

Climate Information and Development: Regional Climate Outlook Forums in Africa

MOHAMMAD KADI

AFRICAN CENTER OF METEOROLOGICAL APPLICATION FOR DEVELOPMENT (ACMAD)

Africa | Information Products

INTRODUCTION

The African Center of Meteorological Application for Development (ACMAD) works to improve the provision of weather and climate information for the promotion of sustainable development of Africa, in the fields of agriculture and food security, water resources, disaster risk management, health, public safety and renewable energy. In this context, ACMAD has organized Regional Climate Outlook Forums (RCOFs) since 1998.

Recognizing that climate predictions could be beneficial to many parts of the world in adapting to and mitigating the impacts of climate variability and change, RCOFs are organized with the overarching responsibility to produce and disseminate climate information for the upcoming season. Climate experts develop a consensus on the upcoming season and deliver their conclusions to participating users groups, which receive advice and action options for climate-sensitive sectors, such as agriculture and food security; water and disaster management; health and safety; ecosystem management and conservation. A regional and national networking of the climate service providers and user-sector representatives is built into the RCOF process (Ogallo et al 2008).

The first RCOF organized by ACMAD was the First West African Forum on Climate Variability and Prediction and its Application in Early Warning Systems for Food Security (PRESAO-01). The forum was held in May 1998 in Abidjan, Cote d'Ivoire. Since then, RCOFs have been held every year for West Africa, Chad and Cameroon. The 15th PRESAO was held in May 2012 in Ouagadougou, Burkina Faso. Though this service was initially provided only for the West African sub-region, it has since been extended to include Central (PRESAC) and North Africa (PRESANORD) as well. The 5th PRESAC and 2nd PRESANORD were held in September 2011 and January 2012 respectively.

SOCIOECONOMIC BACKGROUND

The main socioeconomic sectors addressed by the Climate Outlook Forum include but are not limited to agriculture, water, and health. For instance, the 1982-83 El Niño and related drought in Africa significantly reduced food production, and exacerbated diseases and malnutrition in West and Southern Africa. In 2011, disruption in the distribution of precipitation—late onsets, early cessation and spells—during summer led to a reduction of up to 30% of food production in the Sahel. Some countries, like Niger, called for emergency food supply during the first half of 2012 as a result.

TARGET AUDIENCE

The organizations that participate in the RCOF include the national meteorological and hydrological services (NMHSs), regional economic commissions, the African Union Commission (AUC), UNECA/ACPC (United Nations Economic Commission for Africa/African Climate Policy Centre), the New Partnership for Africa's Development (NEPAD), the African Development Bank (AfDB), the World Bank, various intergovernmental organizations (IGOs). Various humanitarian agencies -- including the International Federation of Red Cross and Red Crescent Societies (IFRC), the World Food Programme (WFP), the UN Office for the Coordination of Humanitarian Affairs (UNOCHA), the United Nations Children's Fund (UNICEF), the UN International Strategy for Disaster Reduction (UNISDR) -- are also involved, as are non-governmental organizations (NGOs), research institutions, USAID's Famine Early Warning System (FEWS), and the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS)

Contingency plans are prepared with RCOFs products as input by national civil protection or emergency management services or agencies during the user's sessions of RCOFs. Advice and action options for farming, livestock, disaster and water management and health communities are becoming part of climate outlooks, assessments and reports disseminated to users.

CLIMATE AND CONTEXTUAL INFORMATION

The production of climate outlooks relies on a set of methods, tools, and products freely available within the framework of the World Meteorological Organization's climate programmes and projects involving global, regional, and national climate institutions.

WMO-designated Global Producing Centres (GPCs) for Long Range Forecasts provide dynamical models outputs, while NMHSs and Regional Centres generate seasonal forecasts using statistical tools developed during the training phase of RCOFs. Expert knowledge and understanding of global and regional climate is provided by national and international experts through analyses of past and present-day climate data. Over some regions, similar years are derived from climate analyses to provide additional inputs for the consensus development process. National and international climate experts consolidate outputs from global dynamical models and statistical tools, climate analysis, and expert knowledge to generate consensus climate outlooks.

Socioeconomic data is not directly incorporated in the development of the forecasts. However, advice and decision support are provided in order to reduce negative socio-economic impacts and benefit from opportunities related to the expected climate conditions. Examples from the 2012 RCOF for West Africa, Chad and Cameroon are provided below. In the context of the climate outlook for the 2012 July/August/ September rainy season, the advice proposed relates to reducing climate risks and maximizing yields of activities in the sectors of agriculture, food security, public health, and management of natural resources, including water. This is articulated below:

ZONE I AND IV : Below-Normal conditions very likely

- Prioritize low-land cropping.
- Sow crop varieties that are very resistant to water stress on highlands.
- Choose ploughing methods that encourage water conservation.
- Choose short-lived and/or drought-resistant food plants.
- Plan an early start for off-season activities
- Promote crop diversification.
- Improve and strengthen emergency assistance, particularly in locations already under food and nutrition crisis.
- Increase vigilance in the management of conflicts related to land use between agricultural and pastoral practices with special attention to areas under crisis
- Prepare early collection and fodder storage.
- Plan an early departure of herds for transhumance.
- Avoid wasting water reserves.

ZONE II AND III : Normal to Above-Normal conditions very likely

- Prioritize upland cropping.
- Encourage rice cropping in low-land areas.
- Plan for management of excess water in dams and reservoirs.
- Maintain levees to avoid flooding in case of excess rainwater.
- In case of early sowing, use long-lived food plants.
- Plan to use more manure to mitigate soil erosion caused by excessive rainfall.
- Prepare for more abundant collection and storage of fodder.
- Move animals away from rivers to avoid drowning.
- Vaccinate animals to avoid epidemics.
- Plan late departure of herds in transhumance.
- Prepare contingency plans for floods.
- Strengthen disease surveillance systems and prepare for early detection and treatment of water borne diseases.

Although there a diverse range of stakeholders are involved in the RCOFs, the use of direct model outputs without human corrections is not yet realistic, making tailoring a required step in forecast preparation. Developing tailored seasonal forecast products for applications requires close collaboration and confidence at the provider-user interface. The tailoring process at the regional level leads to consensus outlooks and related advice, as presented above. It is the output of exchanges and discussions between users of different climate-sensitive sectors (agriculture, food security, water and disaster management and health) and climate experts. At a national level, forums are encouraged involving climate experts, extension workers, farmer's federations, and NGOs working at community levels, to further downscale advice and action options to effectively reach the most vulnerable populations.

Managers and planners of water reservoirs along the Niger River basin have experience and expertise with empirical relationships between

precipitation in sensitive areas of the basin and observed stream flow downstream. Efforts are underway to use long historical stream-flow records to build robust statistical relationships between forecasts of seasonal precipitation and discharge.

Such efforts have proved to be useful in other application sectors. For example, climate outlooks produced through the RCOFs are often used to inform decision makers in the agriculture and food security sector. In Mali, subsequent adjustments in the agricultural calendar, seeds varieties, ploughing and sowing dates, and best harvesting periods have led to improvements in food production by as much as 30%.

Another example is the work of the Red Cross in West and Central Africa, which planned logistics, trained volunteers on rescue and recovery, and made international appeals for support in response to seasonal forecasts in the summer 2010 indicating above-normal precipitation, with heavy precipitating and flooding events more likely. These efforts contribute to a better response to 2010 floods, which affected more than one million people in West and Central Africa (UNOCHA report).

IMPLEMENTATION

PROCESSES AND MECHANISMS

STAKEHOLDER AND ISSUE IDENTIFICATION

The forecast that comes out of the RCOF is of interest to a wide range of stakeholders, ranging from global-scale institutions, to national level meteorological services, to local communities. User stakeholder sectors include agriculture, water, and health. Organizations include FEWS, river basins authorities, drought control institutions, UN regional bodies like the Food and Agriculture Organization (FAO), the World Food Program (WFP), UNOCHA, UNISDR, and non-governmental organizations like the IFRC, as well as regional farmers federations and associations.

The Sahelian Agriculture, Hydrology, and Meteorology Regional Centre (AGRHYMET) is among the user institutions present at the RCOFs; it works with partner organizations to derive hydrological outlooks and advice for agriculture-related sectors in the region including food security and water. Institutions such as WFP, IFRC, FEWSNET, the New Partnership for Africa's Development (NEPAD), the Commission of the African Union (AUC), the African Climate Policy Center (UNECA/ACPC), are key institutional user groups, which incorporate the results distributed following the RCOF into their decision/policy-making processes. These stakeholders were identified using information about their sensitivity to climate variability. The impacts of droughts in the 1970s and 1980s, and particularly the 1984 drought that devastated the Sahel, led to government's decisions and conferences resolutions to focus on climate monitoring and prediction.

STAKEHOLDER INVOLVEMENT

ACMAD, WMO Global Centres and NMHSs collaborate to prepare climate outlooks during the first phase of the forums. The user organizations listed above joined the climate community during the second phase of the forum to discuss expected climate conditions and derive relevant advice and action options for socioeconomic sectors. Press conferences, interviews, debate and discussions with the media are organized for wide dissemination of forums outputs.

Media interactions are organized prior to the forums to communicate the objectives and expectations, as well as during the forum to detail production processes, and after the forum to disseminate results and implications for major socioeconomic sectors. Websites, telephone calls, emails, interviews, and press releases are additional channels used to disseminate information after the forum meetings.

FUNDING MECHANISMS

The RCOF program is supported by ACMAD member states, with additional funding from African Development Bank (AfDB), WMO and in some instances the World Bank and the UNISDR. Meteo-France, the UK Met Office and other WMO GPCs and the International Research Institute for Climate and Society (IRI) have provided technical support for the forum activities.

Because no study is available to convincingly quantify the benefits of climate outlook products, the RCOF activities very much rely on project funds of limited duration, usually just one to three years. Little effort has been devoted to institutionalizing RCOF activities with funding from regular budgets of the involved donors and institutions. Financial sustainability will rely heavily on the development of documents illustrating the value of climate services and their usefulness in raising the awareness of policy makers and donors.

MANAGEMENT AND DECISION MAKING

ACMAD is the primary institution responsible for the organizing the RCOFs, including planning, preparation, implementation, and reporting. AfDB, WMO, the World Bank, and UN-ISDR provide funding for Forum activities.

The NMHSs and GPCs are directly involved in the production of the seasonal climate outlooks. GPC products are particularly important inputs in downscaling tools. Contributing GPC institutions – including the UKMO, Meteo-France, and the European Centre for Medium-Range Weather Forecasts (ECMWF), along with other centers providing global forecasts, such as IRI – were identified because of their active role in establishing the GPC structure and in facilitating the use of GPC products in Africa. Memoranda of Understanding were signed as legal mechanisms between ACMAD and its partner institutions. These centres provide the necessary resources for pre-forum training, which leads to the production of the consensus outlook and the development of national expertise in newly established methodologies.

EVALUATION

ACMAD carried out a comprehensive verification of its RCOFs products according to the work done by Dr. Simon Mason and Simbarashe Chidzambwa in 2008. The results were published in a technical report (bibliographic information is included in the appendix). Value assessment of RCOFs products has not been seriously undertaken, which is reason why, after more than a decade of demonstration, the project has not moved effectively into routine operations.

In terms of evaluation provided by users, the RCOFs are built to include space for such feedback, allowing users to comment on the performance and utility of the seasonal climate outlooks from the previous year. Country climate experts present their on-the-ground observations, interactions with government and other users, as well as their insights regarding the performance of the outlooks. This process is challenging because ACMAD and NMHSs have serious limitations in their communication strategies and expertise. There is a need

to conduct surveys of decisions makers and practitioners to better assess the real benefits of climate outlooks. Such surveys outputs would be tremendously useful in helping to raise the awareness of stakeholders and encourage them to commit more resources from their regular budgets towards the RCOFs.

CAPACITIES

EXISTING CAPACITIES

Identifying partner GPCs and Regional Centres that could help build and/or upgrade member-state capacities was fundamental to the RCOF's establishment. These partnerships were further strengthened by Memoranda of Understanding. As ACMAD initiates new RCOFs for the Mediterranean region and the South West Indian Ocean Islands, new partners will need to be identified and developing similar relationships will be essential.

NMHSs usually have some level of climate expertise, but rely on regional centres and GPCs for support in interpreting and using forecasting products. Some training workshops and forums are organized to upgrade national climate products interpretation skills. Users from the agriculture and water communities include agrometeorologists, hydrologists, and agronomists who had some basic meteorology training in their curricula. However, they still need exposure to climatology and climate forecasting with special emphasis on estimation, interpretation and management of climate uncertainties in their sector. Health, disaster and food security specialists do not usually have any basic training in meteorology and fully rely on external support for interpretation of climate information.

CAPACITY GAPS

In some countries in West Africa, there is an appreciable level of seasonal forecasting capabilities. These countries established formal seasonal forecasting teams with motivated master degree level experts as early as the late 1990s. These experts regularly attended training workshops for seasonal forecasting in and outside the region, which consequently facilitated important skill development. These teams have been exposed to GPCs products, global and regional climate forecasting operations and climate communication courses. However, most countries lacked personnel with the required basic training and/or motivation to develop their national climate forecasting capabilities.

An organized group of climate forecasting experts in the member states would greatly aid the development of improved climate outlooks. These experts are responsible for producing national seasonal forecasts and contribute to regional outlook forums. Skilled professionals with good experience working on regional climate with global centres are very much needed, as current climate expertise at this level is very limited. National climate forecasting services will ultimately be necessary.

Little effort has been devoted to upgrading and observing, data collection, archiving, and processing facilities. In Africa, regional and national climate centres lack data rescue and recovery facilities, advanced base management systems, and high performance computing capabilities. Software and hardware must therefore be upgraded to meet the requirements for modern database management and high performance computing.

At the regional level, support is needed to upgrade training materials, organize more training sessions and transfer training modules in regular regional meteorology training institutes and schools. Another challenge related to capacity gaps has been the difficulty of downscaling seasonal forecasts to local scales. The few cases where this has been accomplished has generated seasonal forecasts with clear added value. Initiatives are underway to provide seasonal forecasts for all seasons of interest to Africa, but limited human resources hinders this effort as well.

LOOKING TOWARD THE FUTURE

GOALS

ACMAD's central goal in the next five to ten years is to improve climate information to support disaster risk reduction and adaptation to climate change in Africa. This will necessarily involve strengthening member-state climate service capabilities and meeting their requirements. This includes the production of seasonal-to-decadal forecasting and climate scenarios. In the future, ACMAD also plans to blend scientific forecasting with indigenous knowledge and to develop new tools for forecast tailoring purposes for agriculture, food security, disasters, health, and water sectors.

PROJECT EXPANSION

ACMAD will continue to expand RCOFs throughout the continent, as it has already begun to do in North Africa, the Euro-Mediterranean region, and the southwest Indian Ocean Islands.

LESSONS LEARNED

The RCOF process has made it clear that it is necessary to study the relevance and feasibility of seasonal forecasting in the context of operations. Regardless of the place, however, identifying partners with a background in the climate and climate variability of the region at hand is always critical. In the Indian Ocean Islands, for instance, where there is an interest in seasonal forecasting of tropical cyclones, partnering with institutions with expertise and experience in tropical cyclones is a prerequisite.

Because of differences in commitment and awareness of managers and policy makers, some countries have not set up sustainable climate forecasting teams and services. After about 15 years of training, countries with little political will and awareness have not been able to upgrade national climate services capabilities. While this program could—and ideally will—be transferred to other locations and sectors, it is critical to approach each region with a specifically tailored methodology. That is, no single approach will suit all locations and sectors.

THE WAY FORWARD

One of the main challenges moving forward is to keep users and stakeholders involved in climate services. At the leadership and management level, it is necessary to raise the profiles of personnel with emphasis on their strategic planning and result-based management skills. At the practical level, it is important to ensure that advanced training in climate is provided, quality management systems are in place, and interactions with users are effective in the sense that providers understand better the needs and decision systems, while users better interpret climate products leading to optimal benefits.

PRINCIPLES OF THE GFCS

Principle 1: All countries will benefit, but priority shall go to building the capacity of climate-vulnerable developing countries.

ACMAD has introduced RCOFs in the regions mentioned above. Throughout the process, these vulnerable developing countries have benefited from pre-forum capacity building and training workshops. ACMAD hosts officers from NMHSs of the member states for on-the-job training on issues related to climate monitoring and the production of climate forecasts.

Principle 2: The primary goal of the Framework will be to ensure greater availability of, access to, and use of climate services for all countries.

ACMAD makes products available via emails, forums, user workshops, and press releases, as well as telephone and media interviews. In collaboration with users who attend RCOFs, ACMAD interprets climate information and derives advice and action options for uses by climate sensitive sectors. ACMAD also attends user meetings, such as food security meetings, to provide climate advice needed for food security assessments and contingency planning.

Principle 3: Framework activities will address three geographic domains; global, regional and national

RCOFs are planned for West, Central and North Africa as well as for Indian Ocean Islands and the Euro-Mediterranean region. National level forums are encouraged.

Principle 4: Operational climate services will be the core element of the Framework.

Principle 5: Climate information is primarily an international public good provided by governments, which will have a central role in its management through the Framework.

ACMAD climate products are freely available for all.

Principle 6: The Framework will promote the free and open exchange of climate-relevant observational data while respecting national and international data policies.

Principle 7: The role of the Framework will be to facilitate and strengthen, not to duplicate.

ACMAD develops climate services in four regions of Africa (West, Central, North, and the Indian Ocean). East and Southern Africa regions have strong institutions generating climate services. ACMAD provides technical support for the production of climate services for these regions, leaving the leadership and organizational role to these institutions.

Principle 8: The Framework will be built through user – provider partnerships that include all stakeholders.

Through the RCOFs, ACMAD is developing a platform for the exchange of information and products between providers and users.

APPENDIX: FURTHER READING

Mason, S.J. and S. Chidzambwa. Position Paper: Verification of RCOF Forecasts. World Meteorological Organization. An International Expert Review Meeting on Regional Climate Outlook Forums. Arusha, United Republic of Tanzania, 3 - 7 November 2008.

Ogallo, L. Bessemoulin, P. Ceron, J-P Mason, S. and Connor, S.J. Adapting to climate variability and change: the Climate Outlook Forum process. WMO Bulletin. 57(2): April 2008.

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