

# Spatial informatics study on the dynamics of mangrove forests under overgrazing in coastal Port Sudan

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## Abstract

The Red Sea of Sudan is known for its fascinating and unspoiled nature, including mangroves and coral reefs. Mangrove stands are important coastal habitats, providing fodder, wood products, fish breeding grounds, and camel grazing areas. Originally, vast stands of mangroves existed where seasonal streams reached the shore to create the brackish and sediment-rich conditions necessary for mangroves to thrive. Today, mangrove forests are severely threatened throughout the coastline due to climate change, overgrazing and overcutting, and in some areas, destruction by coastal industrial development. This study aims to determine the effects of climate change and camel grazing on dynamic changes in the mangroves of Port Sudan on the Red Sea coast using GIS technique. Time-series Landsat satellite data were used to extract changes in mangrove area. Satellite tracking of camels also revealed feeding damage to mangrove forests by camels. Optimizing grazing can increase plant biomass production. The saplings were protected from camel predation by an artificial channel created in 2000. This expanded the distribution of mangrove forests in the offshore direction. However, optimizing camel grazing did not reduce the distribution of mangrove forests, and it is assumed that the NDVI values in such areas show a high index.

*Key words: GIS, camel line, grazing optimization theory, GPS satellite tracking, remotely sensed analysis*

