

**UNFCCC expert meeting**  
*Mexico City, Mexico, 4-7 March 2008*

**Session 4:**

*Data and observations relevant to impacts and vulnerability assessments:*

***Collection, management and use of  
observational data; Regional perspective.***

*Presented by*

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***Some Regional Features and  
Facts***

- ⌘ More than 30% of West African  
population do not have access to clean  
water and sanitation***
  
- ⌘ In West Africa more than 80% of  
diseases are Water related diseases***
  
- ⌘ Agriculture and livestock contribute  
for more than 35% of the PIB of  
Majority of West Africa Countries***

## **Some Regional Features and Facts (cont)**

- ⌘ ***Struggle for food security in many countries of the region***
- ⌘ ***Less than 5% of renewal water resources is mobilized in the region***
- ⌘ ***Less than 20% of irrigable areas is irrigated***

## **Water and MDGs 2015**

<b><i>MDGs</i></b>	<b><i>Place of Water</i></b>
<b><i>Extreme poverty and hunger</i></b>	<b><i>greater</i></b>
<b><i>Education for all</i></b>	<b><i>Education water</i></b>
<b><i>Gender equally</i></b>	<b><i>average</i></b>
<b><i>Reduce child mortality</i></b>	<b><i>greater</i></b>
<b><i>Improve maternal health</i></b>	<b><i>greater</i></b>
<b><i>Combat HIV/AIDS, Malaria</i></b>	<b><i>important</i></b>
<b><i>Environment sustainability Access to water and sanitation</i></b>	<b><i>highest</i></b>
<b><i>Global partnership for development</i></b>	<b><i>important</i></b>

## **Some Regional Features and Facts (cont)**

**⌘ *The availability of water for human use and consumption is one of the most pressing socio-economic issues in West Africa***

### ***PRESENTATION PLAN***

- 1. Impacts of climate change on West Africa***
- 2. Initiatives on data collection, management and use of observational data***
- 3. Present situation of data collection systems***
- 4. Conclusions***

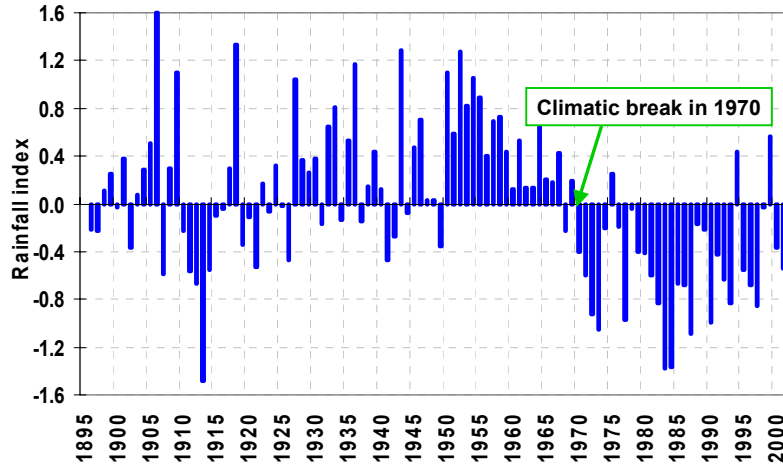
## ***PRESENTATION PLAN***

### ***1. Impacts of climate change on West Africa***

#### ***Impacts of Climate variability in West Africa***

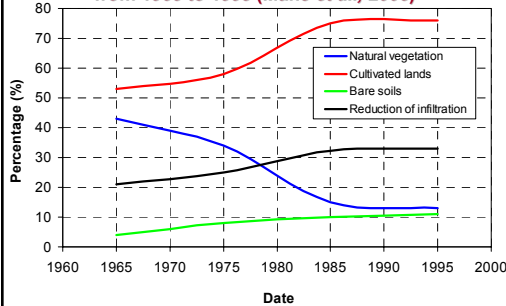
- ⌘ ***Long-term decrease in annual rainfall amount since 1970's (15 to 35%)***
- ⌘ ***Decrease in annual number of rainy days***
- ⌘ ***Shift in isohyets distribution***
- ⌘ ***Increase in dry spells***
- ⌘ ***High variability of the beginning of rainy season***
- ⌘ ***High spatial and inter-seasonal variability of rainfall***
- ⌘ ***Declining of runoff in major Rivers***
- ⌘ ***Declining of groundwater recharge***
- ⌘ ***Major impacts on humid zones and ecosystems.***

### Sahelian rainfall index from 1896 to 2002

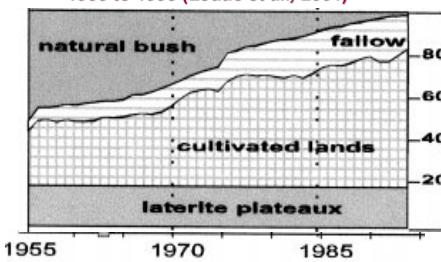


### ➤ Land use and cover change in the Sahel

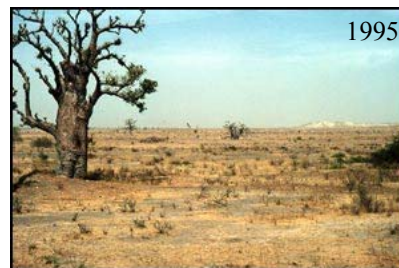
Evolution of land use in the Nakambé basin from 1965 to 1995 (Mahé et al., 2005)



Land use in the Niger region from 1955 to 1995 (Leduc et al., 2001)



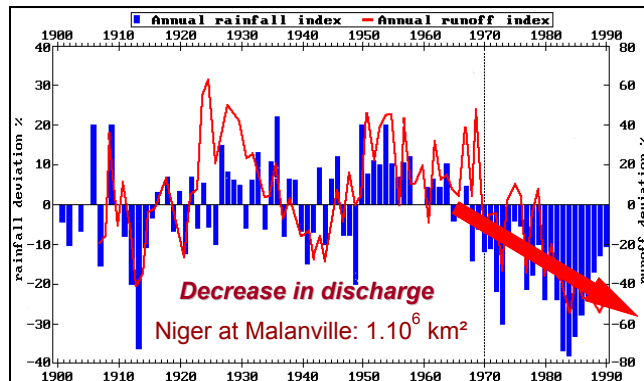
1983



1995

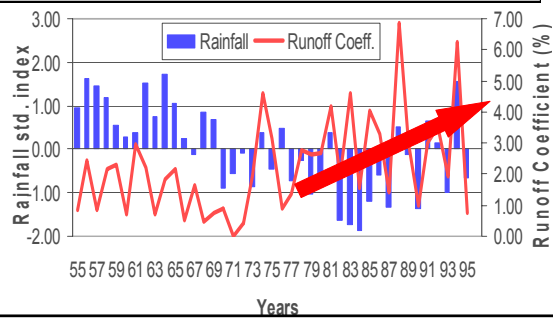
Source : EROS Data Center International Program, U.S. Geological Survey

➤ **Contrasted responses of Sahelian basins according to the new climate and land surface conditions**



Examples of surface water

**Increase in discharge (Nakambé river at Wayen in Burkina, 20 800 km<sup>2</sup>)**  
From Mahé et al., 2005

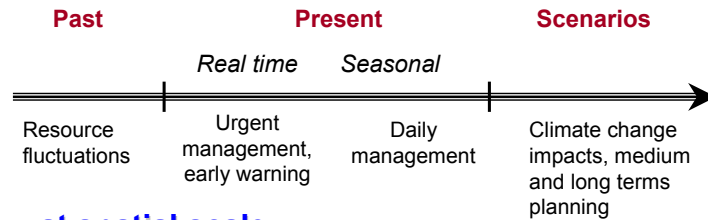


## **Importance of scale in data collection**

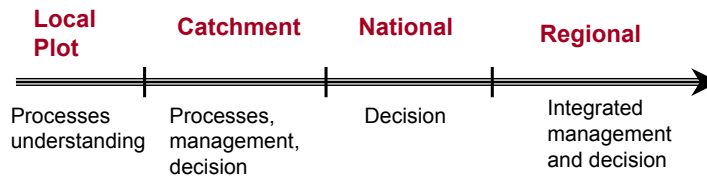
- ☞ **Crucial need for more accurate climate information in the process of impact studies**
- ☞ **Global projections of coarse resolution are important, but less useful for local applications**
- ☞ **Necessity of local observation data for model evaluation and for simulation of these regional features**

## Scaling in climate information for water sciences and management issues

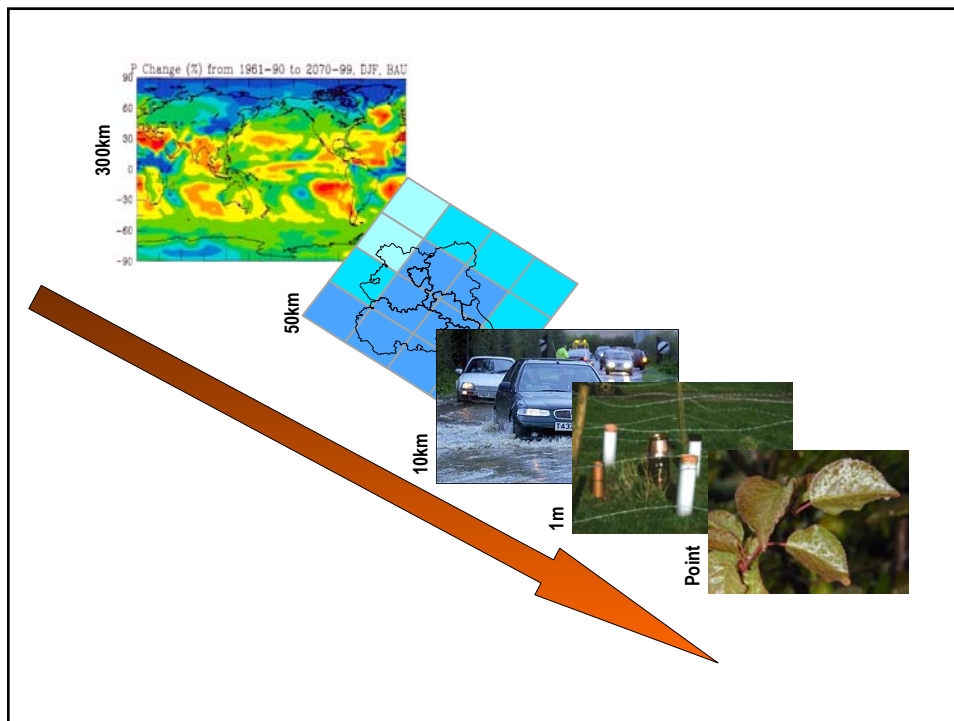
**...at time scale** (*knowledge of the past → best understanding the present → best scenario for the future*)

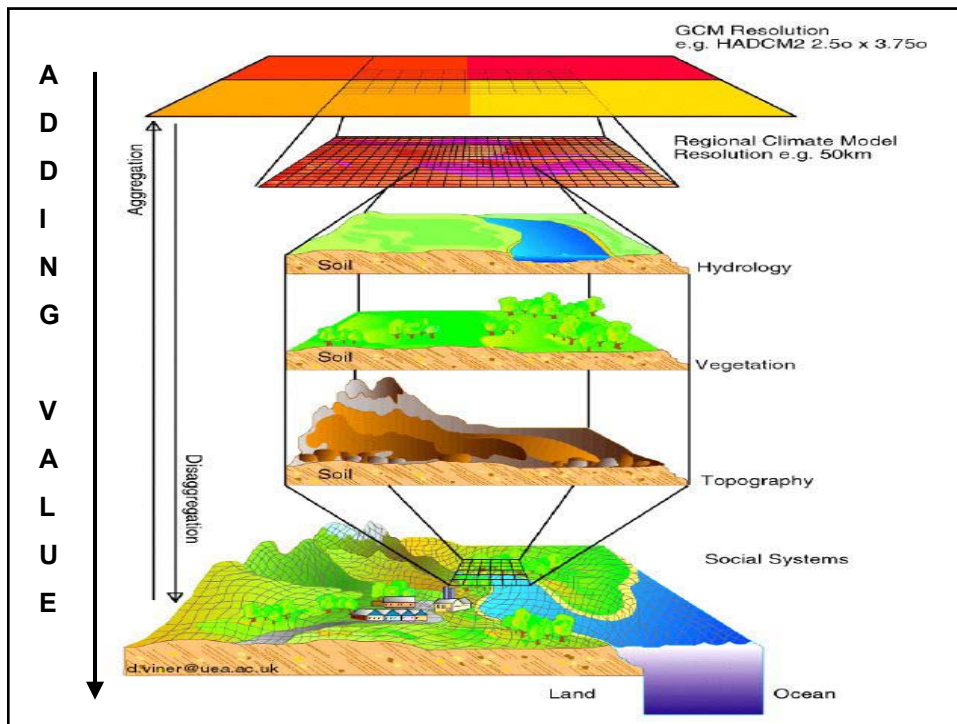


**...at spatial scale**



**...at reliable accuracy**





## ***PRESENTATION PLAN***

- 1. Impacts of climate change on West Africa*
- 2. Initiatives on data collection, management and use of observational data*



## ***Some actions to assess and respond to CC in West Africa***

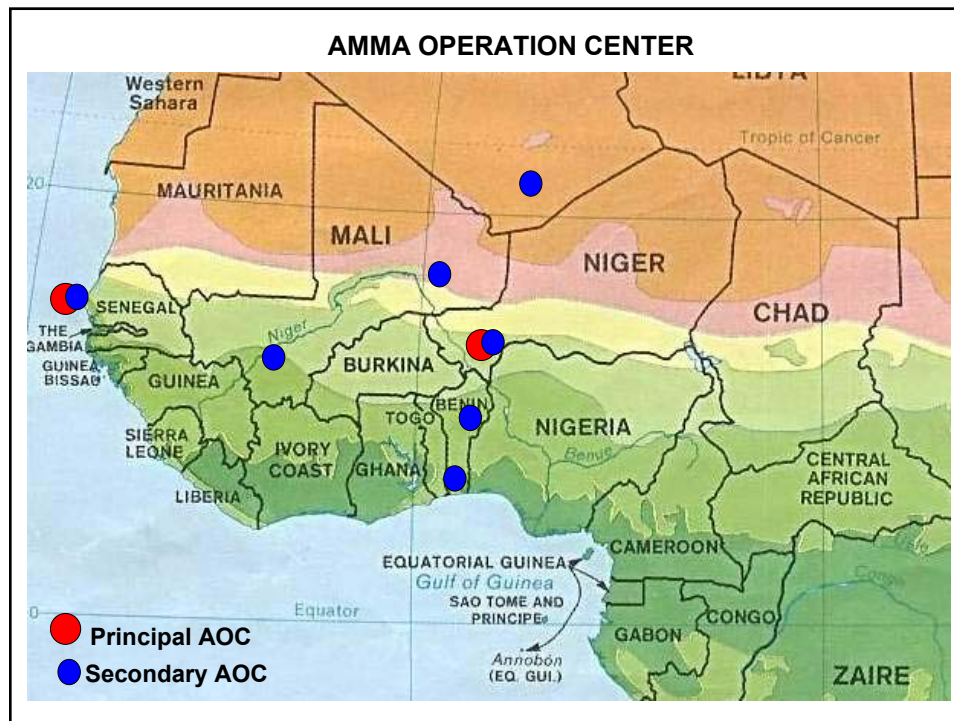
- ⌘ ***These include:***
- ❖ ***The establishment of institutions: CILSS and its associated training and research center, AGRHYMET***
- ❖ ***several initiatives:***  
***Sub-Saharan Africa Hydrological Assessment (WB, UNDP, WMO, EU & France) in 1993 → raised concern that the number and the quality of data collection systems were declining and urged for actions to reverse this trend***

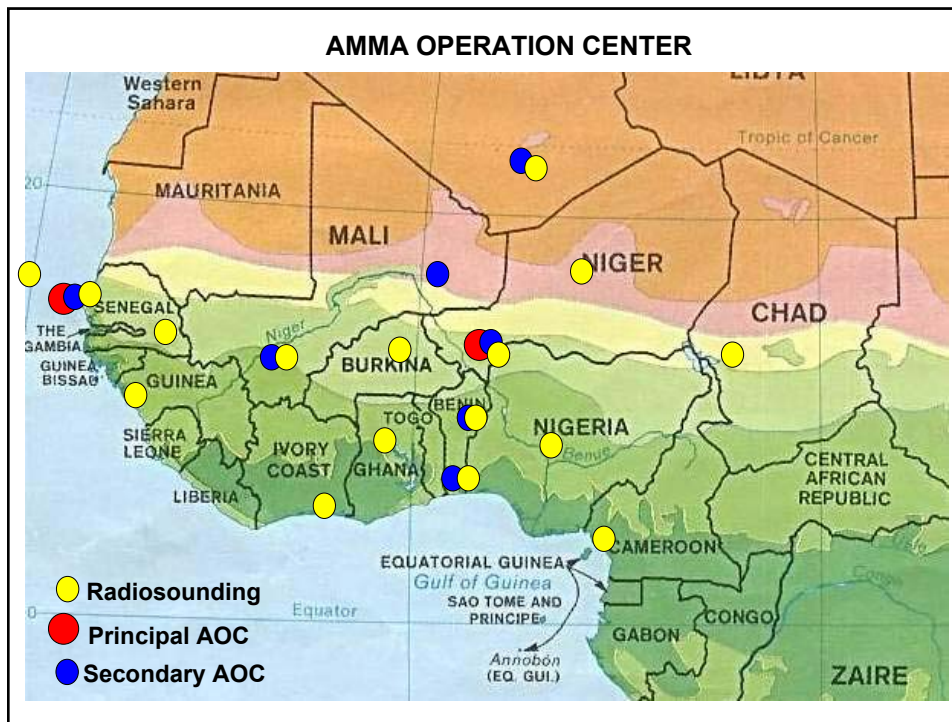
## ***Some actions to assess and respond to CC in West Africa (cont-2)***

- ⌘ ***Some other initiatives :***
- ❖ ***PRESAO (Seasonal Rainfall and Flow Forecast for West Africa), launched in 1998***
- ❖ ***The West and Central Africa Component of the FRIEND-Project (Flow Regime from International Experimental and Network data) under the UNESCO-International Hydrological Programme***
- ❖ ***AMMA-Programme (African Monsoon Multidisciplinary Analysis) and the associated RIPIESCA projects***

## AMMA Scientific objectives

- ⌘ **AMMA: African Monsoon Multidisciplinary Analysis**
- ⌘ **Scientific objectives** → Improve our understanding of the African Monsoon functioning in order to provide guidance on the kinds of methodologies, tools and approaches that can be used for adaptation (detailed in a white book)
- ⌘ **AMMA Operational Tasks**
  - ⊠ **SCIENTIFIC OBSERVATIONAL ACTIVITIES**
  - Long Observing Period, (LOP)
  - Enhanced Observing Period, (EOP)
  - Special Observing Period, (SOP)





### **Summary of African contribution to AMMA**

**Scientific contribution : *The African Involvement Plan (PIAF)***  
**Scientific working packages covering the following items :**

- **Convection and atmospheric dynamic**
- **Aerosols and chemical processes in the Atmosphere**
- **Physical processes over land surfaces**
- **Biological processes over land surfaces**
- **Hydrology**
- **Oceanography**
- **Numerical and statistical modelling**
- **Agro-meteorology**
- **Climate and health**
- **Climate and Food security**

## **Summary of African contribution to AMMA (cont.)**

### **Strategy for resources mobilization:**

FSP RIPIECSA (French Ministry for Foreign Affairs)

**Project Entitled:** *Interdisciplinary and active research on the interactions between the ecosystems, climate and societies of West Africa, RIPIECSA*

#### **Targeted projects:**

- **Seasonal forecasts**
- **Evolution of climate variability at regional, mesoscale and at local scale.**
- **Variability of the meridian gradient of monsoon**
- **Impacts of future climatic variability**
- **Last climatic variability**
- **Climatic impacts on the evolution of the socio-ecosystems**
- **Scenarios of evolution of the impacts on the socio-ecosystems**
- **Capacity building and training**
- **Network of data exchange**

**Links with the topics of the international program (AMMA)**

## **PRESENTATION PLAN**

- 1. Impacts of climate change on West Africa*
- 2. Initiatives on data collection, management and use of observational data*
- 3. Present situation of data collection systems*

## ***Present situation***

### **⌘ *At Regional level***

- ❖ ***Efforts is now being made to improve collection of hydrological data at the river basin scale, therefore **HYCOS-Niger** ( for NBA) and **Volta-HYCOS** (for VBA) are being implemented***
- ❖ ***On-going activities such as AMMA programme and the associated RIPIESCA projects are being implemented in some countries***

## ***Present situation***

### ***At national level***

***Although the research community is well integrated in the research programmes that support the collection, management and use of climate data and information at regional level, recent assessment of operational services indicates:***

- ❖ ***Decline in the size and quality of Hydrological Services (the situation is worsenning in many countries in comparison with the results of SSA-HA report -1993)***
- ❖ ***Lack of skilled Manpower for operational purposes***
- ❖ ***Inadequate maintenance of equipments***
- ❖ ***Security problems***
- ❖ ***Weakness in groundwater studies***

## ***Present situation***

- ⌘ ***At national level (cont.)***
- ❖ ***Hydrological data and climate information collected are widely scattered among various research projects and data collected are not (as yet) available for operational use***
- ❖ ***The poor dissemination of data results in the repetition of data acquisition and very often to the formulation of adaptation projects and programmes based on incomplete information***
- ❖ ***Solutions proposed by countries are technically and financially unachievable in a unilateral way***
- ❖ ***As a result West Africa preparedness to climate change remains very weak (examples of extreme events in 1985, 2000)***

**Le Fleuve Niger à NIAMEY : étiage sévère connu en 1985**



**River Niger at Niamey during low flow in 1985:**

***(Extreme event → the river dried up)***





Niamey, août 2000



Inondation à Niamey - Août 2000

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### ***Conclusions***

- ⌘ There is crucial need to:***
- ❖ Strengthen and consolidate capacity of conventional Hydrological data collection systems***
- ❖ Restore, and update existing networks of hydrometric observations***
- ❖ Take special measure to rescue historical hydrometric data***
- ❖ Take special measure to preserve all data newly collected by AMMA and HYCOS and to disseminate the data as appropriated for operational purposes***



## ***Conclusions (cont.)***

- ❖ ***Raise awareness amongst policymakers of the economic value of climate information and of the need for sustained systematic climate observation systems***
- ❖ ***Build human capacity in data collection, management and use through training and education programmes***
- ❖ ***Enhance the integration of adaptation to climate change in the curricula of primary and secondary education***

***Thank You for Attention***

***GRACIAS***