

Coastal Vulnerability Assessment Of The Marine Protected Area Of Ambodivahibe And Its Extension Using Geospatial Technologies

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Background

The Ambodivahibe Marine Protected Area or MPA and its Extension, selected as a study area, is well known for its richness in flora and fauna both terrestrial and marine. With a total coastline length of 145 kilometers, it is also known for its sea turtle nesting areas and its beautiful sandy beaches.

Due to its low topography and high ecological value, this coastline is considered vulnerable to accelerated sea level rise. Sea level rise due to global warming is estimated to be approximately 43-84 cm by 2100 (IPCC 2019), requiring the identification and protection of vulnerable sections of coastline.

In addition to climate change stressors, there are other human pressures, including traces of the existence of poaching of sea turtles along the beach.

The study aims to assess the coastal vulnerability of Ambodivahibe MPA and its Extension, using remote sensing and GIS tools to calculate the Coastal Vulnerability Index (CVI).

Method

The coastal zone was first divided into geomorphological units, which are often divided into administrative areas such as Fokontany (a subdivision of communal boundaries). The evaluation of the index was then carried out within each unit. Data and scripts acquired during the C-RISe or Coastal Risk Information Service project implemented by Conservation International were exploited and improved to arrive at the results. In addition, socio-economic data of the area was combined with GIS and Remote Sensing data to arrive at the CVI assessment of the area. A range of six physical and terrain parameters: Geomorphology, Land use/land cover, Coastal slope, Offshore bathymetry, Coastline change (1970-2017) and mean tidal height, were considered to calculate the CVI based on USGS classification.

Results

As a result, the variations are significant along the entire coastal zone, and are based on the CVI values calculated for the study area. The coast is thus classified into five classes of vulnerability, namely: very low, low, moderate, high, very high. The two indices "moderate" and "high" dominate the results.

Conclusion

In conclusion, this study has allowed the MPA and its Extension to know with precise values the vulnerability index of its ratings, which are elements of paramount importance, not only for the next and imminent update of the PAG or Plan d'Aménagement et de Gestion but any future management. In addition, these results will be shared with stakeholders, these include local communities and the risk and

disaster management body, along with all other stakeholders working in the area for a sustainable development of the coastal zone and its natural resources.