

Strengthening the potential of seasonal forecasts as tools for early warning of impacts as anticipated under 1.5 and 2.0 degree warming on Agriculture/Food security, Water and Energy and Health nexus over Eastern Africa

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Outline

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Background Information

- ❑ East Africa region is known to be a 'hot-spot' for climatic related risks such as floods and droughts; these occur within sub-seasonal to seasonal timescales. This is exacerbated by ravaging impacts of climate change(Liu et al. 2016)
- ❑ Continuous provision of timely and accurate climate information at different timescales is right efforts towards raising early warning awareness through provision of timely forecast information.
- ❑ Over the last 20 years, IGAD Climate prediction and Application Center (ICPAC) has taken the lead role in raising early warning awareness through provision of timely climate information within GHA region
- ❑ These climate information are disseminated through Greater Horn of Africa Climate Outlook Forum (GHACOF), which is a key node platform for dissemination of climate information and services
- ❑ Introduction of objective forecasting(approach gives the forecast information a greater physical basis) has seen the forecast skill improve and greater demand by users realized(onset, cessation, length of growing seasons etc.)

- The study is based on a hypothesized future changing under a warming 1.5/2.0 degree and starting the activities now (Building back from the future)

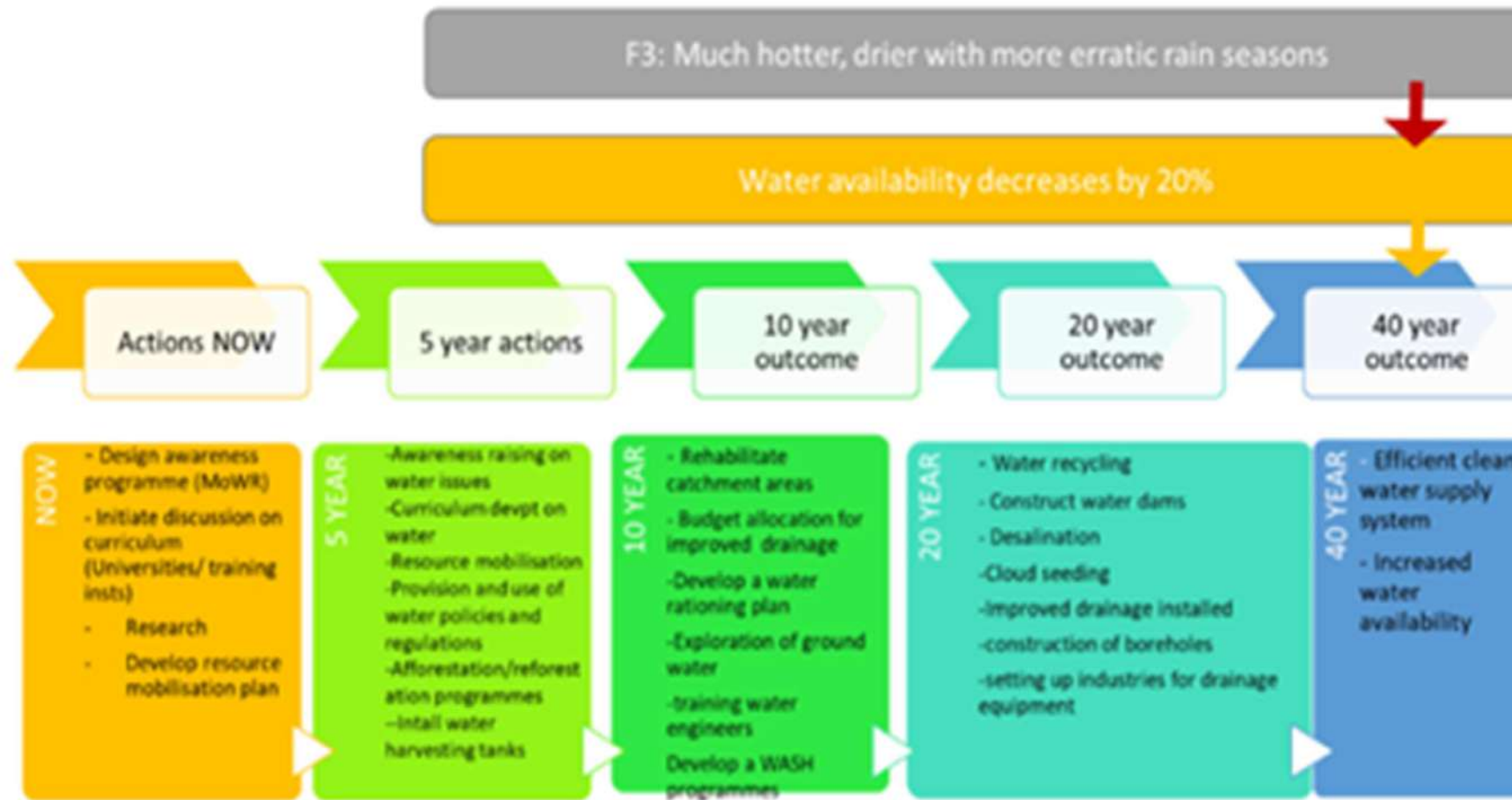


Figure 1. Climate Change Narrative under 1.5/2.0 degree warming(Stepwise interventions based on a much hotter, drier and more erratic rainy season anticipated future

Objectives and Methodology

Specific Objectives

- ❑ Assessment of how GHA Climate Outlook Forum (COF) forecasts have been useful for sectoral planning
- ❑ Assessment of the short, medium and long-term interventions applied at sectoral levels in response to the GHA-COF forecasts
- ❑ Develop recommendations for products and practices that can improve the GHA-COF suite and that are aligned to real-time warning of hazards anticipated under future climate scenarios.

Methodology

- ❑ A total of 65 respondents from Water, Agriculture and health Sector from across 3 countries participated in the survey
- ❑ **In-country Survey**; A structured questionnaire was designed and used to collect information from participants who have had an experience with the GHACOF process.
- ❑ A group discussions to capture diverse opinions from the respondents were conducted as part of the fieldwork.
- ❑ **Validation Workshops**; two validation workshops were held bringing sector focal points from the 3 countries

Sectoral Interventions as a result of GHACOF Products

1. Tanzania

- ❑ **Agriculture**-Enhanced capacity building activities for farmers and introduced climate smart agricultural practices e.g. adoption of modified/ climate resistant crops,
 - ❑ Formulate advisories to farmers especially on choice of crops to plant, when to plant, and when to undertake other farming practices.
 - ❑ Partnership with players in agriculture such as FAO have been built to help farmers adapt to the changing climate
- ❑ **Health**;-The Malaria Control Department under the Ministry of Health has effectively incorporated GHACOF forecast products in their planning.
 - ❑ Changing Larviciding period from 'during' to 'prior to' rainy season
 - ❑ GHACOF products are mostly applicable during dry season where malaria prevalence is high
- ❑ **Water and Energy**; Use of climate information, helps the power generating company to have a projection of power supply and make adequate preparations to ensure that the country's electricity demand is met during all seasons

Water/Energy Cont.....

- ❑ The Ministry of Water and Irrigation uses climate information in water supply planning to ensure that no severe water shortages occur in both urban and rural areas.
- ❑ Planning for alternative water sources such as rain water harvesting and sinking of boreholes

2. Uganda

- ❑ **Agriculture**-The packaging of the advisories to farmers has been improved owing to the introduction of new forecast products including onset, cessation, dry and wet spells, and length of the growing season
- ❑ The continuous engagement of the sector with the GHACOF process has resulted in better understanding of probabilistic forecasts and how it is applicable for sector planning.
- ❑ Advice farmers on which kind of crops to plant depending on the forecast (short maturing crops for areas whose seasonal predictions falls under 'below normal' range)
- ❑ **Health**;-The sector usually uses the GHACOF products in planning, especially in disease prevention and control activities across the country.

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❑ Meningitis surveillance especially during drought seasons, monitoring of population movement and coordinated vaccination across borders

❑ Advisories for destruction of mosquito breeding areas, larviciding

❑ **Water and Energy**; The forecasts from GHACOF usually is used alongside the National products to activate Integrated Water Resources Management including contingency planning for extreme events such as floods and drought thus reducing damages

❑ Regulating water releases for hydropower productivity based on available and forecasted water quantity

❑ Monitoring of flood to lessen its impacts based on GHACOF forecast issued (highland areas of Elgon and Rwenzori and Lowland areas of Uganda)

❑ Use of forecast information to guide water transport sector on operations especially for the above normal rainfall events

3. Ethiopia

- ❑ **Agriculture**-Enhanced research in development and implementation of climate smart agriculture, model development
- ❑ Developing localized cropping calendar and suitability maps for major crops (cereals, pulses/legumes and oil crops like sesame)
- ❑ Use of drought tolerant crops and water harvesting measures depending on the forecast, advise farmers to harvest rainwater, and make proper use of their harvest for future season
- ❑ **Health**-Improving the health system by developing the National Health Adaptation framework to address climate risks
- ❑ Enhancing the planning process in national malaria prevention and control particularly timely vector control (e.g., indoor residual spraying, larviciding and environmental control)
- ❑ Advancing effective communication and sensitization of the respective health professionals engaged in giving health care particularly in outbreak of diseases such as cholera

- ❑ **Water/Energy-** Downscaling of seasonal forecasts to sectoral forecast and making adjustments using the dekadal and monthly forecasts to incorporate in the water sectors, such as reservoir water management, water supply, irrigation water demands and hydropower systems.
- ❑ Developing flood forecasting and early warning systems to protect life, properties, and infrastructure especially in flood prone areas
- ❑ Provide alerts and advisory services to municipalities to inspect the city's drainage systems to repair damages and clear clogs



Figure 2: Key Informant Discussion with Water sector focal points in Luzira, Uganda during field assessment



Figure 3. Key Informant Discussion with Agriculture sector focal points in Addis Ababa, Ethiopia during field assessment



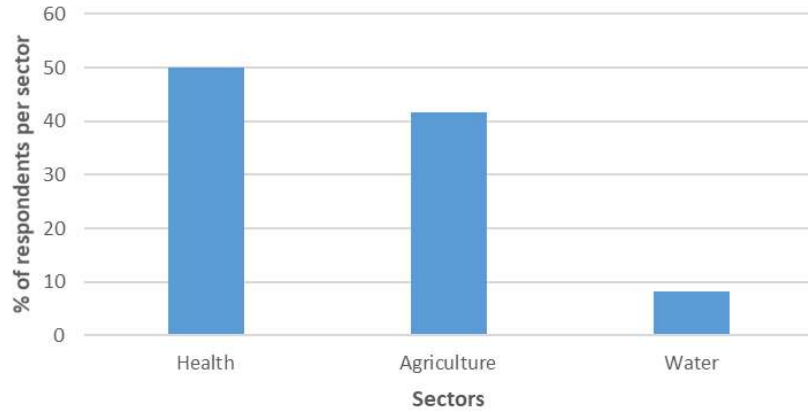
Figure 4. Key Informant Discussion with Agriculture sector focal points in Tanzania



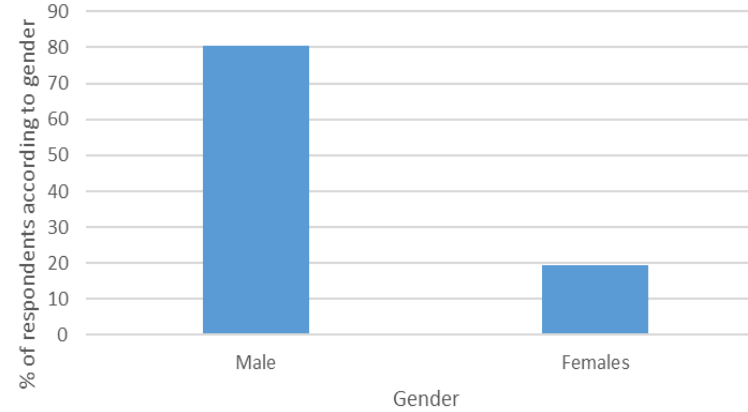
Figure 5. Part of validation team, Mombasa, Kenya

Survey Statistics

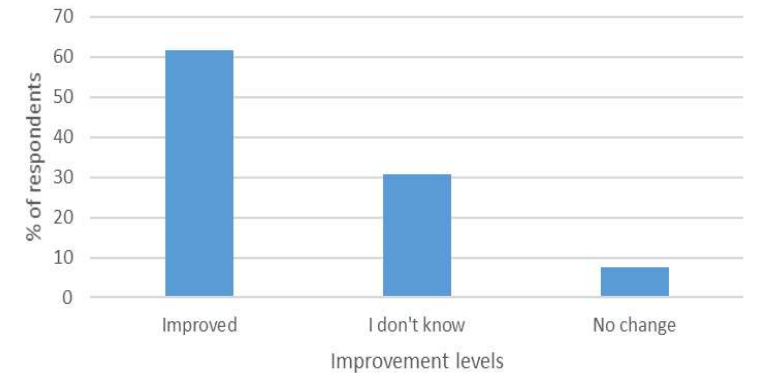
RESPONDENTS PER SECTOR



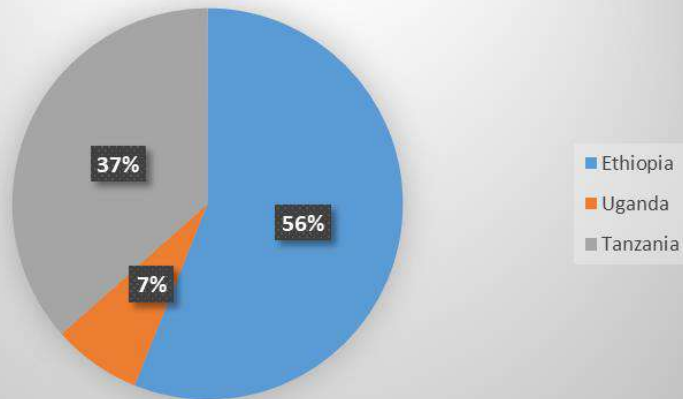
GENDER OF RESPONDENTS



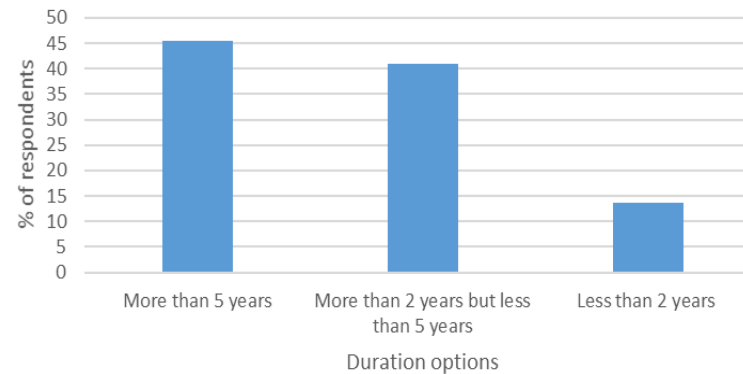
Perception on the usefulness of ICPAC's forecasts



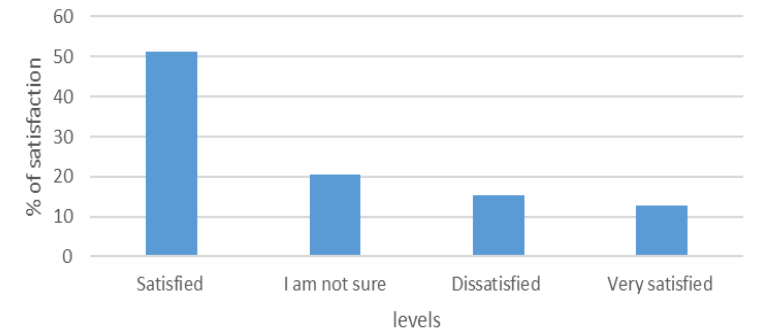
CR4D COUNTRY INTERVIEW RATES



DURATION OF INVOLVEMENT IN GHACOF PROCESS



Satisfaction level with the manner through which the GHACOF seasonal forecasts are released



Summary

- ❑ All the sectors from the three countries incorporate climate information into their sectoral plans; there is deliberate efforts across sectors to mainstream climate change information into future sectoral plans.
- ❑ From the survey, it is evident that there are notable improvements in the GHACOF products as reported by the majority of respondents.
- ❑ The improvements in use of forecasts by sectors can be attributed to adoption of new methods and technologies in the generation of seasonal forecasts over the years.
- ❑ Inclusion of new climate information such as onset, cessation, length of season, wet/dry spell which has made the forecasts more user relevant.
- ❑ GHACOF forecasts information has informed on Campaign activities against prevalence of Malaria in 3 pilot countries
- ❑ The GHACOF forecasts is mostly used alongside National forecasts

Recommendations

- ❑ Member states need to empower the sector focal point persons to help in forecasts dissemination and uptake to the last mile users; as well as harmonizing activities with local national meteorological services and ICPAC
- ❑ There is need to link GHACOF activities with National Framework for Climate Services
- ❑ ICPAC should enhance the capacity of national meteorological services to organize comprehensive national climate outlook forum, where all sectors will be represented, and national actors get a chance to develop advisories at local administrative levels
- ❑ To increase participation by member states, designing of the project needs to conform with the regulations of the implementing institutions
- ❑ NMHS's with support from ICPAC should ensure that strategies are put in place to communicate climate information through appropriate channels and in local language
- ❑ ICPAC to continue improving its forecasting methodologies for better accuracy
- ❑ ICPAC to sustain the provision of seasonal rainfall characteristics like onset, cessation etc. during GHACOF

Limitations/Challenges

- ❑ Absence of institutional structure and staffing that can support the efforts of internalizing GHACOF's output/products into some sectors. There is less effort by individual focal point persons participating in GHACOF to cascade the information from GHACOF events to other staff members.
- ❑ Transition of staff from one ministry to another has led to loss of institutional memory with regards to GHACOF
- ❑ Data collection was limited to member states that have participated in the GHACOF process, limiting the sample size of information collected
- ❑ Inconsistency of the participation in GHACOF limited the amount of information gathered
- ❑ The use of GHACOF and National forecasts poses a challenge in tracking the skill progress
- ❑ Limited time duration in implementation of the project activities as well COVID-19

What Next..

- Present the research findings to a wider audience >300 persons during the upcoming GHACOF59
- Submit report to Directors of member state of three countries through ICPAC for adoption and possible consideration of the recommendations therein
- Finalize on the manuscript draft and submit for publications by end of the year 2021
- Further collaboration for a possibility of scaling up the exercise in the remaining 8 countries of ICPAC/IGAD region

Acknowledgment

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