

Seeds of Survival: Artificial Intelligence and the Quest for Climate Resilience

Thesis Statement: The general school of thought argues that Artificial Intelligence (AI) poses a threat to climate sustainability. However, its thorough and meticulous use at local, national and international level holds the potential to foster long-term climate resilience.

I- Introduction

II- Cause of Climate Change: an overview

III- Role of Artificial Intelligence (AI) in Climate Resilience:

A- AI-driven Waste Management Projects

(Bagherim, B et al (2017), Application of Artificial Intelligence for the management)

B- Power Generation Forecasting (Thomas Institute and National)

Renewable Energy Laboratory Report

C- AI-induced Predictive Maintenance System
(Report of Control Engineering Europe)

D- Forest Fire Risk Management Mapping and Early Warning System
(Multidisciplinary digital planning Institute)

E- AI Assisted Cloud Seeding Operations
(Gulf News Report, 2023)

F- Climate Resilient AI-guided tractors
(John Deere's AI-guided tractors)

G- Renewable Energy Integration System.
(case in point: Australia)

H- AI Imaging Integration for ocean Health Monitoring
(Ocean cleanup Official Report, 2023)

IV- Conclusion

Everything is expected to change - the air, the food, the water, the oceans and the seasons, our children will have to adapt it or become extinct. (Israeli Climatologist, quoted by Noam Chomsky)

Climate change stands as one of the most pressing existential threat of the 21st century, with far-reaching implications on environmental, political and economic spheres globally. Parallely, excessive use of Artificial Intelligence (AI) is creating an Augean stable, as experts have raised concern that AI is a major threat to climate change. Surprisingly, groundbreaking and innovative AI-driven initiatives hold the potential to counter climate driven threats and promote long-term climate resilience. Primarily, AI driven projects at local levels are ensuring sustainable practices, ranging from

waste management and forecasting to predictive maintenance system. Moreover, robust and dynamic utilization of Artificial Intelligence holds the potential to throw down the gauntlet against predicament created by climate change through AI and ~~and~~ aerial integration system. ~~Some~~ Undoubtedly, AI-driven approaches including cloud seeding, seed clouding, mineral carbonation and ocean health monitoring system provide a platform to the world where they hold the capacity to fight against climate change and ~~ensure~~ safeguard the planet. Therefore, AI-guided practices have become the need of the hour ~~to~~ in order to restore the balance of ecosystem.

Before delving into the core discussion, it is imperative to first examine the underlying causes of climate change. One of the major cause of climate change is

unsustainable anthropogenic activities including GHG emissions, capitalist society, deep mining and excessive use of fossil fuels. Unfortunately, the temperature of earth is continuously rising and as per the report of IPCC 2018 Report, earth temperature must not increase more than 1.5°C

otherwise the damage will be irreversible. Besides this, unsustainable ^{all around the world} practices can be observed in the form of deforestation, cattle farming and use of synthetic chemicals. Ultimately, the world is at the brink of chaos and there is utmost urgency to redesign the existing order, enabling the world to rise like phoenix from the ashes of unsustainable practices.

First of all, conventional thinking suggests that Artificial Intelligence is increasing e-wastes; however, in the contrast, AI plays significant role in waste management.

Apparently, human proposed waste management projects lack in various spheres including leaching impact in landfills, low recycling rate and unsustainable combustion.

Although, AI produces e-waste yet detailed and precise AI-driven waste management projects are paving the way for the world to shift on AI-guided projects. **Bagheri,**

B et al (2017), in their research paper **Application of Artificial Intelligence for the management**, claimed that advance AI algorithm detect the **Bo Molybdenum and Sodium** in the water to prevent

Laachate. Similarly, Smart waste sorting ways are practiced by developed countries, resulting in increased recycling rate by up to **30%** according to World Economic Forum Report,

2023. Therefore, when the dust settles, it becomes clear that AI is playing significant role

in ensuring robust and reliable waste management system.

Another leading voice in the field assert that AI poses future threats for the world. In comparison, AI is proving its self helpful in reducing climate driven damages by utilizing its convolutional neural networking. ^{Certainly,} AI powered - generation forecasting systems are used to predict the weather and natural Disasters - Eventually, developed countries including Malaysia and China are using it for rain forecasting and drought prediction forecasting respectively. Moreover, **Thomas Institute and National Renewable Energy laboratory reported, 30%** decline in damages by installing this system. As the system uses meteorological data and historical ~~data~~ trends to forecast precisely and accurately. Hence, the big picture reveals that AI remains a necessary crossing of the

Rubicon in the fight against climate change.

Moreover, the leading voices assert that ~~AI~~ Global data centers are consuming excessive energy.

On the other hand, AI-induced predictive maintenance systems reduces down time and energy wastage.

~~AI~~ Furthermore, it uses real time data to identify potential faults before the failure, not only minimizes unplanned downtime but also optimizes energy usage. Significantly, Control

Engineering Europe reported that AI-powered predictive maintenance

system resulted in 70% reduction

in equipment ~~break down~~ ^{across UK} energy wastage. ~~and~~ In this way

digital transformation and energy efficiency initiatives hold the potential to minimize the consumption of energy. So,

when push comes to shove, AI-induced predictive maintenance

systems proves more effective for the ~~climate~~ climate change.

Apart from the predictive maintenance of equipment, AI-guided systems play vital role in predictive forest fire. Notably, ~~the~~ forest fire risk management mapping and early warning system operates on advance algorithm to predict the forest fire. Moreover, this system provides a systematic analysis on reasons behind the forest fire and highlight the high risk areas. Certainly, Vietnam is using this advance and innovative system; resultantly, as per report of **Multidisciplinary digital publishing Institute**, it is working effectively and efficiently. In this way, developed countries are paving the way for developing countries. Furthermore, such systems hold the potential to protect ecosystem and biodiversity. Thus, by reading between the lines, it is fair to claim that

AI is holding eco-friendly capacities more than eco-unfriendly qualities. In the contemporary era, climate driven threats including meteorological droughts are on its peak.

Some environmentalists believe that Artificial Intelligence is creating predicament for the world by consuming excessive water. However, AI is playing crucial role to counter water scarcity. Importantly, creative and innovative approaches in AI have proposed resilient and dynamic process to balance the hydrologic cycle. One of the major discovery is cloud seeding method to increase the rainfall. Eventually, according to the report of Gulf News 2023, Cloud seeding method introduced in UAE resulted in 10-30% increase in rainfall. As the system operates on advance algorithms to generate clouds artificially and robust precipitation,

resulting in ~~increase~~ rise in rainfall.

In this way, Artificial Intelligence, proved as a successful model to combat climate-induced threat.

likewise, the expert line of reasoning tends to support the view that ^{advancement is} ~~the~~ Artificial Intelligence is a Damocles sword hanging over the world as it increases the job insecurity, leading to food insecurity. Despite this, AI is creating a new job market. Moreover, to combat the threat of food scarcity, advanced research in

AI resulted in climate resilient AI-tractors which uses precise and accurate data for crops, less use of pests and fertilizers, increases the crop yield. As per the report of world bank, John Deere's AI-guided tractors resulted in 80% reduction in the usage of pesticides. ~~and~~
This report suggests that use of

artificial intelligence in a sustainable way holds the potential to eliminate food insecurity. Hence, when viewed through wider lens, artificial intelligence proved to be more productive for humanity than destructive.

In the same fashion, the scholarly dense interprets that AI is a motivating factor behind deep mining. Instead, AI-driven integration system operates on multiple renewable energies. Eventually, developed countries have introduced Renewable energy integration system which utilizes solar, wind, geothermal and hydra energy to run its power plants. Primarily, this ~~is~~ integrated approach is used to shift reliance of power plants on renewable energy instead of fossil fuels and balance the grid. Ironically, Australia has shifted ^{70%} on

renewable energy as per the report of **The Guardian**. Moreover, ~~that~~ it is planning to shift on renewable energy ^{upto} 100% by 2027 by implementing this unwavering and strong system. Ultimately, Australia is a sophisticated and reliable example for the world and to prove ~~the~~ AI as a sustainable approach. Thus, AI holds the potential to untangle the Gordian knot created by climate change.

Lastly, within the academic discourse, it is coined that AI generates water pollution. In contrast, AI-driven Ariad and Inezing approach is used for ocean health monitoring. This approach is used to intercept targeting pollution ~~working~~ ^{reaching} towards oceans using neural networking. In this way, ^{an} ~~Artificial~~ ^{AI} in advance AI monitoring systems are used to capture the water pollution.

The success of ocean health monitoring system can be observed through the report of **ocean clean-up official**, these

projects have successfully removed 200,000 kg of plastic wastes from oceans by 2022, the

report suggest the AI holds the capacity to initiate and ensure climate-friendly projects.

By and large, the discussion shows that the AI is controlling the detrimental situation created by climate change. In this regard, AI proved its self as a seed of survival in the climate driven threatening situation.

In a Nutshell,

Artificial Intelligence is a double-edged sword, ~~its~~ ~~escape~~ ~~de~~ damaging the environment; in contrast, it paves the way to counter the climate driven challenges. Ultimately, it is evident that both

perspectives stem from valid concerns. However, it depends on the usage of AI. In the era marked by escalating climate uncertainties, the integration of Artificial emerges not as a threat, but as a transformative force.

Bearing in mind that time and tide wait for none, it is high time to take prudent and wise actions to mitigate the threats of climate change by utilizing AI.

Eric Holthaus in his book, **the future earth** highlighted the current situation in the world that we have reached a unique and vulnerable moment in human history: our future are simultaneously dependent on others and our personal daily choice. Therefore, the urban clock is ticking and complacency is a luxury we can no longer afford.