

CLIMATE CHANGE AND FRESHWATER RESOURCES IN WEST AFRICA: TRANSBOUNDARY RIVER BASINS

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Outline

- Objectives of study
- Research Questions
- Background & Context
 - Theoretical Framework
 - Main conclusions
- Recommendations



Objectives

- To clarify the **impacts of climate change** on transboundary river basins (TRBs) in comparison to other stressors, and to assess the **adaptive capacity** of Transboundary River Basin Management Institutions (TRBMIs) in West Africa
- To inform potential programming that reinforces the capacity of these institutions to **sustainably develop and protect river basin resources, ecosystems, and livelihoods.**

Research Questions

1) How have climate variability, climate change, and other related stressors impacted Transboundary River Basins (TRBs) in West Africa?

- *How have these factors influenced river basins, linked ecosystems, and surface water supply in West African TRBs?*
- *How have these factors influenced West African TRB-dependent livelihoods and industries?*

2) How do Transboundary River Basin Management Institutions (TRBMIs) currently measure in terms of their capacity to adapt to these impacts?

- *How do West African TRBMIs rate in terms of adaptive capacity as a function of fair governance, leadership, room for autonomous change, learning capacity, variety, and resources (Gupta et al., 2010)?*

Research Questions

3) How can the adaptive capacity of TRBs and TRBMIs be strengthened?

Theoretical Framework

Climate change vulnerability = $f(\text{exposure, sensitivity, adaptive capacity})$ (IPCC, 2007)

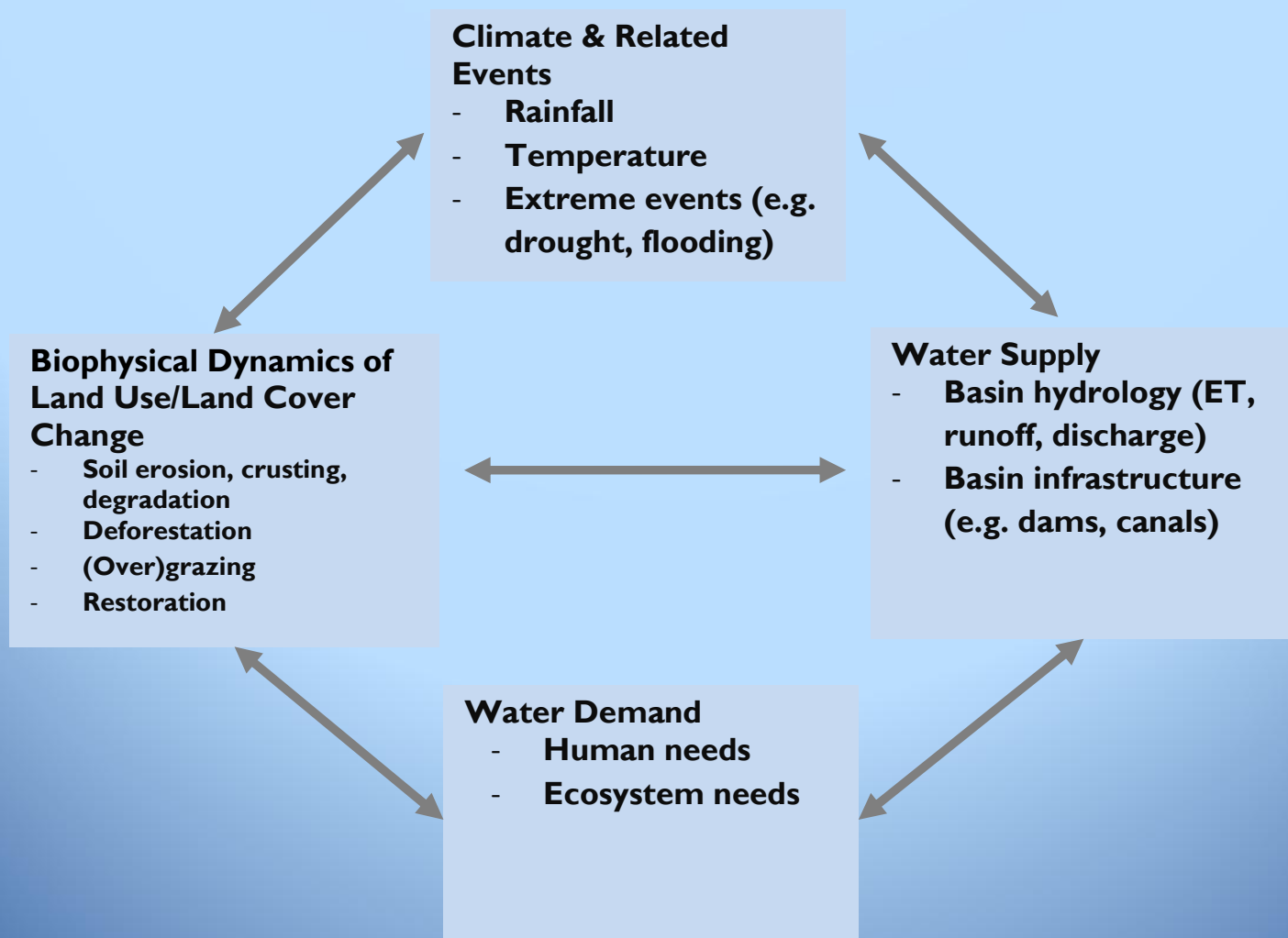
Coupled human and natural systems framework:

(Brondizio et al., 2012; Cumming et al., 2012; Folke et al., 2002; Liu et al., 2007; Monticino et al., 2006; Turner et al., 2003).

Question 1.a


How have climate variability, climate change, and other related stressors impacted Transboundary River Basins (TRBs) in West Africa?

Climate, biophysical land dynamics, and river basin water availability



Question 1.b

How have climate variability, climate change, and related stressors impacted Transboundary River Basins (TRBs) in West Africa?



Adaptation, Coping, and Anticipated Impacts on Surface Water Supply

High Impact

- *Intensification* (to increase agricultural and fishing yields)
- *Infrastructure* (investment in equipment to harness energy and manage water and land)
- *Monetization/commodification of common-pool resources* (e.g. deforestation for sale of timber; monetization of water resources)

• Medium-High Impact

- *Migration* (to water-abundant locations)

• Low-Medium Impact

- *Diversification* (adoption of secondary or tertiary livelihood activity)
- *Transition* (cessation of old and adoption of new livelihood)

• Low Impact

- *Institutions/Management* (implementing new policies/procedures around production and consumption)

Question 2

How do Transboundary River Basin Management Institutions (TRBMIs) currently measure in terms of their capacity to adapt to these impacts?

Adaptive capacity = f(fair governance, leadership, room for autonomous change, learning capacity, variety, resources (Gupta et al., 2010))

Research Question 3

How can the adaptive capacity of TRBs and TRBMs be strengthened?



Recommendations

- Strengthening TRMBI adaptive capacity
 - *Collaborate with fellow TRBMIs to adaptively co-manage TRBs.*
 - *Respond to the dynamic needs of local river-dependent populations.*
 - *Address root causes of anthropogenic water stress.*
 - *Predict, monitor, and respond to climate variability and extreme events.*

Conclusion

*The impacts of climate change on West African TRBs are **not the result of climate alone**; rather, they are the product of numerous complex, site-specific relationships between multiple **social and ecological factors**.*

*Therefore, any efforts to improve adaptive capacity must employ a **3D approach**: that is, one that addresses not only the human and environmental dimensions of climate change, but also the interplay between these dynamics.*

Thank you-Merci-Gracias

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