UNIVERSITY OF KERALA
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LANDSCAPE ECOLOGY APPROACH FOR THE SUSTAINABLE MANAGEMENT OF NATURAL AND BIORESOURCES

NATIONAL SEMINAR

INTERNATIONAL AND INTER UNIVERSITY CENTRE FOR
NATURAL RESOURCES MANAGEMENT
&
DEPARTMENT OF GEOLOGY

9-10 February 2023

Rajesh Reghunath & Ajayakumar A (Eds.)

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Proceedings of the National Seminar

on

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Funded by

University of Kerala

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CONTENTS

MANGROVE DISTRIBUTION MAPPING IN KANNUR DISTRICT OF KERALA, USING GEE AND GIS TECHNIQUES.

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Mangrove forests play a pivotal role in the protection and maintenance of coastal shorelines of tropical and subtropical regions. Mangroves are well reputed for their ecological and economic contributions in the form of protection from coastal attrition, enacting as the breeding and feeding grounds of aquatic beings and execution of water and air purification functions. Being such a valuable biological resource and its highly sensitive nature, the need for implementation of its conservation measures has become an ineluctable task. As per the existing studies and reports, it is evident that the mangrove spread in the Kannur district of Kerala is facing heavy threats from the extensive and fast-developing shrimp farming and Kaipad (paddy) cultivation in the region. As an initial step towards conservation and threat analysis, it is important to develop a better understanding of the landscape distribution of the mangrove ecosystem, which can be achieved by employing periodic mapping and monitoring in the most cost-effective and time-conserving manner. This study aims to opt for a low-cost remote sensing perspective using Google Earth Engine and QGIS platform for the spatiotemporal mapping and monitoring of mangrove spread in the Kannur district of Kerala. The approach mostly relied on Random Forest Classifier, Spectral Indices (NDVI, GCVI, NDDWI) and Band Ratios. Landsat 7 and 8 images for 2009 and 2022 respectively, were taken for analysis and comparison study. The accuracy assessment for the study was performed using ArcGIS platform with the aid of field-derived data. The results of the overall analysis shall provide insights into the current mangrove extent of the study area, thus facilitating the research and environmental communities to take appropriate and prompt actions for the conservation procedure.

Keywords: Mangrove ecosystem, Landsat images, Google Earth Engine, ArcGIS, Mangrove extend mapping, Coastal Attrition, Remote Sensing, Change detection, Spatio-temporal Analysis, Random Forest Classification, Spectral Indices, Band Ratios, Accuracy assessment.

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