

Integrating Land-Sea Connectivity to Prevent Biodiversity and Habitat Loss in Mangrove and Coral Reef Systems

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INTRODUCTION & AIM

Introduction

Mangrove forests and coral reef ecosystems are ecologically interconnected coastal systems that provide critical ecosystem services, including shoreline protection, biodiversity conservation, and fisheries support.

Mangroves reduce sedimentation and nutrient overload entering coastal waters, thereby enhancing coral reef resilience. However, conservation policies often treat terrestrial and marine systems separately, leading to fragmented management approaches.

Aim

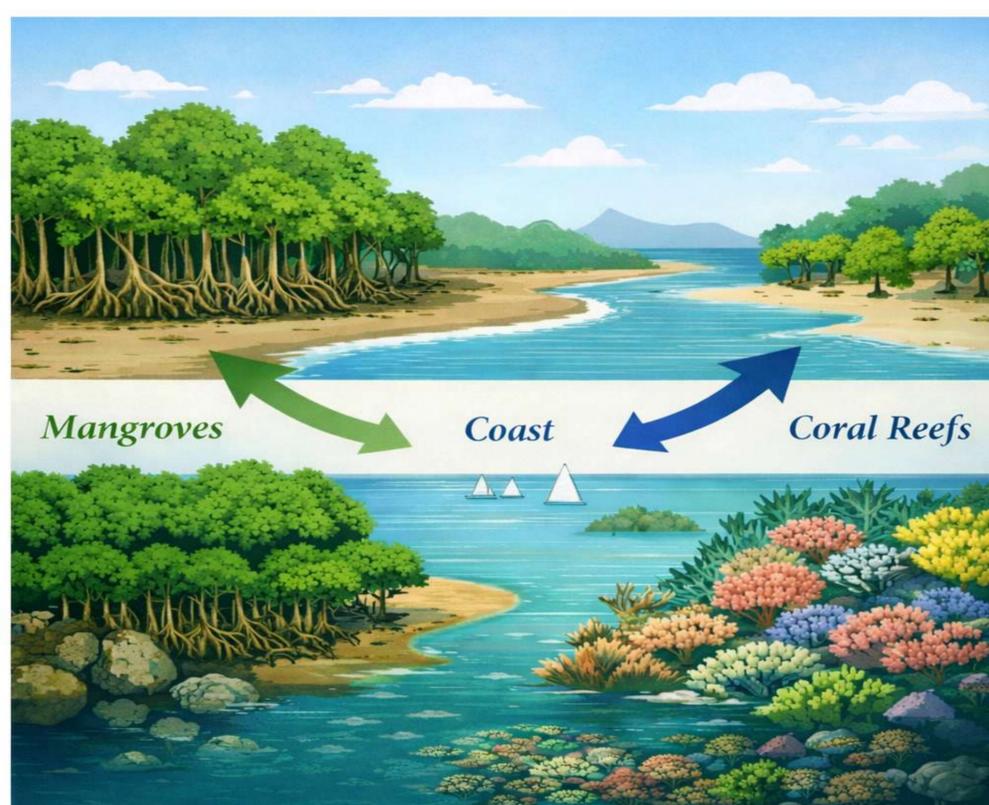
This study evaluates how integrating land-sea ecological connectivity into conservation planning can strengthen biodiversity protection, enhance ecosystem resilience, and reduce habitat degradation in mangrove and coral reef systems.

METHOD

This study applies a qualitative ecological analysis based on:

- Review of peer-reviewed literature on mangrove-coral reef interactions
- Comparative analysis of integrated coastal management frameworks
- Evaluation of policy gaps in land-sea governance
- Conceptual modeling of ecological connectivity pathways

Conceptual Model of integrated Land-Sea Ecological Connectivity



RESULTS & DISCUSSION

- Integrated land-sea management improves sediment regulation and nutrient balance, directly enhancing coral reef resilience.
- Mangrove degradation increases turbidity and sediment deposition, accelerating coral bleaching and biodiversity decline.
- Fragmented terrestrial and marine governance weakens ecosystem recovery capacity.
- Cross-boundary policy coordination significantly increases long-term ecological stability.
- Ecological connectivity strengthens species migration pathways and trophic interactions across coastal systems.

CONCLUSION

Land-sea ecological connectivity is fundamental to preventing biodiversity loss in coastal ecosystems.

Integrated governance, ecosystem restoration strategies, and cross-sectoral policy coordination significantly enhance ecological resilience and long-term sustainability of mangrove and coral reef systems.

FUTURE WORK / REFERENCES

Future Work

- Quantitative modeling of sediment transfer impacts
- Case-study analysis of successful
- Policy framework development for climate-adaptive coastal management

Reference (Use real ones if possible)

Example format:

Alongi, D.M. (2015). The impact of climate change on mangrove forests. *Current Climate Change Reports*.

Mumby, P.J. et al. (2004). Mangroves enhance the biomass of coral reef fish communities. *Nature*.