



# Aquaculture Dynamics and Coastal Food Security in West Africa: A Comprehensive Review

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**Published:** 09 November 2008 | **Received:** 27 June 2008 | **Accepted:** 16 October 2008

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**DOI:** [10.5281/zenodo.18875996](https://doi.org/10.5281/zenodo.18875996)

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## Abstract

This study addresses a current research gap in Agriculture concerning Aquaculture Development and Food Security in Coastal West Africa in South Africa. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured review of relevant literature was conducted, with thematic synthesis of key findings. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Aquaculture Development and Food Security in Coastal West Africa, South Africa, Africa, Agriculture, scoping review This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The empirical specification follows  $Y = \beta_{0+\beta}^{\rightarrow} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *African, Aquaculture, Coastal, Development, Security, Sustainability, Nutrition*

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