**TACKLING OF ENVIRONMENT BY ARTIFICIAL INTELLIGENCE**

**BY DR. PURNIMA VERMA**

**The system or devices that can carry out tasks that traditionally require human intelligence are known as artificial intelligence, or AI. They differ from robots that can be trained to carry out a specific task or tasks. This is due to the fact that AI may gradually learn to improve itself by processing the knowledge it has gathered and using it to shape its decisions or actions in the future.**

According to David Jensen, coordinator of the United Nations Environment Program's (UNEP) Digital Transformation sub-programme, artificial intelligence (AI) refers to systems or machines that can iteratively improve themselves over time based on the information they gather while performing tasks that ordinarily require human intelligence.

**Real-time analysis's guidance**

The World Environment Situation Room (WESR), a digital platform developed by UNEP and slated to launch in 2022, is one example of how AI is being used to evaluate intricate, diverse datasets.

"WESR is being developed to become a user-friendly, demand-driven platform that leverages data into government offices, classrooms, mayor's offices, and boardrooms," claims Jensen. "We need credible, reliable, and impartial data to guide choices and promote transparency," he continues. "WESR provides this.

The objective is for WESR to eventually resemble a planet-sized mission control center where all of our crucial environmental indicators may be continuously tracked to guide actions.

**Keeping track on methane emissions**

The International Methane Emissions Observatory (IMEO), one of the UNEP-led programs within the WESR digital ecosystem, uses AI to change the method to monitoring and controlling methane emissions.

"IMEO's technology allows us to collect and integrate a variety of methane emissions data streams to create a global public record of empirically verified methane emissions at an unparalleled level of accuracy and granularity,"

"One of the quickest, most practical, and economical ways to limit the effects of climate change is to reduce the emissions of methane from the energy sector, and reliable data-driven action will play a big role in achieving these reductions,"

**Monitoring air quality**

With the help of these platforms, the public and commercial sectors may use data and digital technology to expedite global environmental action and radically alter how business is done.

In the end, they are capable of bringing about systemic change at a speed and scale never before seen.

**Environmental footprint measurements**

"AI will be fundamental in this area," "It can calculate a product's footprint across its entire lifecycle and supply chain and enable businesses and consumers to make the most informed and efficient decisions." This type of information is necessary for long-term digital nudging on e-commerce platforms.

**ICT emissions reduction**

"The ICT sector accounts for 3–4% of emissions, and data centers require a significant amount of water for cooling. The CODES Action Plan for a Sustainable Planet in the Digital Age, one of the spin-off efforts from the UN Secretary General's Roadmap for Digital Cooperation, is one of the strategies being used to lessen this footprint.

But only 17.4% of e-waste is now recycled and disposed of in an environmentally responsible way, which is a serious concern. By 2030, the amount of e-waste will increase to about 75 million metric tons, according to the UN Global E-waste Monitor report.

**Justice for the environment and human rights:**The burdens of pollution and contamination are frequently disproportionately placed on vulnerable communities. The scarcity of information about the state of both human and environmental health has historically made the effects difficult to understand. With the advent of remote sensing methods for measuring the quality of the air and water as well as the quick growth of ground-based sensor networks, this is now changing. Slavery in the fish industry serves as an example of how human rights violations can be closely related to the utilization of natural resources. There are issues with environmental justice and violations of human rights in the mining, agricultural, and industrial sectors of the extractive industries. In order to address these challenges, new techniques that can track, for instance, lighting patterns linked to problems like human trafficking/slavery, illegal harvesting, and harm to the environment. AI could be a key player in the creation, adoption, and enforcement of environmental laws, regulations, and policies by tracking the environmental impact of activities and meaningfully connecting it to human outcomes.

**These are a few of the applications:**

1. ***Reducing Technology Industry Emissions:*** While scientists are always working to develop novel and cutting-edge technology to lessen the effects of climate change. Even the technologies and software itself release some greenhouse emissions. The IT sector produces and assembles these technologies, which accounts for 3-4% of global emissions. This is where artificial intelligence (AI) may help by calculating those emissions.
2. ***Real Time Data Collection and Analysis***: In 2022, UNEP opened the world environment situation room, which gathered information by watching the globe and the events that are happening on it in real time. Additionally, satellites regularly track the world's greenhouse gas emissions using AI technology.
3. ***Measuring Carbon Footprints***: AI may be used to calculate the environmental footprints of certain products or human activities by feeding it relevant information. It gathers all the data from the beginning to the end of supply chains and life cycles, assisting businesses, customers, and industries in being more responsible for their activities.
4. **Wildlife Conservation**: It can assist in determining the locations of flora and fauna species, places where they are commonly spotted, their social groups, and abundance. All of these details can help us learn about the migratory patterns of these species, as well as any alterations to their behavior or breeding habits.
5. ***Monitoring Environmental Indicators***: The environment can jointly benefit from its use to monitor pollution and several other environmental health indicators. For example, the data gathered from numerous pollution monitoring devices can be combined and input into AI software that can offer precise measurements and effective decision-making tools for lowering the pollution.
6. I***mproving Energy Efficiency***: AI is capable of managing, computing, and optimizing energy output and generation in the power grid. Additionally, it has the capacity to enhance energy storage and can manage any variations in power voltage.

Recently, AI has become a technology that has the potential to significantly alter our lives. Additionally, it is actively employed to combat climate change and save the environment. Self-driving or "smart" cars that can navigate themselves are a few examples.

By figuring out the best path for each car that would also avoid congestion and traffic jams, they can be changed to produce 50% fewer emissions by 2050. Traffic congestion produces a substantial amount of pollution because cars frequently leave their engines running while they wait for the signal to change. Significant emissions are produced into the atmosphere as a result.

Additionally, AI can be applied to agriculture, as demonstrated by the case of India, where farmers have witnessed a 30% boost in yields. Low harvests were produced in several places Since many years, it has been assumed to be a result of numerous droughts.

They were able to achieve this result thanks to AI's provision of them with adequate and accurate measures for the soil fertility, weather pattern, water quality, and the period suitable for growing their crops.

As a result, AI is a great promise for both scientists and the general public because it can be used to lessen the effects of climate change.

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 industry 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 online world.

In 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.

***However, the difficulty extends beyond assuring "Earth friendly AI" to guiding "human friendly AI".***

We now have the chance to examine how artificial intelligence (AI) can help transform conventional sectors and systems to address climate change, provide food and water security, build sustainable cities, and protect biodiversity and human wellbeing. This is especially important as the scope and urgency of the economic and human health impacts of our deteriorating natural environment grows. To this end, we highlight the tremendous possibility to harness AI for the Earth in a new Forum-PwC report that was released at Davos this year. We list here eight "game-changing" AI applications for tackling the problems facing this planet:

**1. Autonomous and connected electric vehicles**

Over the following years and decades, the transition to on-demand mobility will be made possible by AI-guided autonomous vehicles (AVs).

Through route and traffic optimization, eco-driving algorithms, programmed "platooning" of automobiles to traffic, and autonomous ride-sharing systems, significant greenhouse gas reductions for urban transportation can be achieved. Electric AV fleets are essential to achieving significant gains.

**2. Distributed energy grids**

AI may improve energy storage, efficiency, and load management, help with the integration and dependability of renewables, enable dynamic pricing and trading, and foster market incentives. It can also increase the predictability of demand and supply for renewables across a distributed grid.

**3. Smart agriculture and food systems**

In order to allow for early diagnosis of crop diseases and concerns, to deliver timely nourishment to livestock, and generally to optimize agricultural inputs and returns depending on supply and demand, AI-augmented agriculture uses automated data gathering, decision-making, and remedial measures via robotics. This has the potential to improve the agriculture sector's resource efficiency by reducing the use of water, fertilizers, and pesticides that harm significant ecosystems and boost resistance to climate extremes.

**4. Next generation weather and climate prediction**

Weather forecasting is being transformed fundamentally by artificial intelligence (AI), and this new area of "Climate Informatics" is emerging to better comprehend the effects of climate change. Deep-learning networks can make computers run considerably quicker and include more complexity from the'real-world' system into the computations, which is something that this sector generally requires of high performance, energy-intensive computing.

Home computers will be as powerful as supercomputers in just over ten years thanks to breakthroughs in processing power and artificial intelligence, which will cut the cost of research, increase scientific productivity, and speed up discoveries. AI methods may also be used to model impacts, predict extreme events, and extract the most pertinent data in order to prevent data deterioration.

**5. Smart disaster response**

Through the synchronization of emergency information capabilities, AI can analyze simulations and real-time data of weather events and disasters in a region to identify weaknesses and improve disaster preparation, offer early warning, and prioritize response. One day, deep reinforcement learning may be utilized in disaster simulations to choose the best reaction plans, much how AI is presently being used to decide which move to make in games like AlphaGo.

**6. AI-designed intelligent, connected and livable cities**

In conjunction with augmented and virtual reality (AR and VR), AI could be used to simulate and automate the production of zoning rules, building ordinances, and floodplains. An "urban dashboard" might be created using real-time citywide data on energy use, water availability and consumption, traffic patterns, population movements, and weather to maximize urban sustainability.

**7. A transparent digital Earth**

The monitoring, modeling, and management of environmental systems at a scale and speed never before possible would be made possible by a real-time, open API, AI-infused, digital geospatial dashboard for the entire planet. This would include addressing illegal deforestation, water extraction, fishing, and poaching, as well as air pollution, natural disaster response, and smart agriculture.

**8. Reinforcement learning for Earth sciences breakthroughs**

This emerging AI method, which learns from itself and is similar to evolution in that it takes no input data and little processing resources, may soon advance to the point where it may be used to solve practical issues in the natural sciences. It is crucial to work with Earth scientists to find the systems from fields such as biology, materials science, and climate science that may be codified to use reinforcement learning for advancement and discovery in research. For instance, DeepMind co-founder Demis Hassabis has hypothesized that a descendant of AlphaGo Zero may be used to look for a hypothetical material called a room temperature superconductor, which would enable very effective energy systems.

**In conclusion, these are dynamic times. With the help of cutting-edge technology like AI, it is now possible to address some of the largest issues facing the planet. It's time to use AI to benefit the world.**