

REVIEWER'S REPORT

Manuscript No.: IJAR- 58496

Title: Climate-Related Water Unavailability Risk in the Poro Region, CÔTE D'IVOIRE: Impact Chain and Indicators.

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity			✓	
Significance			✓	

Reviewer Name: **ANAPANA GOPAL**

Reviewer's Comment for Publication.

General Comments

The manuscript presents a conceptual framework for assessing climate-related water unavailability risk in the Poro Region of northern Côte d'Ivoire by developing an impact chain and a corresponding indicator framework. The study integrates the IPCC AR5 climate-risk framework with expert knowledge from hydrology, pedology, and sociology, resulting in a structured model comprising hazard, exposure, sensitivity, adaptive capacity, and 36 operational indicators. The topic is highly relevant to climate adaptation, water resource management, and regional planning.

The manuscript is well organized, scientifically meaningful, and supported by an extensive literature review. The separation between causal factors and measurable indicators represents a valuable methodological contribution. However, several areas require improvement, particularly regarding methodological transparency, validation, practical applicability, and presentation. Therefore, **Minor Revision** is recommended.

Minor Comments

1. Strengthen the novelty statement

Although the manuscript introduces a factor-first impact-chain framework, the novelty should be stated more explicitly.

The Introduction should clearly explain:

- how this framework differs from previous impact-chain studies,
- why existing climate-risk frameworks are insufficient for the Poro Region,
- the scientific advancement provided by separating factors from indicators,
- broader applicability to other Sudanian regions.

2. Methodology requires greater transparency

The expert workshop is central to the study but lacks sufficient methodological details.

Please include:

- number of experts participating,

REVIEWER'S REPORT

- selection criteria,
- institutional affiliations,
- years of professional experience,
- workshop agenda,
- consensus-building procedure,
- measures taken to minimize expert bias.

These details are necessary for reproducibility.

3. Validation of the framework is missing

The manuscript develops the framework but does not validate it.

The authors should discuss possible validation approaches, such as:

- Delphi technique,
- expert agreement statistics,
- stakeholder consultation,
- pilot implementation,
- sensitivity analysis,
- comparison with existing climate-risk frameworks.

Even if validation is planned for future work, this limitation should be discussed more thoroughly.

4. Improve practical implementation

The study stops at conceptual framework development.

Readers would benefit from a brief section describing:

- how future datasets will be integrated,
- indicator normalization,
- weighting techniques,
- GIS implementation,
- spatial mapping,
- composite risk index development.

This would improve practical relevance.

5. Discussion requires stronger critical analysis

The Discussion is informative but largely descriptive.

The authors should compare their framework with:

- other climate-risk assessment methodologies,
- vulnerability assessment frameworks,
- integrated water-resource management approaches,
- recent studies from Africa and other semi-arid regions.

This would strengthen the scientific discussion.

6. Include uncertainty assessment

The manuscript does not discuss uncertainty associated with:

- expert judgement,
- indicator selection,
- conceptual assumptions,
- future climate variability,
- data availability.

A dedicated subsection on uncertainty would improve scientific rigor.

REVIEWER'S REPORT

7. Expand policy implications

The conclusion should provide more concrete recommendations for policymakers, including:

- drought early-warning systems,
- groundwater monitoring,
- climate-resilient water infrastructure,
- integrated watershed management,
- climate-smart agriculture,
- community-based water governance,
- local adaptation planning.

Minor Comments

Abstract

The abstract is concise but should include:

- number of experts involved,
- major methodological innovation,
- future application of the framework,
- stronger concluding statement.

Keywords

Consider adding:

- Climate adaptation
- Water security
- Vulnerability assessment
- Climate resilience
- Water governance
- Sudanian region

Introduction

The introduction is comprehensive but relatively long.

It can be improved by:

- reducing repetition,
- emphasizing the research gap earlier,
- clearly stating the study hypothesis or conceptual assumptions.

Materials and Methods

Please provide additional information regarding:

- expert workshop protocol,
- literature screening criteria,
- rationale for indicator selection,
- limitations of the narrative review.

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Results

The conceptual framework is clearly presented.

However,

- reduce lengthy descriptions of tables,
- summarize key findings,
- emphasize the rationale behind selecting the 36 indicators.

Figures and Tables

Figure 1 is informative and visually clear.

However,

- improve figure resolution,
- enlarge text labels for readability,
- consider using consistent colors for each risk component.

Tables are comprehensive but may be simplified by reducing repetitive definitions.

Discussion

Expand discussion regarding:

- climate adaptation planning,
- Sustainable Development Goal 6,
- integrated climate-risk governance,
- regional transferability,
- future quantitative applications.

Language

The manuscript is generally well written.

Minor editing is recommended to improve:

- sentence flow,
- paragraph transitions,
- readability of lengthy paragraphs.

References

The reference list is appropriate and up to date.

Please verify:

- citation formatting consistency,
- DOI presentation,
- uniform journal abbreviations.

Strengths

- Highly relevant topic addressing climate-related water security.
- Strong conceptual framework based on IPCC AR5.
- Clear distinction between factors and indicators.
- Comprehensive multidisciplinary approach.
- Well-designed impact-chain model.
- Extensive review of scientific and institutional literature.
- Practical relevance for climate adaptation planning.
- Good quality figures and tables.

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Weaknesses

- Limited methodological transparency regarding expert selection.
- No framework validation.
- Lack of uncertainty analysis.
- Practical implementation strategy is not fully developed.
- Discussion could include stronger comparisons with previous studies.
- Policy implications require further expansion.

Recommendation

Minor Revision