

# Security implications of climate change in the Sahel region

## SICSS

### Technical workshop - Réunion technique

**Dakar 17 November 2009**



Sahel and West Africa Club  
(SWAC/OECD)



## Project origin



- A joint initiative funded by the French Ministry of Foreign Affairs and the UK Foreign and Commonwealth Office and co-ordinated by the OECD's Sahel and West Africa Club Secretariat
- Climate change is a threat multiplier: impacting on a large set of multidimensional non-climate variables and rendering existing concerns and vulnerabilities more acute and complex.
  - “Climate change and international security”, Solana, March 2008
  - UK National Security Strategy, March 2008;
  - French government's white report on collective security in the 21<sup>st</sup> century
- Need for regional analysis – higher resolution

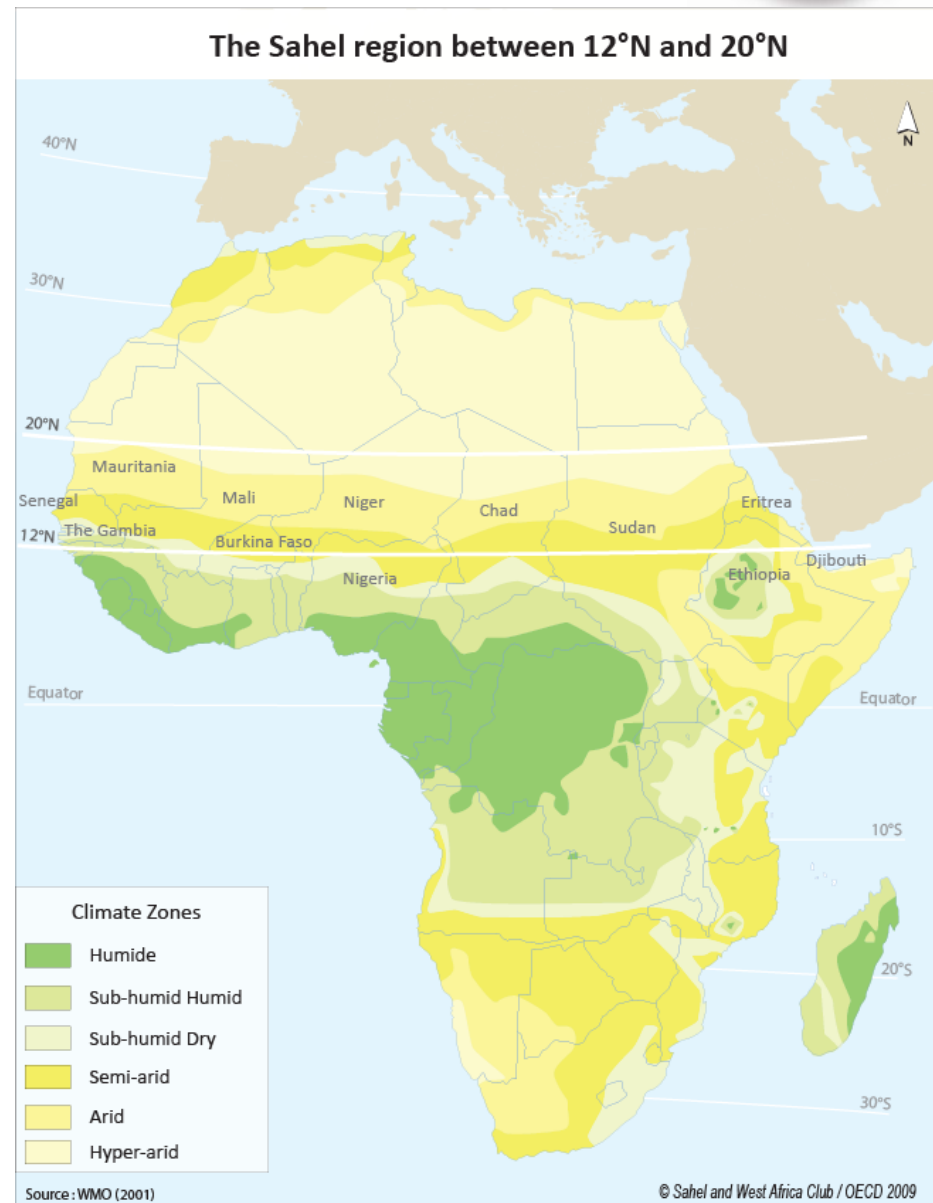


## Project objectives

- Identify possible security implications of climate change for the time horizon 2040
- Raise understanding and awareness of the potential impacts of climate change in the Sahel
- Identify policy priorities and propose concrete follow-up activities
- Identify gaps in data and the need for future research

# Definitions

- Sahel between 12N and 20N
- One rainy season per year  
August month of highest precipitation
- 12 countries: Mauritania, Senegal, the Gambia, Burkina Faso, Mali, Niger, Nigeria, Chad, Sudan Ethiopia, Eritrea and Djibouti
- Security: all elements that impact state and global stability



# Project methodology



*SWAC Document*

**Security implications of climate change  
in the Sahel region**

→ *Methodology*



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- Three analytical components:
  1. Dynamic analysis: retrospective analysis, snapshot, security events
  2. Cross-analysis
  3. Scenarios

# Project methodology: Partnerships



**AU**

**ACMAD**

**CILSS-AGRHYMET**

**ECOWAS**

**FAO**

**FEWS NET**

**IGAD / ICPAC / CEWARN**

**OECD**

**UK Met Office Hadley centre**

# Today



1. Present results of thematic analyses
2. Present and discuss the first “sensitivity” maps (feedback for COP 15, December 14 (EU-Pavilion 6-8pm))
3. Discussing work on scenarios January – April 2010,
4. Discuss and plan related activities (outreach, policy, follow-up)

## Next



1. Carlo Buontempo: Sahel climate 1901 - 2007
2. Emmanuel Balloffet: “snapshot”
3. Emmanuel Salliot: security events 1969 -2007, extended Solana threat typology
4. Sebastien Hissler: specification of econometric model, running of first variables, propositions for further work



# Security implications of climate change in the Sahel region

## Technical workshop - Réunion technique Part II – First conclusions

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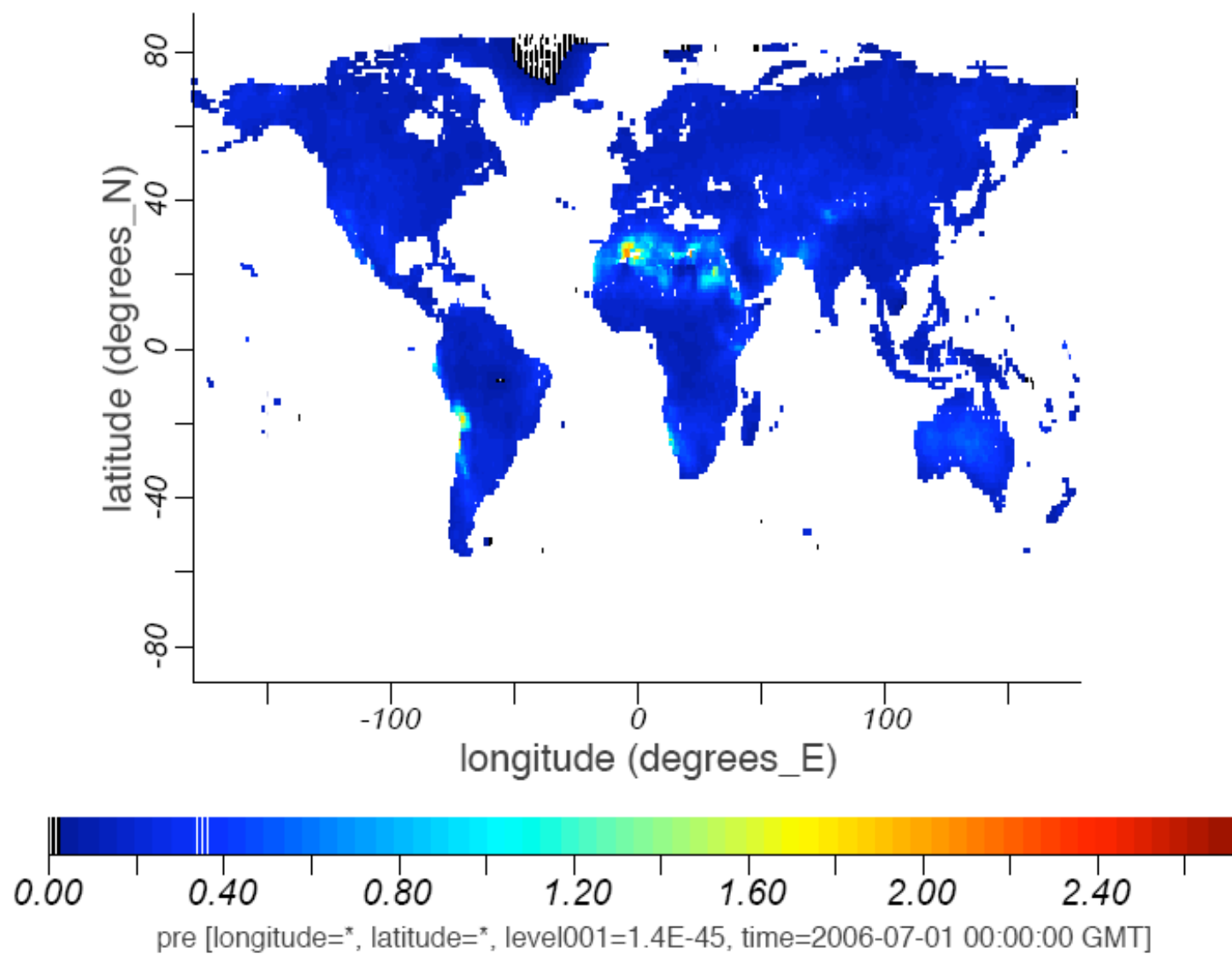
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# First result

annual mean of monthly precipitation





## Climate:

- extreme variability of rainfall
- low confidence of model projections

Policy makers must prepare for managing uncertainty

- improve monitoring
- better performing models needed
- needed at higher resolution, local level



## Security:

- Climate is influential factor; BUT no systematic and no linear relationships
- Solana typology not globally applicable: has to be adapted to a specific area and time (to develop mitigation and adaptation policies regional analyses/frameworks needed).
  - extended typology allows for defining at higher “resolution” specific types of threats/vulnerabilities
  - basis for description today and scenario building



## Modelling:

- Sensitivity to climate variables
  - weak statistical significance of climate variable on security
  - sensitivity difference between countries
  - importance of socio-economic variables

# Security implications of climate change in the Sahel region

## Technical workshop - Réunion technique Part III – Hotspot mapping

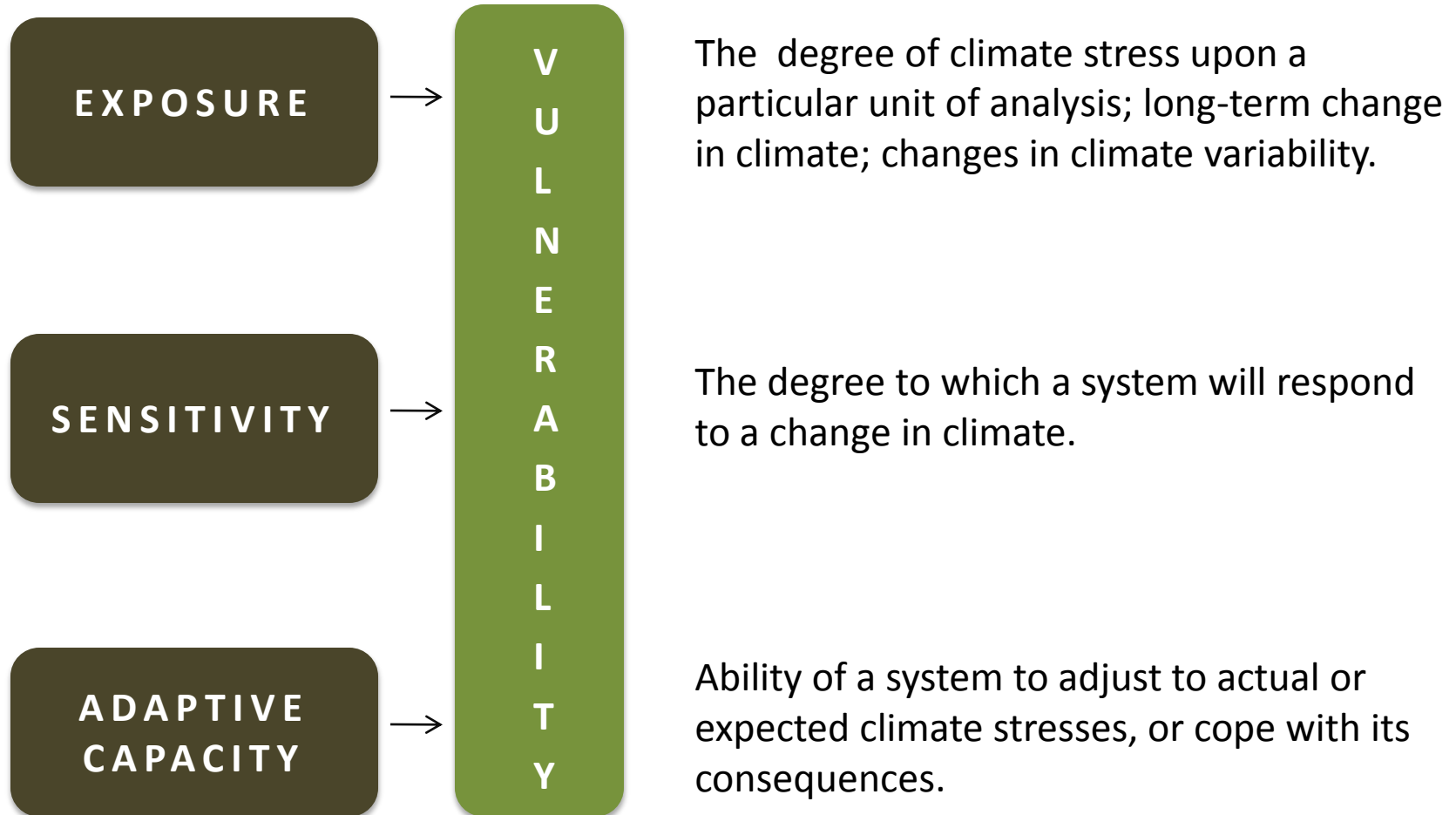
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# Vulnerability mapping



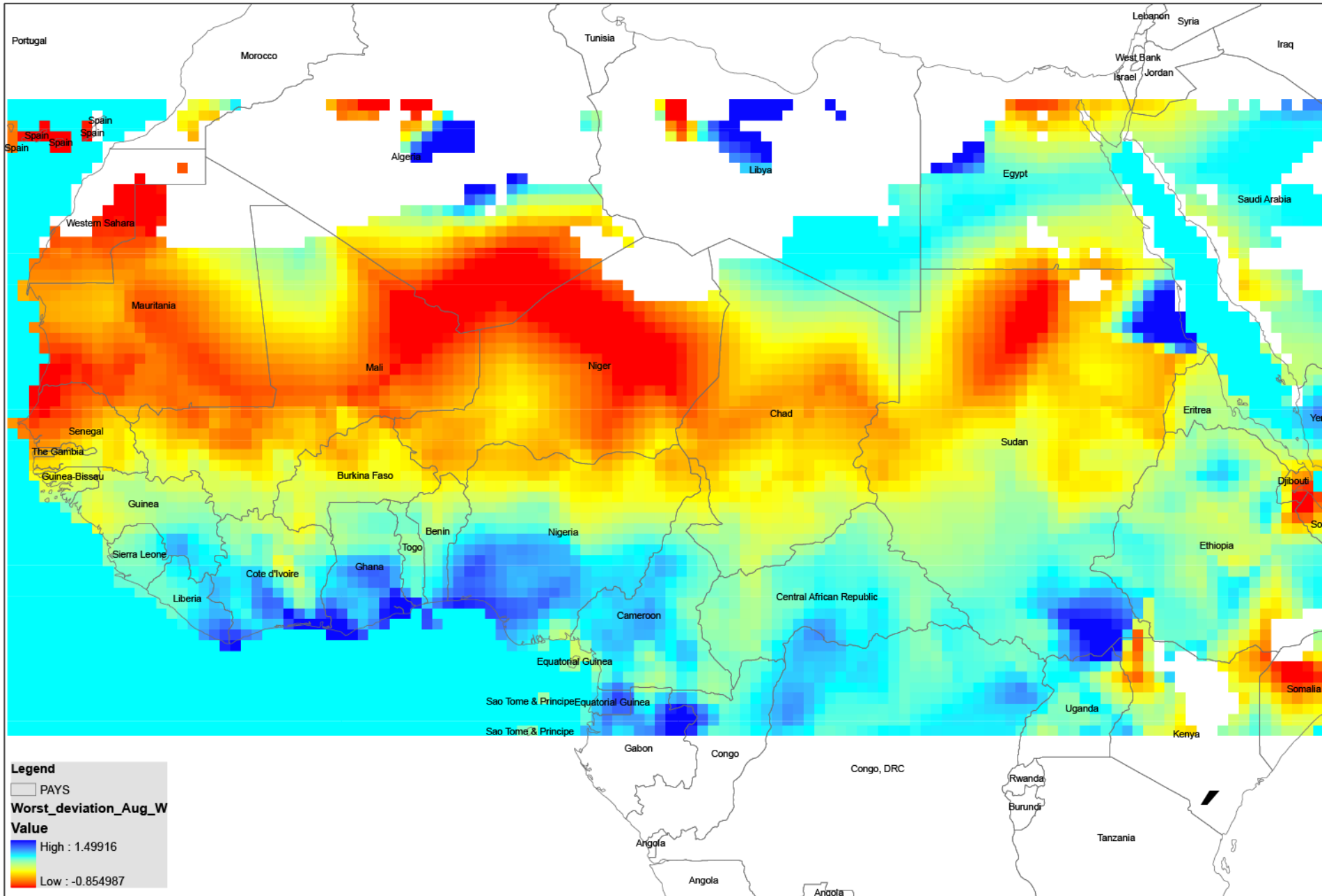
# Hotspot mapping

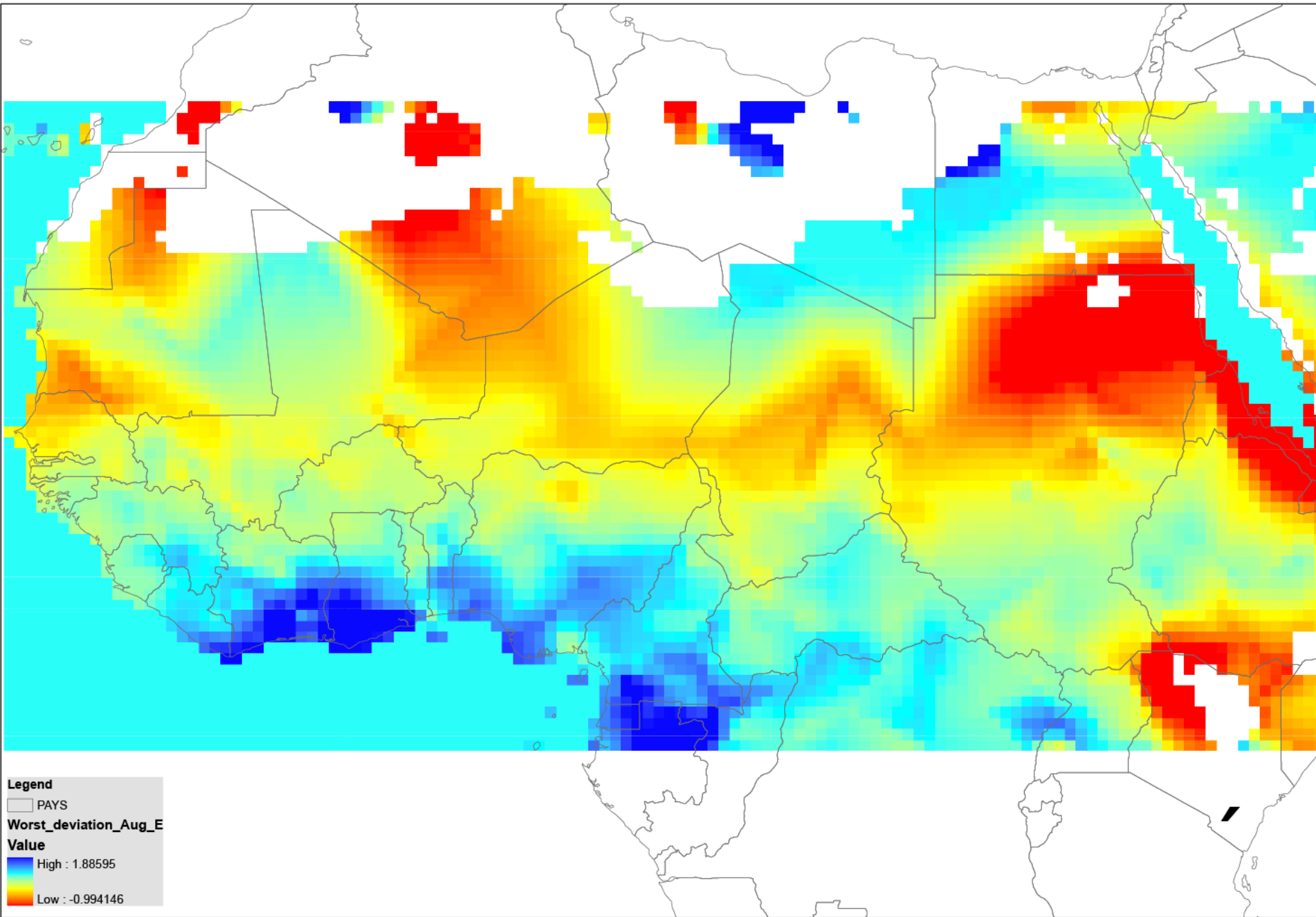


EXPOSURE









**Legend**  
PAYS  
**Worst\_deviation\_Aug\_E**  
**Value**  
High : 1.88595  
Low : -0.994146

# Hotspot mapping



EXPOSURE



SENSITIVITY

- Biophysical / Human geography
- Security / Human geography

# Vulnerability - scenario

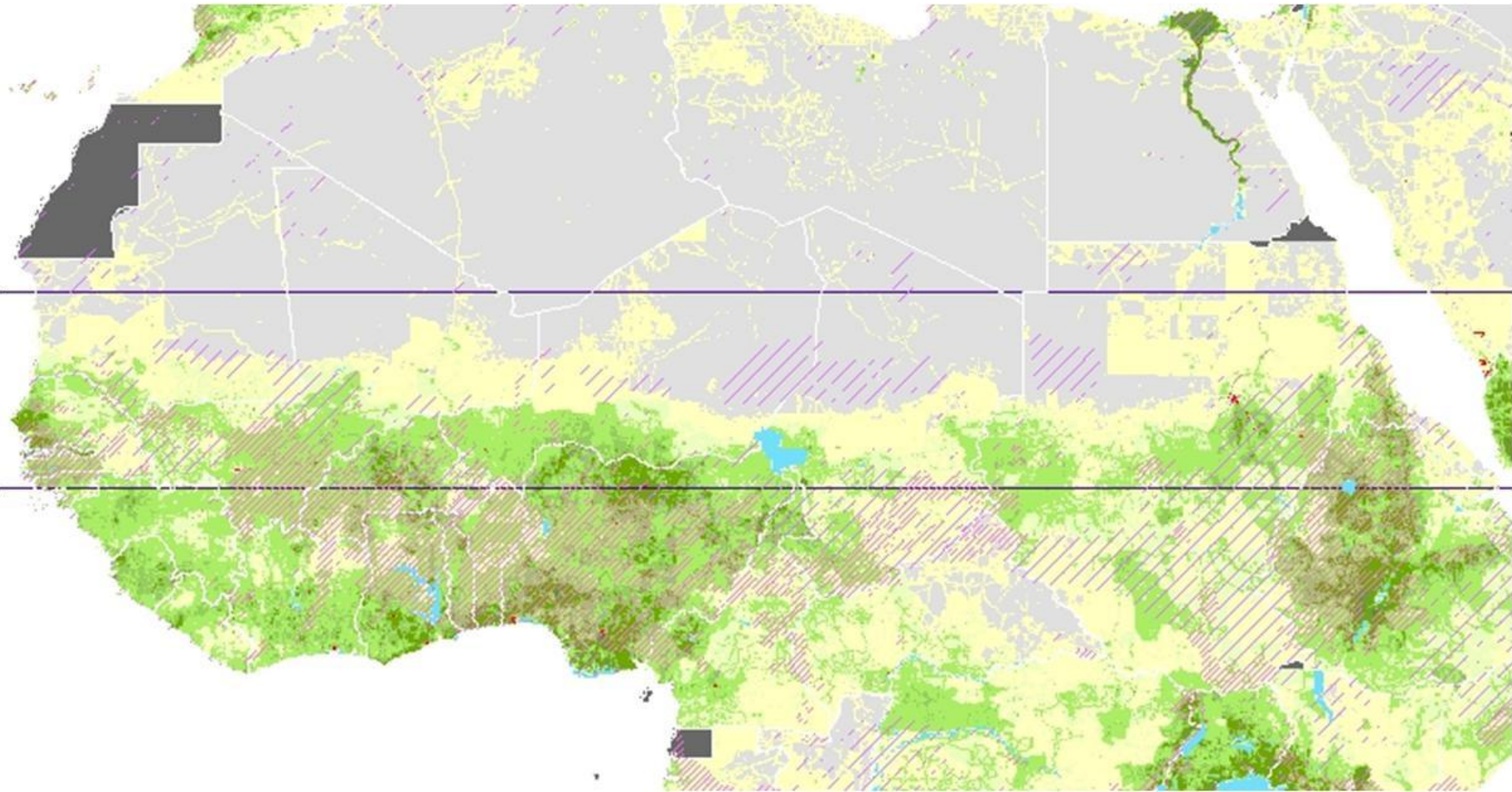


**EXPOSURE**

**SENSITIVITY**

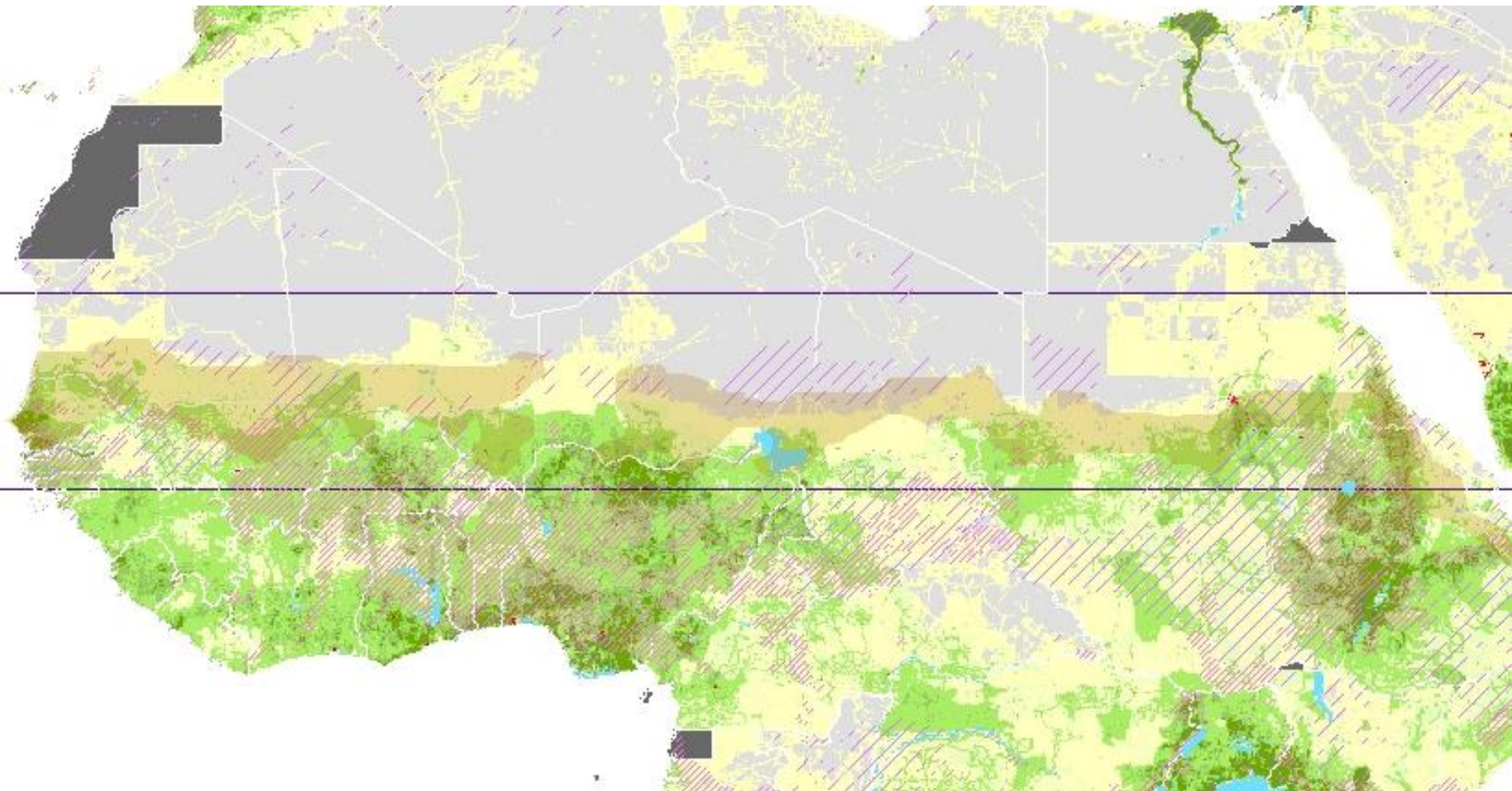
**ADAPTIVE  
CAPACITY**

# Rural density and soil quality

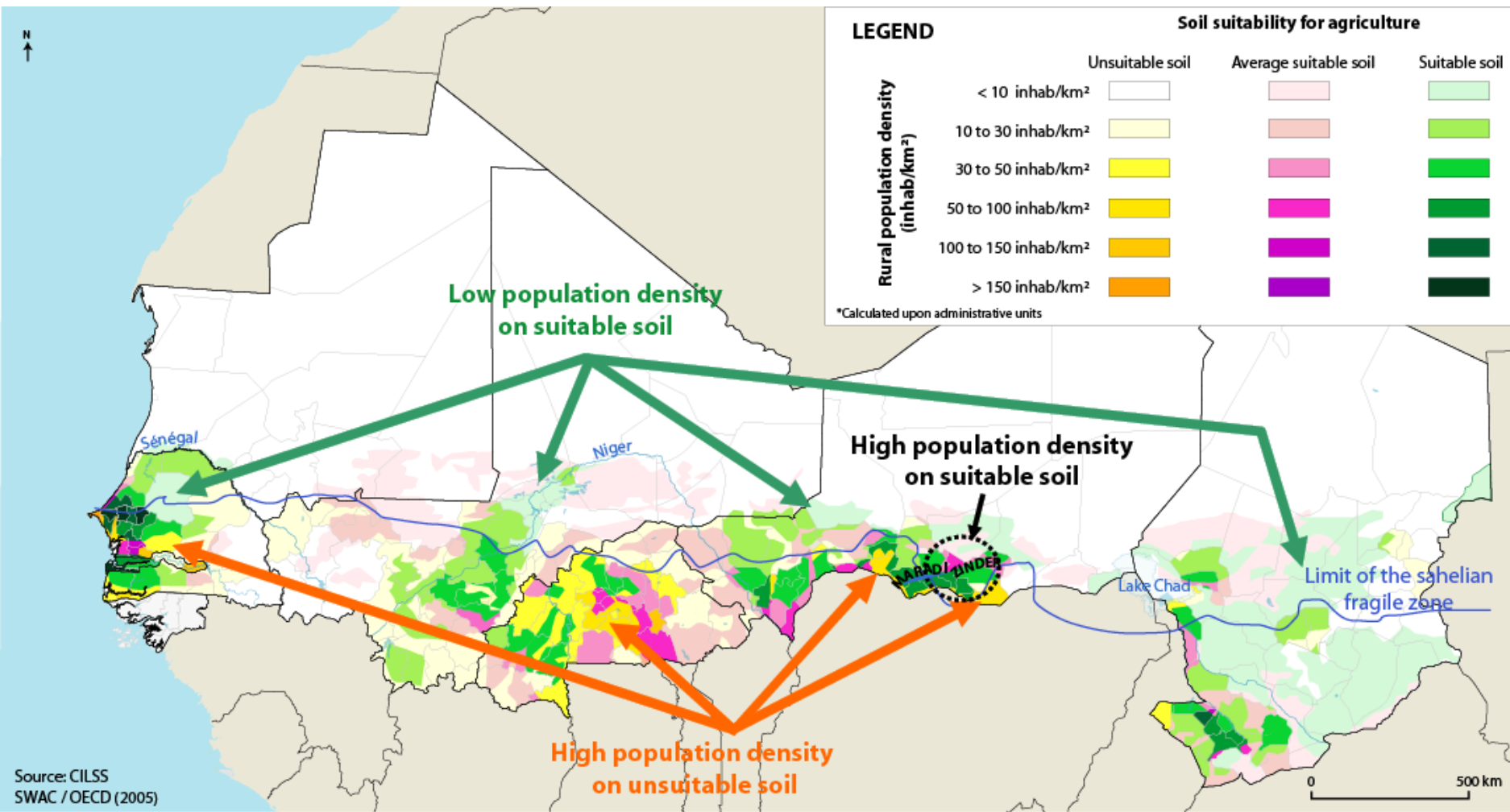




# + Climate hotspots

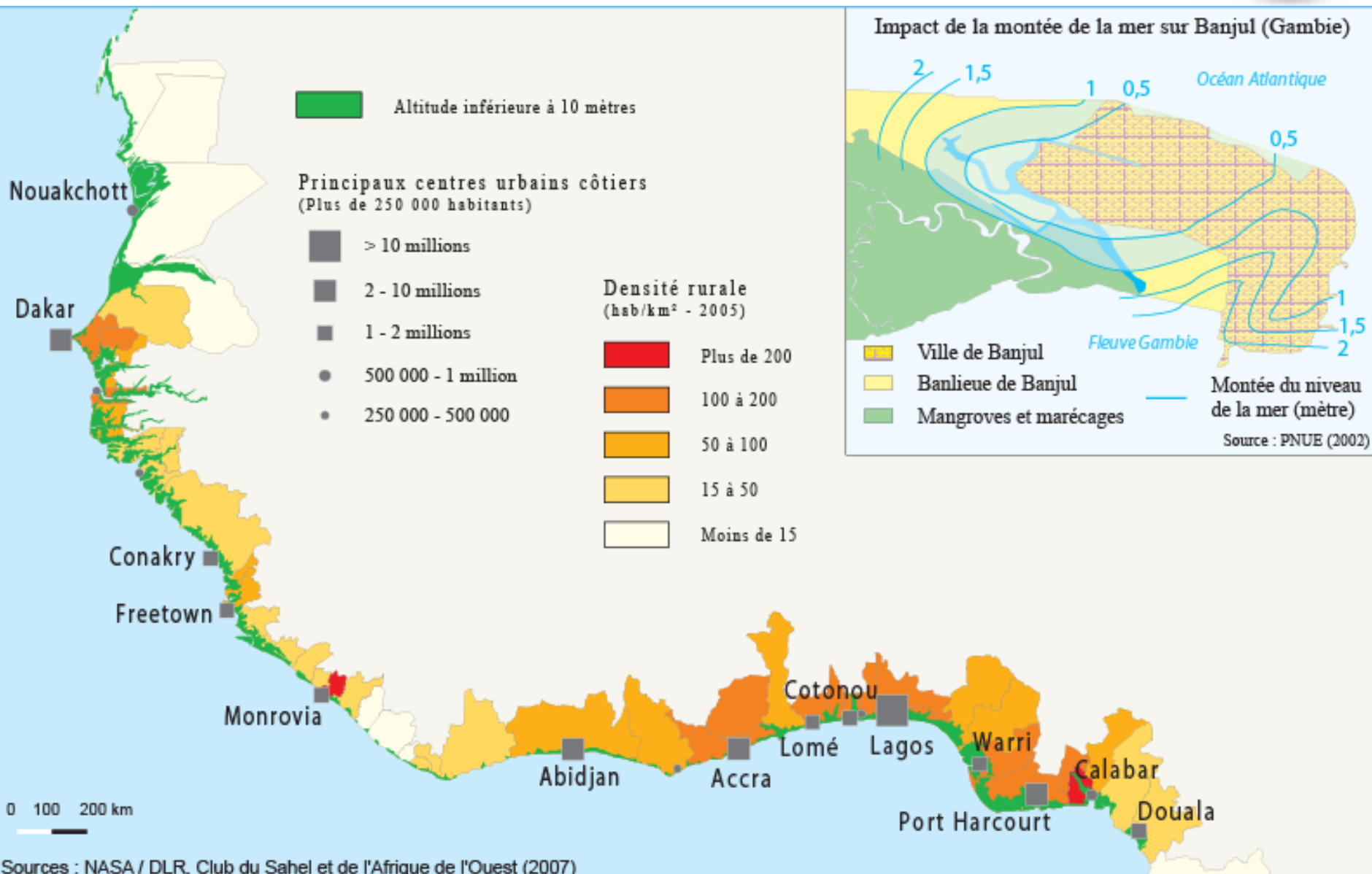


# An example for Sahel West



Source: CILSS  
SWAC / OECD (2005)






# Sea level

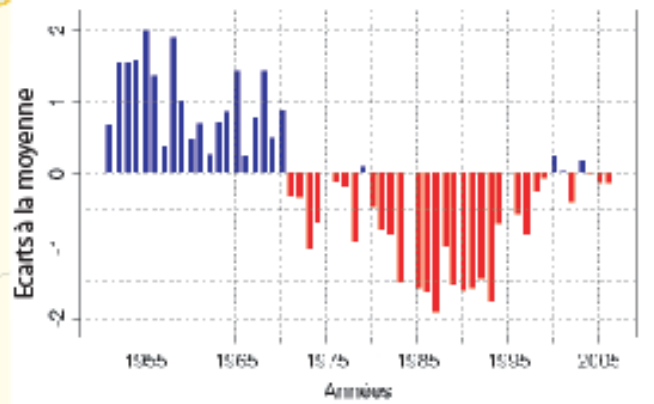
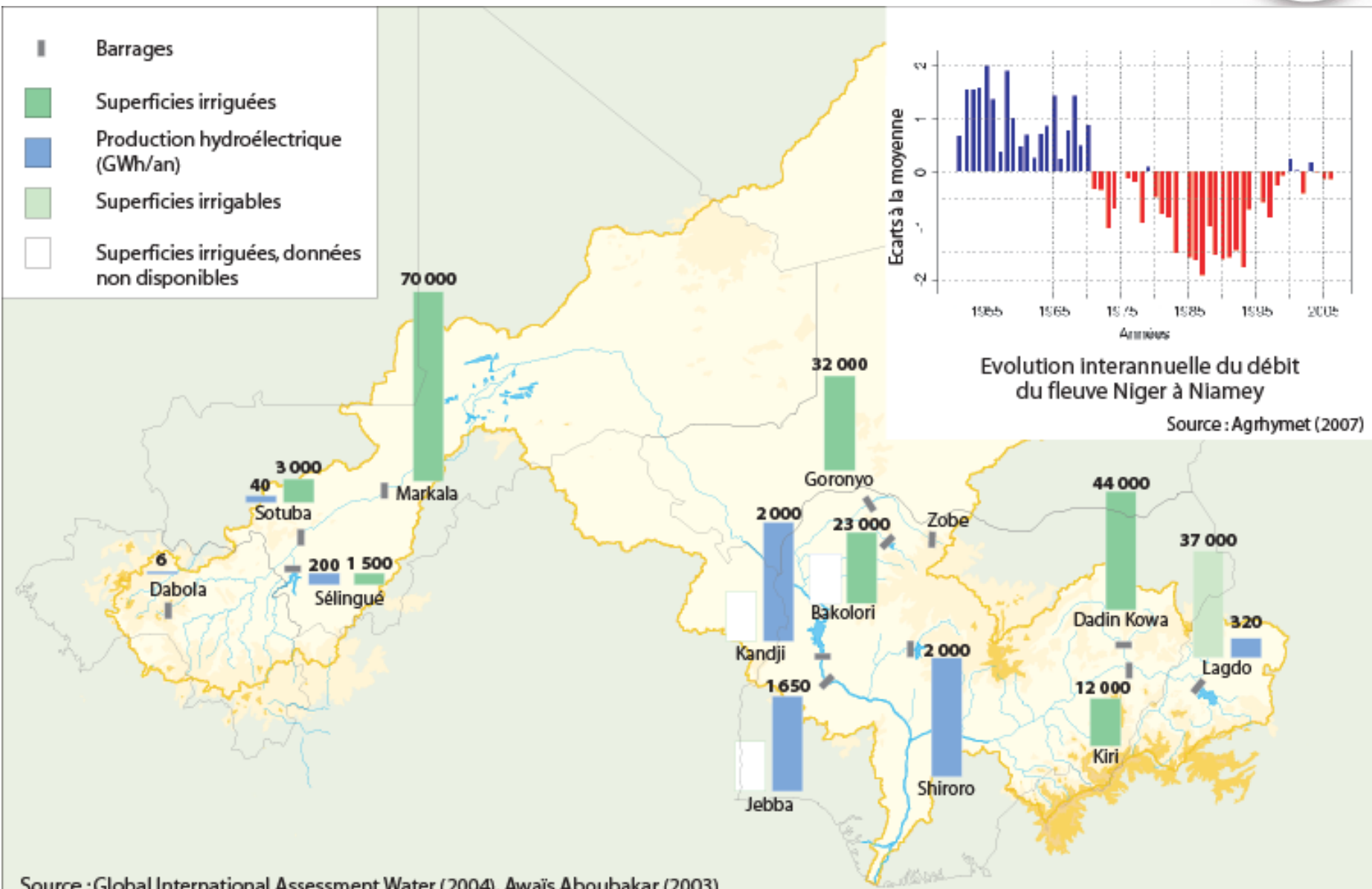




# Irrigation potential



-  Barrages
-  Superficies irriguées
-  Production hydroélectrique (GWh/an)
-  Superficies irrigables
-  Superficies irriguées, données non disponibles



Source : Global International Assessment Water (2004), Awais Aboubakar (2003)