Innovations in Technology for Species Diversity and Habitat Conservation

Earth is an aesthetic planet that encompasses a variety of lifeforms at all scales of biological organization, ranging from genes to species to ecosystems. Biodiversity is rich in the world's tropical regions with a surplus number of natural resources. The unprecedented increase in the global need and dependence of living beings on Earth has become a significant threat to biodiversity. Biodiversity provides many essential ecosystem services that are integral for the survival of life on Earth, and the health communities ultimately rely on the well-functioning ecosystems. Human interference and industrialization have created an imbalance in the ecosystem, leading to habitat loss. Conservation of the habitat and biodiversity is the need of the hour and, in many ways, related to balancing the food chain, maintaining the biogeochemical cycle, replenishing the natural resources, and producing clean water and air.

Employing the latest and inspiring technological advances that assist in conserving habitat and species diversity may raise global awareness towards protecting the environment. The quest to mitigate the biodiversity crisis will require more excellent invasive technologies to sustain life on Earth. It can be implemented by harnessing innovative methods like satellite tracking, artificial intelligence, bioacoustics, drones, biomimicry, remote sensing, and many more. The technology could be utilized strategically to assess biodiversity hotspots where human interference should be limited. Using drones can keep an eye on species diversity and help restore and replant the natural habitat. Satellite tracking is an effective tool for visualizing and analyzing the species in inaccessible environments to humans. These innovations may pave the way for improving research on migration, predator-prey interactions, and restoration of the endangered habitat. Technology innovation can also drive economic and environmental development by building symbiotic relationships with ecosystem restoration and habitat loss. Conservational biologists can also use other revolutionizing technologies and tools like machine learning, quantum computing, and material synthesis. Advanced imaging techniques like hyperspectral imaging can provide detailed parameters of biological processes in both aquatic and terrestrial systems. Remote sensing enables conservation biologists to monitor healthy habitats and alerts them in case of failing trophic systems. The main advantage of exploring these tools in conservation research across the globe is that it has reduced the cost of data collection and analysis. On the other hand, these innovations also have some limitations that may affect the survival of the indigenous population, who are the prime custodians of the ecosystem. However, on the whole, these platforms have contributed a lot to the learning community in conservation and scientific discovery. Hence, this article concludes that innovation and technology are essential to emphasize the preservation of our planet.

Scope of the special issue include but are not limited to the following topics:

- Application of machine learning algorithms for species distribution modeling and predictive habitat mapping.
- Impact of climate change on species diversity and habitat dynamics using advanced modeling techniques.
- Modelling to evaluate the effectiveness of ecological corridors in mitigating habitat fragmentation and promoting species movement.
- Role of ecosystem services valuation in informing conservation policies and decision-making processes.
- Role of Artificial Intelligence and Machine Learning Algorithms in the restoration of ecosystem and biodiversity.
- AI-assisted Interactive Systems for the conservation of ecosystem services.
- Decision support systems and scenario modeling tools for adaptive management of conservation interventions in dynamic landscapes.

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Submission Guidelines/Instructions

Please refer to the Author Guidelines to prepare your manuscript. When submitting your manuscript, please answer the question: "Is this submission for a special issue?" by selecting the special issue title from the drop-down list.