

CLIMATE DATA RESCUE IN AFRICA

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Background

Economic related activities over most countries of Africa rely on climate. Agriculture, which is the mainstay of the economies of most countries, is purely rain-fed. Hydroelectric power generation also depends heavily on rainfall. Fluctuations in the climate conditions therefore impact adversely on the many sectors of the economy. The floods associated with the 1997/98 El-Nino conditions and the subsequent drought that lingered on from mid-1998 to 2000 over some parts of eastern Africa as well as the 1999 cyclone related droughts in Mozambique are manifestations of changes in the climate system that have devastating impacts on the economic well being of most countries. To be able to give early warning for the possible occurrence of such climate extremes, it is pertinent that one understands the past space-time characteristics of climate fluctuations. Recent developments in seasonal climate prediction science and technology especially those related to the ENSO phenomenon, have been successfully used in many regions to provide early warnings of the related climate extremes and the associated socio-economic impacts. Such efforts now form crucial components of early warning and disaster preparedness activities in many regions with strong ENSO signals such as parts of Africa. Several training workshops for climate scientists have been held to enhance the capacities of National Meteorological and Hydrological Services (NMHSs) to issue seasonal climate outlooks with emphasis on climate extremes. In order for these scientists to utilise the acquired knowledge to their full potential, they need climate data in a form that is easy to manipulate.

This requires that climate data banks be created in electronic media so that provision of climate information and prediction products is effective. In some countries of Africa, most of the data is not in electronic media that can be easily accessed and manipulated. One of the major problems faced in discharging some of the activities of NMHSs has therefore been non-availability of appropriate information in appropriate media. For most of the countries, meteorological and hydrological data are stored in various forms not readily compatible with modern archiving and processing facilities. In Kenya, for example, a lot of historical data for the East African region archived during the defunct East African community is on magnetic tapes and microfilms with no facilities to read them. In Ethiopia, data was stored on tapes on the Micro-Vax mini computer, which uses the VMS operating system. This system is now obsolete and the tapes cannot be read. Other data related problems in the region include:

- Lack of long period data
- Some missing data at many locations.
- Changes in instrumentation and exposure.
- Changes in the observation sites during the period of data.
- Many uninhabited areas such as mountains, arid/semi arid lands, and large water bodies had very few network of stations.

Recent attempts for data rescue by WMO have not been able to solve of these problems.

On the other hand, most countries have volumes of data on hard copy and there is the danger of the hard copies either being lost or deteriorating. For hydrological data, efforts are currently being made under HYCOS projects to improve database and observational systems. It is on this basis that the Drought Monitoring Centre - Nairobi has submitted a project proposal on Data Rescue in the Greater Horn of Africa sub region with the principal objective of assisting NMHSs to retrieve climate data, which is stored in forms that are not compatible with modern archiving and processing facilities. It will also endeavour to build capacity in Data Management at the National level.

Specific activities to be undertaken

The specific activities to be carried out include:

- Make inventories of the climate data available at the national climate data centres.
- Make inventories of the data processing procedures and systems available at the national climate data centres.
- Identify the most immediate, medium term and long term needs of the NMHSs.
- Identify the appropriate equipment (preferably portable) and methods required to assist in the data rescue operations.
- Conduct Capacity building training workshops for scientists to be involved in Data Management.
- Develop appropriate formats for data storage on appropriate media and design retrieval procedures.
- Assign experts to be involved in data rescue operations.
- Acquire relevant equipment for data rescue, data processing PCs, and installation of the required soft wares for the NMHSs.
- Create baseline datasets for purposes of developing atlases for risk mapping.
- Carry out Quality Control on the data to ensure that it is near error free.
- Expand NMHSs data base.

Necessary input

- Computers, which can read data, stored using the VMS operating system.
- Powerful PCs on which read data can be stored and processed.
- Card and microfilm readers
- Computer hardware and software for Data Processing at the National Level.
- Workshops, seminars for Data Management Scientists.

Data needs for the region

There are many activities in Africa, which require the availability of good quality climate data that are readily accessible. These vary from one use to the another, but the data needs would generally include:

- Derivation of baseline statistics
- Diagnostic studies (process studies)
- Statistical modelling and prediction
- Dynamical modelling and prediction

- Climate change monitoring, detection and attribution
- Disaster management and applications in all other climate sensitive sectors

Potential roles of the regional centres – ACMAD, DMCs and IMTRs

The regional institutions can play significant roles in some of the specific activities highlighted in 2 above. Such roles would include:

- Capacity Building
- Implementation of regional and national specific projects on data rescue for example the project proposal on data rescue for the GHA countries submitted by DMCN.