Strengthening Climate Information Partnerships – East Africa (SCIPEA)

Joseph Mutemi, Richard Graham, Tracy Small, Andrew Colman, Florian Gallo, Bekki Griffiths, Ailsa Barrow

WISER is composed of two components:

- The East Africa component whose implementation is led by the UK Met-Office
- The Pan Africa component led by ACPC

The objectives of the WISER pan-Africa component are:

1. Strengthen the governance and enabling environment for climate information services uptake and use in Africa, including evidence on impact, donor coordination, protocols for sharing data
2. ACPC's set up and first grants under Climate Research for Development (CR4D) (up to 6 grants to a maximum total value of $3m) for delivery in the period to December 2016
3. Support a fellowship programme (particularly where such fellowships link to CR4D or sub-grant projects)
4. Developing partnerships to the AGN and improve awareness and access to CIS among African youth, women and parliamentarians

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SCIPEA: Climate Partnerships on three levels

Contributes mainly to WISER Component: Supporting organisations …. to **develop global-regional-national links to strengthen production, uptake and use** of climate information.

UKaid from the British people

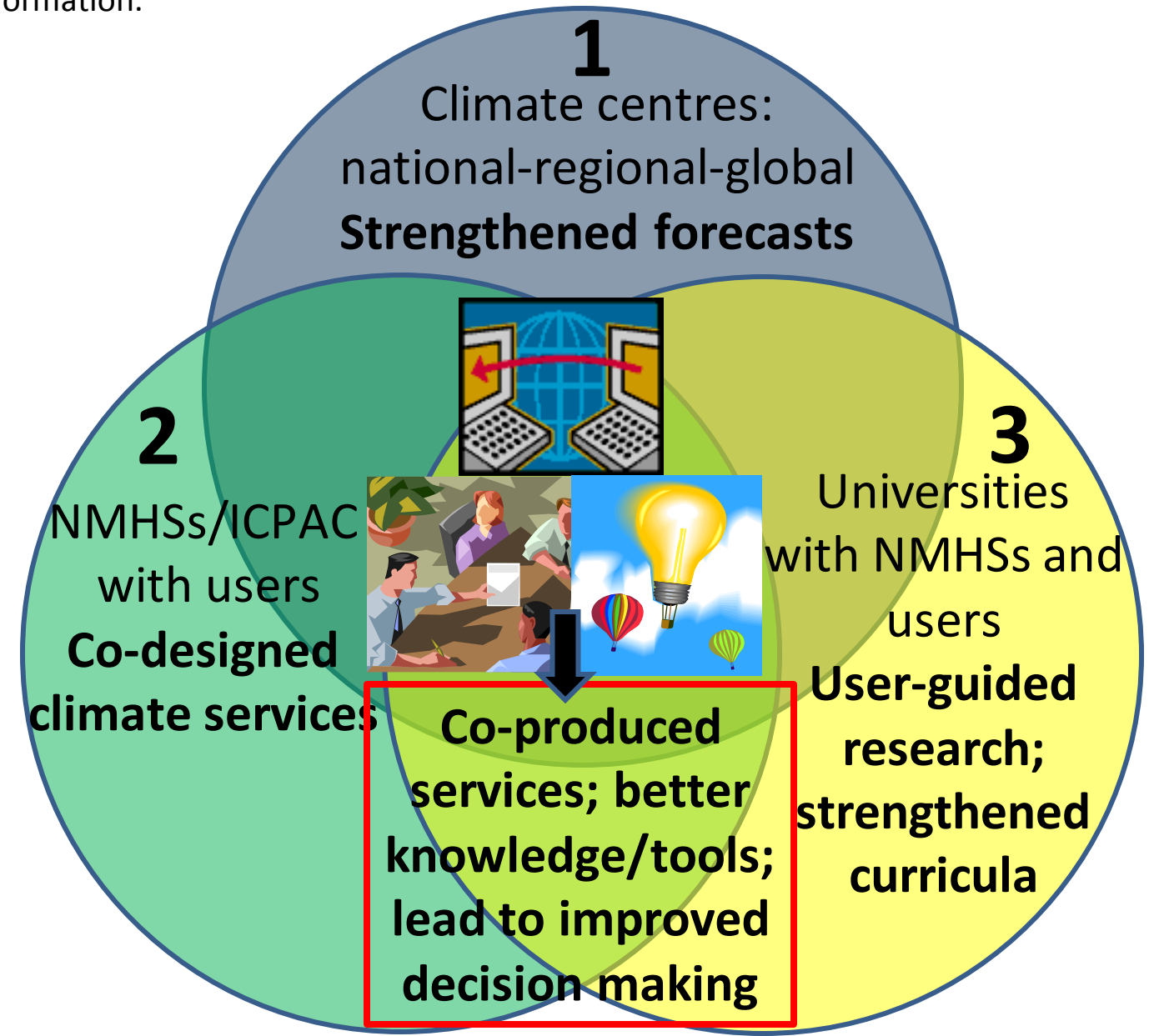
Met Office

International Research Institute for Climate and Society
Earth Institute | Columbia University

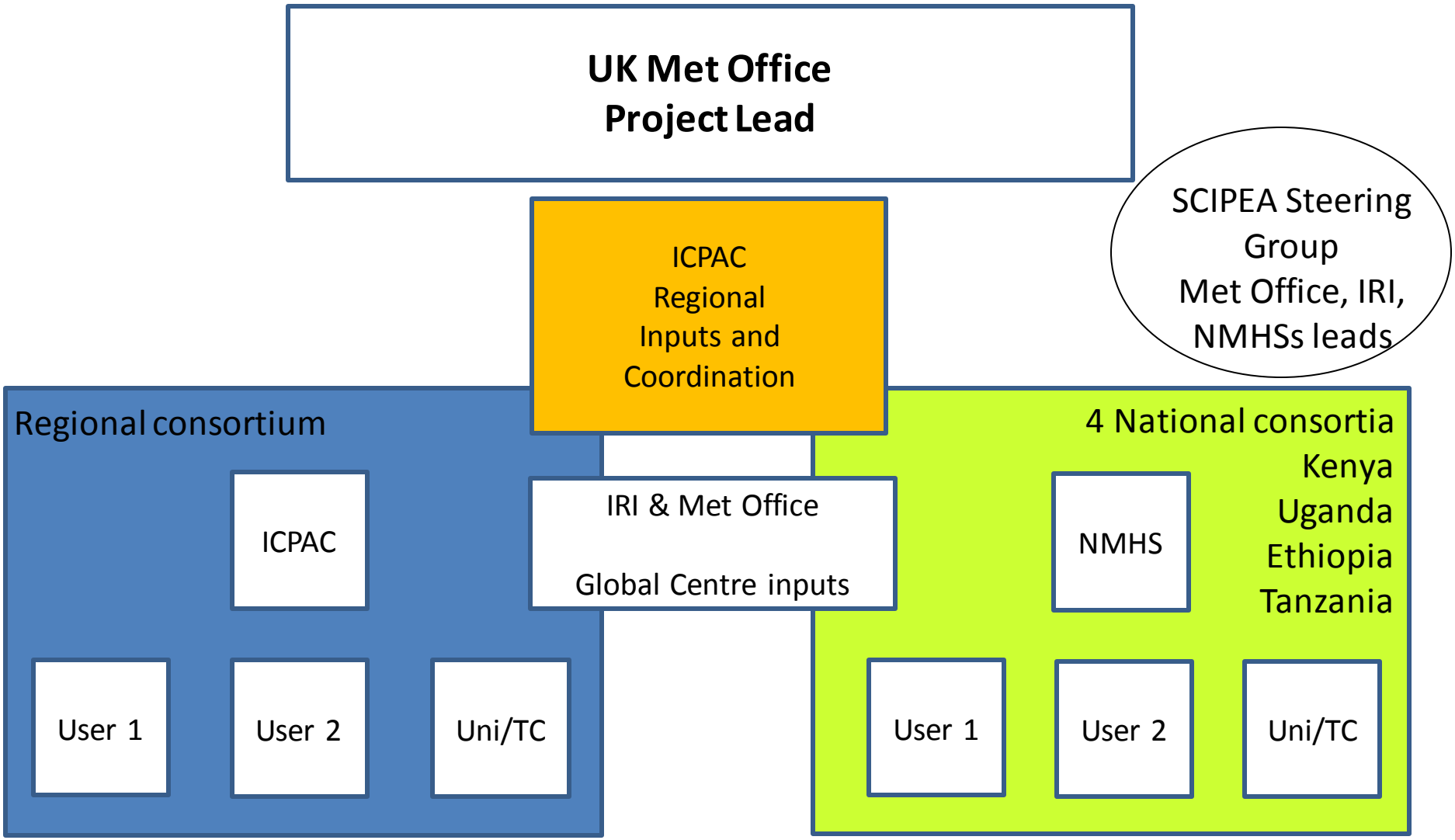
IGAD Climate Prediction and Applications Centre ICPAC

5 Consortia

- GHA
- Kenya
- Uganda
- Ethiopia
- Tanzania



SCIPEA Structure



SCIPEA Project Partners

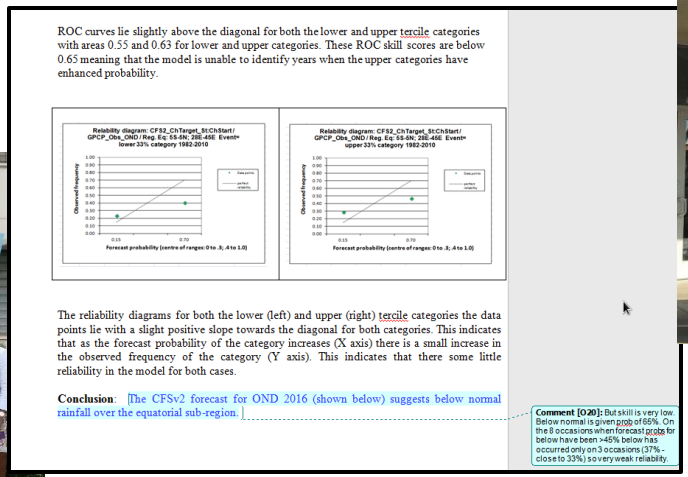
- **Global:** Met Office and IRI
- **Region**: ICPAC, Regional Food Security and Nutrition Working Group (FSNWG), Network of Climate Journalists of the Greater Horn of Africa (NECJOGHA), University of Nairobi
- **Kenya**: KMD, Red Cross Kenya, KenGen, Institute for Meteorological Training and Research
- **Tanzania**: TMA, Ministry of Energy and Minerals, Ministry Agriculture, Livestock and Fisheries, Dar Es Salaam Institute of Technology, University of Dar es Salaam
- **Uganda**: UNMA, MAAIF Early Warning Unit, Water Resource Management, National Meteorological Training School
- **Ethiopia**: NMA, National Disaster Risk Management Commission, Ministry of Agriculture and National Resources, Adama Science and Technology University

Consortia are led by the climate provider (ICPAC/NMHSs), coordination by ICPAC

Outcomes

- Cohort of 11 East African climate scientists trained in dynamical seasonal forecasting, with step-change access to data and tools: Trainings held In the region-**ICPAC(Naivasha & ICPAC-Kenya)**, **IRI-USA**, **& UK Met Office:** Evidence of influence on operational forecasts and advice

3 workshops: total of 10 days training



ROC curves lie slightly above the diagonal for both the lower and upper tercile categories with areas 0.55 and 0.63 for lower and upper categories. These ROC skill scores are below 0.65 meaning that the model is unable to identify years when the upper categories have enhanced probability.

The reliability diagrams for both the lower (left) and upper (right) tercile categories the data points lie with a slight positive slope towards the diagonal for both categories. This indicates that as the forecast probability of the category increases (X axis) there is a small increase in the observed frequency of the category (Y axis). This indicates that there some little reliability in the model for both cases.

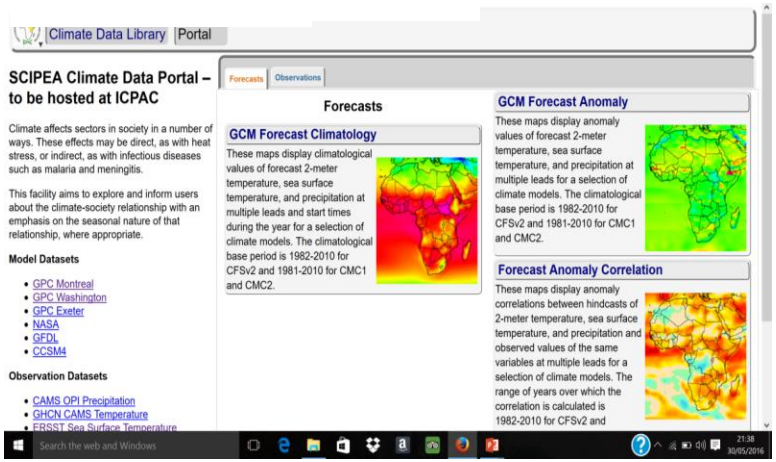
Conclusion: [The CFSv2 forecast for OND 2016 (shown below) suggests below normal rainfall over the equatorial sub-region.]

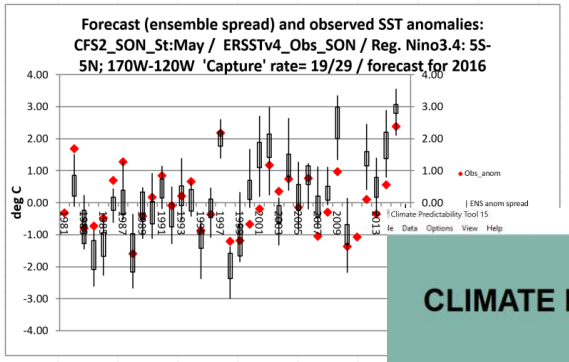
Comment [O20]: But skill is very low. Below normal is given prob of 66%. On the 8 occasions when forecast probs for below have been >45% below has occurred only on 3 occasions (37% - close to 33%) so very weak reliability.

"La Niña watch" 2016 monthly forecast analysis reporting - reviewed by Met Office team

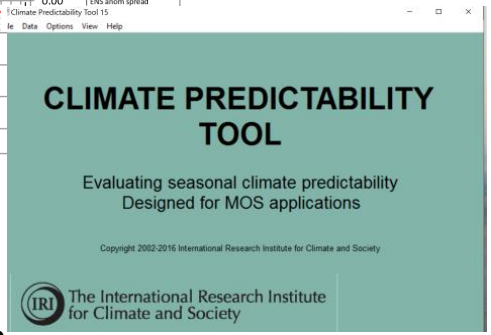
Two 1-month science visits: IRI and Met Office

New access to GPC Model data and tools





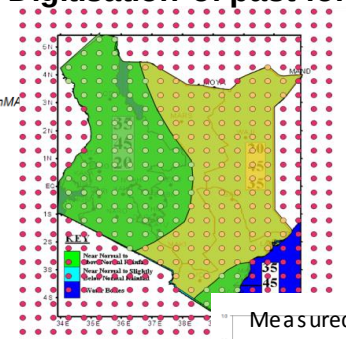
Spreadsheet tool for training and "first look" analysis

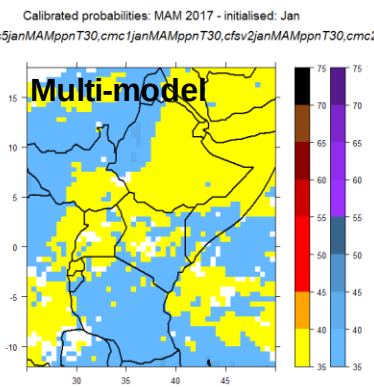


Step-changed improved access to model forecasts and other data through SCIPEA portal into the IRI Data Library, hosted at ICPAC (mirror at IRI): data and visualisation

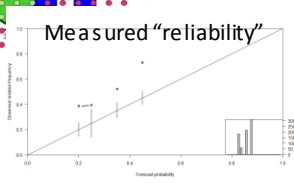
IRI's Climate Predictability Tool:
- Central to the process
- New functionality developed

Digitisation of past forecasts





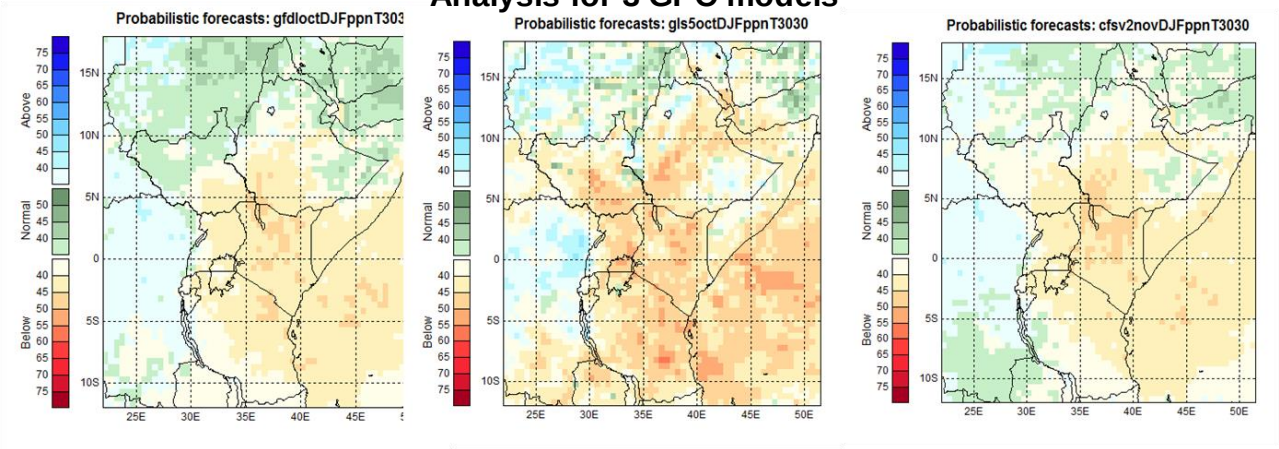
R programming and QGIS for:
- making multi-model forecasts
- verification of past forecasts



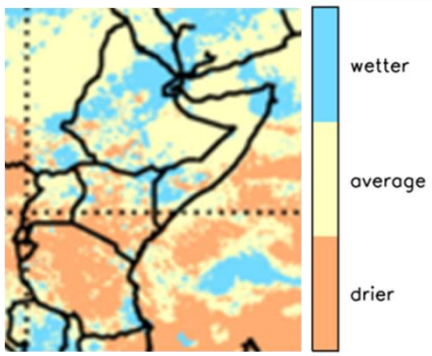
Positive Impacts

- NMHSs and ICPAC report use of actual GPC data sets using the MIH & new methods in preparing forecasts for October-December 2016 season and updates
  - **Ethiopia NMA**: *"....PCR& CCA of CPT, [as well as] Direct method (using the Excel spreadsheet etc) have been properly exploited in conjunction with the IRI maprooms for an accurate and improved seasonal climate forecast with the support of a comprehensive guidance notes provided by the UK Met office."*
  - **Food Security and Nutrition Working Group**: *"...the FSNWG's Oct/Nov 2016 alert ...which warned that the prevailing food security conditions ... would significantly worsen ...utilised information provided through the embedded working sessions with SCIPEA ...These credible messages contributed to governments, humanitarian and other partners responding in time thus preventing food security conditions from reaching famine levels as was witnessed during the 2010/2011 drought ..."*

ICPAC rolling forecast for Dec-Feb 2016/17 - input to the FSNWG Nov 2016 alert
Analysis for 3 GPC models

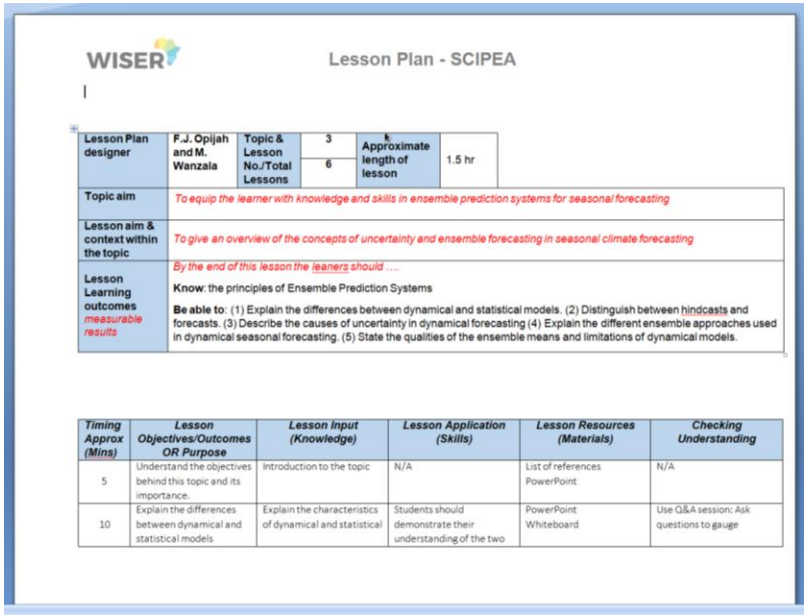


Observed tercile category DJF 2016/17



Sustaining capacity

- Framework developed for “in-region” and “by region” training on use of dynamical seasonal predictions – core lesson planning and materials ready for trial
- Regional collaboration by University of Nairobi, IMTR, Adama Science and Technology University, Dar es Salaam University, Dar es Salaam Institute of Technology, Uganda National Meteorological Training School
- Assistance from MO Hadley Centre and MO College and IRI



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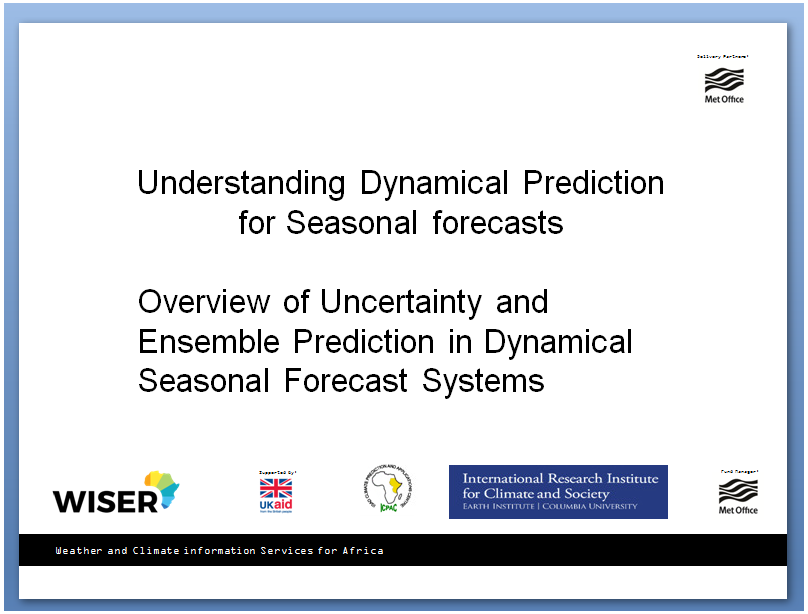
Lesson Plan - SCIPEA

Lesson Plan designer	F.J. Opijah and M. Wanzala	Topic & Lesson No./Total Lessons	3 / 6	Approximate length of lesson	1.5 hr
Topic aim	To equip the learner with knowledge and skills in ensemble prediction systems for seasonal forecasting				
Lesson aim & context within the topic	To give an overview of the concepts of uncertainty and ensemble forecasting in seasonal climate forecasting				
Lesson Learning outcomes *measurable results*	By the end of this lesson the leaners should …. **Know**: the principles of Ensemble Prediction Systems **Be able to**: (1) Explain the differences between dynamical and statistical models. (2) Distinguish between hindcasts and forecasts. (3) Describe the causes of uncertainty in dynamical forecasting (4) Explain the different ensemble approaches used in dynamical seasonal forecasting. (5) State the qualities of the ensemble means and limitations of dynamical models.				

Timing Approx (Mins)	*Lesson Objectives/Outcomes OR Purpose*	*Lesson Input (Knowledge)*	*Lesson Application (Skills)*	*Lesson Resources (Materials)*	*Checking Understanding*
5	Understand the objectives behind this topic and its importance.	Introduction to the topic	N/A	List of references PowerPoint	N/A
10	Explain the differences between dynamical and statistical models	Explain the characteristics of dynamical and statistical	Students should demonstrate their understanding of the two	PowerPoint Whiteboard	Use Q&A session: Ask questions to gauge



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Understanding Dynamical Prediction for Seasonal forecasts

Overview of Uncertainty and Ensemble Prediction in Dynamical Seasonal Forecast Systems

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Weather and Climate information Services for Africa

Prototype Climate Services (PCSs)

- 10 user partners engaged – 2 each per 5 consortia
- Core Service Development Teams (SDTs) – NMHS/User/University – met 3 times (at SCIPEA meetings)
- Regional, Kenya, Tanzania and Ethiopia also had additional meetings – some with expanded SDT membership
- 8 early prototypes developed: User requirement has been established and NMHSs has researched potential to provide the information required
- In 3 cases – PCSs are essentially in trial or early implementation

FSNWG, NECJOGHA and ICPAC

KenGen, KMD & IMTR at KMD HQ

Kenya Red Cross Society, KMD and IMTR at KRCS HQ

Summary of PCS component tables generated – finalised at final Feb 2017 project meeting

Consortium	User	Priority requirements to drive PCSs		
Region	FSNWG	"Rolling" forecast updates	Longer (1-month) lead	Enhanced spatial distributions
	NECJOGHA	Spatial distributions	Forecast Interpretation guides	Science inputs to comms. training
Kenya	KenGen	Enhanced season onset timing (Seven Forks)	Longer lead time; Enhanced spatial distribution;	Reservoir inflow prediction
	KRCS	Enhanced season onset timing (nationwide)	Longer lead time Enhanced spatial distribution;	Impacts (interim proxy could be SPI)
Tanzania	MALF	Enhanced season onset/cessation timing	District-level downscaling, also rain amounts, temperature and humidity	Crop yield prediction
	MEM	Enhanced season onset/cessation timing	Downscaling to sub-catchment	Rainfall exceedence probability
Uganda	MAAIF	Longer (1-month) lead	Enhanced season onset/cessation timing	Rain amounts and timing of peak seasonal rainfall (early or late)
	MWE	Similar to MAAIF		
Ethiopia	NDMRC	Enhanced season onset/cessation timing	Enhanced spatial and temporal distribution (to district level)	Minimum temperature information
	MoA&NR	Not yet established		

Trials and implementation

- Transformational change in response to requirement (evident at Kick-Off and August meeting)
  - GHACOF 45 held 2 weeks earlier than last year, consensus forecast for March-May 2017 issued 2 weeks earlier
  - KMD and UNMA issue national forecasts 2-3 weeks earlier
  - Change is sustained with GHACOF 46 for June-August 2017 planned 2 weeks earlier than in 2016
- ICPAC rolling forecasts to FSNWG – impacts reported
- Network of Climate Journalists of the Greater Horn of Africa (NECJOGHA) and ICPAC
  - Farmer feedback at October café*: "The seasons was very harsh on coffee farming all over the country. The first season which is our main coffee planting season witnessed farmers losing millions of coffee trees drying up. I requested during the October café that the meteorologists should prepare special seasonal forecasts with regular updates to guide coffee farmers to know the dry spells and the windows of opportunity to establish new coffee gardens."*

NECJOGHA/ICPAC climate service: Climate Education and Communication

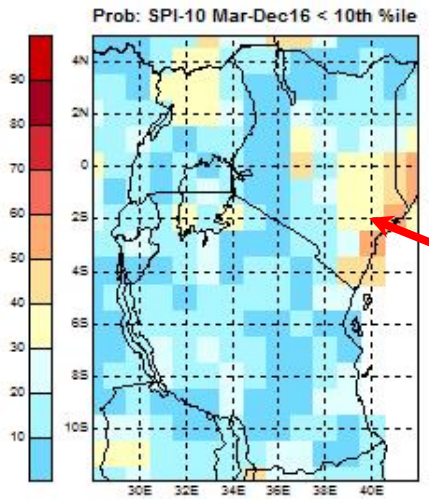
- Two workshops on communicating climate information – whole day Q&A interaction with climate scientists & communication officers of NMHSs
- 3 media journalists and one NMHSs communications officer from each country
- Piloting of climate cafés in Uganda: communication training, forecast update and open forum – communicating the forecast to end users

De-mystifying terciles! Video in development https://vimeo.com/210643341

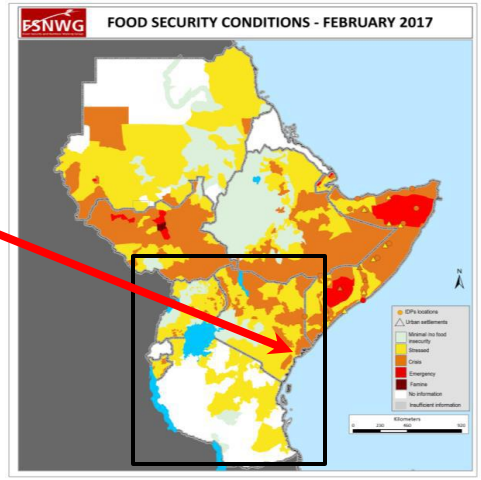
3 Climate Cafes trialled in Uganda (NECJOGHA team)

NMHS work to develop forecast output to meet user needs & requirements

- Season onset prediction; probabilities for exceeding rainfall thresholds; drought indices; reservoir inflow; crop yield

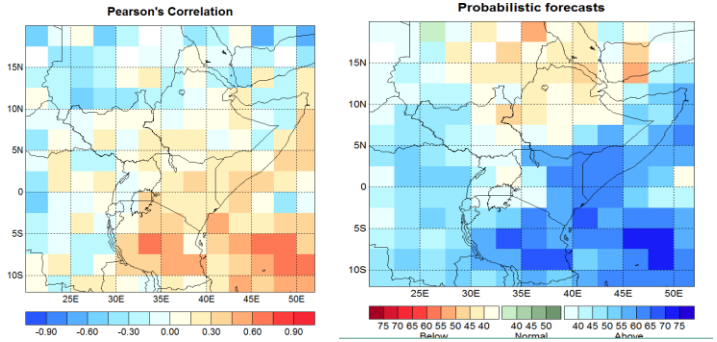


Predicting 2-season deficits: Predicted chance of "moderate" drought: observed deficit March-September is joined to predicted deficit October-December
10-month Standardised Precipitation Index (SPI)
(KMD)



FSNWG Food security status assessment February 2017

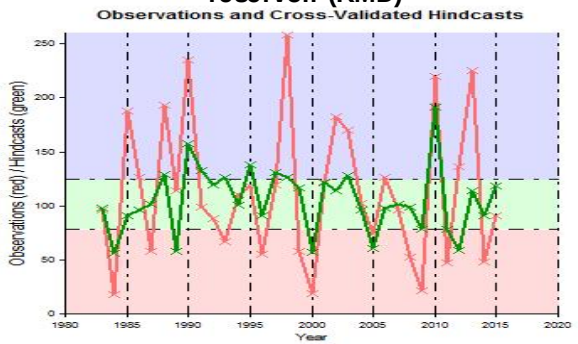
Onset prediction OND season (ICPAC)



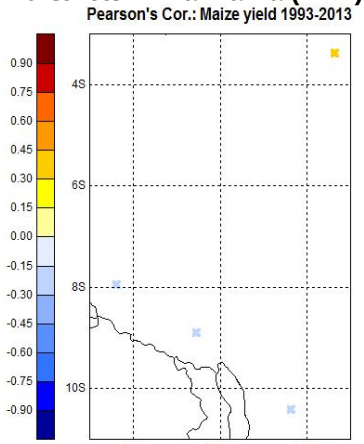
Skill over equatorial and southern regions

Forecast for OND 2016 indicates late onset

Predicted and observed inflow Masinga reservoir (KMD)



Correlation skill for maize yield prediction 4 districts in Tanzania (TMA)



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Weather and Climate Information Services for Africa

Summary of achievements

- Eleven East African climate scientists better equipped to use forecasts from WMO Global Producing Centres (GPCs) – with early evidence of positive impact on communities.
- Step-change improved access to data from the GPCs through the new MIH data portal hosted at ICPAC (strengthened global/regional/national links)
- A new in-region curricula framework to sustain the new skills developed
- Climate provider/user engagement strengthened
- Climate services designed and in prototype development with users
- Innovative/transformational changes:
  - 2-3 week earlier issue of seasonal forecasts from ICPAC and at least 2 NMHSs;
  - new platform (Climate Cafes) for media training and dissemination of forecasts to end users.
- Strengthened regional/national linkages – a result of ICPAC's central role in coordination of all training and user forums.

Future aims to build on Success

- Scale up to other GHA & ICPAC member countries
- Further training: seasonal and sub-seasonal (fellowships for researchers and practitioners)
- Operationalise / amend developed forecast procedures
- Further refine, trial and implement PCSs for wide co-production
- Finalise and trial the regional training module on dynamical seasonal forecasting
- Maintain and expand the GPC MIH data portal
- Build links with IRI ENACTS – further use of the observed data
- Link with other synergistic projects e.g. ForPAc
- Capture methodologies for application in other regions
- **Consider longer-term prediction (1, 3~5yr outlooks).**

Next Steps

- Short “bridge” project prior to Phase 2 Award
- Priority to maintain momentum within reduced budget until then
- Consortia will re-convene at GHACOF47
- Future focus will be stronger regional-led activity

United Nations
Economic Commission for Africa

WISER

WISER Pan Africa

WISER Knowledge Management and Communications Workshop

24 - 26 May 2017

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