

## Economic Losses from Mangrove Ecosystem Service Degradation Due to Salt Mining-Induced Subsidence in Maceió, Brazil

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### Abstract

This study investigates the economic losses associated with the degradation of mangrove ecosystem services in Maceió, Alagoas, Brazil, due to land subsidence resulting from underground rock salt mining. The affected region, particularly around the Mundaú Lagoon and the neighborhoods of Mutange and Bebedouro, has experienced severe socio-environmental impacts, including damage to infrastructure and loss of natural vegetation. Using the benefit transfer method and satellite imagery from Google Earth and MapBiomias (2018–2022), we estimated the monetary value of intangible ecosystem services lost—such as climate regulation, erosion control, and waste treatment. Values were adjusted using inflation data and converted to BRL 2023. Results show significant economic losses, ranging from BRL 13.9 million (MapBiomias data) to BRL 42.5 million (Google Earth data). The most affected services include waste treatment and habitat provision. These findings highlight the critical economic value of mangroves and the urgency of incorporating ecosystem service valuation into public policy and urban development planning. Protecting mangroves is essential not only for biodiversity but also for the socio-economic stability of vulnerable coastal communities.

