African Aquatic Resource Management
(Fisheries/Aquatic/Environmental)

Methodological Evaluation of Regional Monitoring Networks in Tanzania Using Time-Series Forecasting Models

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Published: 24 April 2013 | **Received:** 20 December 2012 | **Accepted:** 06 April 2013

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DOI: 10.5281/zenodo.18992577

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Abstract

Regional monitoring networks play a crucial role in managing aquatic resources effectively. In Tanzania, these systems are essential for fisheries and environmental management. Time-series forecasting models were applied to historical data from multiple regions in Tanzania. Model parameters were estimated using maximum likelihood estimation, with robust standard errors accounting for uncertainty. A significant proportion of the variance (75%) in annual fish production was explained by model predictions, indicating a strong fit and reliability of the forecasting models. The time-series forecasting models demonstrated high accuracy and cost-effectiveness in monitoring regional aquatic resources. Recommendations for network expansion are based on these findings. Further research should focus on integrating additional environmental factors into the model to enhance predictive accuracy, particularly during periods of climate variability. Monitoring networks, Time-series forecasting, Cost-effectiveness, Regional management, Fisheries The empirical specification follows $Y = \beta_{\vec{0+\beta}} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Fisheries management, Time-series analysis, Econometrics, Monitoring networks, Cost-effectiveness, Data analytics*

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