SYSTEMATIC OBSERVATIONS, DATA, CLIMATE METHODS AND TOOLS

AN OVERVIEW

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THE CLIMATE SYSTEM

- The atmosphere
- The biosphere
- The land surface
- The ocean
- The cryosphere
CLIMATE ................

- therefore involves the other components of the climate system in addition to the atmosphere
- is key to the geographical distribution of fauna and flora
- can lead to permanent or seasonal shifts in ecological range of species and socio-economic activities
A DEMONSTRATION OF CLIMATE INFLUENCE

- The shrinking ecological range of coffee, a threat to the country’s economy

CLIMATE CHANGE

- Attributed to natural variability and anthropogenic activities

- Anticipated impacts to affect people differently, depending on their livelihood strategies and asset base; hence relative vulnerability.

- The controversy surrounding climate change and climate variability calls even for more data spanning centuries and millennia
CLIMATE MONITORING

- Knowledge of temporal and spatial climatic trends critical for sustainable adaptation

- NMs, RCs and WCs therefore charged with the monitoring of the climate system.

- Standards set for observations and related operations; but collaboration and discipline are key
SYSTEMATIC OBSERVATIONS

- The climate system needs systematic monitoring in terms of **time**, **space** and **instrumentation**.

- The recording language is also standardised in ‘codes’ to facilitate data exchange.

- Installation specifications including orientation, angle, height/depth and geo-positioning in relation to the surroundings also have standards.
Data Quality Issues

- Proper instrumentation and installation (standard specifications, age and physical damages)
- Temporal and spatial consistence of observations
- Observation and data processing skills and discipline
- Calibration skills and proper maintenance of instruments
- Level of human error
CLIMATE METHODS AND TOOLS

- Initially meteorological services were mainly for defence and aviation needs, which required mainly real time products.

- With increasing climate challenges, extended and long-term climate products are required for advance planning in key sectors.

- These necessitate computer programs, which require more data for reliability and computer space.
CLIMATE MODELS

- GCMs, RCMs and downscaling models

- Several climate modelling centres, though none in Africa.

- However, some climate centres and institutions of high learning in Africa (e.g. ICPAC and Makerere University Kampala), are running some RCMs to build skills within the regions and validate them.

- The Hadley Centre has also developed PRECIS, a regional climate modelling system, which can run on PCs for any region.

- These need quality data for validation before operational use.
### Lessons learnt and best practices

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<thead>
<tr>
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<th>Lessons Learnt</th>
<th>Best Practices</th>
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<tbody>
<tr>
<td><strong>Systematic Observations</strong></td>
<td>Conflicts are part of society especially in the developing world.</td>
<td>collaborative management</td>
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<td>unlikely that a developing country will meet its optimal observation network demand.</td>
<td>AWOS</td>
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<td><strong>Data</strong></td>
<td>Discontinuous data can still be put to some use.</td>
<td>Statistical packages for extrapolation e.g. INSTAT</td>
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<td>The more data there is, the more reliable the products</td>
<td>Modern computers with high capacity available.</td>
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<td><strong>Climate methods and tools</strong></td>
<td>GCMs not very useful at national level decision making, and it takes time to build skills in modelling.</td>
<td>RCMs/LAMs are more accurate in the tropics than in high latitude areas.</td>
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<tr>
<td></td>
<td>Gaps</td>
<td>Needs</td>
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<tr>
<td><strong>Systematic</strong></td>
<td>Stations in areas of regional and world climatic importance are lacking</td>
<td>Strengthening and diversifying observations especially in marginal areas</td>
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<tr>
<td><strong>Observations</strong></td>
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<td><strong>Data</strong></td>
<td>Areas with harsh climatic conditions have scanty or no data</td>
<td>Modern facilities (software and hardware) to handle the increasing volume of data</td>
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<tr>
<td><strong>Climate</strong></td>
<td>Country models lacking</td>
<td>Modelling skills need to be advanced</td>
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<td><strong>methods and tools</strong></td>
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*UNFCCC African Region Adaptation Workshop*
## DIFFERENT ACTORS

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<th>Local</th>
<th>National</th>
<th>Regional</th>
<th>International</th>
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<tbody>
<tr>
<td><strong>Systematic Observations</strong></td>
<td>Observations, security of equipment,</td>
<td>Network design, procurement of equipment, Installations, training of observers and maintenance</td>
<td>Regional guidelines for GCOS</td>
<td>Setting standards, GCOS</td>
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<td><strong>Data</strong></td>
<td>Relay records to processing centres</td>
<td>Data quality control, archiving, dissemination/exchange, processing</td>
<td>Data exchange hubs</td>
<td>Codes, Data exchange guidelines,</td>
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<tr>
<td><strong>Climate methods and tools</strong></td>
<td>IKs</td>
<td>Downscaling of coarse products, updating climate series and undertaking national climatic studies</td>
<td>RCMs and regional climate studies</td>
<td>GCMs and world climate studies</td>
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### UNFCCC Focus

| **Systematic Observations** | Consider to support relevant activities of WMO and its member countries through article 5 of the convention under the Adaptation Fund |
| **Data** | WMO and its member countries may be supported in their efforts to reduce costs for remote sensing data, data processing and management software development as well as high-tech computer hardware under technology transfer for adaptation. |
| **Climate methods and tools** | Support developing countries in the area of modelling at national levels in order to strengthen their adaptation capabilities. |
CONCLUSION

- There is a yawning mismatch between the scale of climate related challenges and the resources available to address them.

- Much of the data from Africa and the least developed countries is characterised by discontinuity and gaps.

- The issue of systematic observations and meteorological data, needs broader attention beyond WMO and its member countries.
THANK YOU