

CLIMATE CHANGE AND AI GOVERNANCE

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Introduction

Climate change is one of the biggest threats to humanity. Climate change refers to long-term shifts in temperature patterns. It can occur for various reasons, mainly due to burning fossil fuels like coal, gases, etc. At present it includes global warming and its impact. Human activities are also leading to climate change. One of the main causes is the emission of greenhouse gases like carbon dioxide, methane, etc. Human activities like cutting down forests, and driving vehicles are the major sources of their emission.

According to the World Meteorological Organization (WMO), 2023 was recorded as the warmest year on record, with the global average near-surface temperature at 1.45 °Celsius. The WMO community is giving a red alert to the world. "Sirens are blaring across all major indicators... Some records aren't just chart-topping, they're chart-busting. And changes are speeding up," said United Nations Secretary-General António Guterres. The WMO observed the concentration of the main greenhouse gases – methane, carbon dioxide, and nitrogen dioxide reached high levels.

What are the Causes of Climate Change?

It is human behaviour and human activities that are one of the main reasons for increasing temperature and global warming over the years. Global warming has changed the weather pattern and natural cycle leading to a rise in temperature, and natural calam-

ities like drought, storms, and earthquakes. Apart from human activities some amount of climate change can also be drawn from natural phenomena. According to NASA, "These natural causes are still in play today, but their influence is too small or they occur too slowly to explain the rapid warming seen in recent decades." Hence, human activities are leading to change at a faster pace. Transportation is one of the major sources of global greenhouse emissions. passenger vehicles emit about 4.6 metric tons of carbon dioxide per year. Another source is generating electricity which requires burning coal, fossil fuels natural gases, etc. Another way we're injecting more greenhouse gases into the atmosphere is through the cutting of the world's forests and the degradation of its wetlands. Producing carbon-intensive products including chemicals, steel iron, etc also adds up to the greenhouse gas emissions.

Climate Change Mitigation

To prevent it we need climate change mitigation which involves actions to reduce greenhouse gas emissions from human activities. Global warming and climate change are the results of human activities that have released dangerous amounts of greenhouse gases since the beginning of the industrial era. Even so, despite clear-cut research on how human activity affects the planet's climate and increasing awareness of the serious threat that climate change poses to our societies, greenhouse gas emissions continue to rise. To address the effects of climate change and reduce global warming, the 196

Parties to the UN Climate Convention in Paris agreed on the historic Paris Agreement in 2015. Its main goal is to keep the increase in global average temperatures to far below 2°C over pre-industrial levels, with attempts being made to keep the increase to 1.5°C. To do this, greenhouse gas emissions must be cut by 45% by 2030 to reach net-zero emissions by the middle of the century.

Given the worldwide scope and magnitude of the problem, international cooperation



and technological transfer are also essential. The Paris Agreement, which serves as the primary forum for global collaboration on climate change, has outlined several obligations and policy instruments for its parties.

Nationally determined contributions (NDCs) specify how each nation will improve climate resilience and lower greenhouse gas emissions. The Paris Agreement requires governments to demonstrate their plans for achieving carbon neutrality by the middle of the century through long-term low-emission development strategies, (T-LEDS.) These are just a few of the ways nations are collaborating to slow climate change on a global scale.

Environmental Governance

Environmental governance encompasses the interactions between governments and

various stakeholders, including strategies, methods, policies, and alternatives aimed at mitigating environmental impacts. It involves identifying key environmental challenges and developing long-term management strategies to address them effectively. Broadly defined, environmental governance refers to the collective framework of organizations, policy instruments, financing mechanisms, rules, procedures, and norms that regulate environmental protection processes.

Key principles of environmental governance include:

1. Integrating environmental considerations into decision-making and actions at all levels.
2. Viewing cities, communities, politics, and economies as subsets of the broader environment.
3. Emphasizing the interdependence between humans and ecosystems, fostering sustainable interactions.
4. Shifting from open-loop (cradle-to-grave) systems—such as waste disposal without recycling—to closed-loop (cradle-to-cradle) systems, promoting zero-waste solutions.

Several nations have embraced strong environmental governance frameworks, including Denmark, Norway, Japan, Switzerland, and Finland, setting global benchmarks for sustainability and environmental responsibility.

Role of AI in Climate Change Mitigation

At present, climate change is one of the most difficult scientific problems humans are facing. By using AI to take responsibility for aspects of climate change that are always changing, we can make better predictions about environmental changes and start mitigation activities sooner. As part of the process of moving from a carbon-based economy to a net carbon-zero economy, artificial intelligence (AI) contributes to the reduction of carbon emissions into the atmosphere. Predictions based on patterns and trends are

combined with the vast amount of data gathered by artificial intelligence. Although models are the foundation of prediction, people must have faith in them to use them to guide their judgments. AI is particularly good at evaluating big, complicated datasets, which is crucial when it comes to climate change. Climate data, including temperature trends, carbon emissions, and energy consumption patterns, can be processed by governments using artificial intelligence.

AI models can forecast future climate conditions and assist decision-makers in choosing appropriate mitigation and adaptation measures. Improving climate modeling and forecasting is one of AI's most significant contributions to climate governance. Climate models have historically been computationally costly and time-consuming, recreating how different elements (such as greenhouse gases, solar radiation, and human activities) affect the climate. Ensuring compliance with environmental laws and regulations is one of the major difficulties in climate change governance, and AI can be extremely helpful in monitoring adherence to environmental policies, such as those governing deforestation and carbon emissions. The public can be involved in climate action through AI. AI can analyze social media, news, and other public information sources to follow sentiment and identify important areas of concern. This data can help governments better understand how the public views climate change so they can adjust their outreach and education initiatives.

Conclusion

The interaction of artificial intelligence and climate change offers a chance to transform our approach to one of the most pressing issues of our day. Through better data analysis, improved decision-making, resource management, and real-time environmental policy monitoring, artificial intelligence (AI) holds promise for enhancing climate change governance. AI can lead to more focused and efficient efforts to fight climate change and prepare for its repercussions through

its capabilities in energy efficiency, climate modeling, disaster response, and compliance enforcement.

But in order to fully utilize AI in climate governance, issues like data privacy, algorithmic bias, and ensuring fair access to AI technologies must be addressed. Transparency, accountability, and inclusivity must continue to be at the forefront of AI-driven solutions to guarantee that the advantages are distributed broadly and that vulnerable communities are not left behind.

Hence, despite the enormous potential of AI, its effective incorporation into climate change governance necessitates meticulous preparation, moral deliberation, and international collaboration. When applied carefully and sensibly, artificial intelligence (AI) has the potential to revolutionize the development of a more resilient, sustainable, and just world in the face of climate change.