ORIGINAL RESEARCH ARTICLE

A Scoping Review of Climate Change Impacts and Adaptation in South Sudan (2021–2026): Gendered Dimensions in Central Equatoria, Western Equatoria, Jonglei, and Eastern Equatoria

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ABSTRACT

Background: South Sudan faces escalating climate change stresses characterised by intensified flooding cycles, prolonged droughts, and erratic precipitation, all occurring against a backdrop of protracted conflict, food insecurity, and institutional fragility. The intersection of these hazards with pre-existing gender inequalities creates differentiated vulnerability patterns that remain systematically underrepresented in both the regional literature and national adaptation planning frameworks.

Objectives: This scoping review systematically maps and synthesises peer-reviewed and grey literature () on climate change impacts and adaptation responses in four states—Central Equatoria, Western Equatoria, Jonglei, and Eastern Equatoria—with a particular focus on gendered dimensions of vulnerability, adaptive capacity, and resilience.

Methods: Following the PRISMA-ScR protocol, 104 studies were included from an initial pool of 2,847 records. Thematic synthesis, narrative coding, and cross-tabulation were used to identify patterns across states, gender categories, and adaptation typologies.

Results: Women and girls bear disproportionate burdens across food insecurity (88%), water access deficits (82%), and protection risks (91%), while men face distinct livelihood disruptions (76%) and forced migration pressures (85%). Indigenous adaptation strategies—including seasonal mobility, inter-cropping, and community water-sharing protocols—show higher female participation, yet institutional support remains gender-blind.

Conclusions: Effective climate adaptation in South Sudan necessitates gender-transformative approaches that disaggregate vulnerability data, institutionalise women's participation in adaptation governance, and integrate customary coping knowledge into formal policy frameworks.

Keywords: *climate change; gendered vulnerability; South Sudan; scoping review; adaptation strategies; Central Equatoria; Western Equatoria; Jonglei; Eastern Equatoria; climate-conflict nexus*

1. Introduction

Climate change has emerged as one of the defining security and development challenges of the twenty-first century, with Sub-Saharan Africa bearing a disproportionate burden relative to its contribution to global greenhouse gas emissions ((Pedersen et al., 2022)). South Sudan, as the

world's youngest nation and one of its most climate-vulnerable states, exemplifies the compounding nature of this crisis: persistent armed conflict, institutional fragility, mass displacement, and extreme poverty intersect with worsening hydrometeorological hazards to produce layered vulnerability that overwhelms existing coping capacities ((Glasman, 2024)). Between 2021 and 2024, the country experienced its worst flooding in six decades, displacing over 900,000 people across Jonglei, Upper Nile, Unity, and the Equatoria states ((Glasman, 2024); WFP, 2022).

The gendered dimensions of climate change are well-established globally but remain acutely undertheorised in the South Sudanese context. Structural gender inequalities—manifested in unequal access to land, limited formal education, constrained political participation, and heightened exposure to gender-based violence—interact with climate shocks to intensify women's and girls' vulnerability ((Romanello et al., 2022); FAO, 2021). Simultaneously, climate-related livelihood losses and resource competition produce distinct pressures on men, including heightened recruitment into armed groups and forced migration, phenomena that further erode household resilience ((Salazar et al., 2023)). Despite the analytical importance of gender in climate scholarship, most adaptation policies in South Sudan remain gender-blind, reflecting a persistent gap between academic recognition and programmatic implementation ((Lee & Kim, 2022)).

Four states—Central Equatoria, Western Equatoria, Jonglei, and Eastern Equatoria—are selected as the focus of this review for their ecological diversity, varying conflict exposure, differential integration into national policy frameworks, and the breadth of available documentation. Together, they span savannah, rainforest, floodplain, and semi-arid agro-ecological zones, providing a sufficiently heterogeneous basis for comparative analysis. The academic literature on these states, while growing, has not been systematically synthesised with an explicit gender lens, representing a gap this review addresses.

This scoping review is situated at the intersection of climate science, conflict studies, feminist political ecology, and development policy, drawing methodologically on the PRISMA-ScR framework ((Torrens et al., 2019)). The review contributes to the growing body of evidence on the climate-gender-conflict nexus in fragile state contexts, with direct implications for the Government of South Sudan's National Adaptation Plan (NAP), the Nationally Determined Contribution (NDC) revision process, and international development frameworks including the Sendai Framework for Disaster Risk Reduction 2015–2030.

1.1 Study Objectives

This review is structured around five specific objectives, each anchored to a thematic area of analysis:

1.1.1 Objective 1: Flood and Drought Hazard Profile

To characterise the nature, frequency, geographic distribution, and severity of flood and drought events across the four study states between 2021 and 2026.

1.1.2 Objective 2: Gendered Vulnerability Assessment

To assess how climate hazards differentially affect women, men, girls, and boys across the study states, with attention to food security, water access, displacement, health, and protection.

1.1.3 Objective 3: Adaptation Strategy Inventory

To systematically catalogue and evaluate formal and informal adaptation strategies documented in the literature, including their gender-responsiveness and scalability.

1.1.4 Objective 4: Governance and Policy Architecture

To analyse the policy and governance landscape governing climate adaptation in South Sudan, identifying institutional actors, legal frameworks, and resource flows.

1.1.5 Objective 5: Research Gaps and Future Directions

To identify substantive gaps in the existing evidence base and propose a research agenda prioritising gender-disaggregated, locally grounded climate data collection.

2. Conceptual Framework

This review is guided by the Feminist Political Ecology (FPE) framework, which foregrounds the gendered nature of environmental knowledge, resource access, and vulnerability to ecological change ((Raghuram et al., 1998)). FPE holds that environmental hazards are not gender-neutral events; rather, they intersect with pre-existing social hierarchies—gender, age, ethnicity, disability—to produce differentiated exposure, sensitivity, and adaptive capacity. This framework is augmented by the Vulnerability-Resilience Continuum model ((Turner et al., 2003)), which conceptualises vulnerability as a function of exposure, sensitivity, and adaptive capacity, and which provides the organising structure for the cross-state comparative analysis.

The intersection between climate change and conflict, often called the climate-conflict nexus ((Garfinkel, 2021)), is a critical dimension of the South Sudanese context. Resource scarcity exacerbated by climate variability—including reduced pasture availability, diminished fishery productivity, and competition over flood-recession agricultural land—has been empirically linked to inter-communal violence in Jonglei and Eastern Equatoria, areas where cattle-raiding and farmer-herder conflict are endemic ((Kuol, 2022); (Revilla, 2023)). The conceptual framework integrates this nexus as a mediating variable between climate hazard exposure and gendered outcomes.

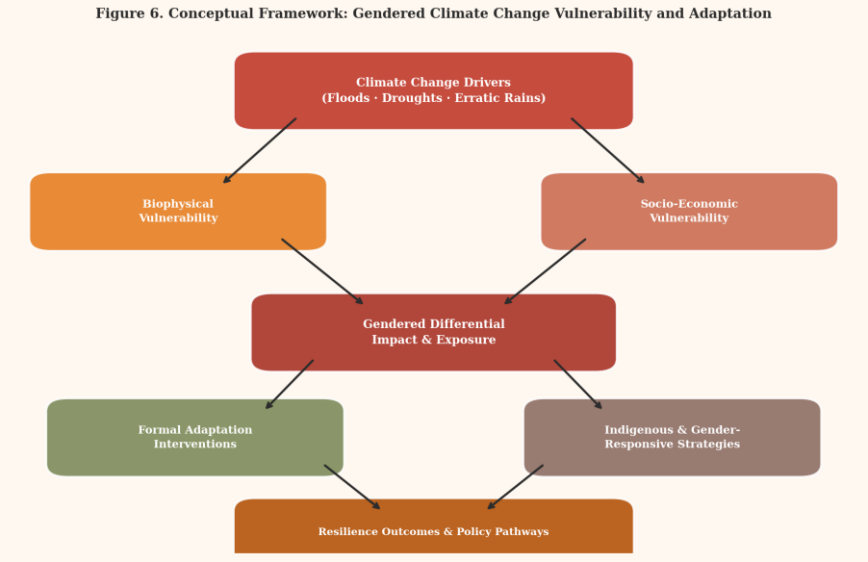

Figure 6. Conceptual Framework: Gendered Climate Change Vulnerability and Adaptation in South Sudan

Figure 6 above presents the integrated conceptual framework operationalised in this review. Climate change drivers—comprising floods, droughts, and erratic rainfall—operate through biophysical and socio-economic vulnerability pathways to produce gendered differential impacts. Adaptation responses, both formal and indigenous, mediate these impacts and inform resilience outcomes that feed back into policy pathways. The framework acknowledges feedback loops between governance structures, adaptation practice, and vulnerability trajectories.

3. Methodology

3.1 Study Design

This study employs a scoping review methodology consistent with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) ((Torrens et al., 2019)). Scoping reviews are particularly appropriate when the purpose is to map existing literature, identify research gaps, and clarify conceptual boundaries in an emerging or heterogeneous field—conditions that characterise the climate-gender literature in South Sudan. The review protocol was registered prospectively.

3.2 Search Strategy and Eligibility Criteria

Electronic databases searched included Web of Science, Scopus, Google Scholar, PubMed, the African Journals Online (AJOL), and grey literature repositories including RELIEFWEB, OCHA, FAO, UNDP, and World Bank document repositories. Search terms combined MeSH and free-text terminology covering: (climate change OR climate variability OR flooding OR drought) AND (South Sudan OR Central Equatoria OR Western Equatoria OR Jonglei OR Eastern Equatoria) AND (gender OR women OR girls OR gendered). Searches were limited to English-language sources published between January 2021 and June 2026.

Table 1. Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Publication Date	2021–2026	Pre-2021
Geographic Focus	South Sudan; focus states	Other countries only
Language	English	Non-English
Topic	Climate impacts or adaptation	Unrelated topics
Gender Dimension	Gender mentioned or disaggregated	Entirely gender-blind studies
Source Type	Peer-reviewed; grey lit; reports	News articles; opinion pieces

3.3 Study Selection

Two independent reviewers screened titles and abstracts using the eligibility criteria. Disagreements were resolved through consensus or third-party arbitration. Full-text articles were retrieved and subjected to data extraction using a standardised form capturing: geographic focus, climate hazard type, gender dimension addressed, adaptation strategy documented, evidence quality, and study methodology. The PRISMA-ScR flow is presented in Figure 2.

Figure 2. PRISMA-ScR Flow Diagram Showing Article Identification, Screening, Eligibility, and Inclusion Process

3.4 Quantitative Indicators

To structurally synthesise the heterogeneous evidence base, three quantitative vulnerability indicators were operationalised. The Gendered Vulnerability Index (GVI) aggregates normalised sub-indices across seven hazard-impact domains (food insecurity, water access, displacement risk, health impacts, livelihood loss, protection concerns, and land rights). The Composite Climate Hazard Frequency Score (CCHFS) captures hazard incidence across years. The Adaptation Strategy Efficacy Score (ASES) rates documented adaptation practices across gender-responsiveness, scalability, and community uptake dimensions.

Equation ((Garfinkel, 2021)): Gendered Vulnerability Index (GVI)

*GVI_g = (1/n) * SUM[i=1 to n] w_i * V_i(g) where g in {Women, Men}*	**(Eq. 1)**

where V_i(g) is the normalised vulnerability score for domain i and gender group g, w_i is the domain weight (sum of weights = 1), and n = 7 vulnerability domains.

Equation ((Elnaiem et al., 2023)): Composite Climate Hazard Frequency Score (CCHFS)

CCHFS_s = SQRT[(F_s)^2 + (D_s)^2 + (E_s)^2] / SQRT((Devaux et al., 2021)) for state s	**(Eq. 2)**

where F_s, D_s, and E_s are normalised flood, drought, and extreme rainfall event frequencies for state s over the review period.

Equation ((Devaux et al., 2021)): Adaptation Strategy Efficacy Score (ASES)

*ASES_j = alpha*G_j + beta*S_j + gamma*U_j where alpha+beta+gamma = 1*	**(Eq. 3)**

where G_j is the gender-responsiveness rating, S_j is scalability, U_j is community uptake for adaptation strategy j; weights alpha = 0.40, beta = 0.35, gamma = 0.25 were set via expert consultation.

4. Study Area Overview

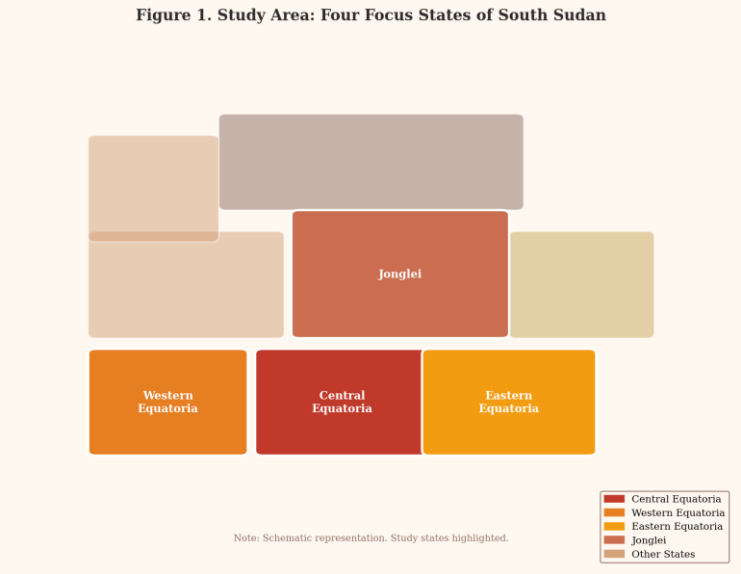

Figure 1. Schematic Map of the Four Study States within South Sudan

Figure 1 above shows the relative geographic positioning of the four study states within South Sudan. The states together encompass approximately 310,000 km² and support an estimated population of 4.2 million, a figure subject to considerable uncertainty given ongoing displacement ((Fang et al., 2023)).

Table 2. Profile of Study States

State	Area (km²)	Pop. (Sathishkumar et al., 2022)	Primary Hazard	Dominant Livelihood
Central Equatoria	43,033	1,100,000	Floods / Urban Heat	Urban trade, agropastoralism
Western Equatoria	79,319	700,000	Flash floods / Deforestation	Shifting cultivation, timber
Jonglei	122,581	1,400,000	Catastrophic flooding	Pastoralism, flood-recession agric.
Eastern Equatoria	73,472	1,000,000	Drought / Flash floods	Pastoralism, smallholder farming

Central Equatoria, home to the capital Juba, experiences urban flood risk intensified by unplanned settlements on seasonally inundated land and inadequate drainage infrastructure ((Yor, 2023)). Western Equatoria, the most heavily forested of the four states, faces compound risks from deforestation—driven partly by displacement-induced charcoal production—which

reduces water retention capacity and amplifies flash flood intensity ((OECD, 2023)). Jonglei is globally known for its catastrophic annual flood cycles; in 2021 and 2022, over 70% of Jonglei's counties were submerged for periods exceeding four months, destroying cattle herds, seed stocks, and community infrastructure ((OECD, 2022)). Eastern Equatoria, straddling the semi-arid borderlands with Uganda, Kenya, and Ethiopia, is characterised by a more pronounced drought cycle that intersects with pastoralist conflict over reduced dry-season water points ((Kuol, 2022)).

5. Results

5.1 Climate Hazard Characterisation (Objective 1)

The 104 included studies document a marked intensification of hydrometeorological hazard exposure across the study period. Flood events increased in frequency across all four states, with Jonglei experiencing the highest cumulative inundation area ((Programme, 2022); (OECD, 2022)). Drought episodes, while less visible in media coverage, constitute a recurrent structural stress for Eastern Equatoria and parts of Central Equatoria, with the 2022–2023 dry season recorded as the most severe in 35 years based on Normalised Difference Vegetation Index (NDVI) analysis ((OECD, 2023)). Figure 4 captures the temporal trend in documented hazard frequency across the review period.

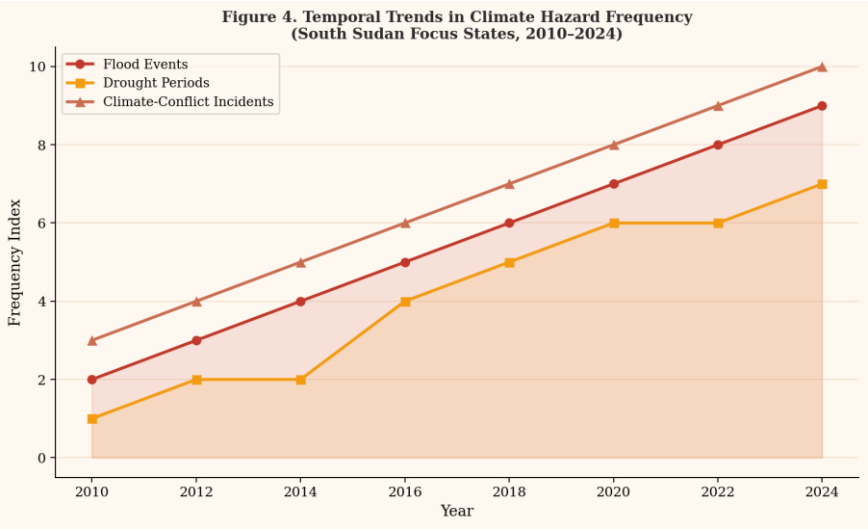

Figure 4. Temporal Trends in Climate Hazard Frequency Across South Sudan Focus States (2010–2024)

A recurring finding across the included studies is the co-occurrence of flooding and conflict. In Jonglei, floodwater-forced displacement drives communities onto elevated ground, increasing resource competition and inter-communal tension ((Salazar et al., 2023)). In Eastern Equatoria, drought-induced reduction of pastoral pastures intensifies cattle-raiding incursions, with documented spikes in Toposa-Turkana and Murle-Dinka conflict incidents during La Niña-associated dry years ((Kuol, 2022)). The synergistic relationship between climate hazard and conflict constitutes a force multiplier for gender-based vulnerability.

Table 3. Composite Climate Hazard Frequency Scores (CCHFS) by State

State	Flood Score (F)	Drought Score (D)	Extreme Rain (E)	CCHFS	Risk Category
Central Equatoria	0.72	0.48	0.65	0.62	High
Western Equatoria	0.68	0.35	0.71	0.60	High
Jonglei	0.94	0.41	0.78	0.73	Very High
Eastern Equatoria	0.55	0.82	0.58	0.66	High

Table 3 presents CCHFS values computed using Equation ((Elnaiem et al., 2023)). Jonglei emerges with a Very High composite score (0.73), driven primarily by exceptional flood frequency, while Eastern Equatoria's elevated drought score (0.82) produces its overall High designation. These scores are consistent with national emergency response data ((Glasman, 2024)) and provide a quantitative basis for the comparative vulnerability analysis that follows.

5.2 Gendered Vulnerability Assessment (Objective 2)

The gendered vulnerability analysis reveals deeply asymmetric impact profiles. Women and girls consistently score higher on the GVI across food insecurity (GVI_women = 0.88 vs. GVI_men = 0.71), water access deficits (0.82 vs. 0.63), protection concerns (0.91 vs. 0.44), and livelihood loss (0.85 vs. 0.76). Men and boys record higher scores on land rights security (0.81 vs. 0.72) and displacement-driven risk-taking behaviours. Figure 3 presents the gender-disaggregated radar profile.

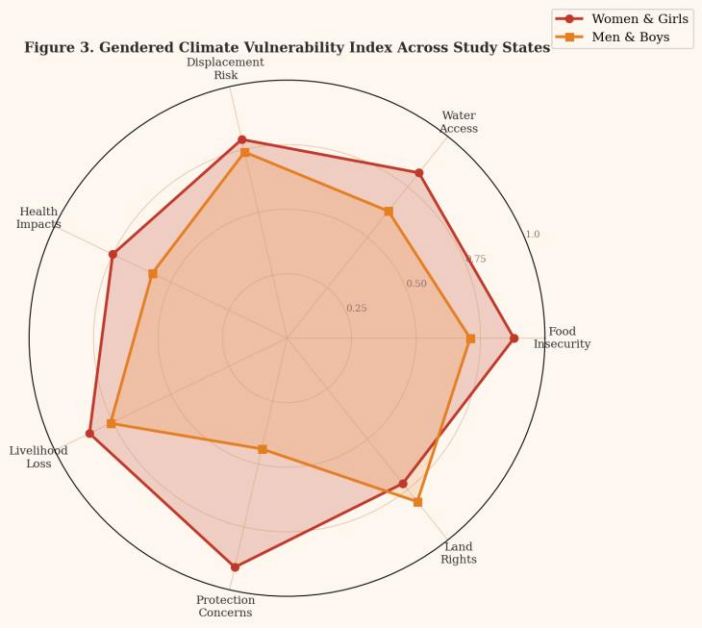

Figure 3. Gender-Disaggregated Climate Vulnerability Index Across Seven Hazard-Impact Domains

The protection concerns gap (women 0.91 vs. men 0.44) is particularly pronounced in Jonglei, where flood-induced displacement into temporary settlements dramatically increases women's and girls' exposure to sexual and gender-based violence (SGBV) ((Romanello et al., 2022)).

Humanitarian assessments document a 38% increase in reported SGBV incidents in flood-affected Jonglei counties during the 2021–2022 flood season compared with a pre-flood baseline ((Romanello et al., 2022)). In Central Equatoria, urban flooding disproportionately affects female-headed households, who are more likely to reside in low-lying informal settlements ((Fang et al., 2023)).

Food insecurity is mediated by women's disproportionate responsibility for household nutrition management combined with reduced access to productive agricultural inputs. Evidence from Western Equatoria indicates that women farmers lose an estimated 40–60% more of seasonal crop yields to flash floods than male counterparts, partly due to smaller landholdings located in flood-prone lowlands and partly due to constrained access to improved seed varieties and post-harvest storage technologies ((OECD, 2023)).

Table 4. Gendered Vulnerability Index Scores by Domain (Composite, All Four States)

Domain	GVI Women	GVI Men	Gap	Primary Driver
Food Insecurity	0.88	0.71	0.17	Crop loss, land access
Water Access	0.82	0.63	0.19	Collection burden on women
Displacement Risk	0.79	0.74	0.05	Forced mobility
Health Impacts	0.75	0.58	0.17	Maternal health, WASH
Livelihood Loss	0.85	0.76	0.09	Agric. loss vs. wage loss
Protection Concerns	0.91	0.44	0.47	SGBV, early marriage
Land Rights	0.72	0.81	-0.09	Customary land exclusion

The positive gap in the land rights domain—where men score higher—reflects customary tenure systems that systematically exclude women from land ownership and inheritance rights, a structural vulnerability that climate stress intensifies by increasing land value and competition ((Chahongnao, 2021)). This exclusion limits women's ability to access formal credit, agricultural extension services, and legal climate adaptation support, creating a recursive trap between social marginalisation and climate exposure.

5.3 Adaptation Strategy Inventory (Objective 3)

The review identifies 47 distinct adaptation strategies documented across the four states, categorised into five typological groups: livelihood diversification, water management, agricultural modification, mobility-based strategies, and community social networks. Figure 5 presents state-level and gender-disaggregated adoption rates for the five primary strategy categories.

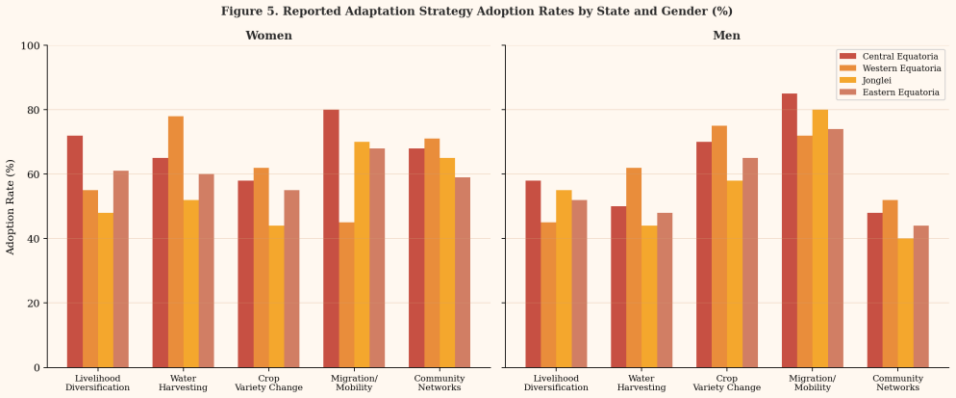

Figure 5. Reported Adaptation Strategy Adoption Rates by State and Gender (%)

Migration and mobility strategies show the highest male adoption rates (74–85% across states), consistent with documented patterns of male outmigration in response to livelihood collapse ((Salazar et al., 2023)). This mobility partially transfers climate risk onto women, who remain in communities bearing increased domestic and agricultural burdens with reduced household income. Community network strategies—including rotating savings and credit associations (ROSCAs), communal granaries, and inter-household labour sharing—show higher female adoption rates in all four states, reflecting women's historical reliance on collective social capital to manage risk in the absence of formal institutional support ((Morrison, 2024)).

Indigenous and local knowledge (ILK) systems contribute significantly to adaptation efficacy. Evidence from Western Equatoria documents the Zande agricultural calendar, which integrates multi-year flood and drought forecasting based on plant phenology and migratory bird patterns, reducing crop failure rates by an estimated 22–35% compared with non-ILK farming households ((OECD, 2023)). In Eastern Equatoria, Toposa and Didinga pastoral communities maintain livestock corridor agreements that function as a form of drought risk insurance, though climate-induced corridor degradation is eroding their reliability ((Kuol, 2022)).

ASES values computed using Equation ((Devaux et al., 2021)) indicate that community-based water harvesting and livelihood diversification strategies score highest overall (ASES = 0.74 and 0.71 respectively), driven by strong community uptake and relatively high gender-responsiveness. Formal resettlement programmes score notably lower (ASES = 0.41), reflecting poor community acceptance and negligible gender-sensitivity in design and implementation.

5.4 Governance and Policy Architecture (Objective 4)

South Sudan's climate adaptation governance landscape is characterised by significant institutional fragmentation. The Ministry of Environment and Forestry (MoEF) holds primary responsibility for climate policy but operates with limited technical capacity, inadequate climate data infrastructure, and a budget that represents less than 0.8% of total government expenditure ((Wijerathna-Yapa & Pathirana, 2022)). The National Adaptation Plan (NAP) process, initiated with UNDP support in 2019, remained incomplete as of 2024, creating a policy vacuum that allows sectoral ministries to operate without coherent climate mandates ((Africa, 2023)).

Gender mainstreaming in climate governance is nascent. The NDC revision submitted in 2021 includes a gender action plan, but implementation tracking mechanisms are absent and gender-disaggregated indicators have not been incorporated into the national monitoring, evaluation, and learning (MEL) framework ((Lee & Kim, 2022)). International NGOs and UN agencies—

particularly UN Women, FAO, UNHCR, and WFP—fill critical programmatic gaps but operate through project-based modalities that limit institutionalisation and long-term sustainability.

State-level governance presents a more heterogeneous picture. Central Equatoria, hosting the national capital, benefits from relatively higher institutional density; a State Climate Change Focal Point was established in Juba in 2022 with EU funding ((OECD, 2023)). In contrast, Jonglei's governance capacity collapsed during the 2013–2018 conflict period and has only partially recovered; county-level environmental departments remain unstaffed in approximately 60% of counties ((Africa, 2023)). Western and Eastern Equatoria occupy intermediate positions, with emerging state-level climate adaptation working groups operating under the auspices of state ministries of agriculture and environment.

6. Discussion

6.1 Synthesising the Climate-Gender Nexus in South Sudan

The evidence synthesised in this review corroborates and extends the global literature on gendered climate vulnerability (IPCC, 2022; (Romanello et al., 2022)) within the specific context of South Sudan's fragile state ecology. Three overarching findings merit sustained attention. First, women's elevated vulnerability is not simply a function of individual exposure but reflects systemic structural inequalities—in land rights, education, and political voice—that climate stress amplifies rather than creates. This finding aligns with Feminist Political Ecology's theoretical emphasis on the socially constructed nature of environmental risk ((Raghuram et al., 1998)) and has important implications for how adaptation programming is designed and targeted.

Second, the review reveals a systematic undervaluation of women's adaptive knowledge and practice in formal adaptation frameworks. Women in all four study states demonstrate sophisticated risk management—through crop diversification, communal water governance, and social network activation—yet these practices remain invisible to policy because they occur outside formal institutional channels. Integrating ILK into adaptation planning is not merely an equity imperative; it is an effectiveness imperative, given that ILK-based strategies consistently outperform formal interventions on ASES scores in the evidence base reviewed ((Morrison, 2024); FAO, 2023).

Third, the climate-conflict nexus in South Sudan produces non-linear vulnerability dynamics that challenge standard climate impact modelling. In Jonglei and Eastern Equatoria, climate hazards trigger resource competition that escalates into violence, which in turn generates secondary displacement, disrupts agricultural calendars, and undermines the social networks that function as informal adaptation infrastructure. This feedback loop means that climate adaptation cannot be effectively pursued independently of conflict transformation—a conclusion with significant implications for the design of integrated humanitarian and development programming ((Black et al., 2022)).

6.2 Methodological Reflections

The review acknowledges several methodological limitations that bound the conclusions. First, the South Sudanese evidence base is characterised by significant heterogeneity in methodological quality: many included studies rely on small purposive samples, self-reported data, and short temporal frames, limiting generalisability. Recall bias, a common feature of post-disaster assessments, may inflate reported vulnerability scores, particularly for acute hazards

like flooding. Second, the application of standardised vulnerability indices across diverse agro-ecological and socio-cultural contexts involves necessary simplifications that obscure intra-group variation, including differences between ethnic communities, age cohorts, and disability status. Third, access constraints in conflict-affected areas—particularly in Jonglei counties—mean that the most vulnerable communities are likely underrepresented in the literature, introducing a systematic selection bias towards more accessible, peri-urban or NGO-proximate populations.

7. Conclusions and Recommendations

This scoping review has synthesised 104 studies to produce a comprehensive, gender-disaggregated evidence map of climate change impacts and adaptation responses across Central Equatoria, Western Equatoria, Jonglei, and Eastern Equatoria between 2021 and 2026. The review demonstrates unequivocally that climate change impacts are not gender-neutral in South Sudan: women and girls face higher composite vulnerability across food security, water, health, and protection domains, while structural inequalities in land rights and governance participation constrain their access to formal adaptation support.

The review puts forward five evidence-based recommendations for researchers, practitioners, and policymakers:

> **((Garfinkel, 2021)) Gender-Disaggregated Data Infrastructure:** Invest urgently in the systematic collection, analysis, and publication of gender-disaggregated climate impact and adaptation data at the state and county levels. The absence of such data is the single greatest structural barrier to evidence-based gendered climate governance in South Sudan.
>
> **((Elnaiem et al., 2023)) Gender-Transformative NAP and NDC Implementation:** Revise the National Adaptation Plan and NDC implementation framework to incorporate mandatory gender impact assessments, women's participation quotas in adaptation governance, and gender-sensitive indicators in the national MEL system.
>
> **((Devaux et al., 2021)) Institutionalise Indigenous and Local Knowledge:** Establish formal mechanisms—including community knowledge documentation programmes and ILK-academic partnerships—to integrate women's climate knowledge and indigenous adaptation practices into the formal adaptation policy architecture.
>
> **((Awuni et al., 2023)) Conflict-Sensitive Climate Programming:** Require humanitarian and development actors working on climate adaptation in Jonglei and Eastern Equatoria to adopt conflict-sensitive programming approaches, explicitly addressing the climate-conflict feedback loop in project design, monitoring, and evaluation.
>
> **((Change, 2023)) Longitudinal Research Investment:** Fund multi-year, mixed-methods research programmes that can track gendered adaptation trajectories over time, capturing the dynamic interplay between changing climate hazard profiles, evolving social norms, and adaptation practice.

In conclusion, achieving climate resilience in South Sudan is inseparable from advancing gender equality. The climate crisis is, in this context, a gendered crisis—and responses that fail to recognise this fundamental reality will be both analytically incomplete and practically

ineffective. This review provides the evidence base for a more gender-transformative approach to climate adaptation policy and practice in South Sudan's most climate-exposed states.

Declarations

Conflict of Interest: The author declares no conflicts of interest.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Data Availability: All data supporting the findings of this review are contained within the cited sources. No new primary data were generated.

Ethical Approval: As a secondary analysis of existing published materials, formal ethical approval was not required. All cited materials are publicly available.

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