RCOF Review 2017

[Regional Climate Outlook Forum for Sudano-Sahelian region of Africa - PRESASS]

Status Report

Specific Climate features of concerned region

This region typically covers the area between the Sahara desert in the north and the tropical Atlantic coast to the south. The regional climate is dominated by the West African monsoon during the rainy season typically occurring during northern hemisphere summer (from July to September).
Associated with the apparent motion of the Sun, the Intertropical Convergence Zone (ITCZ) experiences a latitudinal shift during the year that plays a fundamental role in determining the West African monsoon (WAM) rainfall variability (*Sylla et al.*, 2013). The WAM rainfall variability spans a wide range of time scales, from intraseasonal to interdecadal and is influenced by both local and remote oceanic forcings and associated changes in the atmospheric circulation [*Rodríguez-Fonseca et al.*, 2011].
Major sources of seasonal climate variability and predictability during summer in the region include summer near surface air temperatures over North Africa and southern Europe, Sea Surface Temperatures (SSTs) of the equatorial Pacific (ENSO region), the Mediterranean Sea, the tropical Atlantic Ocean (North and South) as well as the Western Equatorial Indian Ocean. SST predictive skill is limited over most ocean basins except the ENSO region. It is recognized that soil moisture is another important source of climate variability and predictability over the region. Uncertainties on SST forecasts over the Mediterranean Sea, the tropical Atlantic and equatorial Indian Ocean, soil moisture forecasts over land areas of the region are documented.
It has been shown that most dynamical forecast systems capture the main features associated with the rainfall regime south of 10°N (i.e rainfall located mainly south of 10°N and the northward migration of rainfall over the season). On the other hand, only a fraction of these forecast systems capture the characteristics of the rainfall signal north of 10°N associated with the Sahelian regime. Simple statistical models have been shown to be of value outperforming some state-of-the-art dynamical forecast systems when predicting West African rainfall regimes (Rodriguez et al. 2014). Combining all forecast systems does not always lead to improved forecasts when compared to the best single forecast system. In operations, some forecast systems are usually better than others when predicting the variability of the West African rainfall regimes several months ahead. Operational experience and research findings (Rodriguez et al. 2014) suggests that in some occasions even a multimodel approach is not necessarily better than some skillful single model ensemble.
Improvement on understanding and representation of processes and phenomena in ocean models over the tropical Atlantic, land surface models over sub-Saharan Africa and coupled ocean-atmosphere-land models are required to provide better inputs to operational seasonal prediction for the region.
Floods and droughts, late onsets, early and late cessation of rains, dry and wet spells are the main climate hazards of the region. Shortage of water, multiple sowing, food insecurity due to reduction in crop yields, conflicts between farmers and herders due to droughts, epidemic malaria regularly occur. Roads and other infrastructure damages, loss of lives and properties associated with floods have become a matter of strong concern in many cities of the area since the late 90s.

The RCOF background

The RCOF started in 1998. It has been organized as a physical event held once a year usually in May with July-August-September as the main target season. Following request of users, this RCOF started testing the option to be held in late April every year to increase lead time and usefulness of the product. It involves 17 countries in West and Central Africa namely Mauritania, Senegal, Mali, Guinea-Bissau, Guinea, Côte d'Ivoire, Burkina Faso, Niger, Chad, Cameroon, CAR, Nigeria, Benin, Togo, Ghana, Liberia, Cape Vert. National Meteorological and Hydrological services of the region, WMO Global Producing Centres for Long Range Forecasts, AGRHYMET Regional Centre are the major collaborating partners.
The African Centre for Meteorological Applications for Development (ACMAD) is the main coordinating institution for seasonal precipitation outlooks.
The AGRHYMET Regional centre is responsible for discharge outlooks and agrometeorological advices based on precipitation outlooks.

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The RCOF process

The RCOF implementation process includes:

- A pre-COF training workshop on seasonal climate prediction to strengthen the technical capacity of national and regional climate experts;
- Meeting to present and interpret available real-time climate monitoring and assessment, seasonal prediction products from WMO global data and monitoring centres, GPC-LRFs and RCCs as well as the country-level forecasts, assess the skills of forecasting systems, and develop the consensus seasonal climate outlook statement for the region;
- Together with the user representatives, the forum participants discuss the potential applications of RCOF products for decision making in the agriculture, disaster, water and health sectors;
- Special outreach session involving media experts to develop effective communication to stakeholders;
- Verification of past outlooks by NMHSS and ACMAD/RCC, assessment of the use of climate information through surveys, meetings, regional food security and DRR forums, group discussions, dialogue days, exhibitions and side events;
- Share recent studies and findings on regional climate variability, predictability and climate change and discuss their integration in forecasts operations;
- Updates of the consensus product.

The approach for seasonal forecasting involves analysis of climate variability and predictability in the region, assessment of outputs from global single and multimodel ensemble forecasting systems, statistical seasonal forecasting tools, analogue years, persistence, composites and trends analysis as well as available findings from climate studies at local, national, regional and global levels. Interpretation of models outputs rely on relevant predictability and skill products. A technical note is made and discussed during a briefing involving climate experts. A consensus outlook statement is prepared after the briefing targeting experts in sensitive sectors. Sessions for hydrologists and agrometeorologists are organized in parallel generating discharge outlooks and agrometeorological advices presented at the forum plenary. ACMAD/RCC prepare and publish for the disaster management sector a brief for policy and decision making including a synthesized climate outlook, related expected hazards and potential impacts as well as measures for contingency plan updates and implementation.

The verification of past year's climate outlook is done as an operational activity of ACMAD/RCC using simple visual verification and the Ranked Probability Skill Score. The verification information is communicated during the RCOFs, regional food security and DRR meetings and events.

The RCOF outlook is communicated to participants at meetings of the West African regional Committee on disaster management and the national flood management committee in Niger in collaboration with the National Meteorological service.

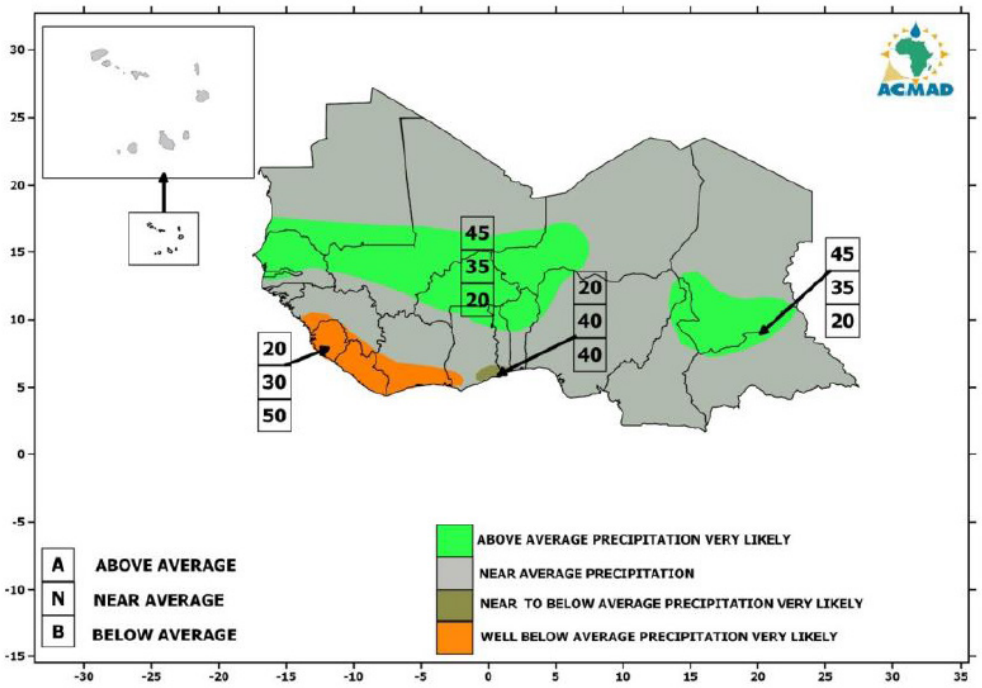

Figure 1: Seasonal Precipitation forecasts issued on May 19, 2017 and valid for July-September 2017 over West Africa, Chad and Cameroon.

Figure2: Participant to the Regional Climate Outlook Forum for West Africa, Chad and Cameroon Ouagadougou-Burkina Faso from May 21-25, 2012.

Capacity needs

Major stakeholders involved in the RCOF are NMHSs of the region, ACMAD, AGRHYMET, NBA, regional offices of OCHA, IFRC. High speed internet for access to data by NMHSs, capacity to format and quickly communicate with users, sub-seasonal and seasonal forecasting training on methods, tools and products interpretation for NMHSs, establishment of formal and operational sub-seasonal to seasonal forecasting teams at national and regional level, dialogue with OCHA, IFRC,

AGRHYMET and NBA to exchange, build trust and facilitate the application of seasonal forecasts were identified.

ACMAD organizes on the job and workshop trainings for NMHSs, dialogue days with NMHSs, African Union, ECOWAS, AGRHYMET, NBA and donors on the budgeting and application of climate information.

To further address capacity needs mentioned above, sessions and consultations at meetings of Regional Committee for disaster management, regional agriculture, water management, diseases surveillance and food security events in West Africa are required to reach out more actors in climate sensitive sectors.

User involvement

During last two decades a number of the RCOFs have achieved remarkable progress in regional networking and user liaison, and substantially contributed to capacity building and user awareness. Liaison at policy level with Regional Economic Communities (e.g ECCAS) and Regional platform for DRR in Central Africa, connections with regional consultation for disaster risk management in ECOWAS region with civil protection and disaster managers of West African states., collaboration with food security communities (CILSS, FAO, WFP regional offices) for west Africa and UNOCHA regional office for West and Central Africa are well established.

Sessions at RCOF and User driven meetings and events dedicated to dialogue are organized to collect and analyze feedbacks. The main key message from these sessions has been the requirement for legal and operational frameworks for effective service provision in the form of help desks or clearing houses.

SWOT analysis

In 2008, ACMAD issued an update of consensus prediction for the region with high probability (up to 50%) for above average rainfall over much of the southern Sahel. Wet to very wet years in the region are usually associated with higher frequency of heavy rains and floods. The forecast was used for an appeal by Red Cross for funding for flood preparedness. The funds were granted leading to prepositioning of relief items (mosquito nets, blankets…). Without this forecast, items would have been provided after floods. The efforts would have then cost more in time and transport expenses. This was the first time in Red Cross's history that based on seasonal forecasts; funds were requested and used to prepare for potential emergency. Wet years are also related to more mosquitoes and malaria in Sub Saharan Africa. UNICEF office in Niger used seasonal forecasts to prepare and preposition drugs and mosquito nets for vulnerable communities. Agrometeorlogical advises are regularly prepared usings seasonal forecasts and other climate information leading to improved food security in the region. Disaster Management Agencies and Civil protection directorates in the region express appreciation of climate forecast and their willingness to sustain its production and delivery during regular consultations and meetings. Having seasonal forecast as a key element in regional multi hazard early warning system is recognized as an investment priority in the ECOWAS humanitarian policy and action plan

The major weakness is the limitation in staff number and technical capacity in NMHSs and regional Centres to effectively absorb advances in climate science and technology and communicate effectively climate information at regional, national and local levels. Optimal number of support staff to operate RCOF and expand its functions and product portfolio is lacking.

Advances both in climate science (observations, understanding of processes and phenomena, modeling and prediction, forecasting and impacts) and technology (i.e internet technology and

computing), development and emergence of open platforms and systems for collecting, processing, sharing data and climate knowledge are opportunities supporting further evolution of the RCOF.

Some threats to RCOF include high level of competencies required for operational sub-seasonal to seasonal forecasting, the gradual involvement of the private sector at a time when the activity lacks standards and recommended operating procedures for climate services in different sensitive sectors. Even though seamless forecasting advantages are now well recognized, the lack of organizational set up for effective seamless forecast operations in NMHSs and Regional Centres is a threat for expansion of RCOF products and services portfolio.

Sustainability of RCOF

The RCOF should be sustained as an operational activity of ACMAD/RCC. It is well recognized by west and relevant central African countries as well as the Regional Economic Communities (ECOWAS and ECCAS) involved. The RCOF has been funded by the African Development Bank through the ClimDev Special Fund and the African Development Fund. The European Union provides additional contribution trough the European Development Fund. The RCOF is led by ACMAD/RCC with planning, mobilizing resources, preparing and organizing sessions and reporting as its main functions. AGRHYMET is the other key player leading similar activities with agrometeorological and hydrological communities. Institutional Support to African Climate Institutions (ISACIP) and Monitoring of the Environment for Security in Africa (MESA) are main projects supporting the RCOF. The long term sustainability of the RCOF relies heavily on efforts to be undertaken to strengthen valuation of seasonal forecasts and associated climate information and relevant sector advices. Valuation of climate services is shown by demonstrating evidences of benefits due to the use of climate services, promoting broad awareness and acceptance of seasonal forecasts, improving NMHSs and user organizations capacity to develop and interpret forecasts, tailor or format climate information, apply climate information , document and record benefits.

Way forward

Scientific research on ocean-land-atmosphere modeling, new predictors for statistical forecasting tools, forecasts assimilation options and optimal combination of forecast models direct outputs, local and regional climate variability and trends studies, assessment of regional performance of forecasting systems including their strengths and weaknesses in predicting regional climate processes and phenomena are proposed to improve consensus outlook products.

Predictions at subseasonal timescales and advances in seamless prediction are ongoing efforts to improve forecasts of anomalous onset and cessation of the rainy season, wet and dry spells during the rainy season. ACMAD/RCC team will be expanded to carry out sub-seasonal outlooks for Africa covering one to two weeks ahead. For medium to long term policies and plans, climate scenarios and decadal climate forecasts, related impacts and vulnerability assessments are required as outputs of future RCOFs for use in disaster risk management and climate change adaptation strategies and programmes.

ACMAD/RCC has developed a procedure for seasonal forecasting and will contribute in emerging efforts for standardization of climate forecasting practices. For the Disaster Risk Management sector, seasonal climate forecasts has been expanded to hazards outlooks, potential impacts expected and suggested preparation and early response measures. Such developments of sensitive sector dedicated services are being planned for the agriculture, health and water sectors.

Participation of climate service providers in user forums namely contingency planning meetings, disaster management consultation meetings, agriculture season planning workshops, vulnerability assessment and water forums is important for effective and wide exchanges, interactions and consensus building on sector relevant impacts, adaptation measures, advices and recommendations. Provision of climate outlook in April instead of May each year and with May to October as target

season is needed for further engagement of a wider range of users and expansion of forecasts application opportunities.

References

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