Representing Maasai Pastoralism in Space-Time to Explore Climate Change Adaptation Strategies

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Maasai pastoralists of East Africa are commonly referred to as opportunistic decision-makers; they mostly react but rarely affect the predominant environmental, social, and political forces in the region. Ensuring proper and timely access to natural resources for themselves and their livestock, in the face of competition from other communities, remains a prime challenge. Increasing climatic variability further complicates this competition for resources. Both historical and current Maasai livestock management practices need to be explored to understand how climate change is inducing short and long-term changes in livelihood strategies of pastoralists. Explicit mapping of their livelihood spaces and changes in human-environment interactions is essential for forming a broader understanding of this complex problem-space. Because of data limitations, establishing an objective, spatiotemporal context of the region's physiography, landcover, and landuse, especially at large mapping scales, is an extremely difficult task. Although global climate change models are becoming sophisticated, they too are unable to downscale regional predictions to local scales. Thus, qualitative local knowledge, available through personal interviews, is currently the only source of historical and contemporary contextual information. This paper will report on geonarrative analysis and qualitative spatiotemporal reasoning to partially reconstruct and geovisualize within a temporally enhanced GIS, the environment, pattern and extent of movements of a group of Masaai pastoralists. The methods and results discussed will be interpreted in the context of a suite of participatory geospatial analysis methods being developed for an NSF-funded study of adaptive capacity to climate change, in the Kilimanjaro region of northern Tanzania.