



# Socio-ecological Dynamics of Inland Valley Swamp Development and Malaria Transmission in Northern Sierra Leone

*A Scoping Review*

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## Author notes

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## ABSTRACT

**Background:** Inland valley swamps (IVS) are critical agro-ecosystems for rice cultivation in sub-Saharan Africa, yet their development alters local hydrology and ecology, potentially influencing malaria transmission dynamics. The socio-ecological interplay between agricultural intensification in these wetlands and vector-borne disease risk in adjacent communities remains inadequately synthesised, particularly for the Northern Region.

**Purpose and objectives:** This scoping review aims to map and synthesise existing evidence on the socio-ecological linkages between IVS rice development and malaria incidence in the Northern Region's farming communities, identifying key knowledge gaps and proposed intervention pathways.

**Keywords:** *Socio-ecological systems, Inland valley swamps, Malaria transmission, Agro-ecosystem development, Sub-Saharan Africa, Scoping review, Agricultural hydrology*

### Article Highlights

- Positive association between IVS development and increased malaria vector breeding habitats
- 30-50% higher vector density in developed vs undeveloped swamps during rainy season
- Evidence shows considerable heterogeneity with confidence

### Methodological Note

Analysis used generalized linear mixed models with random effects for study location to account for heterogeneity in environmental covariates and malaria incidence relationships.

<p>intervals frequently crossing zero</p> <ul style="list-style-type: none"><li>• Fragmented evidence base lacks longitudinal, interdisciplinary health impact studies</li></ul>	<p><i>This review maps evidence gaps in the socio-ecological interplay between wetland agriculture and vector-borne disease.</i></p>
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## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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