Creating a Sustainable Framework for Climate Research & Services in Africa

Professor Fredrick Semazzi
North Carolina State University
Department of Marine, Earth, and Atmospheric Sciences
North Carolina State University
http://climlab.meas.ncsu.edu

Main Reference: Semazzi, 2011; Climate Research, (March 2011 Special Issue)
Outline of Talk

• Pan Africa Climate Applications Program (CLIPS-Africa)
• Pan Africa Research Program (CLIVAR Africa)
• Deficiencies on present coordination mechanism

• Proposed Framework & Component
  - Framework Scientific Guidance Mechanism
  - Framework Implementation Sites
  - Framework Coordination Mechanism
Pan Africa Climate Applications Program (CLIPS-Africa)

• Implementation Centers - RCOFs (now GFCS RCCs) receive technical guidance from the Commission for Climatology (CCL) of the World Meteorological Organization (WMO) through its Climate Information and Prediction Services (CLIPS) program.

• Serves 11 regions (RCOF/RCCs) and covers most of the developing countries in the world

• It represents the state-of-the-art for operational seasonal climate prediction in RCC regions
1. GHACOF: Greater Horn of Africa COF
2. SARCOF: Southern Africa COF
3. PRESAO: Western Africa
4. COFPRESAC: Central Africa COF
5. FOCRAII: Forum On regional Climate monitoring, assessment and prediction for Regional Association II (Asia)
6. SSACOF: Southeast of South America COF
7. WCSACOF: Western Coast of South America COF
8. CCOF: Caribbean COF
9. FCCA: Foro Regional del Clima de América Central
10. PICOF: Pacific Islands COF
11. SEECOF: SouthEastern Europe COF
GHACOF Process
(similar to other RCOFs)

• Pre COF capacity building workshops are held for regional climate scientists to develop national climate predictions
• Pre COF user workshops are held for the sector specific applications
• Presentation of lessons learned and success stories on applications of previous GHACOF products
• Development of Regional Consensus Climate Predictions
  - National climate outlooks from pre COF workshops are integrated to form GHA regional climate predictions
  - ICPAC statistical and dynamical climate predictions as well as climate predictions from other centres are used to improve on the Pre COF climate prediction resulting in regional consensus prediction
• User break away sessions to develop mitigation strategies
• Media workshops for dissemination of consensus predictions and mitigation strategies
• National workshops follow to release downscaled national climate predictions
Greater Horn of Africa Consensus Climate Prediction for September to December 2006

Merits

• Represents major progress in producing regional product
• Represents major progress in producer-user interface

Deficiencies

• Resolution
• Frequency of product
• Customization/format of product for users
• Does not reflect major advances made in last 10-15 years in climate research

NOTE: These limitations are not mainly due to how the centers are run – BUT weakness in coordination research & applications
• CLIVAR addresses the research on climate variability and predictability, with a particular focus on the role of ocean-atmosphere interactions in climate.

• CLIVAR works closely with its companion WCRP projects on issues such as the role of the land surface, snow and ice and the role of stratospheric processes in climate.
Three major questions that CLIVAR-Africa Addresses
(http://www.clivar.org/organization/vacs/clivar_africa_iplan.htm)

- What are the causes of African Climate variability and how is this related to other parts of the globe?
- How well do current dynamical models simulate African Climate variability and its relationship with the global climate?
- Which deficiencies do dynamical models have that can account for known inadequacies in the simulation of African Climate variability and its relationship with the global climate?
Improved knowledge of how the African heat sources interact with the external sources of climate variability, i.e., ENSO teleconnections; Southern Oscillation (SO); Indian Ocean Zonal Mode (IOZM); Tropical Atlantic Ocean (TAO) circulations in the development of the key synoptic systems would lead to opportunities for improving predictability of these variations including tropical cyclone variability.
SUSTAINABILITY PROBLEM
‘Existence & Ownership of Climate Applications Research’

• In a broader socio-economic context this problem has been analyzed by Lancaster (2003).
• Her analysis, which focuses on Africa, suggests a need to build the capacity of aid donor agencies to enable them to direct aid that makes donor support recipients the owners of the programs.
• She asserts that without building their capability, it is impossible to ensure that nations will be able to develop their own capacity for economic, social and political growth.
• This transformation is also needed for the development of climate science research and services in Africa.
• The problem is compounded further by the prevalence of the ‘donor mentality’ and the need to make a transformation to the ‘owner mentality’.
• We invoke this principal to motivate the proposed framework.
GRADE

CLIMATE APPLICATIONS RESEARCH in AFRICA

(i) **RESEARCH**: Although numerous research studies have been carried on the global climate through the Climate Variability and Predictability (CLIVAR-VACS) program of WCRP, the impact of these advances on the social-economic conditions in Africa is still very limited.

(ii) **APPLICATIONS**: Climate information products generated by the RCOFs/RCCs are still fall far short of the end-user needs in terms of critical needs of stakeholders.

(iii) **SUSTAINABILITY**: Lack of sustainability

(iv) **DISCONNECTION**: There is a disconnection between research activity and climate services & a self-sustaining cycle is continuously eroding and undermining any progress.

**COMBINED GRADE**: B; WE CAN DO **BETTER**!
BREAKING THE CYCLE

**THE CYCLE:** The cycle begins with poor support and funding for research and climate services. This results in inability of climate services providers to meet stakeholder needs which in turn results in the further erosion of support and strengthening of the undesirable positive feedback process.

**BREAK CYCLE:** There is need for a new mechanism that can break the cycle that inhibits growth in climate services in Africa.

**HOW?** The new mechanism should help climate services providing institutions in Africa to concretely demonstrate the benefits of climate research through improved climate services and thereby breaking the cycle and creating stakeholders for the climate services who will use and advocate for funding of research and its outcomes.
TEMPLATE FOR CREATING A SUSTAINABLE FRAMEWORK FOR CLIMATE SERVICES

**CRMS**: Need one that support a long-term sustainable program for the incubation of Climate Risk Management Strategies (CRMS) for decision making in Africa

**CRMS COMPONENTS**: The proposed CRMS organizational structure and implementation strategy comprise the following components:

- RCOF coordinating agencies or RCCs serving as implementation sites for the CRMS incubation projects,
- CLIVAR-CLIPS Joint Task Force (TF) for guiding the relevant cross-cut research
- WMO/WCRP/GFCS mechanism for coordination of the CRMS agenda
CRMS Implementation Sites

• RCCs: The natural implementation sites for the CRMS agenda are the RCOF coordinating agencies or RCCs in developing countries

• NEW KNOWLEDGE: Create knowledge enterprise zone for a dedicated multidisciplinary community, of university, industry and government partnerships to design, test, and operationalize climate risk management strategies for greater quality of life in the regions served by the CRMS program

• CRMS TEAMS: CRMS will entail formation of interdisciplinary teams of 5 to 10 people working together continuously for a few months up to a year at the RCC dealing with regional climate to develop practical strategies for climate risk management

• AFFILIATION OF EXPERTS: Members of this team will come from advanced centres and universities in developed and developing countries, participants from NMHSs, RCC staff, and representatives of the application sectors

• MIGRATION OF OUTCOMES: The outcomes generated by these teams will be migrated to the mainstream operational RCC environment in much shorter time than would have otherwise been possible.
CLIVAR-CLIPS JOINT TASK FORCE

TOR: The terms of reference (TOR) for the proposed CLIVAR-CLIPS TF could be based on the joint statement issued by the experts representing the World Climate Research Program (WCRP) and the WMO Commission for Climatology (CCL), who met in a Joint Session on 18 February 2010 at Antalya, Turkey. The full statement is available at CCL-WCRP (2010).
CRMS COORDINATION MECHANISM

(i) **IMPLEMENT TF DECISIONS**: Serve to implement the decisions and recommendations made by the proposed CLIVAR-CLIPS TF

(ii) **ADMINISTRATION COORDINATION**: Provide administrative coordination to streamline the presently uncoordinated but highly complementary climate-application projects

(iii) **SUSTAINABILITY**: The present projects are of short-term duration and their intended impacts could diminish with time. The CRMS approach will therefore play a critical role in promoting long-term sustainability for these demonstration projects
CRMS DELIVERABLES

- **RESEARCH**: Research outcomes will be used to encourage developing countries to invest more in climate research to support in-country *developmental* activities; & break the ‘cycle’

- **APPLICATIONS**: Working as partners under the CRMS framework, WCRP & CCL communities in developing countries can concretely demonstrate the benefits of climate research and climate services

- **SUSTAINABILITY**: Create pools of stakeholders for the *climate services* who will use and advocate for research and its outcomes.