

Impacts technology on the environment & advancement on nature resources

Dr. Raju Porika¹, Dr.Rajitha Tungani², Gosikonda Bhoomeshwar³ and Pattem Brahman⁴

¹Assistant Professor of Zoology, ²Lecturer in Botany, Government Degree College, Mahadevpur, Jayashankar Bhupalpally, Telangana, India

³Lecturer in Zoology, Telangana Minority Residential School & College-Boys, Korutla, Jagityal, Telangana, India

⁴Assistant Professor of Zoology, Government Degree College, Ramannapetta, Yadadri Bhuvanagiri, Telangana, India

*Corresponding author Email: raju42648@gmail.com

Manuscript details:

Available online on <http://www.ijlsci.in>

ISSN: 2320-964X (Online)

ISSN: 2320-7817 (Print)

Cite this article as:

Dr. Raju Porika, Dr.Rajitha Tungani, Gosikonda Bhoomeshwar and Pattem Brahman (2026) Impacts technology on the environment & advancement on nature resources, *Int. J. of. Life Sciences*, Special Issue, A22, 85-92.

<https://doi.org/10.5281/zenodo.21312436>

Article published in the Special Issue of the Two-Day National Seminar on *Emerging Frontiers in Multidisciplinary Research in Life Sciences (EFMRLS-2026)*, held on 25th & 26th March 2026. Organized by the Departments of Zoology and Botany, Nukala Ramachandra Reddy (NRR) Government Degree College (Autonomous), Mahabubabad-506101, TS, India.



Open Access This article is licensed under a Creative Commons Attribution 4.0 International

License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third-party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>

ABSTRACT

The term 'Technology' refers to the application of scientific knowledge for practical purposes and the machinery and devices developed as a result. We are currently living in a period of rapid change, where technological developments are revolutionizing the way we live, at the same time as leading us further into the depths of catastrophe in the form of climate change and resource scarcity. It increases industries coupled with technological progress affects the environment in a number of ways. Using of computers both in the home and universe has a considerable impact on the environment. Emission of large quantity of greenhouse gases such as CO₂, SO₃ in the air by large industries causes air pollution which in turn has degraded environment. Further, technology contributes to depletion of resources. New technological goods are often burdensome to the environment. While technology can be a powerful force to improve our standard of living, it comes at a cost. People currently value the efficient use of resources and technology, one way through which human beings have made extensive use of resources in a very efficient way to encourage minimal wastage. The New knowledge in such areas as materials science and industrial design is used to create new eco-friendly materials and processes, the long-run these simple changes will have a considerable impact on the environment and help to preserve forests. The industrial revolution has brought about new technologies with immense power. The industrial revolution has brought about new technologies with immense power.

Keywords: Technology, Industrialization, Advancement and Environment, Technology Positive and Negative impact on the Environment, AI in *Biodiversity, forest*, Climate, Water, Agriculture and Wildlife

INTRODUCTION

The impact of technology on the environment has been highly negative, the concept of Environmental Technology could save our planet from the harm that has been done. The term 'technology'

refers to the application of scientific knowledge for practical purposes and the machinery and devices developed as a result. We are currently living in a period of rapid change, where technological developments are revolutionizing the way we live, at the same time as leading us further into the depths of catastrophe in the form of climate change and resource scarcity. It drives environmental degradation through resource depletion, energy-intensive data centers, and e-waste, while simultaneously providing critical solutions via renewable energy, AI-driven monitoring, and sustainable manufacturing. Key advancements enable better resource management, though rapid technological evolution often outpaces environmental sustainability, threatening biodiversity and ecosystems.

Technology significantly impacts the environment through increased energy consumption, hazardous electronic waste (e-waste), and accelerated depletion of natural resources like minerals and fossil fuels. While driving pollution through industrialization, technological advancement also offers solutions, such as green technologies, renewable energy, and improved resource management tools, which aid in environmental protection and sustainability.

At the beginning of the third millennium, many global environmental problems, such as diminishing biodiversity, climate change, ozone depletion, over population, and hazardous wastes, are causing significant impacts. The modern world is basically established on high technologies. The industrial revolution has brought about new technologies with immense power. The effects of technology can be good and bad depending on their effects on the nature or the environment. The random utilization of high-tech applications may spoil the ecological balance of the earth and the negative effects are slow down the health of all life on this earth.

Negative Environmental Impacts of Technology

Resource Depletion & Mining: Demand for minerals and rare earth metals for electronics accelerates deforestation and depletes non-renewable resources.

E-Waste & Pollution: Rapid obsolescence generates massive amounts of toxic e-waste (lead, mercury),

contaminating soil and water, while manufacturing creates high pollution.

Greenhouse Gas Emissions: Data centre's, global transportation, and energy consumption contribute significantly to carbon emissions, accelerating climate change.

Habitat Destruction: Land clearance for infrastructure development disrupts ecosystems and reduces biodiversity.

OBJECTIVE OF THE STUDY

- To study the AI technologies to planetary health in one of four areas: biodiversity, climate, water, and agriculture
- To identify the positive and negative impact on the environment

METHODOLOGY

Impact of Environment

Unsustainable consumption and production practices not only deplete natural resources through the use of material inputs, but also cause environmental impacts as a result of the extraction, processing, manufacturing, consumption and waste disposal at every stage of a product or service lifecycle. These environmental impacts of unsustainable consumption and production are driving the three planetary crises we are currently facing: climate change, biodiversity loss, and pollution.

Climate change

One of the most well-known environmental impacts of unsustainable production and consumption is climate change, which is primarily caused by burning fossil fuels like coal, oil and gas to create the energy that powers economic activity. This energy is used for heavy machinery for mining and industrial farming; factories for processing and manufacturing products; trucks, ships and planes for transporting products; energy related to consuming products and services; as well as the energy to power the necessary disposal and treatment of waste leftover from production and consumption.

In addition to energy, climate change is also caused by the extraction and production of certain materials, which can

release greenhouse gases as a result of chemical processes like in making steel for buildings and infrastructure. The production of food and agricultural products is also a major source of greenhouse gases, through the use of fertilisers containing nitrogen, as well as the raising of livestock which excrete methane, and the clearing of land for farming and grazing cattle which reduces the amount of carbon that can be captured and stored by trees and vegetation and increases the amount of CO₂ in the atmosphere.

Biodiversity loss

The ever-increasing amount of land that needs to be used for production and consumption, such as for agricultural, raw material extraction, forestry, or buildings and infrastructure, means clearing the land and removing all natural trees and vegetation. This destroys the biodiversity of the plant life on that land, and also harms animal and insect life through the loss of their habitats. The consequences of this biodiversity loss are dire and are already damaging the life-supporting systems of food, water and air on which all living things on Earth depend.

Pollution

The amount of pollution that is created as a result of unsustainable production and consumption is also causing great damage to the planet's life-supporting systems of food, water and air, and as a result harming human health and the health of the planet. While rubbish in the form of packaging or disused products is a major issue that harms both life in the oceans as well as on land, pollution doesn't just happen at the end of a product or services' lifetime. Pollution takes places at every stage of the value chain of a product or service, during the extraction of raw resources, the processing and manufacturing of goods, as well as distribution and consumption.

The consequences of these environmental impacts caused by unsustainable consumption and production can have a rebound effect that further reduces the quality and quantity of natural resources available. For example, unsustainable use of fertilisers in farming can end up reducing the quality of soil and water that is needing for future farming and fishing.

These environmental impacts are also deeply interconnected and affect one another, for example

pollution contributes to climate change, and biodiversity loss is exacerbated by both climate change and pollution.

It is possible to significantly reduce the significant environmental impact of technology. As consumers, we often have more power than we realize to reduce resource use and protect the environment. This will contribute to reducing air and water pollution. With the rise of various types of technology, there are several negative and positive environmental impacts on our planet. Energy consumption is increasing due to the rise of modern technology and globalization.

- Impact of computers and the Internet have unfortunately been negative, much of it has also been positive. It helps us develop and produce new materials and technologies that are sustainable and do not harm the environment.
- It allow to monitor and study our environment to better understand
- It helps to create smarter technologies that respond to adjust themselves to reduce their environmental
- It allows having a worldwide virtual laboratory, so that experts from all fields can share their research,
- experience and ideas to come up with better, smarter solutions.

Renewable Energy Technology and Endangered life

One of the most significant ways to contribute to saving the environment is to sustainably generate and use the available energy resources. Due to the non-renewability of fossil fuels like coal, petroleum, and natural gas, replace with new ways to generate energy with technology. Energy storage includes developing low-cost storage solutions for energy in the form of modern batteries and improved fuel cells. Some examples of technology efficient energy solutions are fuel cells, lithium-air batteries, hydrogen energy storage, and thermal energy collectors.

- Remote monitoring - drones to detect the wildlife sounds and noises and any predator harm or natural distress.
- Smart collars embedded with GPS, meters, and sensors to keep track of endangered species like

Positive impacts of technology advancement on nature:

New knowledge in such areas as materials science and industrial design is used to create new eco-friendly materials and processes.



Figure 1. Renewable energy resources

Recyclable materials: Advanced technology has enhanced the use of materials that can be recycled over and over again, hence cutting on the use of raw materials and the amount of waste produced.

- **Optimized supply chains:** The business has also benefited from advances in technology by way of supply chain management, which can now be done efficiently to minimize wastage as well as the utilization of resources.
- **Efficient manufacturing processes:** The remaining one has seen an improvement in manufacturing technologies, global resource use, waste, and energy consumption.

Renewable Energy Sources:

One of the critical changes that have occurred in the fight against climate change is the conversion to green energy. Modern innovations have come up with newer ways that tap cheaper sources of renewable energy sufficient to help us cut down on the use of fossil energy sources. Some notable developments solar energy, wind energy and geothermal energy.

Negative impacts of technology on nature-pollution and e-waste:

Due to high levels of innovation especially in the manufacturing of technological products, pollution and especially 'e-waste' has tremendously improved.

The production and disposal of electronic devices have devastating environmental consequences of Toxic chemicals, E-waste dumping and Resource depletion. Climate change and carbon footprint: Technological development has also compounded the carbon footprint of all the activities being undertaken since the energy required to support the technological enhancement is obtained from carbon-emitting sources. The consequences include: Greenhouse gas emissions. Energy consumption and Resource extraction.

Deforestation: The natural materials required for the manufacturing of technologies and other gadgets are extracted hence destroying the natural environment such as forests, which are the natural homes of various species of animals and plants.

Habitat destruction: The construction of such required structures as data centers and server farms for technological necessities has led to habitat destruction and invasions.

Wildlife displacement: Some of the changes include; The noise of the gadgets has shifted the noise quotas of the animals hence cornering other species, and the light which is associated with the devices has intervened on the natural behavior of other species of animals.



Figure 2. Negative impacts of technology on nature-pollution and e-waste:



Figure 3. climate change and carbon foot print

Loss of Biodiversity

Extinction of species: Civilization annihilation of the natural biomes and other systems leads to the wiping out of many species; hence unbalancing the earth's balance.

Disruption of food chains: The extinction could in turn the other forms of life to be destroyed hence the breaking of food pyramids.

Accelerated climate change: The indicated further usage of technologies by people would increase the energy consumption rates aggravating climate change, thunderstorms, hurricanes, and adverse effects on human

life. Destruction of natural habitats, Disruption of natural processes and Increased pollution.

Social Impacts

Displacement of communities: The creation of infrastructure needed for technology development may lead to people's relocation, hence resulting in sociocultural consequences.

Increased inequality: But a problem here is that the differential distribution of technological resources may widen the gap between the social and economic members.

Innovation and Design: Design of products and systems to make them easily recyclable and reusable, minimizing waste and pollution, Bearing in mind the consequences of Implanting modern technologies, Creation of sustainable supply chain management and sourcing. The social issue that came up in the interaction involved a synergistic relationship between the Tech industry and the Environmental industry. Such interaction is important, as only the union of the technical and environmental spheres can create worthwhile solutions to environmental problems. This includes:

Technology Companies and Environmental Non-Governmental Organizations, Dissemination of knowledge and experience and information transfer. In this context, one may properly speak about the co-development of technologies and practices, sustainable for the environment.

Therefore, when we incorporate sustainable and environmentally friendly technologies individuals and the society at large will respect the environment and thus provide future generations with a befitting environment to live in.

DISCUSSION

The Need for Sustainable and Eco-Friendly Technologies:

This becomes a call to action to find solutions to the environmental problems that threaten the future of the planet. In the present epoch when the whole world struggles with climate change issues, environmental pollution, and social injustice, sustainable, and green technologies become a critical imperative. Despite the advantages that are associated with the growth of technology, it has proved to be a threat to environmental conservation and the general well-being of man.

These issues make it possible to overemphasize the importance of adopting green and sustainable technologies that will contribute to the events of the society's available resources vestment in Green Technologies

Artificial Intelligence (AI)

- AI technologies to planetary health in one of four areas: biodiversity, climate, water, and agriculture.
- AI is having an impact on agricultural practices and will soon transform how farming is done in industrialized nations, reducing our reliance on pesticides and drastically lowering water consumption.
- AI will make autonomous vehicles more navigate more efficiently, lowering air pollution.
- AI is being deployed by material scientists to develop biodegradable replacements to plastics and develop strategies to clean our oceans, which receive some eight million metric tons of plastics annually.

Design of products and systems to make them easily recyclable and reusable.

- Minimizing waste and pollution.
- Bearing in mind the consequences of Implanting modern technologies.
- Creation of sustainable supply chain management and sourcing.
- The social issue that came up in the interaction involved a synergistic relationship between the Tech industry and the Environmental industry.

We also need to find ways to effectively manage new technologies so that they continue to have a beneficial impact on ecosystems. Soil pollution from global warming, ozone layer depletion, hazardous waste, acid rain, radiation disasters, climate change, desertification, deforestation, noise and loss of biodiversity is shared by countries around the world. The knowledge and consistent use of technology gained through human resource development, combined with the motivation and positivity of people, both individually and as nations, can pave a sustainable path to saving the world from possible man-made disasters.

The prospects for the further development of technology and the state of nature are closely connected, and the decisions made nowadays will affect future generations.

Innovations are good and should be sought after but should not be sought at the detriment of the nature of this world. The path to the future in which technology and nature are closely intertwined consists of giving preference to sustainable and environmentally friendly technologies, investing in green technologies, and

promoting cooperation between the IT industry and the branch of environmental protection.

Technology is the future area of investment; it remains our responsibility to keep it green. The best thing is to continue supporting development but at the same time ensure that the environment and the beauty of the created systems do not deteriorate in any given way, which has turned technology into a natural human resource.

CONCLUSION

Global warming, soil contamination, ozone depletion, hazardous wastes, acid rain, radioactive hazards, climate change, desertification, deforestation, noise, and diminishing biodiversity are illustrations of current environmental problems that are common to nations worldwide. The growth in human population and rising or deteriorating living standards due to use or misuse of technology are intensifying these problems. If the existing human–environment interaction continues and if the human population increases with the current trends, the evidence shows that irreversible environmental damage may be inflicted on this fragile planet.

The impact of technological advancement on nature is a complex and multifaceted issue, but one thing is clear: This led me to argue another tenet that we should hold: our choices exist. It is high time we select a course that will not only guarantee the advancement of society but also sustain the environment in the future when there will be a kind of integrated society of technologies and nature. Our technological innovations have the potential to harm our environment, but if we use them wisely and develop sustainable ideas, they could also help solve the ecological problems.

Technology is the future area of investment; it remains our responsibility to keep it green. The best thing is to continue supporting development but at the same time ensure that the environment and the beauty of the created systems do not deteriorate in any given way, which has turned technology into a natural human resource.

In conclusion, the impact of technological advancement on nature is a complex and multifaceted issue, but one thing is clear: This led me to argue another tenet that we should hold: our choices exist. It is high time we select a course

that will not only guarantee the advancement of society but also sustain the environment in the future when there will be a kind of integrated society of technologies and nature.

Acknowledgements

The present work acknowledged Innovations are good and should be sought after but should not be sought at the detriment of the nature of this world. The path to the future in which technology and nature are closely intertwined consists of giving preference to sustainable and environmentally friendly technologies, investing in green technologies, and promoting cooperation between the IT industry and the branch of environmental protection.

Conflict of Interest: The authors declare no conflict of interest in relation to this research.

Data Availability Statement: Not applicable.

Correspondence and requests for materials should be addressed to **Dr. Raju Porika**

Peer review information

IJLSCI thanks the anonymous reviewers for their contribution to the peer review of this work. A peer review file is available.

Reprints and permissions information is available at <https://www.ijlsci.in/reprints>

REFERENCES

- Ebenhard, T. (1995). Conservation breeding as a tool for saving animal species from extinction. *Trends in Ecology and Evolution*, 10, 438-443.
- International Resource Panel, United Nations Environment Programme (2009). *Assessing biofuels: towards sustainable production and use of resources*.
- Jahanger, A., Ogwu, S.O., Onwe, J.C., & Awan, A. (2024). The prominence of technological innovation and renewable energy for the ecological sustainability in top SDGs nations: Insights from the load capacity factor. *Gondwana Research*, 129, 381-397. <https://doi.org/10.1016/j.gr.2023.05.021>
- Jin, X., Ahmed, Z., Pata, U.K., Kartal, M.T., & Erdogan, S. (2023). Do investments in green energy, energy efficiency, and nuclear energy R&D improve the load capacity factor? An augmented ARDL approach. *Geoscience Frontiers*, 15, 101646. <https://doi.org/10.1016/j.gsf.2023.101646>
- Khan, I., Hou, F., & Le, H.P. (2021). The impact of natural resources, energy consumption, and population growth on

- environmental quality: Fresh evidence from the United States of America. *Science of the Total Environment*, 754, 142222. <https://doi.org/10.1016/j.scitotenv.2020.142222>
- Latif, N., Rafeeq, R., Safdar, N., Younas, K., Gardezi, M.A., & Ahmad, S. (2023). Unraveling the Nexus: The impact of economic globalization on the environment in Asian economies. *Research in Globalization*, 7, 100169. <https://doi.org/10.1016/j.resglo.2023.100169>
- Lin, Y., Mahmood, M.A., Meng, W., & Ali, Q. (2024). Green economy transition in Asia Pacific: A holistic assessment of renewable energy production. *Journal of Cleaner Production*, 437, 140648. <https://doi.org/10.1016/j.jclepro.2024.140648>
- McKinney, M.L. (1997). Extinction vulnerability and selectivity: combining ecological and paleontological views. *Annual Review of Ecology and Evolution*, 28, 495-516.
- Ni, Z., Yang, J., & Razzaq, A. (2022). How do natural resources, digitalization, and institutional governance contribute to ecological sustainability through load capacity factors in highly resource-consuming economies? *Resources Policy*, 79, 103068. <https://doi.org/10.1016/j.resourpol.2022.103068>
- Stuart, S.N., Chanson, J.S., et al. (2004). Status and trends of amphibian declines and extinctions worldwide. *Science*, 306, 1783-1786.
- Sun, Y., Usman, M., Radulescu, M., Pata, U.K., & Balsalobre-Lorente, D. (2024). New insights from the STIPART model on how environmental-related technologies, natural resources and the use of the renewable energy influence load capacity factor. *Gondwana Research*, 129, 398-411. <https://doi.org/10.1016/j.gr.2023.05.018>
- Zhou, X., Patel, G., Mahalik, M.K., & Gozgor, G. (2024). Effects of green energy and productivity on environmental sustainability in BRICS economies: The role of natural resources rents. *Resources Policy*, 92, 105026. <https://doi.org/10.1016/j.resourpol.2024.105026>

© The Author(s) 2026

Publisher's Note

IJLSCI remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.