FOCUS-AFRICA

Full-value chain Optimised Climate User-centric Services for Southern Africa

STAKEHOLDER WORKSHOP

Focus On South Africa & Mauritius

Third Stakeholder Workshop

30 May – 3 June 2022

Hybrid Modality

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WISER
Weather and Climate Information Services for Africa

IGAD
ICPAC

UKaid
from the British people

Met Office

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Objective seasonal forecasting: Examples from East Africa

Background and principles of objective forecasting

Consensus approach: Forecast information from a range of sources is blended in a semi-subjective way through discussion within a group of forecasters until a consensus is reached

WMO EC-69 (May 2017), recognised: that use of dynamical forecasts from its network of producers was largely **subjective** and that subjectivity of the widely-used **consensus approach** limited the **usability** of forecasts and also the verifiability.

2018-2019: WMO Expert Team produced technical a document: “Guidance on Operational Practices for Objective Seasonal Forecasting”

2019: WMO Ad Hoc Task Force on Regional Forecast Operationalization – focus on GHACOF, SASCOF, PRESASS. With regional steering groups formed

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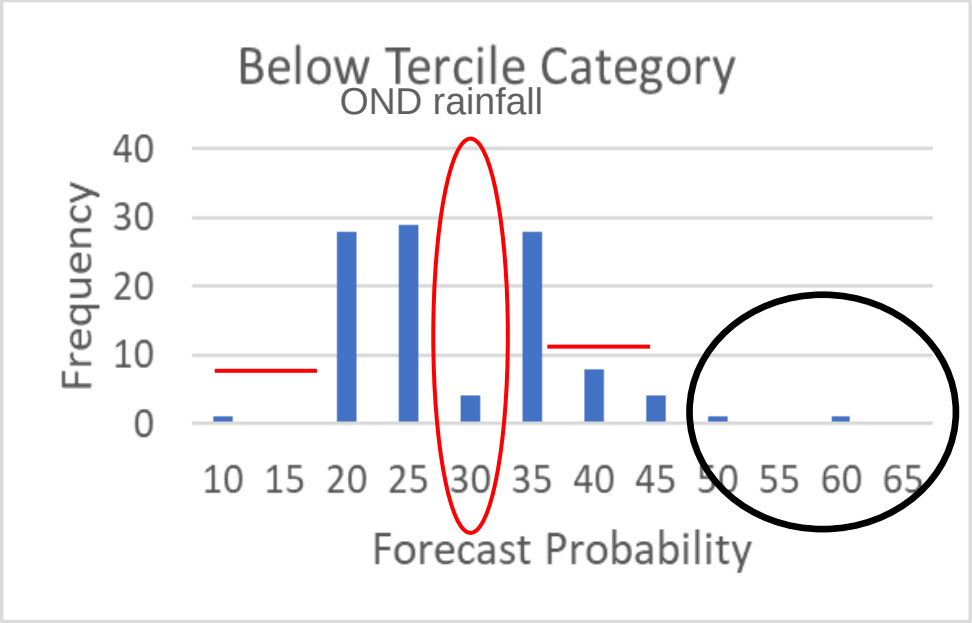
From the 10 principles in the WMO guidance:

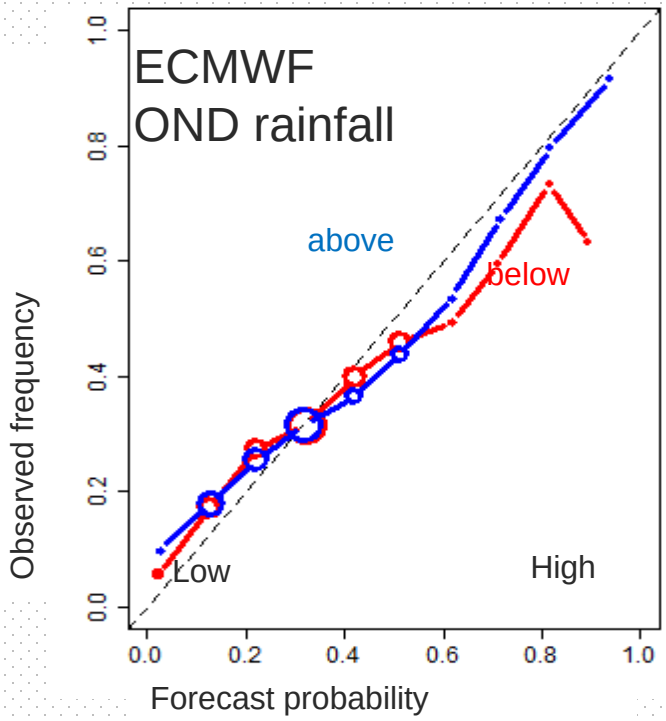
- Use a procedure that is **traceable, reproducible, well-documented** – with forecasts amenable to verification
- Use dynamical climate models as the primary basis

Improving actionability of forecasts through objective use of GCMs: example, OND season GHA

Baseline: consensus approach

Forecasts skilful, but probability range narrow – with evidence of subjectivity (pre-objective era)





Improving actionability of forecasts through objective use of GCMs: example, OND season GHA

Introduced: objective use of climate model outputs
Probabilities are reliable over wide probability range – and can be “bold”!

Met Office, Meteo-France, NCEP, and other systems also perform well

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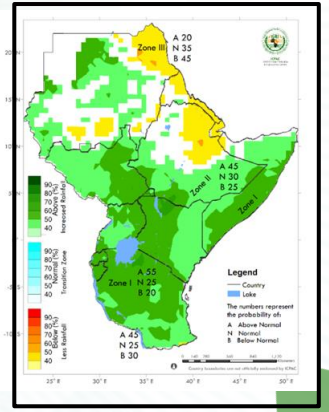
Regional level: Transformational change in regional forecasts

- ICPAC's climate modelling group introduced objective forecast methodology at GHACOF52 (May 2019, Addis Ababa)
- Based on 9 dynamical models: now maintained for 2 years
- Paradigm shift after 20 years of (subjectivity-prone) consensus approach
- Facilitated by cross-project collaboration:
  - New ICPAC HPC cluster from W2SIP
  - Model evaluation - ForPAc/W2SIP/SWIFT
  - ICPAC post-processing development – NORCAP/W2SIP/SWIFT
- **Major resource for NMHSs:** NMHSs can run ICPAC post-processing scripts on the HPC and use the outputs in national-level forecasts
- **Extensive programme of training for NMHSs:** pre-COF workshops now focus on remote utilization of ICPAC facilities



ICPAC regional seasonal rainfall forecast: Oct-Dec 2019

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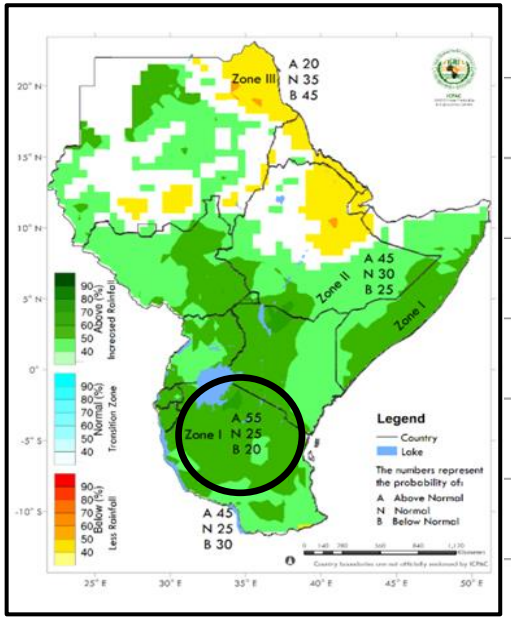
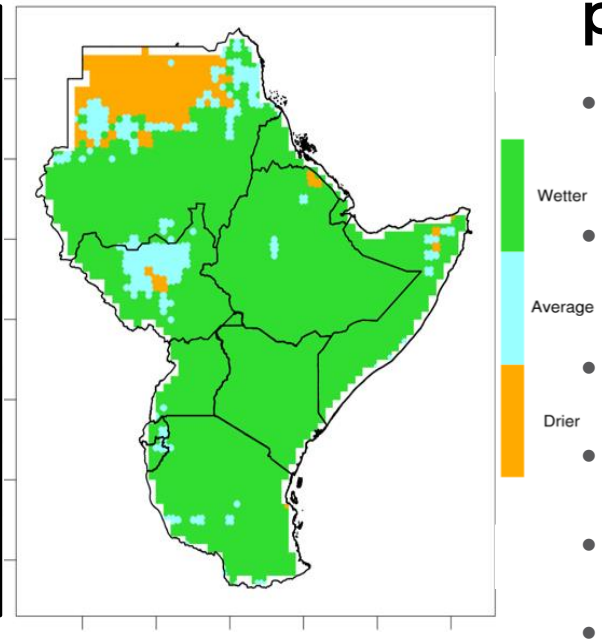
Case study lesson 1: OND 2019 - bold probabilities

Forecast
Probabilities for categories



Observed tercile category



- 55% predicted probability of above normal (only second time > 50% in entire history of GHACOF!)
- Strong positive Indian Ocean Dipole was developing - favouring widespread wet
- But not all models were in line with this
- Subjective intervention would likely have led to weakening of probabilities
- In the event, objective output encouraged better decision making
- Justified by known weakness of subjective approach and good reliability of models (for OND)

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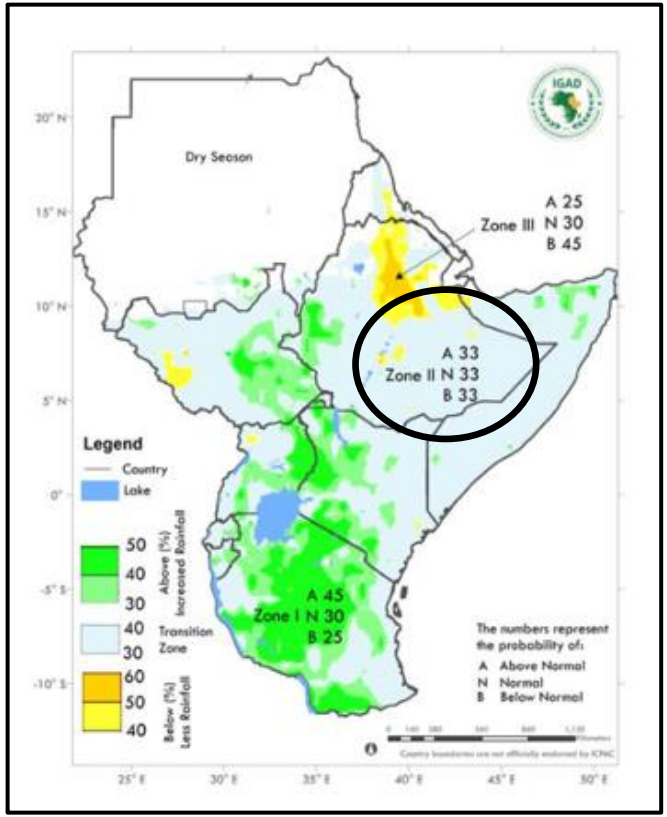
Forecast category probabilities



Case study lesson 2: MAM 2021 - confronting uncertainty

- For MAM 2021, much spread in models resulted in wide areas with “equal chances”
- Low predictability for the MAM season is well known to climate producers…
- … but subjective approach has “hidden” this from users (forecasts always had some signal – even if weak)
- The objective discipline forces/fosters confrontation of uncertainty
- At the GHACOF user response planning, consideration of pre-existing vulnerabilities come to the fore – informing constructive coproduction
- Opportunity to emphasise that 33/33/33/ does not mean “average” - it means there is, e.g. “a 33% chance of worst case”

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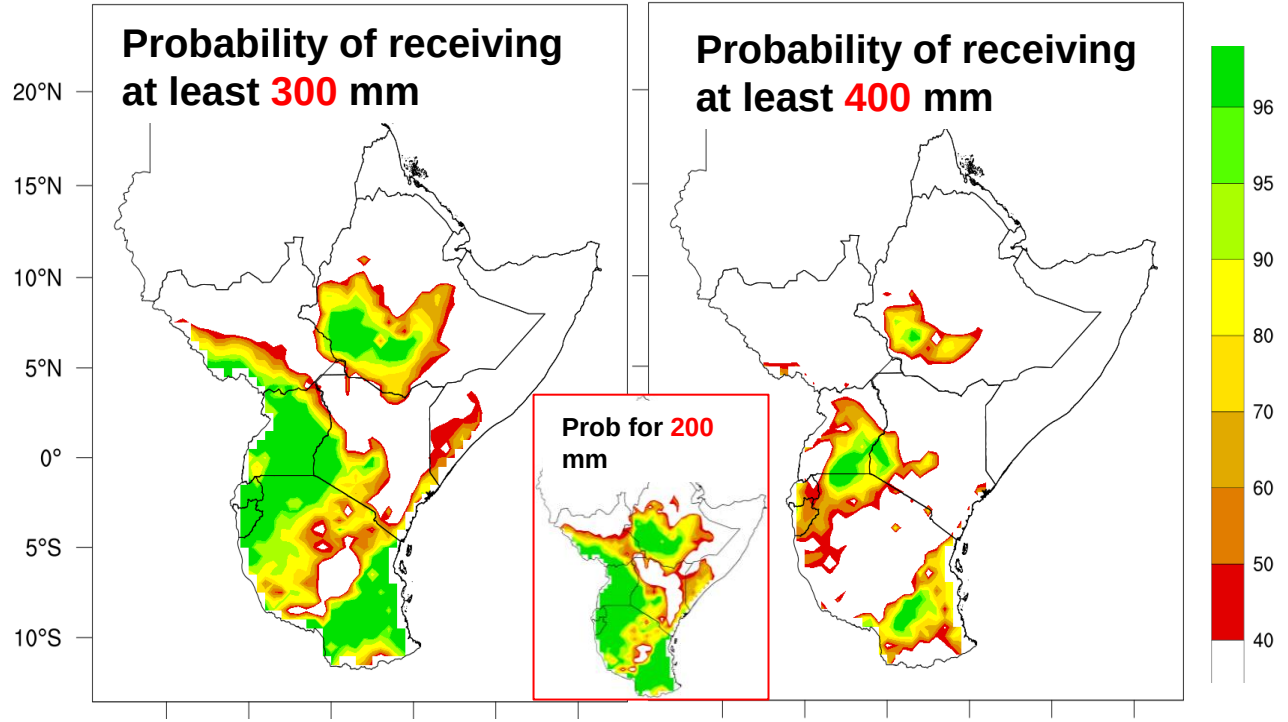
Case study lesson 3: New, more user-relevant products



- Probability of rainfall exceeding user-relevant thresholds
- Virtually impossible to generate with consensus approach
- There is a wide range of other potential products (though all need to be evaluated)
- Spatially-gridded forecast data allows focus on sub regions: national, sub-national, sub-regional (IDDRSI clusters)

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Benefits

- Capable of bolder probabilities (“sharpness”)
- Encourage confrontation with uncertainty (“equal chances”) – and the probabilistic nature of information
- Opens up potential for more user-relevant products, with flexibility for sub-regional/national focus
- Perceived improvement in skill of GHACOF forecasts – this is expected, but sample is still small!

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THANK YOU

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