

Evaluating the Land Use and Land Cover Change of Unprotected Wetland Situated in the Khultabad Tehsil of Aurangabad District, Maharashtra

A. M. Pimparkar¹, *S. N. Patil², A. K. Kadam³, B. D. Patil⁴, Y. J. Mahajan⁵

^{1,2,3,4,5}School of Environmental and Earth Sciences, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon, Maharashtra, India

*Corresponding author: drsnpatil9@gmail.com

Abstract: *The study investigated the effects of Land Use and Land Cover (LULC) change dynamics on the state and status of an unprotected wetland in semi-arid regions of India. The effects of the LULC shift on the wetland during a 15-year period were mapped and quantified using the long-term satellite image data collection. Using the supervised analysis approach, a multi-source satellite image analysis was carried out. The complete research area's Landsat data series were utilised to evaluate, map, and track LULC change over time. Wetland detection maps created for the 2007–2013–2016–2022 temporal periods were examined. According to the findings, the amount of agricultural land remained essentially constant during the comparative period, ranging from 29.71% to 31.43%. The percentage of waste land progressively grew from 14.29% to 22.86% between 2007 and 2016. By 2022, the plantation area will have shrunk from 15.43% in 2007 to 5%. Similarly, it is anticipated that the habitat would grow from 8.07% in 2007 to 12.93% in 2022. Farmland and fallow area figures are different because both land uses were determined using different season satellite pictures. But there is no obvious increase or decrease in the total agricultural area. These results may be used to create specialised wetland management plans and perhaps even a framework for restoring wetlands that are not currently under protection.*

Keywords: LULC, Wetland, Khultabad Tehsil, Maharashtra

REFERENCES

- [1]. Adeli, Sarina, Bahram Salehi, Masoud Mahdianpari, Lindi J. Quackenbush, Brian Brisco, Haifa Tamiminia, and Stephen Shaw., Wetland monitoring using SAR data: A meta-analysis and comprehensive review., Remote Sensing 12, no. 14, pp. 2190 (2020).
- [2]. Alqurashi A, Kumar L, Investigating the use of remote sensing and GIS techniques to detect land use and land cover change: a review. Adv Remote Sens. (2013). Doi: <https://doi.org/10.4236/ars.2013.22022>
- [3]. Berkessa, Yifru Waktole, Tadesse Weyuma Bulto, Mitiku Badasa Moisa, Mengistu Muleta Gurmessa, Birhanu Chalchisa Werku, Getachew Yigezu Juta, Dessalegn Obsi Gameda, and Daniel Assefa Negash., Impacts of urban land use and land cover change on wetland dynamics in Jimma city, southwestern Ethiopia., Journal of Water and Climate Change 14 (7), pp. 2397–2415, (2023). Doi: <https://doi.org/10.2166/wcc.2023.102>
- [4]. Chamling, M. and Bera, B., Spatio-temporal patterns of land use/land cover change in the Bhutan–Bengal foothill region between 1987 and 2019: study towards geospatial applications and policy making. Earth Systems and Environment, 4, pp.117-130, (2020). doi: <https://doi.org/10.1007/s41748-020-00150-0>
- [5]. Jamal, Saleha, and Wani Suhail Ahmad., Assessing land use land cover dynamics of wetland ecosystems using Landsat satellite data., SN Applied Sciences 2 (2020): pp.1-24. Doi: <https://doi.org/10.1007/s42452-020-03685-z>
- [6]. Nilesh Patil, Patil Vilas, Patil Sanjaykumar, Patil Bhavesh, Suryawanshi Arvind, Jadhav Kavita, Analysis of Urban Growth and Its Impact on Agriculture Land around the Chalisgaon City in Jalgaon District of

- Maharashtra, India: A Remote Sensing and GIS Based Approach., Journal of Geomatics 16, no. 2 pp. 213-224, (2022). Doi: <https://doi.org/10.58825/jog.2022.16.2.51>
- [7]. Ozesmi, Stacy L., and Marvin E. Bauer. "Satellite remote sensing of wetlands." Wetlands ecology and management 10, pp. 381-402(2002).
- [8]. Rahimi L, Malekmohammadi B, Yavari AR, Assessing and modeling the impacts of wetland land cover changes on water provision and habitat quality ecosystem services. Nat Resour Res 29, pp. 3701–3718, (2020). doi: <https://doi.org/10.1007/s11053-020-09667-7>
- [9]. Suvarna, K., Pendke, M.S., Patil, S.N. and Patil, B.D., An Integrated Remote Sensing & GIS Techniques Based Approach to Study Spatial Distribution of Parameters Controlling Groundwater Contamination in Parbhani Tehsil of Maharashtra State, India. Bulletin of Pure & Applied Sciences-Geology, 41(2), pp.212-227. (2022). Doi: <http://dx.doi.org/10.5958/2320-3234.2022.00018.X>
- [10]. Thamaga, Kgabo Humphrey, Timothy Dube, and Cletah Shoko., Advances in satellite remote sensing of the wetland ecosystems in Sub-Saharan Africa., Geocarto International 37, no. 20, pp.5891-5913, (2022).
- [11]. Wang L, Dronoval, Gong P, Yang W B, Li Y R, Liu Q., A new time series vegetation–water index of phenological–hydrological trait across species and functional types for Poyang Lake wetland ecosystem. RemoteSensEnviron.125: pp. 49–63 (2012).