Mountain Ecosystems Responses to Climate and Land Use Change disaster in the East Africa Region

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Introduction:

Mountain ecosystems are globally significant habitats that provide invaluable services, including freshwater supply, biodiversity preservation, carbon sequestration, and cultural heritage. However, they are increasingly vulnerable to the impacts of climate change and land use change that affect population health. This abstract aims to summarize the responses of mountain ecosystems to these drivers of change and highlight key findings from scientific research in this field.

Methods:

A comprehensive literature review was conducted to identify studies investigating the responses of mountain ecosystems to climate and land use change. Various sources, including peer-reviewed articles, reports, and books, were reviewed to gather relevant information. Key themes and findings were identified and synthesized to provide a concise overview of the subject matter.

Results:

1. Climate Change Impacts:

- Rising temperatures: Mountain ecosystems are experiencing higher average temperatures, resulting in accelerated glacier melt, altered hydrological patterns, and shifting vegetation zones.
- Changing precipitation patterns: Altered precipitation regimes affect water availability, vegetation dynamics, and ecosystem productivity, leading to increased risks of droughts and floods.

2. Land Use Change Impacts:

- Agricultural expansion: Increased agriculture in mountain regions has led to deforestation and habitat fragmentation, negatively impacting sensitive species and ecosystems.

- Urbanization and infrastructure development: Expanding urban areas and infrastructure projects result in land degradation, loss of biodiversity, and disturbance of ecosystem functions.

3. Ecosystem Responses:

- Changes in species distribution and composition: Mountain flora and fauna are shifting uphill or towards cooler regions in response to temperature changes, leading to potential mismatches in species interactions and potential extinction risks.

- Altered ecosystem processes: Climate and land use changes affect nutrient cycling, carbon storage, and water availability, influencing ecosystem structure and functioning.

- Ecosystem services provision: Mountain ecosystems are crucial for providing freshwater, regulating climate, supporting tourism, and maintaining cultural heritage. Climate and land use changes can either enhance or diminish these services, depending on the specific context.

Conclusion:

Mountain ecosystems are highly sensitive to climate and land use changes, which have profound implications for ecosystem structure, function, and services. It is crucial to implement effective adaptation and management strategies to ensure their resilience and sustainable use. Further research is needed to enhance our understanding of complex interactions between climate, land use, and ecosystem responses, facilitating informed decision-making and conservation efforts in mountains of the East African region.

References

Abdo, K.S., B.M. Fiseha., T.H.M. Rientjes., A.S.M. Gieske. And A.T. Haile (2009). Assessment of climate change impacts on the hydrology of Gilgel Abay catchment in Lake Tana basin, Ethiopia. Hydrological Processes, 23(26), 3661-3669.

African Conservation Centre (2012). SERVIR Africa Biodiversity Project: Assessing the Vulnerability of Biodiversity to Climate Change: Report on Assessing Impacts of Future Climate Change on vegetation in East Africa and Kenya-Tanzania Borderlands.

African Wildlife Foundation., the International Gorilla Conservation Programme., and EcoAdapt (no date). The Implications of Global Climate Change for Mountain Gorilla Conservation in the Albertine Rift.

Bagoora, F. D. K. (1989). A preliminary investigation into the consequences of inadequate conservation policies on steep slopes of Rukiga Highlands, south-western Uganda.

Bates, B.C., Z.W. Kundzewicz, S. Wu and J.P. Palutikof, Eds. (2008). Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva, 210 pp.

Bazaara, N. (2003). Environmental Governance in Africa: Decentralisation, Politics and Environment in Uganda.

Desanker, P.V. (2002). Impact of Climate Change on Life in Africa. World Wildlife Fund.