A systematic review of machine learning algorithms for land use land cover dynamics

Shail Ratna Gairola Dr. Sameer Saran Prof. Y. P. Raiwani

Research scholar H N B Garhwal University DGM NRSC/ISRO Professor HNBGU

[shailrgairola@gmail.com](mailto:shailrgairola@gmail.com) [saran.iirs@gmail.com](mailto:saran.iirs@gmail.com) yp\_raiwani@yahoo.com

**Abstract**. Land use and land cover (LULC) dynamics play an important role in environmental planning, resource management, and sustainable development. With the advent of remote sensing technology and the availability of large-scale datasets, machine learning algorithms have emerged as powerful tools for analyzing and predicting LULC changes. This paper provides a comprehensive review of the application of machine learning algorithms for LULC dynamics. It discusses various algorithms, data sources, and methodologies used in the field, highlighting their strengths and limitations. The review also identifies key challenges and future research directions to enhance the effectiveness of machine learning in LULC analysis.