

Assessing Uganda's National Climate Change Policy: Water, Governance, and Climate Finance for Nomadic Pastoralists in Karamoja

Maxwell Ralph Ochen¹, Joel K. Ng'eno^{2*}, William Orora³

Egerton University

*Corresponding Author

DOI: <https://doi.org/10.47772/IJRISS.2026.100500825>

Received: 12 May 2026; Accepted: 18 May 2026; Published: 15 June 2026

ABSTRACT

Climate change continues to threaten pastoral livelihoods in arid and semi-arid regions, particularly in Uganda's Karamoja sub-region, where nomadic pastoralism remains the foundation of local economies. Despite the implementation of Uganda's National Climate Change Policy (NCCP) in 2015, pastoralist communities still experience limited access to water and grazing land, weak stakeholder engagement, and minimal benefit from climate financing. This study assessed the effects of the NCCP on the livelihoods of nomadic pastoralists in Rengen Sub-county, Kotido District, focusing on three key policy components: water source management, stakeholder engagement, and climate financing. A convergent parallel mixed-methods design was employed, integrating data from 234 households selected through stratified random sampling and 20 key informants purposively chosen from local leaders, government officials, and development partners. Quantitative data were analyzed using descriptive statistics and Pearson correlation in SPSS, while qualitative data were examined thematically. Findings indicated that water source management under the NCCP significantly improved access to water and grazing resources, thereby enhancing livestock health and productivity. However, inadequate maintenance of water facilities and weak alignment with pastoral mobility patterns limited overall effectiveness. Stakeholder engagement was found to be largely top-down, with insufficient inclusion of traditional institutions and pastoralist voices, particularly women. Climate financing supported localized interventions such as valley tanks and rangeland restoration but remained constrained by centralized allocation systems, weak institutional capacity, and low transparency. The study concludes that while the NCCP has made measurable progress in building pastoral resilience, its implementation remains fragmented and insufficiently responsive to the socio-cultural and ecological realities of mobile pastoralism. The research recommends strengthening participatory governance, prioritizing mobile water infrastructure, enhancing community access to climate finance, and integrating indigenous knowledge into adaptation planning. These findings provide evidence-based insights for policymakers and development partners seeking to design more inclusive, flexible, and context-specific climate interventions in Uganda's pastoral regions.

Keywords: National Climate Change Policy, nomadic pastoralists, Karamoja, water source management, stakeholder engagement, climate financing, livelihoods.

INTRODUCTION

Climate change remains one of the most significant global challenges of the 21st century, profoundly affecting social, economic, and ecological systems, particularly in Africa's dryland regions. In Uganda, climate variability manifests through increased frequency of droughts, floods, and erratic rainfall, severely disrupting agricultural productivity and pastoral livelihoods (Ministry of Water and Environment [MWE], 2024; Nsubuga et al., 2021). The Karamoja sub-region, located in northeastern Uganda, is among the areas most affected by climate-induced shocks. Here, nomadic pastoralism, the predominant livelihood system, relies heavily on seasonal mobility to access water and grazing resources. However, recurrent droughts, degradation of rangelands, and competition

over scarce natural resources have weakened the resilience of pastoral households and contributed to food insecurity and inter-communal conflicts (FAO, 2023; Aklilu & Catley, 2020).

Recognizing the escalating impacts of climate change, the Government of Uganda (GoU) formulated the National Climate Change Policy (NCCP) in 2015 to provide a comprehensive framework for climate adaptation and mitigation. The policy aims to promote low-carbon, climate-resilient development through integrated planning, institutional coordination, and community-based adaptation measures (MWE, 2022). Within this framework, particular emphasis is placed on enhancing water source management, strengthening stakeholder engagement, and mobilizing climate finance to support local adaptation interventions. Despite these provisions, empirical evidence from pastoral areas such as Karamoja remains limited regarding how the NCCP has influenced the livelihoods of nomadic pastoralists and their adaptive capacity to changing environmental conditions. This study, therefore, sought to assess the effects of the NCCP on the livelihoods of nomadic pastoralists in Karamoja, focusing on the domains of water resource management, climate financing, and stakeholder engagement. Understanding these relationships is critical for identifying policy gaps and informing the design of inclusive and sustainable adaptation strategies that respond to the unique socio-ecological dynamics of pastoral systems.

Pastoralism in Karamoja represents both an economic and cultural identity, yet it has become increasingly vulnerable to climate variability and ecosystem degradation (Opio et al., 2024; Nyeko & Okurut, 2023). Prolonged droughts and unpredictable rainfall have led to water scarcity, livestock mortality, and diminished pasture availability. These conditions have forced many households into distress migration and alternative livelihoods such as charcoal production, thereby exacerbating land degradation (World Bank, 2024). Historically, government and donor interventions have focused on emergency relief rather than resilience-building. However, with the adoption of the NCCP and complementary initiatives such as the National Adaptation Plan (NAP) and the Uganda Green Growth Development Strategy, the emphasis has shifted toward enhancing adaptive capacity, promoting sustainable resource use, and improving local climate governance (UNDP, 2023). The NCCP specifically identifies the need for integrating climate adaptation into district development plans, strengthening institutional coordination, and ensuring equitable access to climate finance (MWE, 2022).

Despite these commitments, implementation remains uneven. Studies show that pastoral regions continue to experience underfunding, weak policy enforcement, and limited participation of local communities in adaptation planning (Kasirye & Mugagga, 2023). In Karamoja, institutional fragmentation between government departments and humanitarian actors has further constrained effective policy delivery (Nyeko & Okurut, 2023). Therefore, there is a growing need to evaluate how NCCP-guided interventions, especially in water source management and climate finance, translate into tangible livelihood outcomes among pastoral communities.

Water scarcity is a defining constraint to pastoral productivity and resilience in Karamoja. Access to reliable and equitably managed water sources determines the health, productivity, and mobility of livestock, the primary economic asset for pastoralists (Aklilu & Catley, 2020). The NCCP emphasizes investments in water harvesting, catchment protection, and infrastructure maintenance as key adaptation measures (MWE, 2022). Empirical evidence from the current study indicates that these interventions have led to an improvement in the number of accessible water points, a reduction in the distance to water sources, and greater reliability throughout the year. These findings echo those of FAO (2023) and Nsubuga et al. (2021), who found that sustainable water source management significantly enhances pastoral resilience in semi-arid Uganda.

However, while quantitative findings suggest positive progress, qualitative evidence highlights persistent challenges, including inadequate maintenance of valley tanks, siltation, and unequal access linked to local power dynamics. Such disparities undermine the sustainability of policy interventions and risk reinforcing social exclusion. Similar challenges were observed by Kaboha et al. (2024), who reported that despite improvements in infrastructure, maintenance gaps and limited community ownership continue to hinder the effectiveness of water resource projects in northern Uganda.

Effective implementation of the NCCP depends heavily on accessible and well-coordinated climate financing mechanisms. In theory, climate finance under the NCCP and related initiatives, such as the Green Climate Fund

(GCF) and Adaptation Fund, is intended to support projects that enhance community resilience through capacity building, infrastructure investment, and livelihood diversification (UNEP, 2022). The findings from Karamoja reveal that climate finance has contributed to improved access to veterinary services, the introduction of drought-tolerant livestock breeds, fodder production, and the expansion of water infrastructure. These investments have directly improved pastoral productivity and household income.

Nonetheless, access to funding remains uneven across communities, with limited transparency and weak institutional capacity at the district level. The correlation analysis from this study showed only moderate relationships between climate finance and resilience indicators, confirming earlier observations by Ochieng et al. (2021) and Kasirye and Mugagga (2023) that climate finance in Uganda's drylands often suffers from fragmented coordination and inconsistent flow of resources. The limited local ownership of adaptation projects also diminishes their long-term sustainability (UNDP, 2023).

Stakeholder engagement is central to participatory climate governance and effective policy implementation. The NCCP calls for inclusive processes that empower local governments, traditional leaders, and community-based organizations to co-design adaptation interventions (MWE, 2022). Findings from Karamoja show that while institutional coordination has improved, particularly through partnerships with FAO, GIZ, and Mercy Corps, stakeholder participation remains largely top-down. Local pastoral institutions are often engaged at the implementation stage rather than during policy formulation.

This observation aligns with Nyeko and Okurut (2023), who argue that limited decentralization and insufficient engagement of customary structures have constrained the localization of climate policy in Karamoja. Similarly, Asingwire et al. (2022) highlight that enhancing local participation and education is critical for building adaptive knowledge and collective ownership of resilience initiatives. Without inclusive governance, climate interventions risk remaining externally driven and short-lived.

Overall, the reviewed evidence suggests that Uganda's National Climate Change Policy has made measurable progress in improving pastoral livelihoods through enhanced access to water, improved veterinary services, and the promotion of alternative income-generating activities. However, the policy's impact is constrained by insufficient financing, weak institutional coordination, and limited local participation. Addressing these challenges requires decentralizing climate finance, strengthening local institutions, and integrating indigenous knowledge into climate planning. Doing so will enhance the policy's effectiveness in fostering sustainable, community-led adaptation across Uganda's pastoral regions.

METHODOLOGY

Research Design

This study adopted a convergent parallel mixed-methods design, integrating both quantitative and qualitative approaches to comprehensively assess the effects of Uganda's National Climate Change Policy (NCCP) on the livelihoods of nomadic pastoralists in Karamoja. The mixed-methods approach was chosen to enable data triangulation and provide a more nuanced understanding of how policy interventions, specifically in the domains of water source management, stakeholder engagement, and climate financing, affect pastoral livelihoods. The design enabled the collection of both statistical evidence and in-depth experiential insights from community members and key stakeholders (Creswell & Plano Clark, 2018).

Study Area

The research was conducted in Rengen Sub-county, Kotido District, Uganda's Karamoja sub-region. Karamoja is characterized by semi-arid climatic conditions, erratic rainfall averaging 350–600 mm per annum, and recurrent droughts that heavily impact water and pasture availability (MWE, 2024). The population primarily depends on pastoral and agro-pastoral livelihoods, with mobility being a key adaptation strategy. The sub-county was purposively selected because it represents both the ecological and socio-economic challenges typical of the wider Karamoja region, where climate variability, land degradation, and policy implementation gaps are most pronounced (FAO, 2023).

Study Population and Sampling

The study targeted households of nomadic pastoralists, local government officials, and representatives of development organizations involved in climate adaptation. The total study population was estimated at approximately 1,200 households across selected parishes in Rengen Sub-county. Using Yamane's (1967) sample size determination formula at a 95% confidence level and a 5% margin of error, a sample of 234 households was selected for the quantitative survey. Stratified random sampling was employed to ensure representation across different villages and socio-economic categories.

For the qualitative component, 20 key informants were purposively selected based on their knowledge and involvement in climate adaptation and policy implementation. These included the Chief Administrative Officer (CAO), District Production and Marketing Officer (DPMO), Climate Change Adaptation (CCA) Focal Point Person, LCV Chairperson, Secretary for Production, and representatives from partner organizations such as FAO, Mercy Corps, World Vision, Welthungerhilfe, and ICCA.

Data Collection Methods

Quantitative Data

Structured questionnaires were administered to 234 household heads to gather data on their experiences and perceptions regarding the NCCP's influence on water access, resource management, climate financing, and livelihood outcomes. The questionnaire consisted of closed-ended questions on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Data collection was conducted with the help of trained research guides fluent in Ngakarimojong to ensure accuracy and comprehension.

Qualitative Data

Qualitative data were collected through Key Informant Interviews (KIIs) to capture in-depth perspectives on the implementation of the NCCP, local adaptation initiatives, and barriers to pastoral resilience. A semi-structured interview guide was used to maintain consistency while allowing flexibility for participants to elaborate on their experiences. All interviews were audio-recorded with consent and later transcribed verbatim for thematic analysis.

Data Analysis

Quantitative Analysis

Quantitative data were coded and analyzed using Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics (means, frequencies, and standard deviations) were used to summarize respondents' characteristics and perceptions. Pearson's correlation coefficient was employed to examine the relationships between NCCP implementation components, such as water source management and climate financing, and key livelihood indicators. Statistical significance was determined at the 0.05 level ($p < .05$).

Qualitative Analysis

Qualitative data were analyzed thematically following Braun and Clarke's (2019) six-step framework. Transcripts were repeatedly reviewed to identify emerging patterns and themes related to climate policy implementation, adaptation outcomes, and community participation. Codes were grouped into major thematic categories, such as policy effectiveness, climate financing, water management, and livelihood diversification, to facilitate comparison with quantitative findings. Representative quotations were used to support interpretations.

Integration of Quantitative and Qualitative Findings

In a convergent mixed-methods design, quantitative and qualitative findings were integrated during the interpretation stage to provide a comprehensive understanding of NCCP effects. Quantitative data provided statistical trends and associations, while qualitative narratives explained the contextual and institutional

dynamics underlying those patterns (Creswell & Plano Clark, 2018). Triangulation enhanced the credibility and validity of the findings.

Validity, Reliability, and Trustworthiness

To ensure the validity and reliability of quantitative instruments, the questionnaire was pre-tested among 40 respondents in Kotido sub-county with similar characteristics, leading to minor adjustments in question wording. The Cronbach's alpha coefficient for the instrument was 0.83, indicating good internal consistency (Tavakol & Dennick, 2011). For the qualitative component, trustworthiness was achieved through triangulation of data sources, member checking with participants, and maintaining an audit trail of coding and analysis decisions.

Ethical Considerations

Ethical approval for this study was obtained from the Egerton University Research Ethics Committee, a research permit was obtained from the Uganda National Council of Science and Technology, and permission to conduct the study was granted by the Kotido District Local Government. Informed consent was obtained from all participants after explaining the study's purpose, confidentiality measures, and their right to withdraw at any stage. Data were anonymized to protect participants' identities, and findings were reported with sensitivity to cultural norms and community values.

RESULTS, INTERPRETATION, AND DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

Quantitative Results

Water Source Management and Livelihoods

Gender

Most respondents were male (161), with women also represented (73). Both genders demonstrated strong agreement that water sources are effectively managed, although men expressed higher levels of strong agreement (24.2%) than women (21.9%)

Table1: Gender and Perception of Water Source Management

Sex	Disagree	Not Sure	Agree	Strongly Agree	Total
Male	1	16	105	39	161
Female	5	11	41	16	73
Total	6	27	146	55	234

Age

Respondents aged 26–45 expressed the highest agreement levels, indicating that active pastoral adults are central to water management efforts. This age group dominates natural resource governance due to physical capacity and household responsibilities (Nsubuga et al., 2021).

Years of Pastoralism

Individuals with 16–24 years of pastoral experience demonstrated the highest perceived benefits from water management infrastructure. Long-term pastoral experience appears to enhance environmental knowledge and stewardship (Aklilu & Catley, 2020)

Education Level

Respondents with primary education recorded the highest levels of agreement, followed by those with secondary and vocational education. Basic literacy enhances understanding of sustainable water management (Asingwire et al., 2022).

Descriptive Statistics on Water Source Management

Descriptive statistics revealed that most respondents agreed that the implementation of Uganda’s National Climate Change Policy (NCCP) improved access to water resources in Rengen Sub-County. Respondents reported better availability of boreholes and valley tanks, reduced livestock trekking distances, and improved livestock health. The mean scores (3.91–4.14) indicate strong agreement that NCCP interventions improved water availability, accessibility, reliability, and equitable distribution.

Table 2: Descriptive Statistics for Water Management Variables

Statement	Mean	SD	N
Adequate maintenance of water sources	3.91	1.02	234
Increase in accessible water points	4.14	.92	234
Year-round access	3.98	1.12	234
Reduced distance to water	4.06	.89	234
Equitable sharing	4.14	.90	234
Involvement of local leaders	3.91	1.14	234
Participation in water meetings	4.03	.94	234
Improved reliability	4.01	1.01	234
Positive government contributions	3.92	1.10	234

The highest mean (4.14) indicates broad recognition that NCCP expanded water points and improved equity, reducing household burdens and pastoral conflicts, consistent with FAO (2023).

Correlation Analysis

Pearson correlations revealed significant positive associations between key water management indicators.

Table 3: Selected Significant Pearson Correlations

Variable Pair	r	p
Water management × More water points	.465	.000
Water management × Year-round access	.480	.000
Water management × Reduced distance	.514	.000
Improved reliability × Government support	.474	.000
Water scarcity reduction × Reduced distance	.361	.000

These results suggest strong relationships between NCCP interventions and improved pastoral resilience.

Qualitative Insights

Climate Stressors

Key informants emphasized the damaging effects of drought, erratic rainfall, and floods on water sources, echoing regional evidence on climate variability (Nyeko & Okurut, 2023).

For instance, the Climate Change Adaptation Focal Person noted that *“Droughts have dried up valley tanks... while floods cause soil erosion and siltation.”*

Policy and Project Implementation

Informants acknowledged that NCCP provides a strong framework but highlighted funding and coordination challenges:

“Implementation remains slow due to limited funding and weak local capacity.” – LCV Chairperson

Livelihood Impacts

Interventions such as valley tank construction, borehole rehabilitation, and rangeland protection, implemented through NCCP, KALIP, NUSAF III, FAO, GIZ, and Mercy Corps, have reduced migration pressures, improved livestock health, increased water reliability, and strengthened community resilience.

DISCUSSION

Findings demonstrate that NCCP interventions significantly improved water access and pastoral livelihoods. Mean values above 3.9 indicate widespread acknowledgement of these gains, consistent with FAO (2023) and MWE (2022).

Participation of local leaders and communities also had positive correlations with water reliability and scarcity reduction. This reflects the importance of decentralized governance and participatory management (Aklilu & Catley, 2020; Asingwire et al., 2022).

However, persistent constraints, including weak institutional capacity, funding gaps, climate extremes, and livestock disease outbreaks, limit sustainability. These challenges echo national findings reported by Kaboha et al. (2024) and Kasirye & Mugagga (2023).

Overall, water source management interventions under NCCP have demonstrably enhanced resilience, yet long-term impact depends on sustained financing, multi-stakeholder coordination, and community-led planning.

Stakeholder Engagement and Livelihoods

Stakeholder engagement plays a central yet uneven role in strengthening the livelihoods and climate resilience of nomadic pastoralists in Karamoja. Qualitative findings reveal that government departments, NGOs, and community structures collaborate through multi-actor partnerships to implement climate adaptation initiatives. District authorities, together with organizations such as World Vision, Mercy Corps, and the Uganda Red Cross, coordinate efforts in natural resource management, rangeland restoration, water access, and early warning systems. These partnerships create synergies that enhance service delivery and strengthen adaptive capacities among mobile pastoralists.

Culturally grounded participatory approaches serve as the primary channels of engagement. Stakeholders rely on kraal-based sensitization, mobile livestock clinics, elders' forums, women's associations, and rangeland groups to communicate adaptation practices. Such methods have improved trust, local ownership, and adoption of innovations, including drought-tolerant crops, pasture reseeding, and livestock vaccination. These findings are consistent with research showing that participatory engagement enhances community buy-in and resilience in pastoral systems (Jones et al., 2021; Owuor et al., 2022).

Despite these contributions, major constraints limit the scale and sustainability of stakeholder engagement. High illiteracy, persistent insecurity related to cattle rustling, migration patterns, and mistrust arising from project delays undermine continuity and community confidence. These challenges align with studies highlighting governance deficits and mobility-related barriers that inhibit effective climate service delivery in East African pastoral regions (Stites & Akabwai, 2019; Opiyo et al., 2022). Stakeholders reported that insecurity frequently disrupts field activities, while migration weakens follow-up and consistency in implementation.

Nevertheless, when interventions align with pastoralist realities, particularly through localized early warning systems, radio programs in Ngakarimojong, and community-led rangeland restoration, positive livelihood outcomes emerge. Improved access to water points, enhanced livestock health, strengthened savings groups, and diversification opportunities such as beekeeping demonstrate the potential of well-tailored engagement strategies. These findings support scholarship emphasizing the importance of context-specific, mobility-aware, and community-owned adaptation frameworks in pastoral areas (Reid et al., 2023; Homewood et al., 2022).

Overall, stakeholder engagement contributes meaningfully to livelihood resilience in Karamoja, yet its effectiveness remains constrained by structural and governance challenges. Long-term, community-driven strategies and stronger institutional capacities are required to address these barriers and sustain adaptation gains.

Climate Financing and Livelihoods

Descriptive results show that while respondents recognized the existence of climate-related projects such as valley tank construction and rangeland restoration, many indicated that funding did not reach the community directly.

Demographic Characteristics and Perceptions of Climate Finance

The study surveyed **234 pastoral households** to assess how gender, age, education, and pastoral experience shape perceptions of climate finance.

Table 4: Climate Finance Perception by Gender

Sex	Disagree	Not Sure	Agree	Strongly Agree	Total
Male	3	21	109	28	161
Female	6	14	45	8	73
Total	9	35	154	36	234

Male respondents showed higher agreement on the effectiveness of climate financing (67.7%) than female respondents (61.6%). Both genders expressed optimism, though women reported slightly more uncertainty, reflecting gender-based disparities in access to climate-related programs.

Age-based Perceptions

Respondents aged **26–45 years** exhibited the highest agreement (>70%), indicating that active pastoral adults are primary beneficiaries of climate finance interventions such as restocking, fodder production, and water harvesting systems. Older adults (46–55 years) recorded the highest levels of *strong agreement*.

Education Level

Respondents with **secondary** and **vocational** education displayed the strongest perceptions of climate finance effectiveness, whereas those with no formal education expressed higher uncertainty. Education appeared to enhance awareness of funded adaptation programs and financial literacy.

Pastoral Experience

Respondents with **15–24 years** of pastoral experience showed the highest agreement, demonstrating that mid-career pastoralists benefited more from climate finance compared to very elderly pastoralists (>40 years), who recorded little engagement.

Education and experience emerged as important determinants of positive perceptions, consistent with Musinguzi et al. (2022), who found that literacy enhances participation in climate financing initiatives. However, persistent gender disparities indicate the need for more inclusive approaches.

Descriptive Statistics

Table 5: Descriptive Statistics for Climate Finance Indicators

Indicator	Mean	SD	N
Awareness of government climate finance programs	4.09	.903	234
Improved access to livestock-related services	4.08	1.03	234
Household directly benefited from funding	4.17	.875	234
Fair distribution of climate finance	4.03	1.05	234
Received training or capacity building	4.03	.976	234
Climate finance matches community needs	3.99	1.10	234

Transparency in climate finance management	4.07	.995	234
Improved resilience to droughts/floods	3.65	1.11	234
Accessible channels to request funding	3.82	1.08	234
Increased income-generating opportunities	3.77	1.18	234

All indicators recorded means above **3.65**, indicating favorable perceptions of climate finance. The highest score (4.17) reflected the tangible direct household benefits from climate-related funding. However, the lowest mean (3.65) indicated that improvements in resilience to droughts and floods remain limited.

The findings demonstrate that climate finance has broadly improved pastoral livelihoods, especially in areas of livestock health services, training, transparency, and income diversification. High mean scores across variables indicate that communities have become more aware of and engaged in climate finance programs, reflecting improved institutional communication.

Correlation Analysis

Table 6: Selected Significant Correlations

Variable Pair	r	p
Climate finance × livestock support services	.482	.000
Climate finance × training received	.319	.000
Climate finance × transparency in fund use	.327	.000
Climate finance × accessible funding channels	.392	.000
Climate finance × income-generating opportunities	.215	.001

Climate finance demonstrated strong and moderate positive correlations with improved livestock services, training opportunities, fund transparency, and livelihood diversification. Correlation with improved drought and flood resilience was weak ($r = .063$, $p > .05$), suggesting lingering climate vulnerability.

The strong correlation between climate finance and livestock support services ($r = .482$, $p < .01$) suggests that funding has directly contributed to improved veterinary service delivery. This aligns with literature showing that targeted adaptation financing enhances livestock resilience in arid regions (Aklilu & Catley, 2020).

Qualitative Findings

Key informant interviews revealed that Climate finance enabled mass vaccination, veterinary infrastructure, cold chain facilities, and capacity building for community animal health workers. Stakeholders such as FAO, Mercy Corps, and MAAIF were credited for improving livestock health systems. Initiatives include drought-tolerant breeds, fodder production, pasture management, and climate-smart agriculture. These interventions reduced mortality and improved productivity. Droughts, environmental degradation, and livestock disease outbreaks were reported as major economic threats. Key actors described declining household wealth and increased dependence on humanitarian aid.

Although the NCCP provides an effective framework, limited funding, weak institutional capacity, and slow implementation hinder effectiveness. Climate finance facilitated alternative income options, including beekeeping, agro-pastoralism, small-scale irrigation, and FMNR-based enterprises. These opportunities empowered women and youth. Green Climate Fund (GCF) and Adaptation Fund projects improved micro-enterprise development, water harvesting, rangeland restoration, and tree-based livelihoods.

The weak association between climate finance and climate shock resilience suggests that the scale and frequency of droughts and floods still exceed current adaptation investment levels. This interpretation aligns with broader evidence that climate hazards in pastoral zones often outpace adaptation interventions (Kasirye & Mugagga, 2023).

DISCUSSION

The study provides robust evidence that climate finance—channeled through Uganda’s NCCP—has had a significant positive effect on adaptive capacity among nomadic pastoralists. Quantitative indicators show improvements in service access, institutional transparency, household benefits, and income diversification. Qualitative findings complement this by highlighting strengthened livestock systems, increased training, and expanded livelihood options.

However, limitations persist. Climate finance has not yet translated into substantial resilience to extreme events. This indicates that although adaptation interventions are impactful, they remain **insufficient in duration, scale, and coverage**. Weak institutional capacity and inconsistent funding cycles were recurring constraints noted by key informants, echoing national reports citing low absorption and disbursement rates.

The demographic findings further show that **middle-aged, moderately educated, and mid-career pastoralists** are the principal beneficiaries of climate finance. More targeted strategies are required to include women, youth, and elderly pastoralists in climate adaptation and financing initiatives.

Overall, climate finance is a powerful enabler for pastoral resilience, but its full potential will only be realized through long-term and predictable financing, strengthened district-level implementation capacity, gender-inclusive programming, and community-led adaptation planning.

Interpretation and Discussion

The findings reveal that the NCCP has had positive yet uneven impacts on the livelihoods of nomadic pastoralists in Karamoja. Quantitative and qualitative evidence converge on three major observations: water source management, stakeholder engagement, and climate financing.

CONCLUSION

The implementation of Uganda’s National Climate Change Policy has positively influenced water resource availability and livestock productivity among nomadic pastoralists in Karamoja. However, the effectiveness of these interventions is undermined by insufficient maintenance of infrastructure, limited participatory governance, and inequitable access to climate financing.

RECOMMENDATIONS

Enhance community-driven water management by establishing inclusive water user committees.

Institutionalize participatory governance to ensure traditional and women’s groups’ involvement.

Decentralize climate financing with district-level transparency mechanisms.

Integrate indigenous knowledge and mobility patterns into adaptation planning.

Strengthen monitoring and evaluation through participatory systems, focusing on resilience indicators.

REFERENCE

1. Aklilu, Y., & Catley, A. (2020). Livelihoods and climate resilience in pastoral communities of East Africa. Feinstein International Center.
2. Asingwire, N., Okiror, J. J., & Mugisha, S. (2022). Education and adaptation to climate change among semi-arid communities in Uganda. *Environmental Research and Policy Review*, 15(3), 45–59.
3. FAO. (2023). Building climate-resilient pastoral systems in Uganda. Food and Agriculture Organization of the United Nations.
4. Kaboha, P., Namara, R., & Akello, J. (2024). Assessing water and climate resource management under Uganda’s National Climate Change Policy. *African Journal of Climate and Development*, 9(2), 33–49.

5. Kasirye, I., & Mugagga, F. (2023). Challenges of implementing climate change adaptation policies in Uganda's drylands. *Climate Policy and Development Studies*, 8(2), 78–91.
6. Ministry of Water and Environment (MWE). (2022). National Climate Change Policy Implementation Framework 2021–2026. Government of Uganda.
7. Ministry of Water and Environment (MWE). (2024). Uganda Climate Action Progress Report 2023. Government of Uganda.
8. Musinguzi, P., Oryema, B., & Adoch, J. (2022). Education, gender, and financial literacy in climate adaptation programs in northern Uganda. *Development Practice and Policy Journal*, 12(1), 22–40.
9. Nsubuga, F. N. W., Kansime, F., & Nakileza, B. R. (2021). Climate variability and adaptive governance in arid Uganda. *Regional Environmental Change*, 21(2), 1–14.
10. Nyeko, R., & Okurut, A. (2023). Localizing national climate policy: Lessons from Karamoja sub-region. *Journal of African Policy and Governance*, 7(1), 55–70.
11. Ochieng, J., Auma, L., & Tenywa, G. (2021). Climate finance for resilience building in Uganda's semi-arid areas. *African Journal of Environmental Economics*, 14(3), 112–130.
12. Opio, E., Lomo, D., & Akello, F. (2024). Integrating indigenous knowledge into climate adaptation among pastoralists in Karamoja. *Pastoralism: Research, Policy and Practice*, 14(1), 12–27.
13. UNDP. (2023). Community-driven climate adaptation in pastoral areas of Uganda. United Nations Development Programme.
14. UNEP. (2022). Gender and climate finance in East Africa: Equity and participation report. United Nations Environment Programme.
15. World Bank. (2024). Resilient drylands: Strengthening pastoral livelihoods under climate change. Washington, DC: World Bank Group.