

Popular Scientific Summary

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Does mangrove's ecological importance equal its perceived importance? Mangroves are globally recognized for their ability to support climate change adaptation and disaster risk reduction through various ecosystem services, such as coastal protection and livelihood. In Maputo Bay, Mozambique, these services are important given the region's exposure to coastal hazards. Yet, both human-induced and environmental threats continue to degrade these forests. But why? Is it because individuals perceive mangrove services differently? Or is it because the services themselves vary in quality? To what extent is the forest degraded, and what do residents and experts think about it?

This thesis examines how mangrove ecosystem services interact, how well they function, and how different stakeholders value them, as well as the main perceived threats to mangroves in Maputo Bay, Mozambique. This thesis also compares mapped mangrove coverage based on satellite data between the years 2017 and 2025 with what local stakeholders actually observe on the ground. Both interviews and mangrove mapping analysis showed different, contradicting results.

The mapped mangrove coverage analysis showed an overall decrease of mangroves by 1862 hectares, whereas the experts and residents near the mangroves indicated an overall increase, but with localized changes. This indicates that heavy reliance on a larger scale may not translate well into the local realities, especially since the local stakeholders can give a more dynamic understanding of the losses and gains of mangrove cover. Therefore, it is important to balance both scales when looking at mangrove patterns. Equally, it is just as important to balance multiple, contradicting viewpoints when talking to experts and residents. The thesis shows that experts rely mostly on a science-based approach and quantification when discussing mangrove coverage and ecosystem services, whereas residents discuss more from lived experience. Nevertheless, both groups agreed that ecosystem services, such as livelihood extraction in terms of fisheries and coastal protection (erosion and floods), were the most valued services, with a general decline in charcoal or fuelwood extracted from mangroves. It was shown that the value of these services varied across the regions, mainly due to social and economic factors, but also the structure of the mangrove trees. For example, curvy and short mangroves are less used for their material services compared to straight and tall mangroves. Likewise, people residing in

the capital city of Maputo indicated alternative livelihood options, reducing the value of mangrove services. Therefore, mangroves' ecological importance is not equal to their perceived importance.

The undervaluation of mangroves and different priorities, especially near the capital, lead to continued infrastructure development in mangrove areas, increasing their vulnerability and decreasing mangroves' protective functions against coastal hazards. Other identified threats include implementation challenges that do not align with local realities, climatic events, localized cutting, and littering. Stakeholders indicated that these threats are, similar to the ecosystem services, dynamic and not the same across all parts of Maputo Bay. They are shaped by different influences, including how people think about the environment and how rules and institutions are set up. Since many of these threats are human-induced, some coherent suggestions for future management include knowledge sharing and visually showing local communities the importance of mangrove services and how they benefit communities at the local level. At the regional/national levels, densification and combining multiple perspectives from different stakeholders were proposed. By combining socio-ecological perspectives of mangroves and their ecosystem services, a more comprehensive understanding can be made of how they function, leading to more precise priorities in mangrove management and locally accurate interventions in the future.