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A systematic literature review to identify factors that influence community vulnerability to health risks associated with climate change in livestock and aquaculture systems in Eastern, Western, and Southern Africa

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ADMINISTRATIVE INFORMATION

Support - Department for Environment, Food & Rural Affairs (DEFRA), United Kingdom.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 5 September 2026 and was last updated on 5 September 2026.

INTRODUCTION

Review question / Objective The SLR aims to identify factors influencing the vulnerability of livestock and aquaculture farmers to climate-sensitive diseases in western and southern Africa. It will also examine how vulnerability is conceptualized and operationalized in animal health and aquaculture.

Rationale In Eastern, Western, and Southern Africa, climate change has exacerbated the prevalence and impacts of climate-sensitive diseases of livestock and fish. These risks threaten food security, livelihoods, and public health. Understanding factors and processes that influence the vulnerability of livestock and fish farmers to these health risks can guide the development and deployment of improved adaptation and coping strategies for improved production of animal-sourced foods.

Condition being studied Vulnerability of livestock and aquaculture farming communities in Western, Eastern, and Southern Africa to health risks arising from climate-sensitive diseases driven by climate change (e.g., drought, floods, heat stress, rainfall variability, and associated increases in disease prevalence, pathogen emergence, morbidity, and mortality).Climate change indicators.

METHODS

Search strategy The systematic search will be conducted following PRISMA guidelines to ensure transparency, reproducibility, and comprehensive coverage of the literature. A multi-database search strategy will be applied to identify peer-reviewed and grey literature related to climate change, vulnerability, livestock and aquaculture systems, and climate-sensitive diseases in Western, Eastern, and Southern Africa.

Participant or population Livestock and aquaculture farming households and communities

in Western, Eastern, and Southern Africa who are exposed to climate-sensitive animal and fish diseases.

Intervention Adaptation and coping strategies implemented by livestock and aquaculture farming communities to manage or reduce vulnerability to climate-sensitive animal and fish diseases.

Comparator Because this systematic review focuses on vulnerability determinants and adaptation/coping strategies rather than controlled interventions, no formal comparator group is required.

Study designs to be included Observational and qualitative study designs, including cross-sectional, cohort, case-control, mixed-methods, and qualitative interviews or focus groups. Grey literature such as technical reports, theses, and conference papers will also be included if they provide empirical evidence on vulnerability, climate risks, or adaptation/coping strategies.

Eligibility criteria Studies will be included if they:
• Focus on vulnerability, adaptation, or coping related to climate-sensitive diseases in livestock or aquaculture systems.
• Are conducted in Western, Eastern, or Southern Africa.
• Provide empirical data (quantitative, qualitative, or mixed-methods).
• Are published in English (and French for West Africa).
• Include peer-reviewed articles, theses, technical reports, or conference papers.
Studies will be excluded if they:
• Are outside the geographic scope.
• Do not address climate-related vulnerability or disease risks.
• Focus solely on climate change without animal or aquaculture health components.
• Are opinion pieces, commentary, or lack empirical evidence.

Information sources The review will draw on multiple bibliographic databases and grey literature sources. Scientific databases include PubMed, Web of Science, SCOPUS, ScienceDirect, CAB Abstracts, AGRIS, AGRICOLA, SpringerLink, JSTOR, and African Journals Online (AJOL). Grey literature will be identified through Google Scholar and the Social Science Research Network (SSRN). Reference lists of included studies will also be screened to identify additional relevant sources. All searches will follow PRISMA guidelines.

Main outcome(s) The primary outcome of this review is the identification and characterization of factors that influence the vulnerability of livestock and aquaculture farming communities to climate-sensitive animal and fish diseases in Western, Eastern, and Southern Africa. Outcomes will focus on how vulnerability is defined, operationalized, and measured across different study contexts.

Additional outcome(s) Secondary outcomes will include:
• Geographic patterns in vulnerability and climate-related disease risks across Western, Eastern, and Southern Africa.
• Types of climate hazards most frequently associated with increased disease burdens in livestock and aquaculture systems.
• Gaps in evidence, including understudied regions, species, diseases, or vulnerability dimensions.
• Policy and institutional factors influencing farmers' adaptive capacity (e.g., availability of veterinary services, early-warning systems, government support).
• Perceptions and knowledge of climate-related disease risks among farmers and key informants.
• Documented recommendations for improving resilience of livestock and aquaculture systems.

Data management All search results will be exported into Zotero reference management software for storage, organization, and removal of duplicates. Screening (title/abstract and full-text) will be conducted using a structured eligibility form, with decisions recorded systematically. A standardized data extraction sheet will be developed in Excel to capture study characteristics, vulnerability factors, climate hazards, disease outcomes, and adaptation/coping strategies.

Quality assessment / Risk of bias analysis A structured quality assessment will be conducted for all included studies using tools appropriate to their study design. Quantitative observational studies (cross-sectional, cohort, case-control) will be assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists. Qualitative studies (interviews, focus groups, ethnographic studies) will be appraised using the JBI Qualitative Assessment Checklist.

Strategy of data synthesis Data from included studies will be synthesized using a narrative and thematic approach, given the expected heterogeneity in study designs, disease outcomes, climate hazards, and vulnerability measures.

Quantitative and qualitative findings will be analyzed separately and then integrated to provide a comprehensive understanding of vulnerability factors and adaptation/coping mechanisms in livestock and aquaculture systems.

Subgroup analysis Subgroup analyses will be conducted where sufficient data are available to explore variations in vulnerability, climate-sensitive disease risks, and adaptation/coping strategies. Potential subgroups include production system type like livestock vs. aquaculture. Livestock production systems include pastoral, agro-pastoral, aquaculture systems, such as pond culture, cage culture, smallholder vs. commercial, geographic regions such as Western, Eastern, and Southern Africa, and the country-level comparisons, and climate hazards like drought, floods, heat stress, and rainfall variability.

Sensitivity analysis A qualitative sensitivity analysis will be conducted to assess the robustness of the review findings. This will involve comparing results with and without studies rated as low quality or high risk of bias based on the JBI and MMAT appraisal tools. Differences in conclusions or identified vulnerability factors will be noted. Sensitivity checks will also examine the effect of excluding grey literature and non-peer-reviewed sources. Given the expected heterogeneity and absence of meta-analysis, sensitivity analysis will be narrative rather than statistical.

Language restriction The review will include studies published in English, and French-language studies will also be included for West Africa due to the linguistic context of several countries in that region. No.

Country(ies) involved Kenya - International Livestock Research Institute (ILRI), Nairobi, Kenya.

Keywords Climate change; vulnerability; coping; livestock; aquaculture; adaptation.

Dissemination plans Findings from this systematic review will be disseminated through multiple channels to ensure wide accessibility and impact. A full technical report and a peer-reviewed journal article will be prepared and submitted for publication in an open-access journal focusing on climate change, One Health, or agricultural systems. Results will also be presented at relevant scientific conferences, workshops, and policy engagement forums across Africa. In addition, summary briefs and policy-oriented knowledge products will be developed for stakeholders, including government agencies, livestock and aquaculture sector actors, and development partners.

Contributions of each author

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