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A Preliminary study : the changes of mangrove area in 4 years based on satellite imageries at Jakhau coast, Gujarat

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Abstract: *Mangroves are vital bioresources that play a critical role in the coastal ecosystem. Mangroves are disappearing quickly as a result of overexploitation, urbanization, and tourism-related degradation. In addition to being a significant fish landing site, Jakhau in Kachchh maintains a high mangrove-covered creek system. Therefore, it is imperative to evaluate the state and future directions of Jakhau's mangroves. Using a GIS approach, the site was assessed to determine the mangrove cover and any associated changes. The photos from 2017 and 2021 showed notable changes that showed the steady disappearance of the mangrove forests along the Jakhau shoreline and the neighboring coastal area.*

Keywords: *Mangroves, Jakhau, ERDAS Images, coastal area.*

1. INTRODUCTION:

The distribution of mangrove ecosystems, species distinction, health state, and fluctuations in mangrove populations have all been extensively mapped using remote sensing data and techniques [1]. Around the world, mangrove habitats can be found in many tropical and subtropical regions. They are found developing near sheltered coastlines like tidal marshes and river estuaries [1]. These forests rank among the world's most valued ecosystems due to the variety of products and services they offer. Mangroves support thousands of marine and pelagic species and provides - food, medicines, fuels, and building materials for the local inhabitants, although making up less than 0.4% of all forests on Earth [2]. As a carbon free forests in the tropic area, they also play an important role in mitigating the consequences of climate change by absorbing CO2, the principal greenhouse gas emitted from the atmosphere, aside from water vapor [3]. Additionally, they protect coastal regions from storms, tsunamis, and tidal waves [4]. Satellite data are with some fine to medium spatial resolution, such as Quickbird, Ikonos, & Landsat Thematic Mapper, can give sufficient spatial detail for mapping mangrove habitats. [5]. The hyperspectral pictures are excellent for distinguishing between different mangrove species [6]. Malaysian mangrove ecosystem has been researched utilizing different remote sensing data for mangrove detection/areal demarcation [7], mangrove changes were found [8], and mangrove species categorization [9].

Geographic information systems (GIS) and remote sensing (RS) offer useful tools for this goal since they are quick, accurate, and efficient ways to retrieve information and spot changes that occur over time. The knowledge acquired can be put to good use in mangrove forest planning and management.

2. STUDY AREA:

Jakhau and surrounding costal area has chosen for the current study area, which is located in Godia Creek, constituting northern coast of gulf of Kachchh in the western side of Gujarat. Jakhau is marked by open sandy coast, devoid of any mangrove vegetation, which is followed by network of creeks where mangrove vegetation forms very dense stands. The boundary of the study area lies between the latitude of 23°14’0”N and longitude 68°38’0”E.

3. MATERIAL AND METHODOLOGY:

Classification was carried out using satellite imagery acquired from the website USGS (United States geological survey). To study the mangrove forest cover changes during last four years, landsat 2 images of jakhau for year 2017 and 2021, same season were used for the study.

While ARC MAP 10.2 was utilized for the map generation and onscreen digitization of the coastal area, ERDAS Imagine 2017 was employed for the processing, categorization, and data transformation of satellite images. Databases, graphing, and word processing were done using Microsoft Word and Microsoft Excel.

4. RESULT AND DISCUSSION:

Land cover pattern of the study area:

Based on the tonal pattern & variations in imagery the land use and the land cover map of the study area were generated for all two temporal imagery of year 2017 and 2021. The five land uses were delineated in this area viz. Mangrove, Mud, Water, Saline soil and other vegetation.

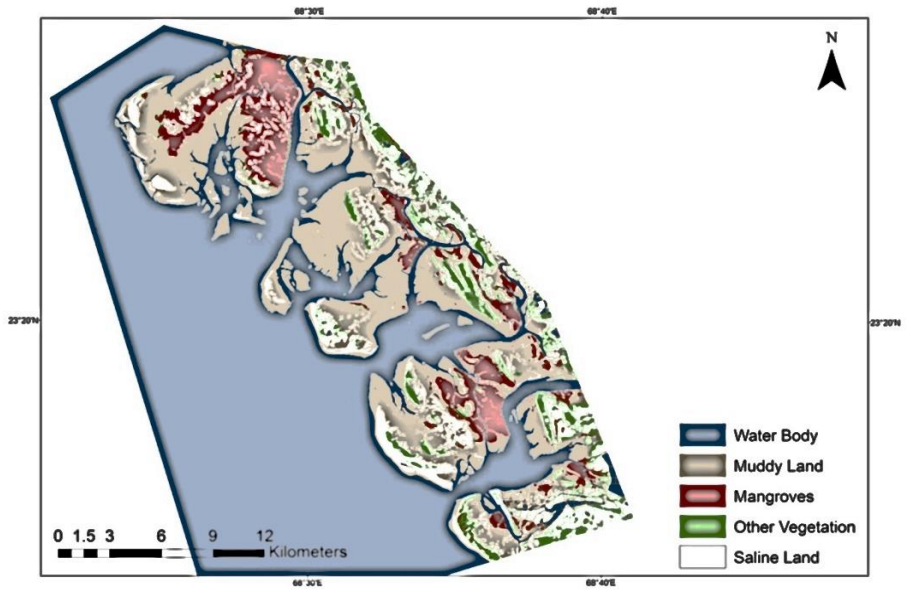

Fig.1 Land covers - Jakhau and surrounding coastal area, Year 2017.

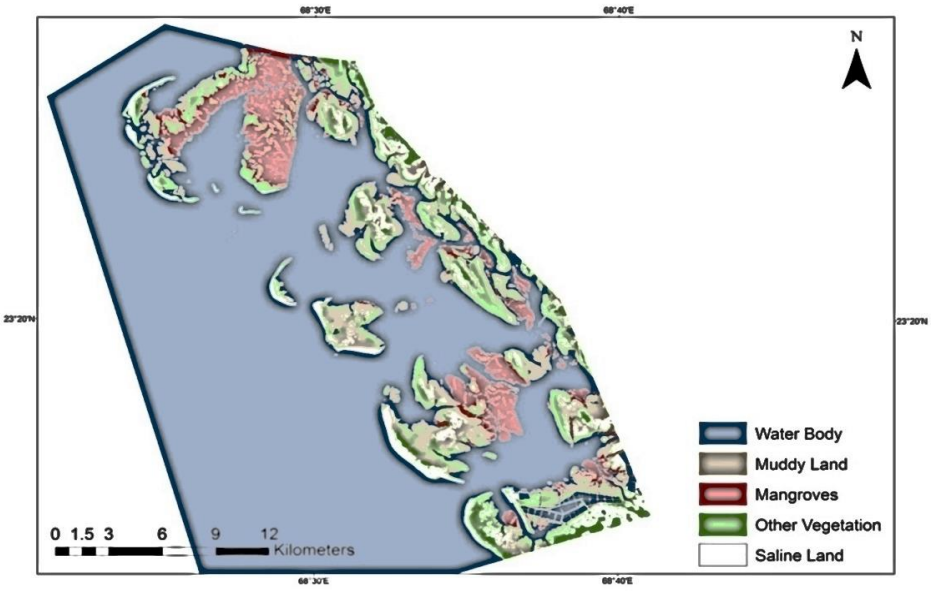

Fig.2 Land Cover - Jakhau and surrounding coastal area, Year 2021

Table.1 Land covers area statistics for year 2017 and 2021

Class	Area 2017 (ha)	Area 2021 (ha)	Area changed(ha)
Mangrove	4763.11	4365.13	-397.95
Other Veg	2643.81	4848.80	2205
Mud	15058	6223.75	-8834.21
Saline area	7138.32	2740.12	-4398.20
Water	44176.4	55602.70	11426.20

5. CONCLUSION:

According to the current study, mangrove areas have shrunk during the previous four years. To prevent further coverage loss, the area must be protected with systematic monitoring and control techniques. Remote sensing technology can be used for routine mapping and monitoring, especially when combined with digital classification methods. Table 1. shows the estimated area of changes.

REFERENCES:

1. Giri, C.; Ochieng, E.; Tieszen, L.L.; Zhu, Z.; Singh, A.; Loveland, T.; Masek, J.; Duke, N. Status and distribution of mangrove forests of the world using earth observation satellite data. Glob. Ecol. Biogeogr. 2011, 20, 154–159.
2. Spalding, M.; Kainuma, M.; Collins, L. World Atlas of Mangroves, 2nd ed.; Earthscan: London, UK, 2010; p. 350.
3. Dittmar, T.; Hertkorn, N.; Kattner, G.; Lara, R.J. Mangroves, a major source of dissolved organic carbon to the oceans. Glob. Biogeochem. Cycle 2006, 20, doi:10.1029/2005GB002570.
4. Cornforth, W.A.; Fatoyinbo, T.E.; Freemantle, T.P.; Pettorelli, N. Advanced land observing satellite phased array type L-band SAR (ALOS PALSAR) to inform the conservation of mangroves: Sundarbans as a case study. Remote Sens. 2013, 5, 224–237.
5. Giri, C.; Long, J.; Abbas, S.; Murali, R.M.; Qamer, F.M.; Pengra, B.; Thau, D. Distribution and dynamics of mangrove forests of South Asia. J. Environ. Manag. 2015, 148, 101–111.
6. Kamal, M.; Phinn, S. Hyperspectral data for mangrove species mapping: A comparison of pixel-based and object-based approach. Remote Sens. 2011, 3, 2222–2242.
7. Sulong, I.; Mohd-Lokman, H.; Mohd-Tarmizi, K.; Ismail, A. Mangrove mapping using Landsat imagery and aerial photographs: Kemaman district, Terengganu, Malaysia. Environ. Dev. Sustain. 2002, 4, 135–152.
8. Pourebrahim, S.; Hadipour, M.; Mokhtar, M.B. Impact assessment of rapid development on land use changes in coastal areas; case of Kuala Langat district, Malaysia. Environ. Dev. Sustain. 2014, 17, 1003–1016.
9. Roslani, M.; Mustapha, M.; Lihan, T.; Juliana, W.W. Applicability of Rapideye satellite imagery in mapping mangrove vegetation species at Matang mangrove forest reserve, Perak, Malaysia. Environ. Sci. Technol. 2014, 7, 123–136