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*Department of Environmental Science*

MSS's Arts, Science & Commerce College, Ambad, Dist. Jalna

(Maharashtra-India)

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**Role of Artificial Intelligence in Sustainable  
Development & Environmental Challenges**

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## Editorial Message

The **Department of Environmental Science**, represents a landmark exploration into the **Role of Artificial Intelligence in Sustainable Development and Environmental Challenges**. As we stand at a global crossroads, the research compiled here demonstrates that the intersection of digital innovation and ecological stewardship is no longer a luxury, but a necessity. By leveraging Artificial Intelligence (AI), we are moving from traditional, reactive conservation methods toward proactive, data-driven solutions. From harnessing AI for precision plant identification and forest fire buffer zone mapping to developing complex mathematical frameworks for predictive modeling, these papers illustrate a future where technology acts as a powerful ally to nature.

While the focus is on cutting-edge innovation, this collection remains firmly anchored in the essential bedrock of empirical biological research. The transition to a "smart" environment is only possible through the rigorous field studies presented here—such as the phytoremediation of wastewater using *Lemna minor*, air quality assessments in Chhatrapati Sambhajnagar, and biodiversity surveys across the Jalna district. By combining the "brain" of AI with the "heart" of environmental chemistry and field biology, we ensure that our industrial growth and urban expansion remain within the safe boundaries of our ecosystem.

The significance of this subject extends deeply into the fabric of society and human life. For the general public, the integration of AI in environmental monitoring leads to direct benefits such as cleaner air, safer water, and enhanced public health through early-warning systems for pollutants. Furthermore, the inclusion of multidisciplinary studies—ranging from the legal accountability of AI to its role in mental health and the preservation of historical heritage—ensures that our technological journey is ethical, culturally sensitive, and human-centric.

For **students and researchers**, this volume opens a new frontier of professional growth. Students are equipped with "future-ready" skills that blend environmental science with digital literacy, preparing them for a modern workforce that demands cross-disciplinary expertise. For researchers, AI offers high-precision tools to process massive datasets and model complex environmental economics, bridging the gap between scientific discovery and government policy. Ultimately, this editorial collection serves as a call to action for all stakeholders to embrace a future where technology, law, and environmental ethics operate in total harmony for the benefit of all living beings.

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