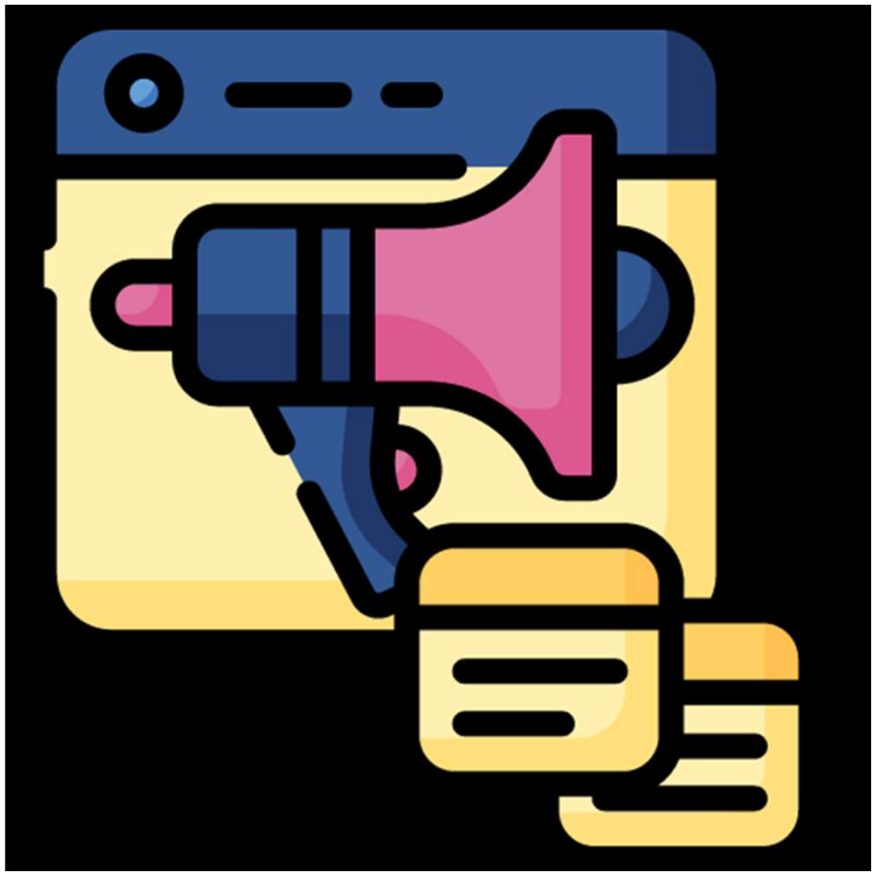
THE ROLE OF JOURNALISTS AND MEDIA

- **Educate** the public about climate change with robust information
- **Hold** greenhouse emitters accountable and advocate for more ambitious commitments
- **Be the voice** of the most vulnerable on the impacts they face potential solutions

THE ROLE OF JOURNALISTS AND MEDIA

- **Disseminate** climate information and early warnings to the public
- **Support building public-private partnerships** to disseminate climate information
- **Hold Governments accountable** on adaptation and mitigation plans and activities they commited to implement



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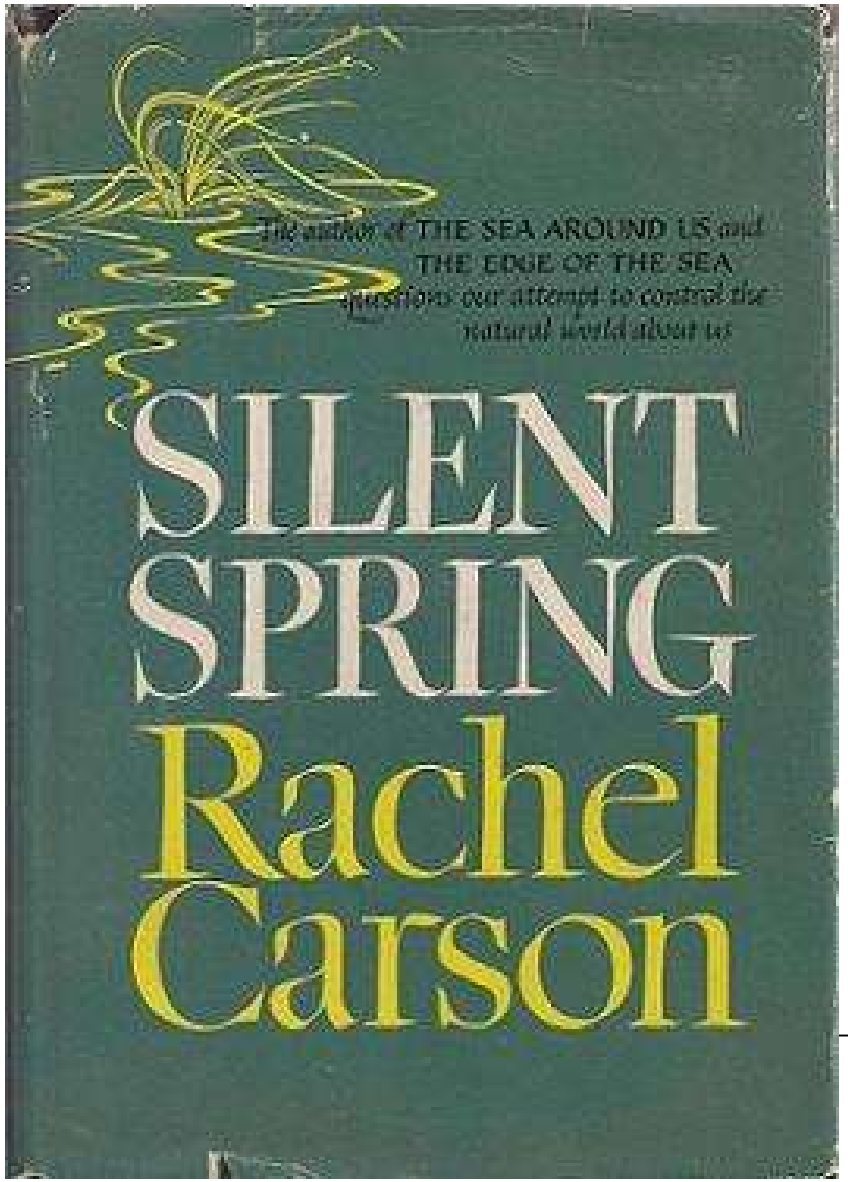
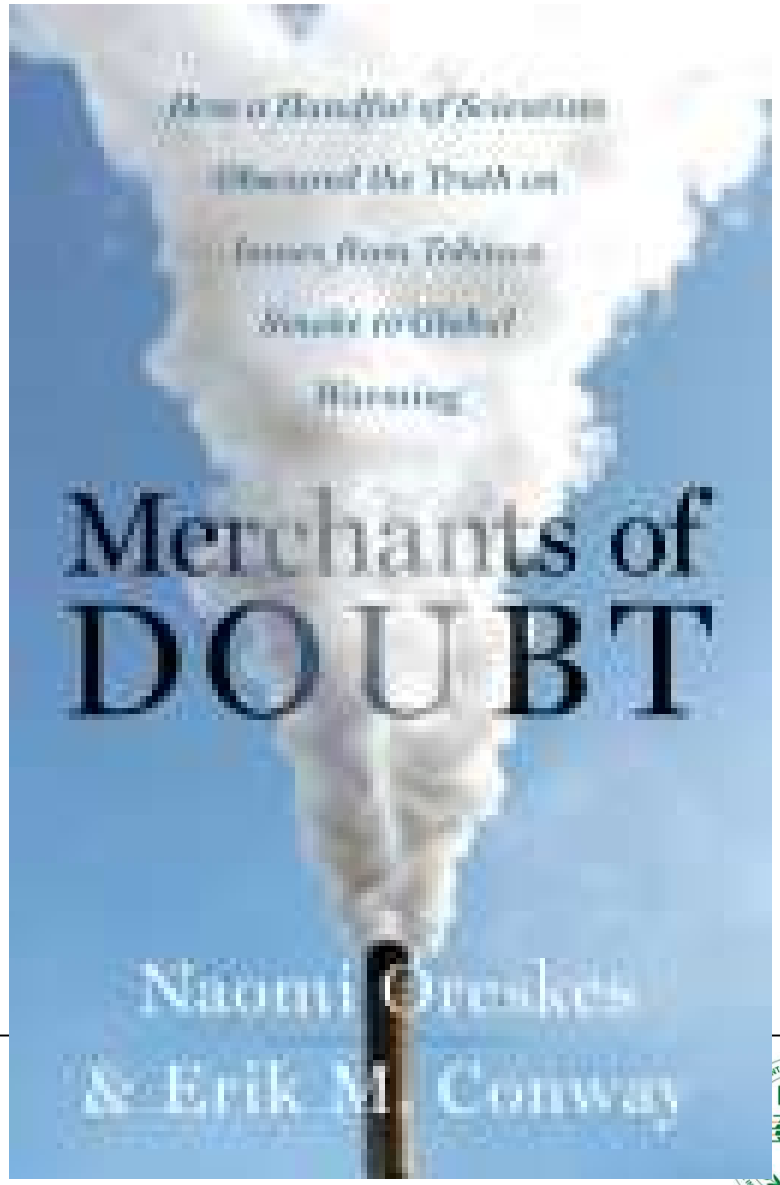
AFRICANS ARE NOT A MAJOR EMITTER

Britons reach Africans' annual carbon emissions in just two weeks

Research for Oxfam shows inequality between footprints of people in UK and in countries including Rwanda, Ethiopia and Malawi

KEEP REPORTING ON CLIMATE CHANGE





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OUR CLIMATE CHANGE SERVICES

What We Do

Trends and projections

Analyse trends and projections of rainfall, temperature and extreme weather

Analyse Climate Extremes

Understand drivers of climate and weather extremes (ENSO, IOD, AMO).

Impacts Assessments

Understand impacts of Climate Change on livelihoods.

Scenario analysis

We analyse different climate scenarios.

Advocacy for Climate Action

We advocate for Climate Change mitigation and adaptation.

Access to Climate Finance

Increase access of member countries to Climate Finance

THANK YOU!

Contribute to the Conversation on Twitter
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