iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** X **Month of publication:** October 2023

DOI: https://doi.org/10.22214/ijraset.2023.55966

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue X Oct 2023- Available at www.ijraset.com

Artificial Intelligence: A Ray of Hope for a Sustainable Future

Shraileen Kaur[1], Dr. Vivek Kumar[2]
[1]*Law Student, ICFAI University, Dehradun*
[2]*Faculty of law, ICFAI University, Dehradun*

Abstract: ***Artificial intelligence (AI) has a significant impact on the global economy. From eradicating hunger and poverty to establishing sustainable energy and gender equality, AI plays a crucial role in achieving environmental sustainability. Artificial intelligence is undeniably the best course of action for the protection and preservation of biodiversity. The rapid development of artificial intelligence and its wide-ranging effects on numerous industries call for an assessment of how these factors will affect the achievement of the Sustainable Development Goals (SDGs). The three subcategories of the SDGs are society, economics, and the environment. AI is used in a variety of environmental fields, including waste management, pollution control, agriculture, energy management, wildlife preservation, and natural resource conservation. In the long run, AI will assist energy systems that are more energy efficient and have a low carbon footprint, which is necessary to combat climate change. AI can assist in properly regulating the intricate ecosystem's structure and activities. In addition to the aforementioned uses, it can aid in decision-making and environmental planning by spotting trends in desertification across vast areas. Due to the development of numerous new technologies, AI can now be used in nations with diverse cultural values and economic statuses. The technique has become more well-known as a result, worldwide. Advanced AI-based product design, technology, and research may need a lot of computer power, which can be provided by big data centres. Such facilities have a significant carbon footprint and a high energy need. Although this kind of resource abuse has not been extensively reported, AI-based ecosystem knowledge may lead to resource exploitation.***

The necessary regulatory body must encourage and protect the development of AI. There will be a lack of safety, transparency, and morality as a result of the monitoring. Despite all the pros and cons of artificial intelligence, it is a matter of fact that the problems of air pollution, environmental degradation, ageing of the planet, etc. have only one solution, i.e., artificial intelligence. The development of AI which is more environmentally friendly today and in the future is necessary.

Keywords: Artificial Intelligence, Sustainable development, global economy, carbon footprint, Sustainable Development Goals.

I. INTRODUCTION

Environmental concerns have recently sparked public indignation, debates, conversations, awareness campaigns, and programs that have stoked interest in emerging technology like artificial intelligence. A multitude of outside applications employs the use of artificial intelligence (AI) fields, such as agriculture, waste management, clean energy, natural resource conservation, wildlife preservation, and waste and pollution control.[1] It is believed that these technological advances, also known as intelligent machines or AI, will have the most impact on the global market.

By 2030, it is predicted that AI would have considerable share in the global economy and might be worth up to $15.7 trillion, which is greater than the current production of China and India taken together.

According to the UN Artificial Intelligence Summit, which took place in Geneva in 2017 and discussed the technology (AI) that powers voice and facial recognition in smartphones, be used to support sustainable development and aid efforts to end world hunger and poverty as well as to preserve natural resources and save the environment.

A. Artificial Intelligence (AI)

The development of human intelligence by automated computer systems is known as artificial intelligence. Expert systems, machine learning, natural language processing, speech recognition, and machine vision are some specific uses of AI. Artificial intelligence

[1] Khakurel, The rise of artificial intelligence under the lens of Sustainability, MDPI. Multidisciplinary Digital Publishing Institute. https://www.mdpi.com/2227-7080/6/4/100 accessed on 25 April 2023.

can be used to forecast future states, computers typically ingest a substantial quantity of labelled training data, analyse it for correlations and patterns, and then apply these patterns to arrive at conclusions. Artificial intelligence's three main areas are learning, reasoning, and self-correction.[2]

B. Environmental Sustainability

Ecological equilibrium is key to preserving the environment. From the last 2000 years, humans have been carbonizing our planet, which has affected the climate. According to the Intergovernmental Panel on Climate Change (IPCC), the United Nations body tasked with assessing the science related to climate change, human actions have unquestionably affected the world, causing our atmosphere, seas, and land to warm.

As the repercussions of climate change continue to have severe effects, more governments, organizations, and individuals are embracing and supporting environmental sustainability. These many groups are collaborating to achieve the aspirational goal of decarbonizing the earth to preserve our global ecosystems for the benefit of future generations.[3]

C. Environmental Sustainability and AI

The discussion of artificial intelligence has become mainstream in recent years. Major strides in artificial intelligence have been made thanks to developments in other modern technologies such as big data, cloud computing, the Internet of Things (IoT), virtual reality, and more. AI applications will not only benefit society and the economy, but they will also revolutionize environmental sustainability. [4]

Given the volume and complexity of interactions that occur inside an ecosystem, scientists contend that one of the major obstacles to environmental sustainability is understanding how it functions. Simply put, neither the human brain nor conventional statistical methods are capable of analyzing the amount of information that is now available.

We can better comprehend the effects of the ecosystem on us and vice versa by using cutting-edge techniques and technologies. Large volumes of data may be collected by sensors, and AI can help analyse this data and create models to help people traverse these complexities and make quick judgments in unstable and uncertain situations. [5]

II. APPLICATIONS OF AI IN THE ENVIRONMENT

Many businesses, like Microsoft, Google, and Tesla, have spent a lot of money developing "Earth Friendly" AI systems while pushing the bounds of human ingenuity. For instance, Google's own DeepMind AI helped the corporation reduce the energy use of its data centres by 40%, increasing their energy efficiency and reducing overall GHG emissions. The development of these AIs not only improves energy efficiency but also reduces carbon emissions, as data centres alone consume 3% of the world's energy each year help establish microgrids, integrate renewable energy sources, and provide electricity access to isolated communities.

Instead of using conventional power grids, which can be wasteful due to erratic power distribution, smart grid installation in cities can use artificial intelligence techniques to regulate and control specific aspects of the local power grid to deliver precisely the amount of electricity required or requested by its dependents.

As AI-driven autonomous cars get ready to enter the automotive sector, to lessen the carbon impact and the overall number of cars on the road, measures including route optimization, eco-driving algorithms, and ride-sharing services will be used. In terms of artificial intelligence (AI), it's a momentous time. Big data, technological advancements, newly developing potent AI algorithms, and an open-source community for tools that lower entry barriers for both businesses and start-ups are all coming together.

As a result, AI is being thrust into our daily lives from city navigation to ride-sharing to our energy networks to the internet world.

Since 2018, everyone is beginning to recognize the economic benefits of AI. Every year, technology is added to more and more objects, and as it gets more and smarter, it speeds up human creativity. But as AI gains strength, autonomy, and a wider range of applications and effects, the unresolved problem of AI safety becomes more and more important. Bias, subpar judgment, lack of transparency, employment losses, and malicious usage of AI, such as autonomous weapons, are all risks.

---

[2] Mulhern, Can ai help achieve environmental sustainability? Earth.Org. https://earth.org/data_visualization/ai-can-it-help-achieve-environmental-sustainable/ accessed on 23 April 2023

[3] Team, What is environmental sustainability?, https://sphera.com/glossary/what-is-environmental-sustainability/ accessed on 22 April 2023.

[4] Gow, Environmental sustainability and ai, Forbes. Forbes Magazine. https://www.forbes.com/sites/glenngow/2020/08/21/environmental-sustainability-and-ai/ accessed on 21 April 2023.

[5] PricewaterhouseCoopers, How AI can enable a sustainable future, PwC. https://www.pwc.co.uk/services/sustainability-climate-change/insights/how-ai-future-can-enable-sustainable-future.html accessed on 23 April 2023.

On a broader scale, the creation of smart buildings and the smart cities they are housed in may benefit from integrated sensors to use energy efficiently, and structures like buildings and roads will also be constructed using more intelligent materials. Modern building materials have been developed by material scientists and architects using natural resources, such as organisms-based bricks, carbon dioxide-absorbing cement, and solar and wind-powered cooling systems, all while paying tribute to the patterns seen in nature. For the benefit of larger metropolitan areas, solar energy is becoming increasingly commonplace both within and outside of cities. These are the basic, inexpensive initiatives that will lead to sustainable infrastructure and raise our awareness of environmental issues.

Detecting leaks, possible risks, and deviations from industry norms and regulatory requirements is one difficulty that smart networks and sophisticated learning machines could be of assistance. Another one is managing garbage and industrial pollution difficulty. IoT technology, for instance, has been used in several industrial projects, including retail stores, thermostats, and refrigerators.

Microsoft launched its $50 million AI for Earth effort in 2017 to serve the express purpose of addressing problems relating to climate change, agriculture, water, and biodiversity. As a result of a lack of techniques for transforming the gathered relevant data into necessary answers, scientists are still having difficulty predicting climate changes and other future natural barriers or obstructions.[6]

iNaturalist and eBirds are two more comparable AI-enhanced Earth apps. They collect data on the species seen from their extensive network of experts and use it to track their population, favoured environments, and movement patterns. Furthermore, a greater understanding and protection of freshwater and marine ecosystems have benefited greatly from these applications.

Fuzzy neural networks are used by several organizations, NGOs, and start-up businesses to produce intelligent agricultural solutions. Along with using artificial and bio-sensor-driven algorithms to enable extensive evaluation of the soil & crop yield, certain tools may be used to develop predicting analytical frameworks to track and forecast a variety of variables and contributing factors that could affect yields in the future.

A deep learning program called Plantix, created by Berlin-based agricultural tech business PEAT, is said to be able to detect potential flaws and nutritional deficits in soil. Software algorithms undertake analysis by connecting certain foliage patterns to specific soil issues, plant pests, and diseases.

Both AWhere and FarmShots, American businesses, employ satellites and machine learning algorithms to forecast weather, assess the sustainability of crops and inspect inspecting farms for disease and pest presence. Adaptive irrigation systems, which autonomously irrigate the field based on data collected from the soil via sensors by an AI system, are increasingly gaining popularity because of their critical role in water management and a lot of appeals among farmers. [7]

III. CONNECTIONS BETWEEN AI AND THE SDGS

The analysis of the relevant data shows that AI may act as a facilitator on 134 objectives (79%) across all SDGs, usually through a technology development that may allow us to overcome certain present limitations. However, 59 objectives (or 35% of all SDG targets) may suffer as a result of the growth of AI.[8]

A. How might Artificial Intelligence help Lessen the Consequences of Climate Change?

Artificial intelligence is a disruptive paradigm that, by effectively using data, learning algorithms, and sensing devices, can evaluate, anticipate, and lessen the harm posed by climate change.

To lessen the effects of climate change, it calculates, predicts, and makes choices.

Artificial intelligence (AI) helps us better understand the effects of climate change across a variety of geographical places by creating efficient models for weather forecasting and environmental monitoring.

It assesses meteorological information and offers estimates for precipitation, additional socioeconomic effects of climate change, and severe weather. In terms of technology, AI improves climate forecasts, illustrates the effects of extreme weather, and identifies the real source of carbon emissions, among other logical breakthroughs.

This aids decision-makers in becoming aware of the loss of species, storms, increasing sea levels, and degrading natural ecosystems.[9]

[6] Sustainability applications for Artificial Intelligence, Sustainability Magazine. https://sustainabilitymag.com/sustainability/sustainability-applications-for-artificial-intelligence accessed 20 April 2023.

[7] Wynberg, Sustainable AI: AI for Sustainability and the sustainability of Ai - Ai and Ethics, SpringerLink. Springer International Publishing. https://link.springer.com/article/10.1007/s43681-021-00043-6 accessed on 24 April 2023.

[8] The alliance between Artificial Intelligence and Sustainable Development Sustainability for all. https://www.activesustainability.com/sustainable-development/the-alliance-between-artificial-intelligence-and-sustainable-development/#:~:text=Artificial%20Intelligence%20(AI)%20is%20the,and%20its%20sustainability%20more%20effectively Accessed on 24 April 2023.

B. AI Applications for Reducing Climate Change

The few areas listed below are where AI can directly assist in reducing the threats that climate change poses:-

1) Climate change prediction models with AI assistance
2) The use of machine vision in climate analysis and forecasting
3) A sustainable environment is being achieved by recent advancements in AI that reduce carbon footprints.
4) AI for managing environmental risks AI to encourage the use of green energy
5) AI-assisted expert systems for assessing and predicting the risks of climate change
6) Analytics of Big Data Assisted by AI Utilising IoT, big data, cloud computing, and AI approaches to predict and reduce climate change
7) Artificial Intelligence for a Green, sustainable future
8) Using AI to Lessen Climate Change's Effects
9) Deep learning for effective information technology and earth monitoring [10]

C. Does AI Has the Potential to Speed Up Climate Change Response

1) Increase Energy Efficiency: Over the next three to five years, artificial intelligence will increase power efficiency by 15%, according to the Capgemini Research Institute. [11]
2) Optimize the development of clean energy: AI computer models can identify dam locations with the lowest feasible GHG emissions, maximizing the growth of renewable energy.
3) Minimize Energy Waste from Buildings: Businesses, governments, and leaders regularly use AI solutions to minimize building energy waste, prevent waste, or comprehend supply and demand.
4) Improve Transportation Efficiency: In some places, smart transportation networks and AI-powered autonomous vehicles, particularly shared vehicles, are currently a reality.
5) Tools to Assist in Carbon Footprint Understanding: AI may be used to help create tools to assist both individuals and businesses in understanding their carbon footprints and the steps to minimize them.
6) Development of New Low-Carbon Materials: AI might stop global warming if it could develop new materials with equivalent properties but a less carbon footprint. [12]

IV. WHAT ARE THE KEY DEVELOPMENTS INFLUENCING THE WORLDWIDE DEVELOPMENT OF AI TECHNOLOGY?

A. Unfair Start

Certain early material advantages are present in certain industrialized economies and also establish rules.

They benefit from a competitive edge in research and development, a skilled workforce, and enough funding for artificial intelligence.

B. Political Advantage

Questions about the technological know-how of policymakers in poor countries, as well as their representation and empowerment at the international organizations that produce rules and standards for AI, are raised by the current governance inequality in this field. Few benefits, because just a few countries are receiving the social and economic benefits of AI, developing and poor nations, have not reaped the majority of those benefits. [13]

---

[9] Mastrola, How AI can help combat climate change, The Hub. https://hub.jhu.edu/2023/03/07/artificial-intelligence-combat-climate-change/#:~:text=Another%20application%20of%20AI%20to,are%20found%20in%20the%20environment. accessed on 25 April 2023.

[10] Artificial Intelligence for Climate Change Risk Prediction, adaptation, & Mitigation SpringerOpen. https://www.springeropen.com/collections/AICC accessed on 25 April 2023.

[11] Capgemini Research Institute (2023) Capgemini. https://www.capgemini.com/insights/research-institute/ accessed on 25 April 2023.

[12] Snow, how artificial intelligence can tackle climate change, Environment. National Geographic. https://www.nationalgeographic.com/environment/article/artificial-intelligence-climate-change accessed on 25 April 2023.

[13] Stahl, how AI will impact the future of work and life, Forbes. Forbes Magazine. https://www.forbes.com/sites/ashleystahl/2021/03/10/how-ai-will-impact-the-future-of-work-and-life/ accessed on 25 April 2023.

C. Artificial Intelligence and India

AI was lauded as a revolutionary technology in Budget 2022–2023 that will "assist sustainable development at scale and modernize the country."

India is ranked 10th in the world for research and has 386 of the 22,000 researchers with a Ph.D. worldwide. The majority of AI research is conducted at institutions like IITs, IIITs, and IISc.

1) *Artificial Intelligence in Use Today:* In India, among the industries are smart mobility and transportation, healthcare, agriculture, education, and smart cities & infrastructure. where AI is presently used.
2) *CORE:* COREs, or Centres of Research Excellence in AI will focus on fundamental AI research as more industries adopt AI.
3) *ICTAI:* The ecosystem for the creation and use of application-based technologies will be provided by the International Centre for Transformational Artificial Intelligence (ICTAI).
4) *AIRAWAT:* It is a cloud-based system for big data analysis and absorption. It will include a substantial, power-efficient AI infrastructure for computers and make use of cutting-edge AI computing.[14]

D. AI Opportunities in India

The potential for AI to drive growth includes:

1) Smart digitization, refers to the ability to automate difficult real-world operations that cut across sectors and call for adaptability and quickness.
2) Labour and capital augmentation: enhancing human talents, increasing capital efficiency, and allowing people to concentrate on tasks that offer the most value.
3) Diffusion of innovation, or accelerating innovation as it spreads throughout the economy

V. HOW DOES AI TECHNOLOGY AFFECT THE ENVIRONMENT?

1) *Carbon Footprint:* The energy required for building and running large AI models accounts for a significant portion of AI's effect on the environment.
2) *Emissions:* Between 1.8% and 6.3% of all global emissions in 2020 came from digital technologies.
3) *Development:* The development and application of AI in various industries soared at the same time, and the need for more processing power to handle ever-larger AI models also increased.
4) *Quantification:* Measuring AI's energy use and carbon emissions and making this data available are important issues to address to lessen the impact of AI on the climate.
5) *The Work of UNESCO:* The Work of UNESCO Sustainability is quickly becoming a topic of discussion concerning Sustainable development and AI.

Actors are urged to follow the latest UNESCO support of the Recommendation on the Ethics of Artificial Intelligence "reduce the harmful effects of artificial intelligence, notably though not limited to its environmental footprint."[15]

A. Artificial Intelligence – A major player in the Middle East situation

This tremendous tsunami has also affected the Middle East region as more nations make major shifts towards the use of AI and other cutting-edge technology. The development and application of technologies like information technology and digital transformation to enhance the effectiveness and efficiency of the healthcare sector and to provide citizens with the knowledge and skills they need to compete in the future labour market have shown a promising commitment from the United Arab Emirates, Saudi Arabia, and Qatar.

Oil price volatility has forced the economy to look for alternate sources of revenue and development, and as a result, Middle Eastern countries are anticipated to be among the key players in this market by 2030. Future investments in AI are expected to contribute to about 15% of the MENA region's GDP due to its large number of unexplored markets and industries. With such rapid development, it is also reasonable to assume that governments will take a much more aggressive approach to utilize these technologies in the construction of a successful model for environmental sustainability.

[14] PricewaterhouseCoopers, Artificial Intelligence in India - hype or Reality, PwC. https://www.pwc.in/consulting/technology/data-and-analytics/artificial-intelligence-in-india-hype-or-reality.html accessed on 20 April 2023.

[15] Dhar, The Carbon Impact of Artificial Intelligence, Nature News. Nature Publishing Group. https://www.nature.com/articles/s42256-020-0219-9 accessed on 23 April 2023.

An intelligent tracking system might help with improvements in marine farming, better using and safeguarding of freshwater resources, reducing overfishing and pollution, and introducing far more successful aquaculture practices. Many Middle Eastern nations are devoted to safeguarding the aquatic variety of the seas nearby. [16]

B. AI can be Strategically used to Achieve Environmental Sustainability

Huge expenditures have helped the area of artificial intelligence (AI) flourish. Big corporations with significant environmental impacts can employ AI to improve the sustainability of their operations. The promotion of environmental sustainability through the use of AI can aid in achieving these objectives. AI is essential for achieving all other sustainable development goals, including eliminating hunger and poverty, in addition to environmental sustainability., promoting gender equality and sustainable energy, maintaining environmental sustainability, and preserving biodiversity.

The 17 goals that make up the UN's definition of sustainable development can be broken down into three categories: the economy, the environment, and society. Research that was published in Nature Communications looked at how the development of AI may both improve technology and impede it.

The argument is that while AI presents previously unimaginable opportunities, the outcomes it produces may vary depending on the framework in which it is used. As an illustration, AI can encourage nationalism, bigotry, and undemocratic election outcomes in nations with weak ethical regulation, transparency, and democratic principles. The future of humanity is significantly impacted by AI and sustainable development, hence better regulatory organizations are required to oversee environmental sustainability. [17]

C. Possibilities for using AI for Environmental Issues

AI assists in reducing energy emissions, detecting carbon removal, designing more ecologically friendly coordinating transit systems, keeping an eye on deforestation, and predicting severe weather, all of which contribute to environmental protection and resource conservation. Potentially, it might quicken international efforts.

D. Changing Climate

1) Real-time artificial intelligence optimization of energy demand and output. A smart grid that uses renewable energy as well as increases predictability and efficiency contributes to environmental sustainability. Buildings can use smart sensors and meters to monitor, analyse, and optimize their energy usage for environmental sustainability.
2) Google Maps and Waze are just two examples of smart transportation applications that use artificial intelligence to improve navigation. It improves safety and offers data on traffic patterns and congestion. [18]

E. Conservation and Biodiversity

1) When paired with satellite data, AI can identify changes in land use, vegetation, and forest cover as well as the consequences of natural catastrophes.
2) It is possible to track, recognize, and finally eliminated using any of the aforementioned technologies, including computer vision and artificial intelligence for environmental sustainability. A company called Blue River Technology uses artificial intelligence to spot invading species and other changes in biodiversity.
3) Prediction tools are used by anti-poaching squads to aid in patrol route planning. [19]

F. Recommendations - Heading towards a greener future

1) *Research:* In this area, focused investigations, increased R&D spending, and better policy interventions are needed. To meet societal requirements and safeguard the environment by using less energy than it consumes, AI must be developed and put into use.

[16] Aligning Artificial Intelligence with Climate Change Mitigation https://www.researchgate.net/publication/361202518_Aligning_artificial_intelligence_with_climate_change_mitigation accessed on 24 April 2023.
[17] How artificial intelligence is helping tackle environmental challenges https://www.unep.org/news-and-stories/story/how-artificial-intelligence-helping- tackle-environmental-challenges accessed on 24 April 2023.
[18] R.C., Artificial Intelligence-a game changer for climate change and the environment, State of the Planet. https://news.climate.columbia.edu/2018/06/05/artificial-intelligence-climate-environment/ accessed on 25 April 2023.
[19] Artificial Intelligence https://www.europarl.europa.eu/news/en/headlines/society/20200918STO87404/artificial-intelligence-threats-and-opportunities accessed on 25 April 2023.

2) *Sustainable Development and Technology:* It's time to combine the two current hot-button issues of digital technology and environmental sustainability in particular to ensure that AI is employed to benefit society rather than cause harm. The wisest potential use of the resources at our disposal might be to employ the former to save the latter.
3) *Opportunities for the Developing World:* In light of the environmental effects of AI, developing country governments, especially those in India, should assess their top goals for technology-led prosperity.
4) *WEF's Advice:* The WEF recommends that those who develop artificial intelligence "must incorporate the health of the natural environment as a fundamental dimension."

The accuracy, fairness, and transparency of the data produced by artificial intelligence systems must be ensured by researchers and scientists. More multinational corporations, academic institutions, and government sectors need to fund more R&D of these technologies and provide appropriate standardizations for producing and applying them due to the rising demand for automation solutions and higher precision data-study for environment-related problems and challenges. More developers and technicians also need to be drawn to this technology. Environmental sciences and environmental management have profited from the progressive influence of artificial intelligence on our daily lives. [20]

VI. CASE LAWS RELATED TO ENVIRONMENTAL SUSTAINABILITY AND ARTIFICIAL INTELLIGENCE

A. *Nestle USA Inc. v. Doe*

In this case, a group of plaintiffs sued Nestle and other companies for allegedly aiding and abetting child slavery and forced labour in the cocoa industry. One of the key pieces of evidence was a report produced using machine learning algorithms that analysed satellite imagery of cocoa farms in West Africa. The report helped to establish the scope and severity of the problem and was cited by the court in its decision.[21]

B. *Friends of the Earth v. Sanderson Farms*

In this case, environmental groups sued Sanderson Farms for allegedly violating state and federal environmental laws by discharging pollutants into waterways. The plaintiffs used satellite imagery and other remote sensing technologies to gather evidence, which was then analysed using machine learning algorithms. The court ultimately ruled in favor of the plaintiffs, citing the strong scientific evidence presented.[22]

United States v. Microsoft: This case involved allegations that Microsoft violated antitrust laws by engaging in anti-competitive practices. One of the key pieces of evidence was a report produced using machine learning algorithms that analysed millions of emails and other documents. The report helped to establish patterns of behaviour and intent that were used to support the government's case.[23]

C. *The City of Chicago v. Purdue Pharma*

The city of Chicago sued Purdue Pharma in this instance for allegedly contributing to the opioid epidemic through deceptive marketing practices. The plaintiffs used machine learning algorithms to analyse social media posts and other online content to identify patterns of behaviour and influence. The court ultimately ruled in favour of the plaintiffs, citing the strong evidence presented.[24]

D. *Greenpeace v. Google*

In 2019, Greenpeace filed a lawsuit against Google, alleging that the company was not doing enough to combat climate change. The lawsuit cited Google's contracts with oil and gas companies and its use of AI to develop and improve oil and gas extraction methods.

[20] How AI can enable a sustainable future. https://www.researchgate.net/publication/340386931_How_AI_can_enable_a_Sustainable_Future accessed on 24 April 2023.
[21] Nestle USA, inc. v. Doe - Legal Information Institute. Legal Information Institute. https://www.law.cornell.edu/supremecourt/text/19-416 accessed on 25 April 2023.
[22] McKeown, Friends of the Earth v. Sanderson farms, Inc.., Legal research tools https://casetext.com/case/friends-of-the-earth-v-sanderson-farms-inc-1 accessed on 25 April 2023.
[23] United States v. Microsoft Corp. https://en.wikipedia.org/wiki/United_States_v._Microsoft_Corp. accessed on 25 April 2023.
[24] City of Chicago v. Purdue Pharma L.P Justia Law. https://law.justia.com/cases/federal/district-courts/illinois/ilndce/1:2014cv04361/297040/999/ accessed on 25 April 2023.

Greenpeace argued that Google should use its AI expertise to support renewable energy and other sustainable practices instead. While the lawsuit was eventually dismissed, it sparked a public debate about the role of tech companies in addressing environmental issues.[25]

E. Carbon Tracker Initiative v. ExxonMobil

The Carbon Tracker Initiative is a non-profit organization that uses data analysis and other tools to promote sustainable investment practices. In 2020, the organization filed a complaint with the SEC alleging that ExxonMobil was not accurately disclosing the risks associated with climate change in its financial reports. The complaint cited AI and other data analysis techniques to show that ExxonMobil's projections of future demand for fossil fuels were not in line with climate goals.[26]

F. The Ocean Cleanup v. Systemic

Ocean Cleanup is a non-profit organization that uses advanced technologies, including AI, to remove plastic waste from oceans and waterways. In 2020, the organization filed a patent infringement lawsuit against Systemic, a consulting firm that specializes in sustainable finance and investment. The lawsuit alleged that Systemiq had used proprietary technology developed by The Ocean Cleanup without permission. The case highlights the importance of intellectual property safeguards in the creation and use of sustainable technology.[27]

VII. STATE OF MINNESOTA V. 3M COMPANY

In 2018, the state of Minnesota sued 3M Company for damages related to groundwater contamination caused by the company's production of chemicals used in various products, including non-stick coatings and firefighting foam. The plaintiffs used AI and other data analysis tools to show that 3M had been aware of the environmental risks associated with these chemicals for decades but had failed to take appropriate action. The case resulted in an $850 million settlement, one of the largest environmental settlements in US history.[28] These cases demonstrate the varied ways in which AI is being used in the context of environmental sustainability, from analysing financial data to developing new technologies for cleaning up pollution. As concerns about climate change and other environmental issues continue to grow, we can expect to see more cases that rely on AI and other advanced technologies to help address these challenges. Legislators and jurists have different views on the intersection of environmental sustainability and artificial intelligence (AI). Some believe that AI can play a significant role in promoting sustainability, while others are more cautious about its potential risks and unintended consequences. Here are a few examples:

A. Positive Views

In 2019, the European Union released a report on the potential of AI to support sustainability goals, stating that "AI can provide tools for more efficient, precise and effective monitoring and management of environmental resources." The report also emphasized the need for ethical guidelines and transparency to ensure that AI is used in ways that are consistent with sustainability goals.[29]
Some lawmakers' bills that would encourage the use of AI in environmental monitoring and management have been introduced in the United States. The Sustainable Energy and Environment Act (SEE), for instance, would permit the utilization of AI and other technologies to enhance the efficacy and efficiency of federal programs related to energy, environmental protection, and natural resource management.

B. Cautionary Views

Some jurists have expressed concern about the potential risks of using AI in environmental decision-making. For example, in a 2018 article in the Columbia Law Review, legal scholar David Dana argued that AI could reinforce existing biases and power imbalances, leading to unfair or unjust outcomes.
Others have raised concerns about the environmental impact of AI itself, particularly in terms of its energy consumption and carbon footprint.

---

[25] Person and Malo, S. (2021) Judge toss Greenpeace suit over Walmart recyclable labelling, Reuters. Thomson Reuters. https://www.reuters.com/legal/litigation/judge-tosses-greenpeace-suit-over-walmart-recyclable-labeling-2021-09-21/ accessed on 25 April 2023.
[26] The Existential Crisis (2023) Carbon Tracker Initiative. https://carbontracker.org/reports/exxonmobil-the-existential-crisis/ accessed on 25 April 2023.
[27] Reddy, S. and Lau, Breaking the plastic wave: Top findings for preventing plastic pollution, The Pew Charitable Trusts. The Pew Charitable Trusts. https://www.pewtrusts.org/en/research-and-analysis/articles/2020/07/23/breaking-the-plastic-wave-top-findings accessed on 25 April 2023.
[28] State of Minnesota vs. 3M company Minnesota Judicial https://www.mncourts.gov/Media/StateofMinnesotavs3MCompany.aspx accessed on 25 April 2023.
[29] A European Approach to Artificial Intelligence Shaping Europe's digital future https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence accessed 25 April 2023.

Overall, the views of legislators and jurists on the role of AI in promoting environmental sustainability are varied and evolving. While there is growing recognition of the potential benefits of AI in this context, there is also a need to carefully consider the risks and unintended consequences and to ensure that AI is used in ways that are consistent with ethical and sustainability principles. Here are some quotes from legislators and jurists on the intersection of environmental sustainability and artificial intelligence:

C. Positive Views

"Artificial intelligence is already revolutionizing the way we manage our natural resources and protect our environment." - Senator Maria Cantwell, co-sponsor of the Sustainable Energy and Environment Act (SEE)

"AI is already being used to reduce waste, cut carbon emissions, and monitor wildlife, and we are only scratching the surface of what's possible." – Dr. Sue Black, founder of #techmums and author of "Saving Bletchley Park"

"AI can be a powerful tool in the fight against climate change, helping us to reduce emissions, improve energy efficiency, and protect natural resources." - European Commission Vice-President Maroš Šefčovič

D. Cautionary Views

"There is a real risk that AI will reinforce, rather than reduce, existing inequalities in our society, particularly concerning access to environmental resources." - David Dana, Professor of Law at North-western University

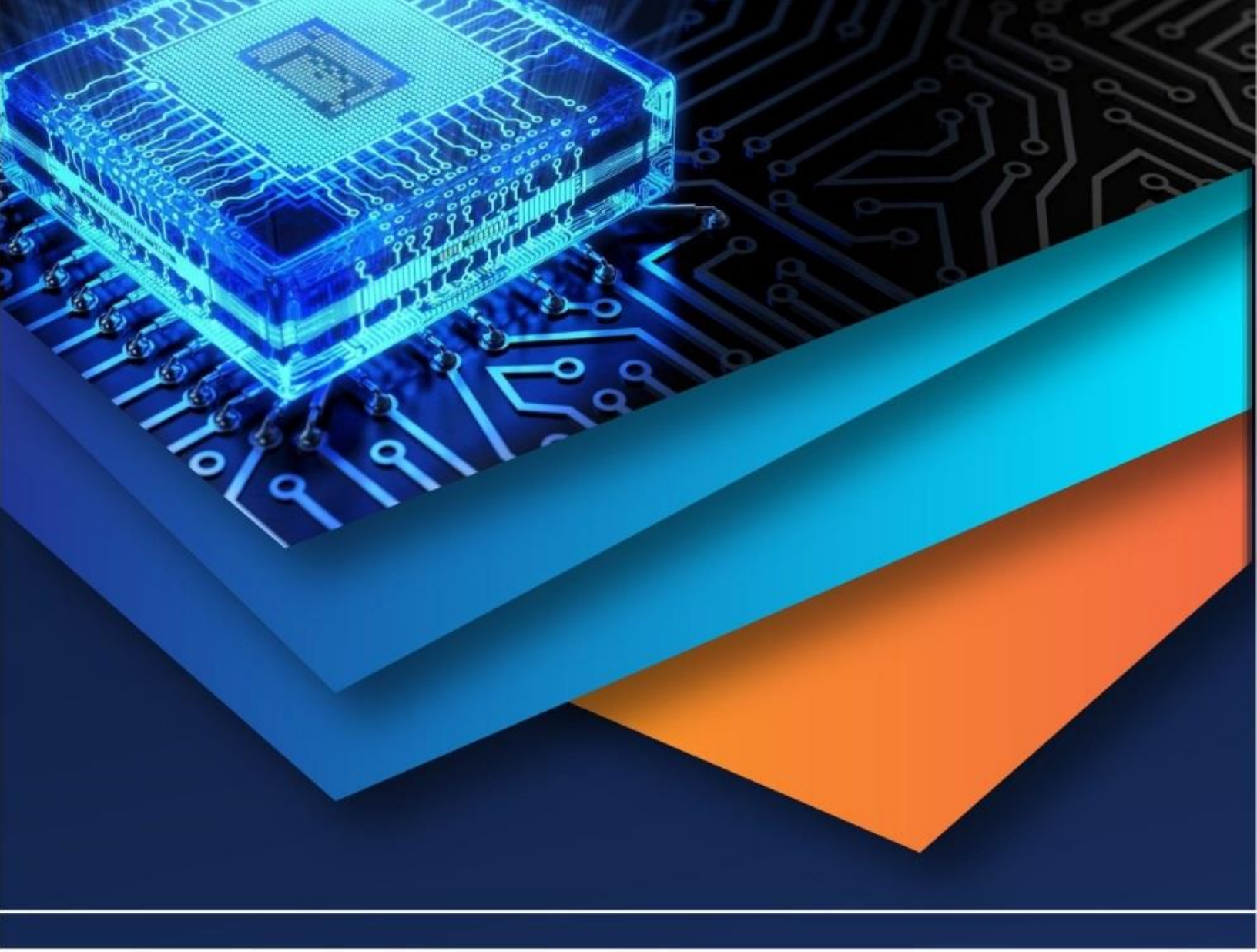
"We must ensure that the development of AI is consistent with our values of sustainability and environmental responsibility and that it does not have unintended negative consequences for our planet." - Professor Karen Yeung, the director of King's College London's Centre for Technology, Ethics, and Law in Society "While AI has enormous potential to help us address environmental challenges, we need to be mindful of the energy consumption and environmental impact of AI itself." - Researchers from the University of Massachusetts AmherstThese quotes illustrate the range of perspectives on the role of AI in environmental sustainability, from enthusiastic support to cautious optimism to concerns about the risks and unintended consequences. As policymakers and legal experts grapple with the complex and rapidly evolving issues at the intersection of AI and the environment, we will likely continue to see a diversity of views and approaches.[30]

VIII. CONCLUSION

Artificial Intelligence (AI) by enabling effective resource management, lowering carbon emissions, and assisting in the shift to a circular economy, has the potential to greatly contribute to environmental sustainability. Large data sets can be analysed by AI technologies to find trends and improve waste, transportation, and energy management systems, thereby lowering greenhouse gas emissions and other environmental effects. The management of energy systems is one of AI's most important contributions to environmental sustainability. By anticipating energy consumption, discovering energy-efficient technology, and enhancing energy storage and distribution systems, AI algorithms can optimize the use of energy in homes, factories, and power grids. AI can lower carbon emissions and improve energy system efficiency by optimizing energy use, which will result in financial savings and favourable environmental effects. AI may also help in reducing carbon emissions in the transportation industry. AI-driven traffic management systems can improve traffic flow, ease congestion, and encourage the use of environmentally friendly means of transportation including public transportation and electric cars. AI can also aid in supply chain management and logistics optimization, lowering transportation's carbon impact and fostering sustainable practices. AI can promote the circular economy by improving waste management techniques. AI can spot chances for material recycling and reuse, cutting down on trash sent to landfills and encouraging the management of resources more sustainably. AI can also support the creation of more sustainable practices and regulations by monitoring environmental consequences and spotting potential risks. It's crucial to understand, though, that AI itself can have negative effects on the environment as well, such as the energy used by the computer power needed to operate AI algorithms. To prevent AI from contributing to the exploitation of natural resources or sustaining current environmental injustices, it must also be employed responsibly and ethically. In conclusion, by maximizing energy use, lowering carbon emissions, and fostering a circular economy, AI has the potential to significantly contribute to environmental sustainability. However, for AI to help create a more sustainable future, it is crucial to utilize technology responsibly and take into account any potential negative effects on the environment. [31]

[30] Artificial intelligence for Sustainable Development: synthesis report, Mobile Learning Week 2019. https://unesdoc.unesco.org/ark:/48223/pf0000370308 accessed on 25 April 2023.

[31] Miteva, How can AI help in achieving the Sustainable Development Goals https://www.valuer.ai/blog/how-can-ai-help-in-achieving-the-sustainable-development-goals accessed on 25 April 2023.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY