



# Climate Change Adaptation in Sahelian Pastoralist Systems: A Comparative Study in Ghana

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**Published:** 04 May 2009 | **Received:** 24 December 2008 | **Accepted:** 16 March 2009

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**DOI:** [10.5281/zenodo.18890142](https://doi.org/10.5281/zenodo.18890142)

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## Abstract

Climate change impacts are increasingly evident in Sahelian pastoralist systems, affecting water availability, pasture quality, and livestock productivity. In Ghana's semi-arid regions, these systems face unique challenges due to their reliance on natural resources that are becoming more unpredictable. The study employs a mixed-methods approach combining qualitative interviews with quantitative data analysis of local climate records from to . Data collection was conducted in three regions: Upper East, Upper West, and Northern Ghana, ensuring regional diversity and comparability. Findings indicate that while some pastoralists have successfully diversified their livestock breeds to include more resilient varieties (e.g., sheep instead of cattle), others continue to rely heavily on traditional practices. Water management innovations such as the construction of small dams and borehole installation show varying degrees of effectiveness across regions, with significant improvements in water availability noted in Upper West. The study highlights the critical role of adaptive strategies in mitigating climate change impacts for Sahelian pastoralist systems in Ghana. It underscores the importance of local knowledge integration into climate adaptation policies to enhance their success and sustainability. Policies should encourage community-led initiatives that support sustainable water resource management, promote genetic diversity through selective breeding programmes, and facilitate early warning systems for seasonal droughts. The empirical specification follows  $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** Sahelian, Adaptation, Pastoralism, Livestock, ClimateImpact, Mobility, Irrigation

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