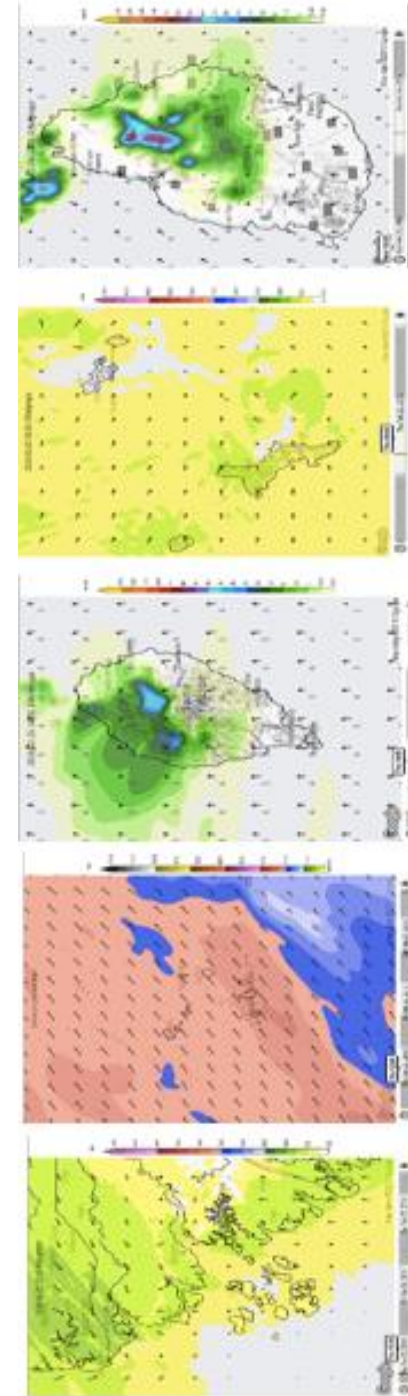


Climate research need and funding gaps in Africa



Yosef Amha

*Nairobi, Kenya
03 Sept. 2023*



Outline

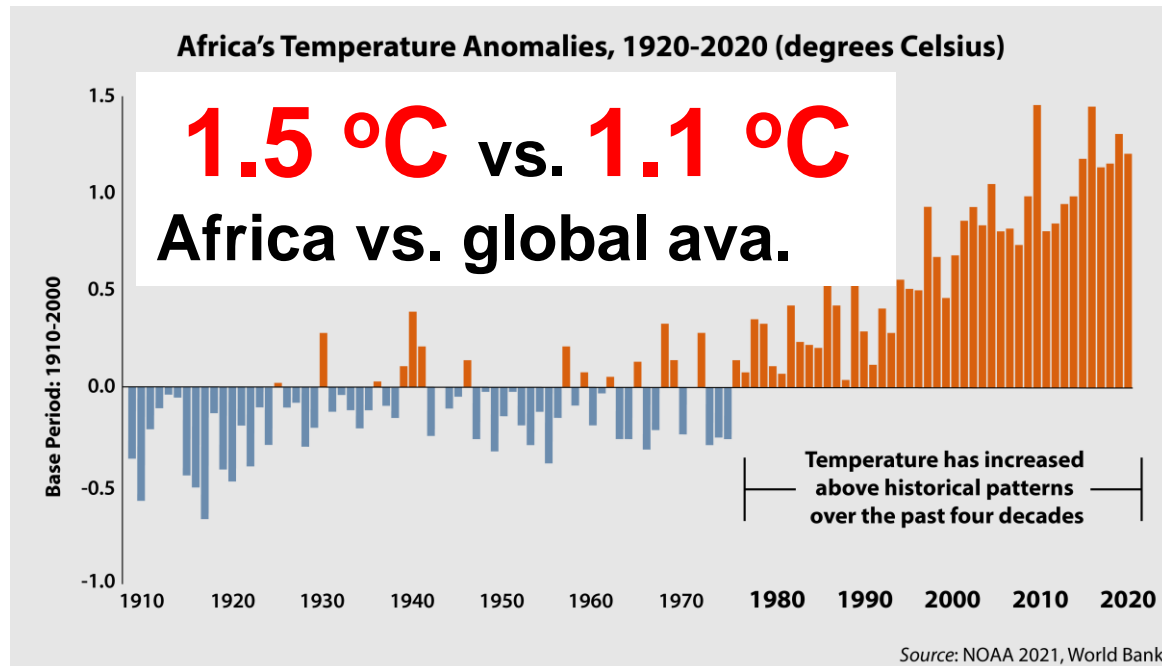
- *Why is climate research important in Africa*
- *Climate research funding landscape*
- *Climate Research for Development in Africa (CR4D) initiative*
- *The way forward*

Part I

**Why is climate research
important for Africa?**

Why climate research?

#1. increases in the frequency and severity of observed temperature, droughts, floods...



↑ 60%
frequency & severity of droughts

↓ 10-30%
rainfall over the past century

↑ 200%
Number of floods (1980-2015)

The rate of temperature rise across Africa was **~+0.3 °C per decade** from 1991-2021, is faster than the global average.

Why climate research?

#2. The economy is dependent on climate sensitive sectors, with low adaptive capacity

70%
popⁿ employed



95%
rain-fed type

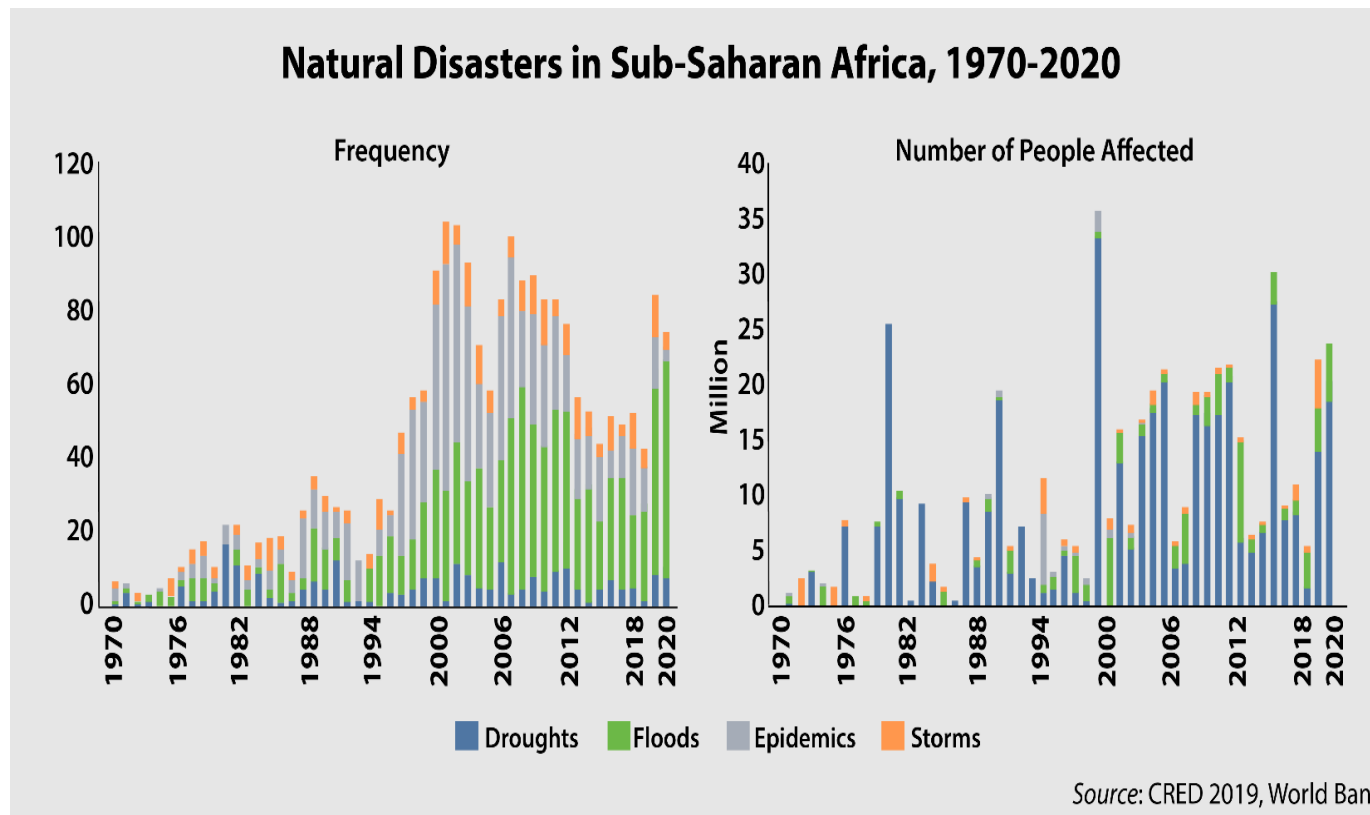
15%
contribution
to total GDP

↓34%
in productivity
since 1961

e.g., Agriculture sector

Why climate research?

#3. Climate-related disasters increased



337 million

People affected

420,000

People died

\$30 billion

lost in sub-Saharan and North Africa

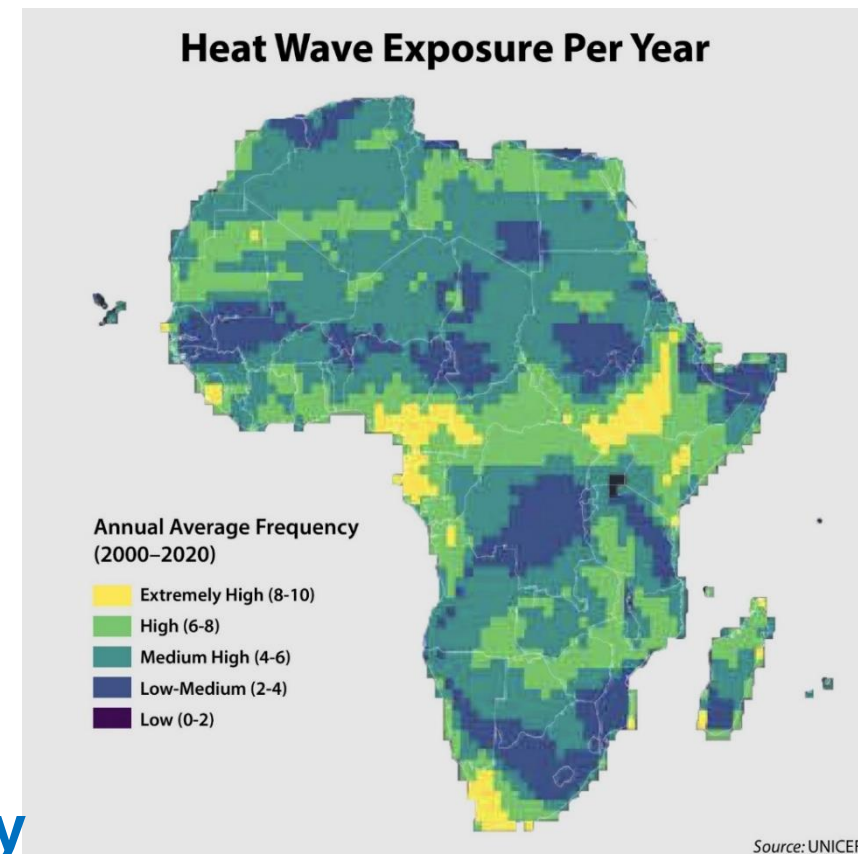
2008-2018 (FAO, 2022)

3-5% lose of GDP to climate change by 2030, with greater variation in sub-regions.

Why climate research?

#4. Projected climate is a gloomy in most RCPs/SSPs

- African countries within 15 degrees of the equator are projected to experience an increase in frequency of **heat waves and increased extreme events**
- **Total deglaciation** by the 2040s (*shrinking to less than 20% of their late 19th-century extent*)
- Increased **water risks** (*1 in 3 African citizens are impacted by water scarcity*)
- Loss of **biodiversity, land productivity and significant portion of the GDP**



Why climate research?

- Given the **scale** and **severity** of observed climate change impacts and future climate risks, the continent merits greatest attention in global climate research *(Overland et al., 2022)*

Funding plays a key role in directing research priorities and our responses to climate change!!



Part II

Climate research funding landscape in Africa?

Funding

Africa, with ~1/6 of the world's population is a home for

- **<1%** of the world's research outputs (*Scopus database*)
- **0.1%** of global patents (*Nature.com*)
- **1.1%** of the world's scientific researchers (*The World Bank*)
- **79 vs 4,500** scientists per million (Africa vs the USA) (*Etoqa-Beka and Samba-Louaka*,
- **0.4-0.72%** of global expenditure in research and development (R&D)



Funding...

Countries funding Africa climate research (1990-2020)

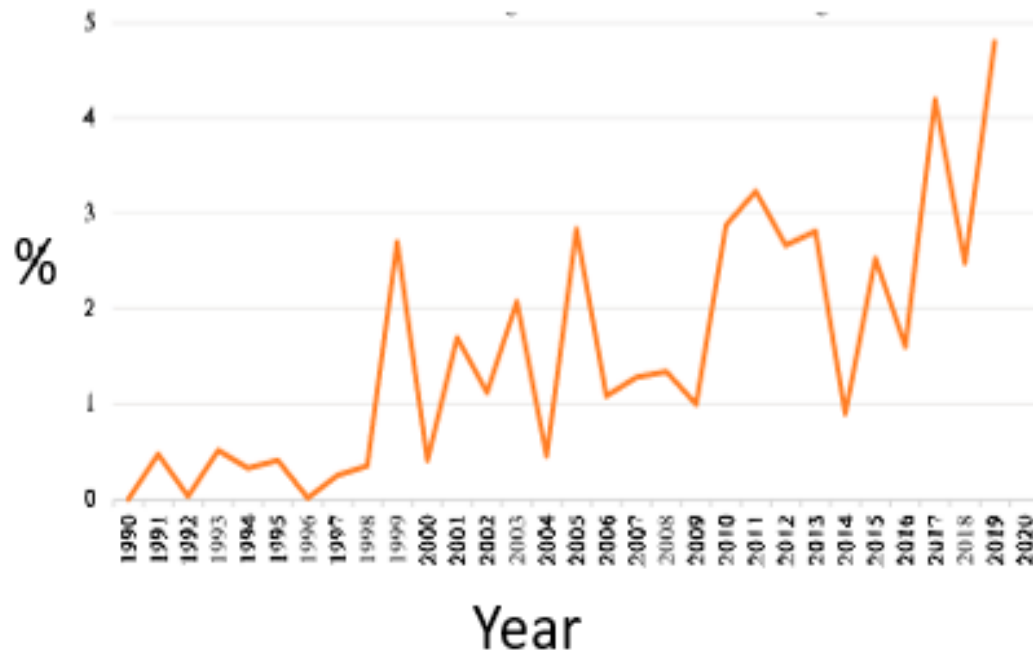
Funder country	Funding 1990–2015	Funding 2016–2020	Sum of funding 1990–2020
United Kingdom	77667534	110673319	188340853
European Union	144952400	41551705	186504104
United States	123802697	14493330	138296026
Germany	26953569	5684966	32638535
Sweden	9598347	11500847	21099194
Norway	9319752	3418124	12737877
France	4269654	3160988	7430642
Canada	2940291	2571212	5511502
Finland	5214792	0	5214792
Switzerland	3231838	1449798	4681636
China	1131816	2111828	3243645
Poland	461868	864101	1325970
Japan	1051253	63573	1114825
Australia	732165	0	732165
Italy	591821	0	591821
Denmark	284120	0	284120
New Zealand	231973	0	231973
Estonia	100853	0	100853
Portugal	57956	0	57956

1.262 billion USD

98% funding comes from government institutions

Funding...

a) Africa's share of the global

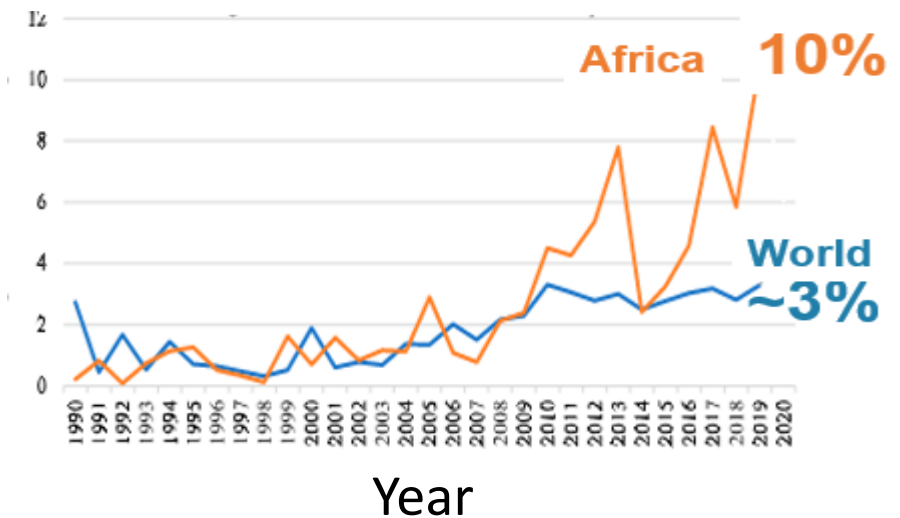


Africa received only <5% of global climate research funding

(Overland et al, 2022)

Climate-related research funding to Africa is 10% of global funding

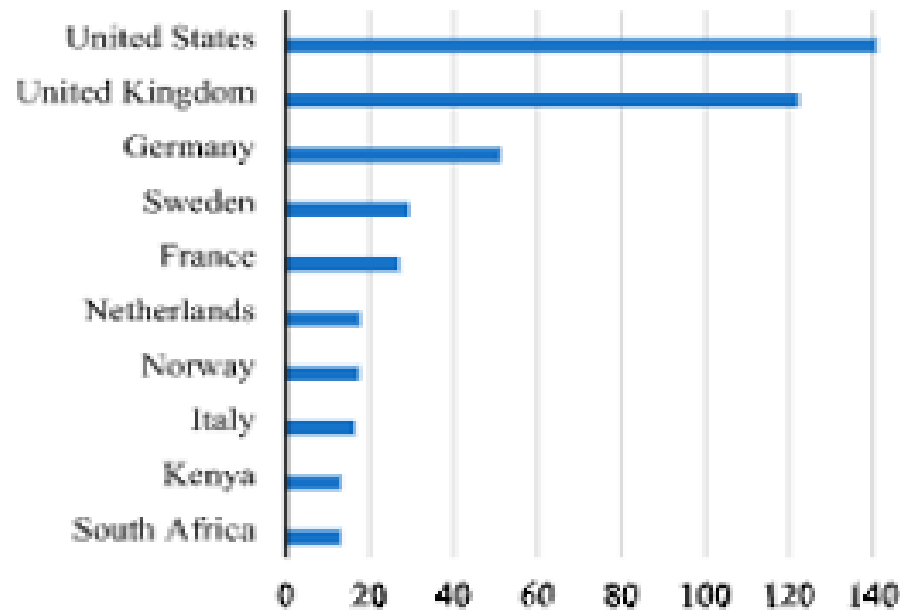
b) Climate research as % general funding



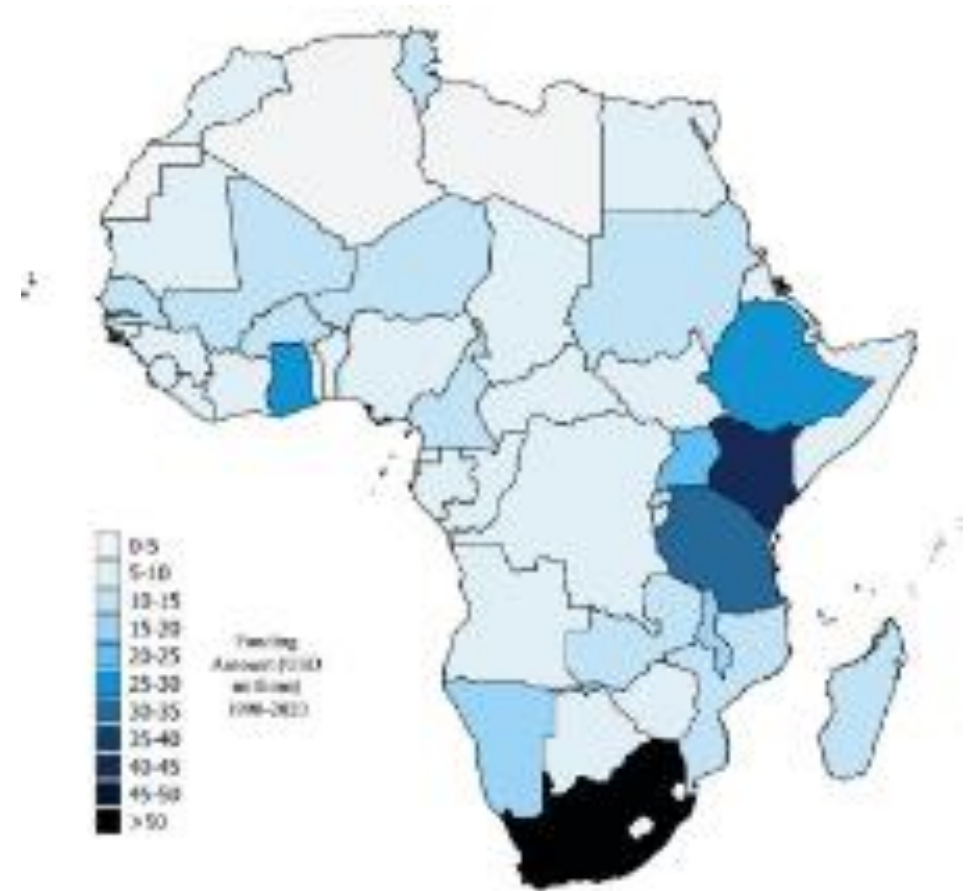
Funding...

Recipients of Africa-related climate research funding (1990-2020)

Overland et al, 2022)

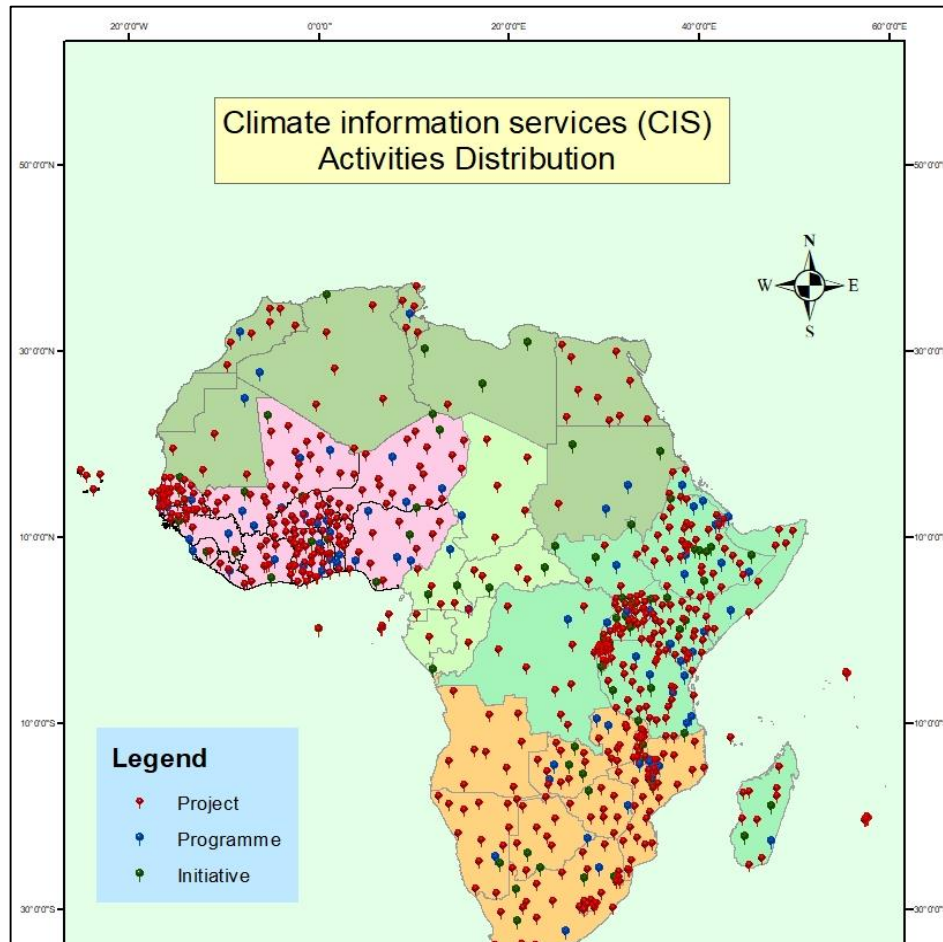


78% vs 14.5% Europe and USA based institutions vs. Africa-based institutions



South Africa, Kenya, Ghana, Tanzania, Ethiopia

Funding...



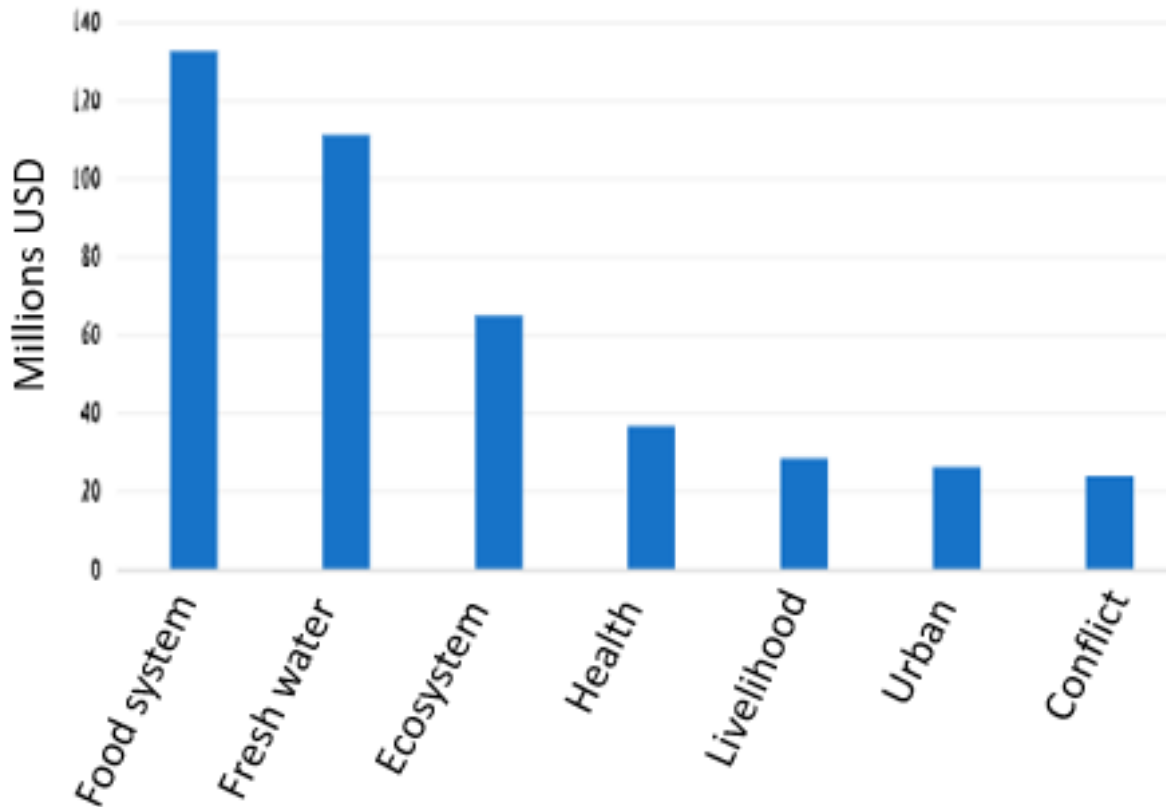
The figure indicates 79 initiatives, 538 projects and 83 programme across the African continent (ACP/C, 2018).

Funding by discipline

Of the funding for climate-related research issues in Africa

- Climate-change-impact studies ~40%
- adaptation studies received almost 40%
- mitigation research received substantially less, at 17%.

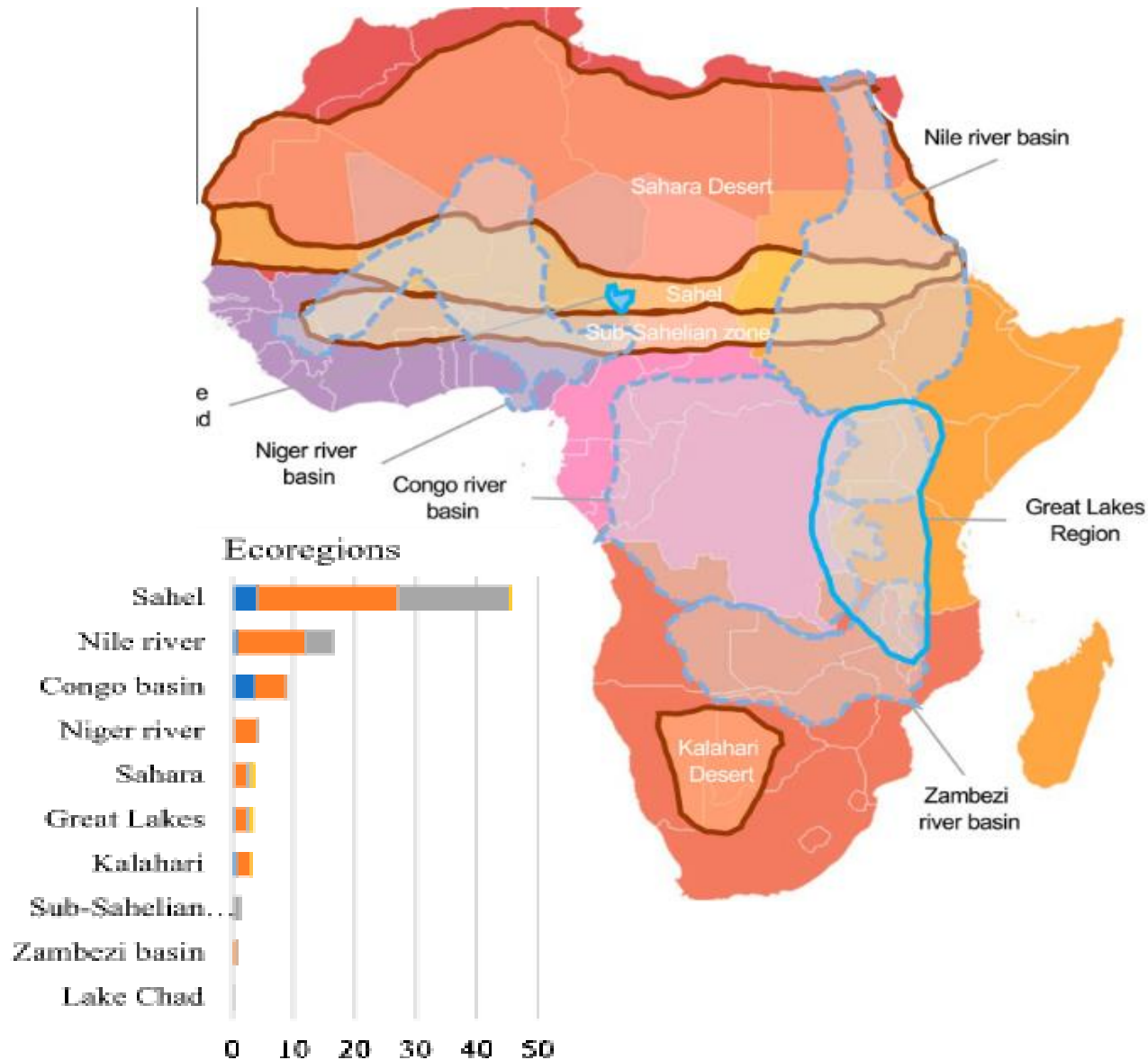
Funding...



Distribution of funding across risk categories (1990–2020)

- **Food systems and water** are the most highly prioritized topic in funding for Africa-related climate research
- **Social science** (**28%** Africa vs **12%** to global)

Funding...



Ecoregions

- **Sahel the highest followed by Nile River while projects on Lake Chad received the least**

Funding...

However, funding for climate change research on Africa is:

- largely dictated by the agenda/priorities of government institutions in the EU, the UK and the USA;
- leaving large knowledge and skill gaps;
- lacking capacity building initiatives as part of research projects



The African Climate Conference 2013 (ACC-2013) was held in Arusha, Tanzania, to address these challenges and pave ways for the establishment of CR4D

Part III

Climate Research for Development in Africa (CR4D) initiative



Climate Research for
Development in Africa

CR4D...

Climate Research for Development (CR4D)

- To strengthen the links between climate science research and climate information needs in support development planning in Africa
- Founding partners



- An outcome of the African Climate Conference 2013 (ACC-2013)

CR4D...



Key milestones of CR4D

CR4D...

CR4D structural goals

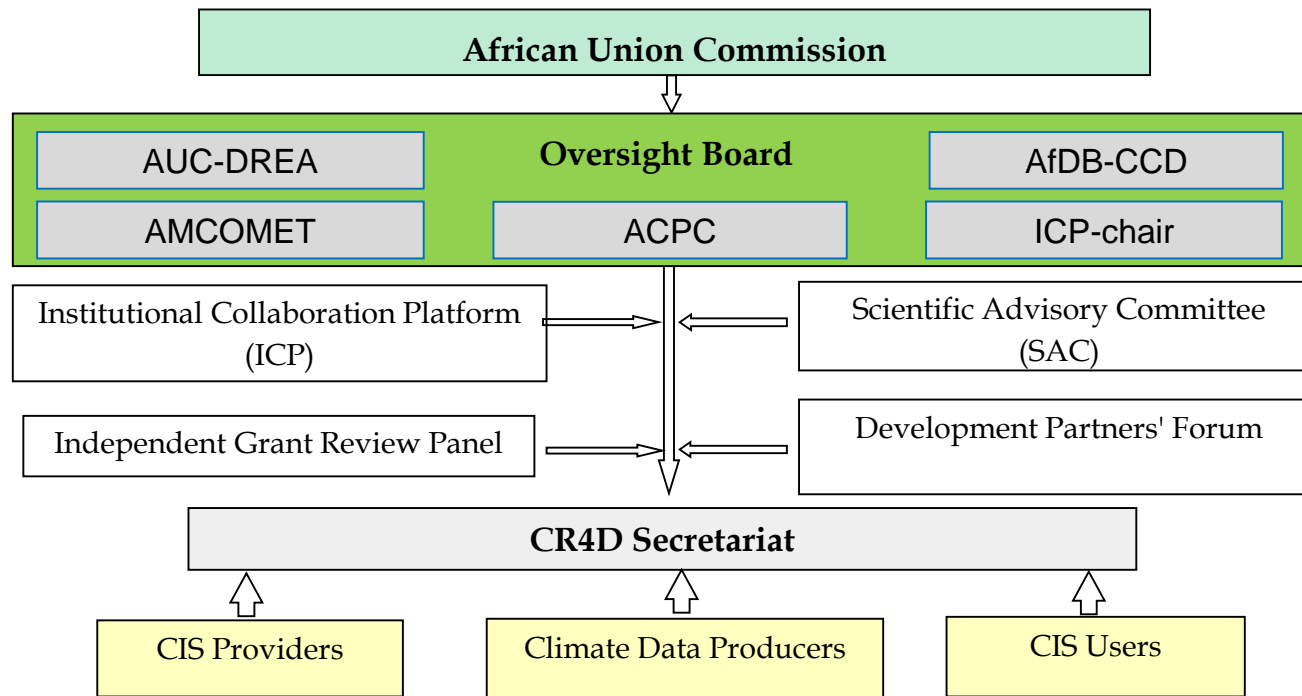
- **Conducting co-designed and co-produced multi-disciplinary research;**
- **Filling gaps in knowledge and data sets;**
- **Enhancing Africa's scientific and institutional capacities and networks;**
- **Fostering effective collaboration and partnership among climate science, services, policy, and practice communities.**



*Major Achievements of the
CR4D initiative
(2016-2021)*

CR4D Achievements...

#1. Functional structure established and operationalized (2016-2017)



The overall CR4D governance structure

CR4D Achievements...

#2. The 5-years Strategy Plan (2019-2023) developed, with
4 structural goals,
3 knowledge frontiers,
11 research thematic areas
53 projects



- **KF1 – Foundational Climate Science**



- **KF2 - Impacts, information translation, communication**



- **KF3 - Engagement with policy, development and decision communities**

Knowledge Frontiers (KFs)

CR4D Achievements...

#3. Research/Study conducted



- **3** a comprehensive study on institutions, initiatives and experts in Africa conducted and interacting maps developed;
- **2** regional pilot projects on sub-seasonal to seasonal (S2S) in West and Central Africa;
- **4** foundational climate science research projects;
- **14** impact research projects;
- **3** climate policy research projects.

CR4D Achievements...

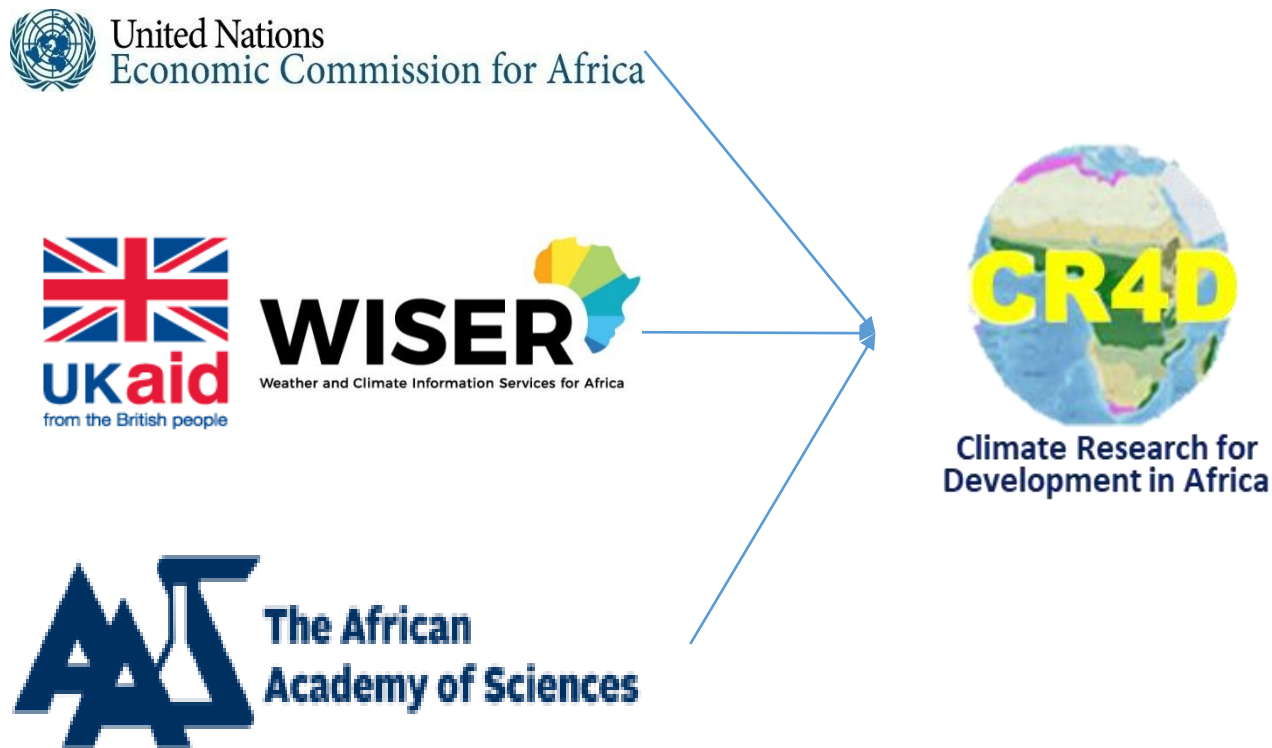
#4. Partnerships established



- **50+** partnerships with national and regional institutions;
- **118+** partnerships through the AAS, partner who also managed the CR4D research grant.

CR4D Achievements...

#5. CR4D research grant mechanism established



CR4D Grant

The first cohort of the research grant

- **178 proposals** reviewed by 5 independent reviewers,
- **30 applicants** invited face-to-face interview (*Gender, geographic distribution, thematic areas, originality, capacity building...*),
- **21 research projects** from fourteen African countries selected
- **100k to 130k USD** per research granted,
- **18 months of project span** – initial time was 18 months.

The WISER-funded CR4D research grant was officially launched on 3rd of June 2019 in Nairobi, Kenya

CR4D Grantees

Foundational Climate Science (4)



Improving weather and climate early warnings in Southern Africa (*Dr. Mary Jane Bopape, South African, South African Weather Service*)



Climate-Resilient development for Southeastern African Islands (CRISTAL) (*Dr Monrovia Barimalala, Madagascar*)



Strengthening the potential of seasonal forecasts for early warning of sectorial impacts as anticipated under 1.5/2.0 degree warming over Eastern Africa, (*Dr George Otieno, Kenyan, ICPAC*)



Multiple datasets and drought indices for supporting the mitigation of and adaptation to drought in Ethiopia. (*Dr. Mekonen Adnew, Debre Brehane, Ethiopia*)

CR4D Grantees...

Climate Change and Agriculture (4)



Mainstreaming climate services for resilient agricultural systems and sustainable development in West Africa (*Dr Philip Antwan-Agyei, Ghanaian, Kwame Nkrumah University of Science*)



The Implications of the 1.5-2.0 degree Celsius to Uganda's Climate, Agriculture and Water, - *Dr Isaac Mugume, Ugandan, Makerere University*



Plasma N₂: Emissions saving through production of low cost Fertilizers, using air as a raw material -*Dr Stella Kabiri-Marial, Ugandan, Mukono Zonal Agricultural Research and Development Institute*



Crop diversification and Nutrition security: Evidence from Sub-Saharan Africa. *Dr Eleni Yitbarek, and Dr. Hiwot Girma, South Africa, University of Pretoria*

CR4D Grantees...

Climate Change and Gender (2) Climate Change & Water/Flood (2)



The impacts of Gender inequality on Climate Change Adaptations and the livelihoods of Marginalized Communities around Protected Areas in Tanzania (-Dr Asanterabi Lowassa, Tanzanian, Tanzania Wildlife Research Institute)



Adaptation strategies of dairy livestock women cooperatives to climate change in Benin Niger and Burkina-Faso (West Africa) -
-Dr Marthe Montcho, Beninese, University of Abomey-Calavi



FLood Risk Reduction under Paris Agreement (FLORR-PA) for three West African capital cities -Dr Stella Kabiri-Marial, Ugandan, Mukono Zonal Agricultural Research and Development Institute



Trading water for soil fertility in rice systems under climate change. Dr Madaka Tumbo, Tanzanian, University of Dar es Salaam.

CR4D Grantees...

Climate Change and Health (3)



Implementing an early warning system for building communities' resilience to health impacts of climate change in the North of Senegal (IW4HI) - *Dr Ibrahim Sy, Senegalese, Centre de Suivi Ecologique)*



Impact of climate change on the transmission risk of malaria in southern Côte d'Ivoire - *the late Dr Richard I'Mbra Ivorian, University of Peleforo Gon Coulibaly*



Impact of weather variability on aeroallergens and allergic diseases: implication on public health in Nigeria , *Dr Marthe Montcho, Beninese, University of Abomey-Calavi*

CR4D Grantees...

Climate Change and settlement/ infrastructure/ Ecosystem (3)



Strengthening climate adaptation within informal settlements in coastal zones of urban areas - *Dr Olumuyiwa Adegun, Nigerian, Federal University of Technology*



Predicting synergies and trade-offs of water-related ecological infrastructure for climate adaptation in peri-urban Sub-Saharan Africa, *Dr Jessica Thorn, Namibian, University of Cape Town*



Building adaptive capacity to cope with effects of climate change on riparian based ecosystems and livelihoods in semi-arid areas of Zimbabwe *Dr Olga Laiza Kupika, Zimbabwean, Chinhoyi University of Technology*

CR4D Grantees...

Policy, development and decision communities (3)



**Advancing REDD+
Implementation in Ghana
and Cameroon** - *Dr Dieudonne
Alemagi, Cameroonian, University
of Ghana)*



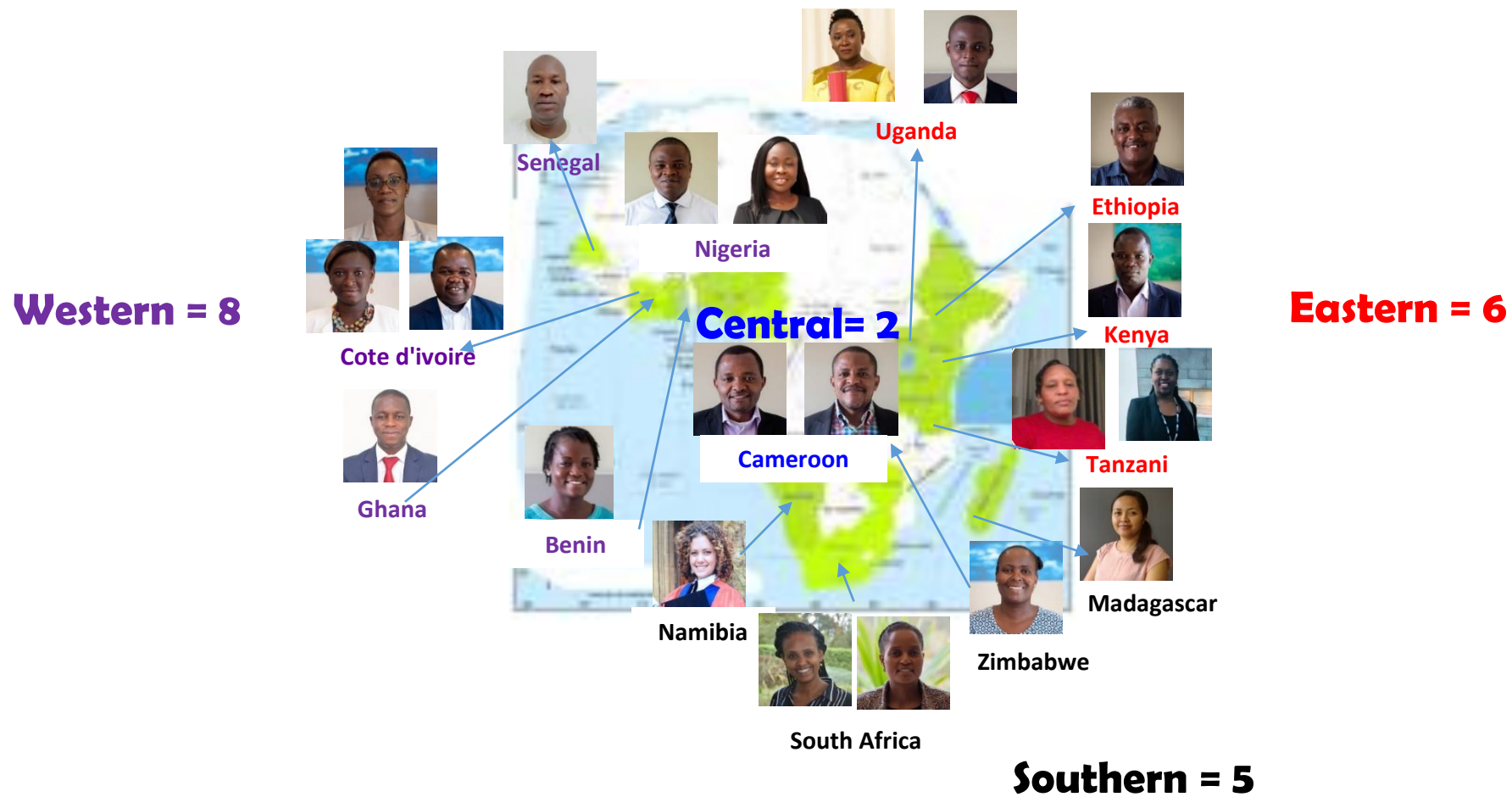
**Spillover effect of climate
change on cattle economy in
Côte d'Ivoire**, *Dr Ariane Amin,
Ivorian, Centre Suisse de
Recherches Scientifiques*



**Modelling the transition towards
a low-carbon economy in the
East African Community** *Dr
Anderson Kabila, Cameroonian,
Stockholm Environment Institute,
Kenya branch*

CR4D Grantees...

Grantees by region, country and gender



Gender - 12 Females and 9 Males

CR4D Grantee Outputs

- **87 publications** in form of journal articles, policy briefs, book chapters, blogs, and others
- **47 scientific forum/conference** presentations
- **235 media mentions** from January 2019 to August 2021
- **human capacity building** - fellows supervised and mentored about **69** master students, **25** PhD candidates, and **3** Postdoc fellows
- **about 50% of the fellows reported promotions** and career growth in one form or another while **67%** were engaged in additional research projects

Conclusions

Major trends in Africa's climate research *(Overland et al, 2022)*...

- Research agenda/priorities is largely defined by institutions based in the EU, the UK and the USA;
- Most funding for climate-change research on Africa goes to researchers based outside the continent;
- Relatively little funding targets North and Central Africa compared to Southern and East Africa and most former British colonies and/or Anglophone countries;
- Climate change impacts and adaptation have been the major foci of funding for research on Africa and low for mitigation.

Thank you
Mercy
Asante