Role of Artificial Intelligence in Environmental Management

Manisha, Assistant Professor, Manohar Memorial College of Education, Fatehabad

Abstract

Environmental degradation, climate change, biodiversity loss, and pollution have intensified the need for innovative solutions in environmental management. Artificial Intelligence (AI) has emerged as a transformative technology capable of enhancing environmental monitoring, predictive modeling, and sustainable resource management. This paper examines the role of AI in environmental management through data-driven approaches, machine learning algorithms, remote sensing integration, and decision-support systems. AI enables real-time monitoring of environmental indicators such as air quality, water resources, deforestation, and climate variability by processing large-scale datasets from satellites, Internet of Things (IoT) sensors, and historical environmental records. Studies indicate that AI-based predictive models often outperform traditional statistical methods in accuracy and scalability. Applications include flood forecasting, air pollution prediction, water quality assessment, biodiversity tracking, and smart urban planning. Despite its benefits, AI adoption raises ethical and governance concerns, including algorithmic bias, transparency, data privacy, and unequal access to technological infrastructure. The paper also discusses challenges related to data quality, model interpretability, and institutional capacity. Finally, recommendations are provided for responsible AI implementation in environmental governance, emphasizing transparency, interdisciplinary collaboration, and policy integration. AI-driven environmental management represents a shift from reactive to proactive and predictive environmental governance, enabling resilient and sustainable ecological systems in the face of global environmental challenges.