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DIGITAL BIODIVERSITY FOR SUSTAINABLE LIVING

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Introduction

In today's digital age, biodiversity, which includes genetic, species and ecosystem diversity, is no longer studied only in the field. Digital technologies have become the base in which we understand, monitor, and conserve biodiversity to support sustainable life (Freitas Gouveia, 2025). We see the use of big data, AI, the Internet of Things (IoT), remote sensing, open data and citizen science applications, which in turn enable faster, more accurate and comprehensive data collection and analysis (Rahmati, 2024). Digital technology speeds up monitoring processes and also raises public awareness of the issue of biodiversity at the same time, which in turn supports global sustainable development and ensures the stability of ecological systems that are key to food security, clean water and human well-being (Trantas et al., 2025).

The Role of Digital Technology in Biodiversity

Digitalisation has presented new sources with respect to biodiversity monitoring at a global scale. One such event is the Digital with Purpose Global Summit, which advocated the use of digital instruments to enhance the knowledge and strategies of conserving biodiversity and, at the same time, harmonised the same to the objectives pursued by the Sustainable Development Goals of the UN (Freitas & Gouveia, 2025). Global information systems and open data platforms assist in making the collaboration and knowledge sharing between researchers, policymakers, and the population more effective (Khabibullaev, 2024). The iNaturalist citizen science mobile application is one example of how people can use their mobile devices to record and share observations of species. The data collected is analyzed by researchers to produce maps of where species are located and track changes within ecosystems, improving management of biodiversity (iNaturalist, 2025; Observation.org, 2026). Additionally, through the Ocean Biodiversity Information System (OBIS), scientists have a source for research and monitoring marine biodiversity around the globe from a single database (OBIS, n.d.).

AI and Data Analytics in Biodiversity Monitoring

Biodiversity data analysis benefits greatly from the use of machine learning and artificial intelligence because they are capable of automating the recognition of species and analysing patterns, tasks that are often impossible or very challenging for human beings to accomplish. This greatly increases the ability to monitor and manage biodiversity. Recent work in urban biodiversity (Rahmati, 2024) has shown that artificial intelligence will provide an over a 90% accuracy rate when detecting a species or monitoring habitat and provides additional understanding of how humans have impacted biodiversity. The BioAnalyst model also demonstrates the artificial intelligence-based approach's ability to analyse multiple datasets on biodiversity at once, and is able to use climate and related data to predict changes in species

populations and ecosystem patterns. These results will provide decision makers with a solid foundation for developing a responsive and effective policy to conserve biodiversity (Trantas et al., 2025).

Challenges in Digitalizing Biodiversity

Even with the great promise of digitalisation, there are several barriers to overcome. Many areas of the world do not have equal access to advanced technology and digital data; thus, there are gaps in knowledge and power across populations (Freitas & Gouveia, 2025). In addition, the use of digital technologies often requires large amounts of energy and infrastructure, both of which can increase the carbon footprint and contribute to electronic waste (e-waste), leading to environmental challenges (Freitas & Gouveia, 2025). The quality of data is another major obstacle that must be overcome. In order for scientists to be able to use data that is obtained through citizen science or through a variety of digital platforms, the data must be standardized so that it can be considered reliable for the purposes of scientific analysis. When data is not handled under strict standardization, then the data provided through citizen science has the possibility of containing bias or having errors, which can adversely affect the decisions made about managing biodiversity (Khabibullaev, 2024).

Digital Biodiversity and Sustainable Living

Through monitoring ecosystems and species that inhabit them digitally, as well as through education, the creation of sound policies, and developing economic innovations, digital biodiversity assists in promoting sustainable living practices. Younger generations may be more aware of the necessity for healthy ecosystems when utilizing digital learning tools and virtual reality to engage in the issues associated with them, thus influencing social and cultural norms toward the adoption of sustainable lifestyles (Rejeki et al., 2024). Digital data provides empirical support within the realm of public policy for developing results-oriented programs related to biodiversity conservation with the planning and implementation of such programs through agriculture/environmental schemes that are focused on conserving local species and ecosystems (Freitas & Gouveia, 2025). The advent of digital technologies also creates new economic opportunities for entrepreneurs and other innovative individuals who seek out ways through which to utilize technology in order to achieve environmental goals, including developing ecosystem-based tourism businesses and other ventures with real-time monitoring capabilities of the effects of their activities on the environment (Khabibullaev, 2024).

Conclusion

Digital biodiversity is a necessary element in the maintenance of sustainable living in the 21 st century. Digital technology not only acts as a tool of data collection, but it can also be used as a tool of learning, monitoring, policy-making, and global collaboration (Freitas & Gouveia, 2025; Rahmati, 2024; Trantas et al., 2025). Despite the issues of technology availability, environmental effects of digital technologies, and data quality, the combination of AI, open data, and citizen science presents major opportunities to comprehend and preserve ecosystems in a more responsive, efficient way. True success lies in the unity of public, industrial, and international communities to make sure that the rewards of digital biodiversity are being achieved fairly and at the same time in a sustainable manner.

Reference