



Stratification and Data Integration Techniques in Community-Based Natural Resource Management Assessments within Botswana's Socio-Ecological System

Ntsaba Mabasa¹

¹ Botswana International University of Science & Technology (BIUST)

Published: 16 February 2012 | **Received:** 25 October 2011 | **Accepted:** 30 January 2012

Correspondence: nmabasa@gmail.com

DOI: [10.5281/zenodo.18969920](https://doi.org/10.5281/zenodo.18969920)

Author notes

Ntsaba Mabasa is affiliated with Botswana International University of Science & Technology (BIUST) and focuses on Environmental Science research in Africa.

Abstract

Community-based natural resource management (CBNRM) in Botswana's socio-ecological systems seeks to balance conservation and community livelihoods. Despite successes, challenges persist related to equitable resource distribution and sustainable use. We employed hierarchical cluster analysis (HCA) with k-means clustering for stratification, integrating qualitative and quantitative data using geospatial technologies. Uncertainty in our models was addressed via bootstrapping. Hierarchical clustering revealed distinct resource management zones (RMRZs), contributing to more precise target area delineation and equitable distribution of resources among communities. Our stratification techniques have identified key RMRZs, facilitating improved resource allocation strategies in Botswana's socio-ecological systems. Policy makers should consider these stratified zones for targeted interventions to ensure sustainable CBNRM outcomes. Community-based natural resource management, hierarchical cluster analysis, data integration, socio-ecological system, Botswana The empirical specification follows $Y = \beta_{0+\beta}^{\vec{p}} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Socio-ecology, GIS, Participatory Mapping, Indicator-Based Assessment, Community Engagement, Ecosystem Services, Sustainability Metrics*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge