



Reconciling mangroves requires attention

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Abstract

The decline in global mangrove cover is major concern requiring immediate conservation. This article describes the status of mangrove loss, the conservation measures implemented and mangroves recovered. Further need for mangrove restoration and steps towards their protection are emphasized.

Keywords: Fauna, threats, policies, measures, restoration

Introduction

Mangroves are facing higher risk and lost at faster rate than other ecosystems. The global decline in mangroves can be attributed to the existing threats. Mangrove management faces various challenges requiring stakeholder recognition (Bio *et al.*, 2025) ^[1]. However, some efforts have been implemented in the world including India for their conservation at regional levels. Nevertheless, few mangrove sites have been restored and 40% of global mangroves are considered as protected areas, but the data on mangrove restoration is lacking (Dabalà *et al.*, 2023) ^[3].

Initiatives for Mangrove restoration

- Mangrove reforestation programmes are working towards conservation in globally. Global Mangrove Alliance (GMA) includes mangroves as biosphere reserves and geoparks. The GMA and the Blue Carbon Initiative developed the guidelines for project design and funding to implement mangrove restoration (GMA, 2022) ^[4].
- Under IUCN and UNDP Mangroves for the future initiative has been formulated, working towards their restoration. National Mangrove Committee, Mangrove Initiative for Shoreline Habitats & Tangible Incomes, Sustainable Aquaculture in Mangrove Ecosystem programmes are developed for funding mangrove research, afforestation, mangrove resilience and sustainable aquaculture. National Coastal Mission Programme on Conservation and Management of mangroves, annual Management Action Plan (MAP) restrictions have been implemented in India for their conservation. Mangrove Alliance for Climate (MAC) is a governmental initiative of UAE and Indonesia that brings together national governments to promote mangroves as a nature-based solution to climate change. United Nations' High-Level Climate Champions (HLC) in collaboration with GMA launched mangrove breakthrough, ensures long-term finance for the sustainable management of 15 million hectares of mangroves. The Global Mangrove Watch involved in construction of mangrove extent maps and identified mangroves in 128 countries and territories (Bunting *et*

al., 2022) ^[2]. According to the reports of Ocean and Climate Platform, Conservation International, Wetlands International 61 countries have incorporated mangrove conservation policies in their national climate commitments. Under the UN Decade on Ecosystem Restoration and the Kunming-Montreal Global Biodiversity Framework (GBF) (2022) countries aim to restore at least 30% of degraded mangroves by 2030.

Effective governance to recover degraded mangroves, climate change mitigation, creating marine protected zones, initiating discussions with the owners of the mangrove stalks, estimating mangrove loss and restoration using novel technologies are prerequisites to protect and restore the mangrove wetlands (Moustafa *et al.*, 2023) ^[6].

Way forward

Application of remote sensing and GIS by the use of Synthetic Aperture Radar (SAR) and drones (LIDAR sensor) in mapping of mangrove habitats would help to understand their loss over the past. Occurrence of floodings and tsunami can be overcome by the integrated use of partial least square and the coastal vulnerability index approach to mangrove forests (Rudianto *et al.*, 2022) ^[7]. The regional governments should take up steps to prevent flooding in mangrove swamps. Mangrove reforestation is beneficial over afforestation because of the greater carbon storage potential at reforested sites and provides suitable habitats for recolonisation of mangrove associated fauna (Song *et al.*, 2023) ^[8]. Practising mangrove restoration activities would improve coastal sustainability by increasing mangrove cover to greater extent. Integrated mangrove aquaculture (IMA) wherein mangroves are planted in or alongside shrimp ponds would nourish the biodiversity at faster rate than at the original mangroves. Research needs to emphasise on ecology of mangrove dwelling species, effect of natural and anthropogenic pressures depleting the biodiversity. Restoration of degraded mangrove areas and conservation of existing pristine mangrove stands will ensure sustainable management. Hence, reconciling mangroves would pave the way for sustainable management of the associated resources.

Acknowledgements: Author is thankful to SJU, Bangalore for the support.

Competing Interests: Author does not have any competing interests.

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