

Monsoons Panel - Africa Monsoon WG

Objectives :

- Defining a membership relevant to cover academic research and research-society links for all of regional monsoon systems (west, central, east, south Africa).
- Addressing scientific burning issues common to all of regional monsoon systems and providing some added-values to related existing activities shared between west, central, east and south Africa.
- Setting-up priority activities.
- Identifying regional funding opportunities.

Monsoons Panel - Africa Monsoon WG

Membership (11) of the WG and remits :

	<i>Status</i>	<i>Affiliations</i>	<i>Monsoon system</i>
- Serge Janicot	Co-Chair	IRD/France & AMMA	West Africa
- Alessandra Giannini	Co-Chair	IRI/USA	Africa
- François Mkankam Kamga	Co-Chair	Univ/Cameroon & CR4D	Central Africa
- Françoise Guichard	Member	CNRM & Meteo-France	West Africa
- Cathryn Birch	Member	Univ Leeds /UK & FCFA	Africa
- Benjamin Lamptey	Member	ACMAD & CR4D	Africa
- Fredrick Semazzi	Member	NCSU/USA & HyVic	East Africa
- Mouhamadou Bamba Sylla	Member	WASCAL & CORDEX	West Africa
- Pauline Dibi Kangah	Member	UFHB/Ivory Coast	West Africa
- Claudine Wenhaji-Ndomeni	Member	CNR-ISAC/Italy	West Africa
- Tbd*	Member		South Africa

* Mxolisi Shongwe contacted but not allowed; Mark New contacted but has not yet answered; Babatunde Abiodun not yet contacted

North/South issue (4/6) - Gender issue (5/5)

Monsoons Panel - Africa Monsoon WG

Membership (11) of the WG and remits :

Topics	West	Central	East	South	PIs
Metrics process-based					C. Birch
Metrics user-based & bias-corrections					M.B. Sylla
Intra-seasonal time scale					S. Janicot
Detection & Attribution					A. Giannini & C. Wenhaji-Ndomeni
Climate Services					B. Lamptey & A. Giannini
Observations-Modeling					F. Guichard
Region PIs	P. Dibi Kangah	F.M. Kamga	F. Semazzi	Tbd	S. Janicot

Monsoons Panel - Africa Monsoon WG

Priority topics :

- Development of Process-based & Users-based **Metrics** for CMIP5 and future CMIP6 models evaluation; including CORDEX; bias-corrections; based on FCFA projects.
- Evaluation of climate variability, predictability and forecast skill, and associated teleconnections over Africa, at **intraseasonal** time scale, especially over 10-60-day periodicities; exploiting S2S data sets and contributing to a seamless forecast approach.
- **Detection-Attribution** studies of climate variability and climate extremes events over Africa; see example on East Africa paradox (Rowell 2015, *Gewex News* 2015).
- Contributing to **Climate Services** and fill-in gaps between research, forecasting and applications tailored to end-users needs.
- Contributing to enhanced interactions between **observational and modelling** research; recent field campaigns DACCIWA, PREFACE, HyVic,...

Monsoons Panel - Africa Monsoon WG

Priority topics : Development of **Process-based** & Users-based **Metrics** for CMIP5 and future CMIP6 models evaluation; including CORDEX; bias-corrections; based on FCFA projects.

Rationale :

- Need to develop specific process-based metrics over Africa to evaluate and reduce uncertainties of climate projections in CMIP5 and next CMIP6.
- Taking advantage of recent observational and research progress made over the regional monsoon system areas (AMMA, on-going FP7 DACCIWA, PREFACE projects, on-going GEWEX RHP HyVic).
- On-going FCFA projects (-2019) over various areas of sub-Saharan Africa (AMMA-2050, UMFULA, FRACTAL, HyCRISTAL, and Pan-Africa IMPALA including high-resolution Convection-Permitting simulations).
- These projects focus on the role of convection and land surface interactions on the regional monsoon systems.
- Several MP-Africa PIs are involved in some of the FCFA projects; on-going development of process-based metrics over West Africa (for instance).

Activities :

- Contributing to the Africa Process Evaluation Group (UK; C. Birch).
- Set-up interactions between the different FCFA projects aimed on a suite of process-based metrics.
- Reporting on progress on land-convection couplings at high-resolution scale.

Monsoons Panel - Africa Monsoon WG

Priority topics : Development of Process-based & **Users-based Metrics** for CMIP5 and future CMIP6 models evaluation; including CORDEX; bias-corrections; based on FCFA projects.

Rationale :

- Need to co-develop specific users-based metrics over Africa specifically on high-impact weather events (extremes) and on their modeling impacts in terms of crop yields, drought and flood risks, health,...
- Evaluating and reduce uncertainties of their occurrences, intensity and impacts in climate projections in CMIP5 and next CMIP6.
- Need to address the robust climate model biases and to develop bias-corrections before running impact models and providing information to society.
- On-going FCFA projects (-2019) over various areas of sub-Saharan Africa are addressing this issues.
- Several MP-Africa PIs are involved in some of the FCFA projects; on-going development of users-based metrics over West Africa (for instance).

Activities :

- Computing bias-corrections over the whole Africa on CMIP5 simulations and application to hydrological and crop models simulations.
- Sharing these bias-corrected data sets between all the FCFA projects.
- Workshops with end-users for the different monsoon systems areas.

Monsoons Panel - Africa Monsoon WG

Specific focus : CORDEX-Africa.

Rationale :

- C. Lennard is coordinating CORDEX-Africa activities. Sub-WG exist on West (Sylla), East, and South Africa. A new Central Africa regional team initiated in May 2015.
- Large activities on evaluation and use of RCM for impact studies. Free data access, common diagnostics, regular training and analysis workshops, international co-publications, dialog with vulnerability-impact-adaptation scientists.
- CORDEX-2 (CORDEX Flagship Pilot Studies): 3 calls has been opened (last deadline 15 Oct 216) by CORDEX/WCRP for :
 - Targeting fine scale processes and clear scientific questions of interest(higher simulations (< 25kms to CP) on restricted domains)
 - Use of observational data including in-situ measurements and derived products
 - End-to-end perspectives and potential for support demonstrated local/regional needs.
- CORDEX-Africa has submitted presently three proposals for CORDEX FPS calls.

Activities :

- Create synergies between CORDEX-Africa and projects like those of FCFA program.
- Bias-corrections & impacts studies.
- Climate services & co-development of climate information services.
- Report on Mexico Oct and other meetings (Sylla & Lennard's contact).

Monsoons Panel - Africa Monsoon WG

Priority topics : Evaluation of climate variability, predictability and forecast skill, and associated teleconnections over Africa, at **intraseasonal** time scale, especially over 10-60-day periodicities; exploiting S2S data sets and contributing to a seamless forecast approach.

Rationale :

- Intraseasonal scale modes of variability (bi-weekly, MJO-linked) are highly active in the various monsoon systems in Africa (wet and dry spells, monsoons onset, breaks and withdrawal).
- It is a critical scale for impacts and end-users (drought, floods, heat waves during dry seasons, crop yields,...), and forecast products designed for societal applications are needed.
- Predictability is not fully evaluated and it is not well monitored in operational meteorological services.
- Teleconnections linked to some of these modes over Africa are not enough known.
- Climate model do not simulate them well.
- S2S and other databases are free-access but not fully exploited.

Activities :

- State-of-the-art report on Intraseasonal modes over each of the monsoon systems areas and highlighting inter-monsoons teleconnections (intra-Africa & Tropics/Mid-latitudes).
- Workshops with Meteorological Agencies and ACMAD/ICPAC for the different monsoon systems areas (for instance Handbook for forecasters in West Africa & diagnostics on MISVA platform).
- Closer integration in S2S project & aim at setting-up a coordinated project over Africa.
- Towards a seamless forecast chain ?

Monsoons Panel - Africa Monsoon WG

Priority topics : **Detection-Attribution** studies of climate variability and climate extremes events over Africa; see example on East Africa paradox (Rowell 2015, Gewex News 2015).

Rationale :

- Decadal natural variability can be high over Africa and attribution of specific recent climate anomalies between natural variability and anthropogenic forcing can be difficult.
- This is a key-issue for society and it can lead to mal-adaptation strategies.
- In the released annual BAMS report on Climate Variability Attribution, there are very few contributions concerning Africa.
- On-going research covering Africa: for example (i) WAMME2 project addressing the role of SST, land-use and aerosols on historical West African monsoon decadal variability (Climate Dyn. 2016); (ii) the East African "paradox" (Rowell 2015) addressing contradictions between the observed last two-decade East African rainfall decline and increasing rainfall in CMIP5 projections ; (iii) the debate about attribution of the recent partial rainfall recovery over the Sahel (Gewex News 2015).

Activities :

- Focus on East and West Africa case study. Work on organizing a coordinated multi-models project (see contacts with Yongkang Xue / WAMME2).
- Identification of similar issue over South and Central Africa ?

Monsoons Panel - Africa Monsoon WG

Priority topics : Contributing to **Climate Services** and fill-in gaps between research, forecasting and applications tailored to end-users needs.

Rationale :

- Climate services can be considered as a keyword for Africa, as it concerns both observation systems and environmental monitoring, research, modelling and forecasting, information systems, end-users platform and capacity building.
- Institutional pan-Africa dynamics of CR4D (Climate Research for Development) can provide a favourable context and support to link research and applications.
- Several on-going contributions to climate services have been identified ; ex. FCFA program, WISER (Weather and climate information SERVICES for Africa) program, Afclix (African climate exchange project) dialogue platform,....

Activities :

- Getting closer to CR4D and see which added-value we can provide.
- Following the activities in FCFA program and see what can be done in terms of coordination/sharing between the different projects and their case studies applications.
- Set-up of a Climate Services Portal on one country (Senegal ?) providing climate information and dialogue with a community of stake-holders and end-users ; an atlas on "climate change in Senegal" addressing exposure, impact and vulnerability to climate change for various environmental and economical sectors.
- Link with CORDEX2-Africa activities.

Monsoons Panel - Africa Monsoon WG

Priority topics : Contributing to enhanced interactions between **observational and modelling** research; recent field campaigns DACCIIWA, PREFACE, HyVic,..

Rationale :

- Taking advantage of recent observational and research progress made over the regional monsoon system areas (AMMA, on-going FP7 DACCIIWA, PREFACE projects, on-going GEWEX RHP HyVic).
- Need to go on improving climate models over Africa and reducing uncertainties of climate projections in next CMIP6.

Activities :

- Follow how the exploitation of new observations is carried out for improvement in key-process knowledge and their parametrizations in climate models, and identify potential gaps.
- Promote the set-up of a field campaign over Central Africa.

Monsoons Panel - Africa Monsoon WG

Specific focus : Central Africa

Rationale :

- Central Africa is one of the areas of most intense convective activity in the world. Its location near the equator induces a high activity in convectively-coupled equatorial waves and potential teleconnections within the tropical band at intraseasonal scale.
- There are very few available observations and our knowledge is weak in terms of Central African climate and its variability, scale interactions between convection, land surface and large-scale atmospheric circulation.
- There is no significant on-going or scheduled observational or research program.
- A community of young scientists from Central Africa is present but not well coordinated and weakly supported by the local institutions.

Activities :

- Producing a state-of-the-art report of Central Africa weather systems and climate variability, and on-going projects.
- Use support from CORDEX Central Africa group.
- Promoting the highlighting, coordination and financial support of the scientific community.
- Promoting a field campaign over this region.

Monsoons Panel - Africa Monsoon WG

Regional funding opportunities :

- CLIMDEV Africa platform, connecting researchers, end users and stakeholders
 - We need to determine how the Regional WG can contribute to CLIMDEV and how financial support can be received. This would necessitate having activities led by a local organisation.
 - CLIMDEV supports more than just meeting activities, but also dedicated research.
- Other possibilities for funding include the Africa Bank of Development, the World Bank,..., but the way to get it is not clear.
- See also national institutions and other international structures [AFD, DFID, IDRC Canada (similar to UK DFID), NOAA African Desk, START]
 - See Arona Diedhiou, Cheikh Kane, and others for more information
 - In the UK, further work could be done on lobbying DFID on activities to give similar opportunities such as HyVic.
 - Initiatives could also target UK NERC's strategic programme development, perhaps relating to East Africa. This could then generate new funding opportunities.
- There may be training opportunities that can be developed via ICTP.