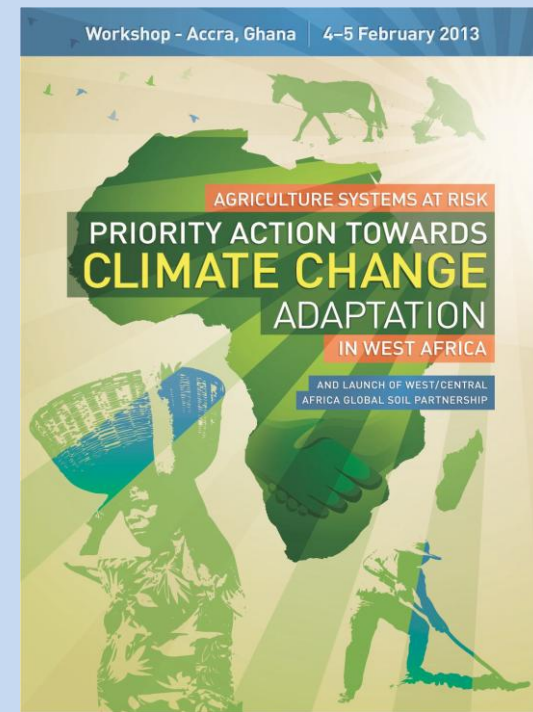


# AWM and Climate Change: research results & future needs

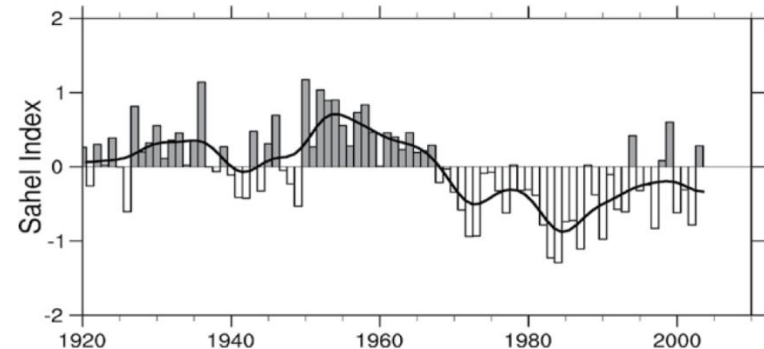
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# Climate change (CC) and water availability in West Africa

**Rainfall:** substantial reduction and greater variability



**Droughts:** more frequent and severe



Increased **flooding** and erosion



# Water availability & livelihoods

**How do the additional pressures imposed by CC on water availability affect livelihoods?**

- Water-energy-food nexus
- Human & animal diseases
- Biodiversity losses
- Agricultural challenges



**West Africans depend primarily on natural resources for their livelihoods but their resource base – already severely stressed and degraded by overuse – is expected to be further impacted by climate change.**



# AWM and Climate Change – Solutions derived from IWMI's research

Solutions for ADAPTATION	Solutions for MITIGATION
1. Transform water governance	1. Manage water for afforestation and reforestation
2. Revisit water storage	2. Address the water energy food nexus
3. Manage water demand	3. Manage dams for multipurpose use
4. Increase water productivity	4. Measure water footprints
5. Produce more food per unit of water	5. Reduce food waste
6. Assessment of environmental flows	

**Related study: Rice and irrigation in West Africa**



# Rice, Irrigation & Climate change

General effects of CC on rice production:

- Heat stress
- Drought
- Flooding and submergence
- Salinization

However, the **extent of production loss** depends greatly on **water availability**



Water management for climate-resilient rice



# The study

## SITES:

- Ghana (Ashanti/Brong-Ahafo)  
supplementary irrigation (priv irrigation)
- Ghana: (North, Gollinga scheme)  
reservoirs, gravity-fed, open canals (pub irrigation)
- Burkina Faso (Karfiguela)  
reservoirs, gravity-fed, open canals (pub irrigation)
- Niger (Daibery)  
Niger river, pumps, open canals (pub irrigation)



Objective: Analyze private and social profitability of rice production under different policies and agricultural water management regimes



# Main results

- Adaptation strategies (e.g. water management, soil and fertility improvement) have a greater potential if they address the poor quality and low quantity of rice produced.

➔ More crop and **MORE VALUE** per drop.

- Strong level of commonality in CC impacts on rice production in West Africa.

➔ Implementation of a **regional** response.



# Future needs

## 1) Climate forecasting

- Greater involvement of climatologists and GIS experts in hydrological modelling
- Data collection systems

## 2) Local adaptation strategies

- Capitalize on local knowledge and water management adaptation strategies, particularly the role of **groundwater as natural storage infrastructure**
- Estimate the cost of impacts and alternative adaptation strategies to climate change





# Future needs

## 3) New institutional arrangements

- Decision rules to allocate limited water (holistic framework: competing uses besides agriculture)
- Adaptive, multilevel, collaborative governance arrangements to manage water and resolve conflicts, especially in the agricultural sector
- Devolve decision making power from centralized 'hydro-bureaucracies' to users



# Thank you

