Drought Monitoring and Early Warning
in West Africa

At the AGRHYMET Regional Center

By

Seydou B. TRAORE,
agrometeorologist

WMO Inter-Regional Workshop on Indices and Early Warning Systems for Drought
Lincoln, Nebraska, USA, 8-11 December 2009
Outline

• Introduction
  – Background information about AGRHYMET

• The Early Warning System of AGRHYMET

• Some products

• Some facts in 2009
Introduction
The Sahel Droughts

A unique case by its severity and its spatial extent

Fig. 3: The change in high summer (July-August) total precipitation (mm day⁻¹), 1967-1998 minus 1948-1966, estimated from land surface records (‘g55wld0098.dat’ constructed and supplied by Dr. Mike Hulme at the Climatic Research Unit, Univ. of East Anglia, Norwich, UK).
Introduction

AGRHYMET, a Specialized Institution of CILSS (Cape Verde, Mauritania, Senegal, The Gambia, Guinea Bissau, Mali, Burkina Faso, Niger and Chad)

• **Created in 1974**, following the catastrophic droughts of the early 1970’s

• **Mission**: to contribute to achieving sustainable food security and rational natural resource management by:

  – **Capacity building** of member States technical offices (*training, equipment and financial support*)

  – **Information production and dissemination** to various decision makers (national authorities, cooperation partners, NGOs and farmer associations)

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AGRHYMET operating scheme

Partners

Financial and Technical assistance

Data and Information

Hydrology

Meteorology

Agriculture

Crop protection

Animal Husbandry

Countries

Analysis Diffusion Training

Data Collection and Storage

Satellite Data

Ground Observation and Surveys Data

Extension to ECOWAS member countries

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The Drought Early Warning System

– From May to October
  • Seasonal rainfall and hydrological forecasts (PRESAO),
  • Monitoring the rainfall situation
  • Monitoring the progress of sowing and the crop water satisfaction (field data and agrometeorological models),
  • Monitoring the pastures situation (Vegetation Indices),
  • Crop and biomass yield forecasting (Agrometeorological models),
  • Identifying risk zones (Synthesis of all the products),

– In October: Joint pre-harvest assessment missions (CILSS, FEWS NET, FAO, WFP, governments ….)

– Early November: Annual consultative meeting

– Targeting vulnerable populations.
Some products
Rainfall maps (ground measurements)
Some products
Rainfall maps (satellite estimation, MSG)
Some products

Vegetation indices (ICN, MODIS)

31st July 2009

31st August 2009
Some products

Vegetation indices (VCI, MODIS)

11-20 August 2009
Some products
Crop water balance (DHC model)

Sowing dates

Water Requirement Satisfaction Index

Yield forecasts

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Some products
Regional Cereal /Food balance

Production céréalière prévisionnelle révisée 2006/2007
Comparaison des productions céréalières prévisionnelles révisées par rapport à la moyenne 2001 - 2005

© AGRHYMET, Niamey Niger, avril 2007, Sources : Réunion Régional sur le suivi de la situation agricole et alimentaire-opportunité échanges

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Another mode of interannual variability seems to be established in the Sahel.


Persistance d’années humides

Persistance d’années sèches

Abrupt change from very wet to very dry years
Different pattern of variability from Western to Eastern Sahel

Standardized Rainfall Anomalies

Western Sahel

Still dry

Eastern Sahel

Back to wetter conditions

Standardized Niger River Discharge Anomalies

Koulikoro, Mali

Lokoja, Nigeria

Some facts in 2009

Millet field in Niger

11th August 2009
Some facts in 2009
Prayer ceremony for rains in Niger

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Some facts in 2009
Failed millet crop in Niger

27th September 2009
Some facts in 2009

Rice field lacking water in Chad

22nd October 2009
Thank you!