Challenges to coping strategies with agrometeorological risks

and challenges in Africa

Elijah Mukhala & Adams Chavula
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The continent has:

- Varied climate regions, the west, central, horn and southern Africa.
- Experience uni-modal and bimodal rainfall systems – within the calendar year and overlapping two calendar years.
- Varied cropping and animal production systems comprising small and large grains, tubers, goats, sheep, cattle etc.
The continent has:

✓ However, in sub-Saharan Africa, 90% of agricultural activities are rain fed – only 10% is irrigated.

✓ The continent prone to floods and drought affecting livelihoods and food security – recent – Ethiopia, Mozambique, Malawi, Kenya etc
Impact of climate variability on food security

- Climatic variability defines production uncertainty at all levels
- Climatic variability is a major impediment to growth

Source: KPC Rao, ICRISAT
Every year FAO and WFP with local VAC conduct CFSAMs to:

- establish crop prospects
- Causes of failure
- Number of countries affected

In many instances, climate variability ranks among the top causes of poor crop yields.
African Economies and Climate

Sub-Saharan African economies are especially susceptible to climate due to their predominately agrarian structure.

On average, 25% of GDP derives from agriculture, 70% of the work force is in the rural sector and,

where there are no mineral resources, most of the exports originate in this sector.

Example: Floods in Mozambique in 2000

700 people were estimated to have died

Damages were estimated to be around US$450 million

GDP dropped from 10% to 2% (source: Lucio 2006.)
GDP and Rainfall Relationship

Challenges to agmet risks and uncertainties

Source: Grey & Sadoff, 2005

Source: World Bank
Challenges to agrometeorological risk and uncertainty management
1. DATA COLLECTION

✓ Large areas of Africa do not report at all (or consistently) data to the global network.

✓ Local stations may provide individuals or local organizations with valuable climate data (particularly rain gauges on farms) but in many areas these volunteer stations have also declined in number.

Source: Gap Analysis Report, 2006
Global Telecommunications System Reporting Stations and Natural Disaster Risk Hotspots

Natural Disaster Risk Hotspots: A Global Risk Assessment
Columbia University, World Bank

Climate info supply
2. DATA SUITABILITY

✓ There is no shortage of climate information
  ✓ Whether that information is suitable for specific applications

✓ Africa has a number regional institutions that provide climate information, among them are:
  ✓ ACMAD, ICPAC, DMC-Harare, Agrhymet
  ✓ Universities
  ✓ National Meteorological institutions
  ✓ International Research institutions

✓ The continent also receives a lot of satellite data from NOAA and FAO
Seasonal forecasting: obstacles for application

3. DATA APPLICABILITY

- Mismatch between farmers’ needs and the scale and relevance of available forecasts.
- Sufficient explanation to ensure understanding by farmers and their advisors
- Timely access to information
- Lack of institutional, financial, political support including inputs, markets

Case studies in climate info applic
In Nov 2002, the SADC RRSU convened Workshop in Harare, Zimbabwe.

‘Application of climate information to sustain agricultural production and food security”

Stakeholders - interviewed and requested to prepare detailed responses regarding their assessment as to the extent to which the climate information system currently served the agricultural sector in their countries. 12 countries responded.
Specifically, participants were asked to answer four overarching questions:

- What are the specific forecast needs for agricultural decision-making, given the specific characteristics of your agricultural sector?
- To what extent are such forecast needs currently being accommodated in your country’s forecast system?
- What are the specific gaps in your forecast system (as it serves the agricultural sector)
- Can you identify three strategies to close these gaps?
Pilot Projects to assist for decision making

Identified priority weaknesses/Gaps in the climate information system

- Intra-seasonal distribution
- Language/terminology
- Communication channels
- Capacities
- Stakeholder awareness/training
- Tailored forecasts
- 'Further' forecasted parameters
- Key relationships
- Lack of data
- Spatial distribution
- Timely issuance
- SARCOF process

Source: Archer, Mukhala, Walker. 2006

SADC members responding
Pilot Projects to assist on-farm decision making

✓ Pilot projects have been conducted in East and Southern Africa (Machakos and southern Zambia + Lesotho) (funding USAID thru IRI)
✓ Local Universities
✓ Regional Climate Centres
✓ National Meteorological Centres
✓ International Research Institute for climate and society

✓ Objective: Assessing the use of tailored seasonal climate forecast in decision-making by farmers and intermediaries and the impact on desired outcomes
✓ Results showed great promise to understanding decision making and use of climate information to improve food security and reduce poverty

On-farm coping strategies
On-farm coping strategies to risks and uncertainties

On the positive side there is evidence in southern Africa that farmers are attempting to adopt strategies to cope with the risks and uncertainties.

Among the strategies that are being adopted to cope include;

- ✓ crop diversification
- ✓ the use of drought tolerant varieties
- ✓ the adoption of reduced tillage methods
- ✓ Supplementary irrigation
On-farm coping strategies to risks and uncertainties

Conservation farming method is one method that is being used widely in southern Africa to sustain agricultural production and mitigate the impacts intra-season rainfall variability.

- protect the soil from the damaging effects of rain splash;
- reduces runoff and keeps more of the rain on the fields (rain harvesting)
- make the best use of costly fertilizer and seed and
- allow farmers to finish land preparation well before the rains begin.
On-farm coping strategies to risks and uncertainties

FAO in collaboration with National Farmers Organizations has been funding projects in conservations farming in southern Africa.

Among the benefits of these projects are:

- Yield of maize have increased from about 0.8 tons to 3 – 4 tons/ha;
- Incomes have been generated through sales of extra grain

Weather based insurance
Weather based index insurance - recognition as one of the methodologies that can be used sustain livelihoods and reduce poverty as part of the MDGs.

A few countries in Africa are piloting the methodology and among the countries included are Malawi and Ethiopia.

Due to high levels of poverty, the farmers were not credit worth and hence they could not access loans to purchase inputs.

The insurance helps farmers obtain financing necessary to obtain certified seeds, which produce increased yields and revenues as well as greater resistance to disease.
Similar actions are being explored in Morocco, Kenya, Tanzania, Uganda, and South Africa.

However, development of these index strategies is hindered by gaps in available climate data.

Gaps could likely be eliminated through appropriate efforts in data collection and availability.
"It is good to note that in case of severe drought I do not have to worry about paying back loans in addition to looking for food to feed my family. In future I hope to send my children to school with income from this project."
Further effort in methodology and tools

Prior to Sowing

✅ Provides info for decision making – what, when, where to plant

SIAC Instat, Univ of Reading

Extensive use of climate data for decision making

Post Sowing

Provides info for humanitarian assist – what, when, where

AgroMetShell, FAO
The challenges to agrometeorological risks and uncertainties are well documented, the question is deal with them effectively.

There is a need for intra- and inter-institutional co-operation, building on strengths of comparative advantages.

Need to compile all available tools and methodologies for use by those in need for decision making and early warning.

There is need for a holistic approach to achieve a solution, aiming at reversing recent negative trends in longer-term development.
Thank You