



AI ACCELERATION WITHIN THE FOUR CORNERS OF ECOLOGICAL BALANCE: AN ANALYSIS

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Abstract

Moving is the global race, Growing is the Populace; Depleting is the Ecology, Advancing is the Technology! The series of this synergy has been experiencing since a long decade back, wedging deeply its roots in the contemporary controversies over the long lasting rage at international regime concerning the ecology. Artificial intelligence signifies the customization of varied technicalities so as to respond these new challenges and needs of the emerging world. The present research contributes to analyze the recent development of AI adoption in different sectors. Besides, assessing the major threats that might be posed by the AI instrumentalities is one of the main contributions of this research study.

Keywords: Artificial Intelligence, Environment, Ecological Balance, Industrialization, Climate

Introduction

Increased toxins and polluted effluents have led to the catastrophic degradation of the environmental ecological balance. In furtherance, Industrial revolution is the major outbreak of the ecological imbalance. Arrival of globalization is composed of two aspects

i.e. one, promoting the imbalance of atmosphere due to the growing industrialization; second, accelerating the advancement of information technology and communication (ICT).

Societal shift that has been triggered by the innovative era of ICT has significantly been propelled to experience abundance of new technicalities to approach, bringing with it overflowing opportunities to cater the contemporary and advancing needs of the human beings as well as nature. Artificial Intelligence is that one invention amongst the innovative technicalities which cures the fallacy expounded by its very existence.

Very well known fact is the continuous warming up of our planet which in turn showing the worsened impacts of climatic changes. The year 1980 witnessed the occurrence of 772 disastrous

events and weather related inevitable events too. Out bursting of the like series of event has seen in 2016 which was thrice in degree of comparison with that of the 1980. Recently, due to such alarming threat of environmental degradation, 20% species are being noticed to get extincted and with the passing of time, this number is seemingly been at increasing pace & by the coming year 2100 this number probably could rise up to 50%. And even if all countries keep their Paris climate pledges, by 2100, it's likely that average global temperatures will be 3°C higher than in pre-industrial times.¹ But we

<<https://news.climate.columbia.edu/2018/06/05/artificial-intelligence-climate-environment/>> Accessed 9 June, 2021



have a new tool that would somehow help us better manage the impacts of climate change and protect the planet i.e. Artificial Intelligence (AI).² As per World Economic Forum report, the definition of Artificial Intelligence signifies it being the computer system which has the potential to sense its environment and take actions and measures following the response of their environment & according to the prearranged objective.

With the arrival of artificial intelligence, it's been proven that where on one hand, the technology is itself be the prime cause of creating a mess to the nature; simultaneously on the other hand, technology itself endeavoring its hardest in curing such flaws under the name of Artificial Intelligence.

Evolution of AI

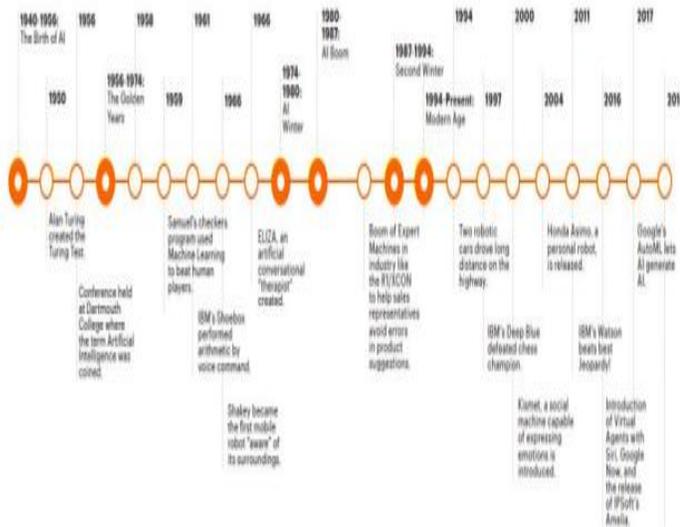


Figure 1: Series of AI Evolution |

Legal Measures and Methodology

The present study has adopted the methodology of analytical research basing

the pillar of present research on the secondary sources. By adopting the analytical approach, the researcher endeavors his best to reach at a pragmatic conclusion by doing review of literature of the existing sources concerned with the relevant field. The present research is exclusively the doctrinal research which uses various secondary sources with a view to meet the goals of conducting this study.

Ongoing Threat?

Scientifically, there is an upsurging rise in the amount of unprecedented stress upon the Earth. Global consensus has been experienced as to the infinite loss in the value of Earth's security. Progressive approaches as to build out a human friendly AI, ends up in the evolution of enhanced controversy in the field of AI itself. The tremendous aftereffects of Information and Technology (IT) can better be inferred outside the boundaries of Information Technology under the guise of industrial revolution, which in turn leaves a terrific impact outside industrial sector in the semblance of environmental degradation as well as the ecological disruption. Besides the harms releasing out of industries, there are lot many other factors responsible for the atmospheric spoil; amongst them, disruption of climatic cycle is the foremost, resultant owing to manmade pollutants.

The innovative model of human development as well as economic development has rigorously been done at the cost of earth. The process of industrialization and that of the ICT too, has put the Earth's stability at the stake of risk. Scientists have identified nine "processes and systems (that) regulate the stability and resilience of the Earth System", and say four of the nine- climate change, loss

² Ibid.



of biosphere integrity, land-system change and altered cycles in the globe's chemistry have now crossed "boundary" levels, due to human activity.³ The United Nations Sustainable Development Goals (UNSDGs) provide another lens for the challenges facing humanity. 6 out of 17 goals apply directly to the environment & humans' influence over it in turn such as combating climate change, using ocean and marine resources wisely, managing forests, combating desertification, reversing land degradation, developing sustainable cities and providing clean affordable energy.⁴

The report of World Economic Forum has profoundly depicted the significance of AI tool in the realm of illumination of critical challenges to the environment at large; they are- *Climate change*, bearing a major threat of worst emission level of greenhouse gases; *Conservation of Biodiversity* faces the extinction of species at a higher pace amounting the extinction of about more than

50 % of one of the five species on earth⁵ "Current deforestation rates in the Amazon Basin could lead to an 8% drop in regional rainfall by 2050 triggering a shift to a "Savannah State" with wider consequences for the Earth's atmospheric circulatory systems"⁶; *Healthy Oceans* are experiencing the acidification of warming are leading to unprecedented damage to fish stocks and corals⁷; *Water Quality and Security* is being experienced at a continuing declined rate which might short fall of 40% of the amount of fresh water by 2030.⁸ *Air Quality*, The WHO has reported that around 7 million people die annually from exposure to air pollution, one death out of every eight globally.⁹ *Weather and Disaster Toughness*, In 2016 the world suffered 772 geophysical, meteorological, hydrological and climatologically natural loss events have been experienced triple the number which has been suffered in 1980.¹⁰

³ Stockholm University, Stockholm Resilience Centre [media release], 'Planetary Boundaries – An Update' (2015)

<<http://www.stockholmresilience.org/research/research-news/2015-01-15-planetary-boundaries---anupdate.html>> Accessed 9 June, 2021

⁴ United Nations Sustainable Development Goals <<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>> Accessed 11 June, 2021

⁵ McKie, R., 'Biologists think 50% of species will be facing extinction by the end of the century' (2017) <<https://www.theguardian.com/environment/2017/feb/25/half-all-species-extinct-endcentury-vatican-conference>> Accessed 11 June, 2021

⁶ Ceballos, G, et al., 'Accelerated Modern Human-Induced Species Losses: Entering the Sixth Mass Extinction' (2015) *Science Advances* <<http://advances.sciencemag.org/content/1/5/e1400253>> Accessed 11 June, 2021

McKie, R., 'Biologists Think 50% of Species Will be Facing Extinction by the End of the Century' (2017) <<https://www.theguardian.com/environment/2017/feb/25/half-all-species-extinct-endcentury-vatican-conference>> Accessed 13 June, 2021

<<https://www.coralcoe.org.au/media-releases/scientists-assess-bleaching-damage-on-great-barrier-reef>> Accessed 14 June, 2021

⁷ Arc Centre of Excellence for Coral Reef Studies, James Cook University [media release], 'Scientists Assess Bleaching Damage on Great Barrier Reef' (2016)

<<https://www.coralcoe.org.au/media-releases/scientists-assess-bleaching-damage-on-great-barrier-reef>> Accessed 14 June, 2021

⁸ United Nations: World Water Assessment Programme, 'World Water Development Report' (2015)

<http://www.unwater.org/publication_categories/world-water-development-report/>. Accessed 14 June, 2021

⁹ World Health Organization, '7 Million Premature Deaths Annually Linked to Air Pollution' (2014) <<http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/>>. Accessed 14 June, 2021

¹⁰ MunichRE's NatCatService (2017) <<http://natcatservice.munichre.com/>>. Accessed 14 June, 2021



Progressive Outbreak of Artificial Intelligence: Recent Study related to AI’s Efficiency

Adjoining the progressive approach with respect to address the recent issues related to the environmental threat, studies are focusing the pragmatic arrival of advancing technology which brought the new AI driven *game changers* wherein the application of AI has the tendency to bring out the relaxing reform to the environment quality, with the significant collaboration with the advancing technology. Below are discussed the potential AI-game changers with their elaborative capabilities to foster the contemporary need of regulating the environment sustainability-

a. Self Governed Electric Vehicles vis a vis Environment

Efficacious vitality has been considered from the establishment of electronic vehicles which contains the autonomous feature in handling, resulting into putting a ban on discharge of greenhouse gas emission from the fuel driven vehicular mechanisms. Such a smart approach of Artificial Intelligence for transportation has been proven as a blessing for refilling the ugly scars deepened on the face of earth. “Machine-learning-enabled autonomous electric vehicles will improve the efficiency of transport networks as connected vehicles communicate with one another and with transport infrastructure to identify hazards while optimizing navigation and network efficiency.”¹¹

Routinely, the ongoing increased demand for the transportation might undermine the contributory efficiency gains. But such

¹¹ World Economic Forum, ‘Harnessing Artificial Intelligence for the Earth’ (2018) < http://www3.weforum.org/docs/Harnessing_Artificial

deficiency would now have the tendency to get overcome or be cured with the introduction of AI-based tools, proven to be the landmark for lower emission. Besides, imbibed with an unprecedented feature of handling with the obscurity in the car transportation which can be analyzed with the help of diagram below:

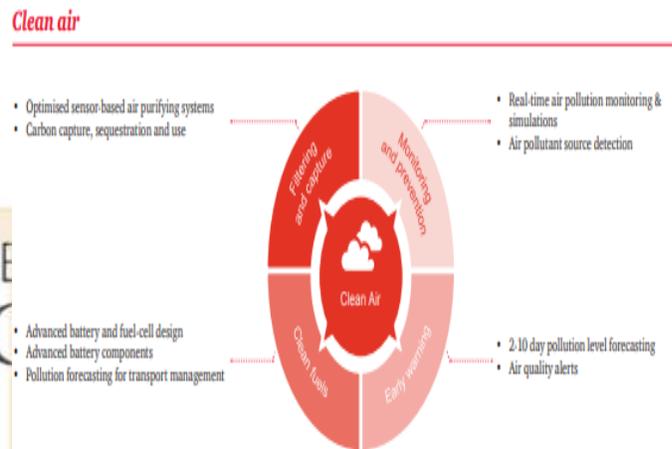


Figure 2: Efficiency of AI for improving the Environment | Source: PWC

b. Distributed Energy Grids

The mechanism of deep learning under the auspices of machine learning application is qualified to be the most wanted element in modern times of globalization. For the better regulation of environment, Artificial Intelligence promotes the foreseeability as to the renewables’ demand & supply, improves the efficacy of energy storage, ratings and trading of AI based renewable dynamics. AI driven virtual power plants can integrate, aggregate & optimize the use of solar panels, microgrids, energy storage installations and other facilities.¹²

<_Intelligence_for_the_Earth_report_2018.pdf>. Accessed 15 June, 2021

¹² Ibid



Climate change

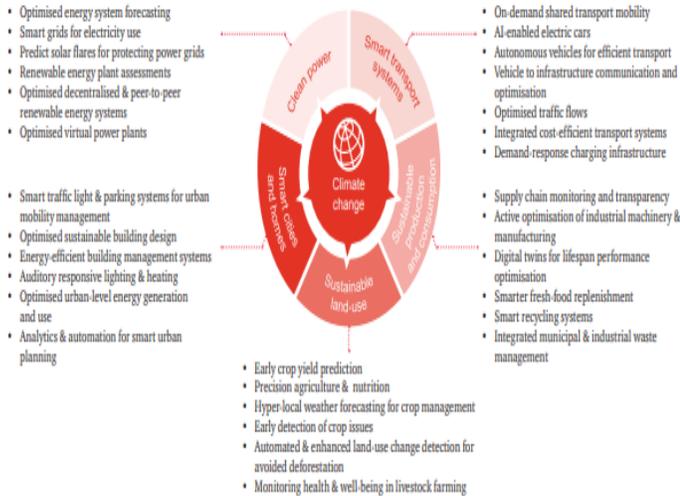


Figure 3: Efficiency of AI for improving the Environment | Source: PWC

c. Well-equipped Agriculture

In the growing world of innovations and enhanced technology, precision agriculture encompasses the well nourished elements of Artificial Intelligence that provides the efficacious mechanized data collection tools and programmed decision at the agricultural level which place the farming at ease. These tools include the deduction as to the planting, spraying as well as harvesting the produce. AI based agricultural programming helps the same in saving from the beat of pests by detecting the early birth of crop damaging insects or pests. This ensures the rapid growth of resource coherence in the realm of agricultural industry as well as lowering the

excessive water supply and application of pesticides.

d. Weather Forecasting

Mobilizing the instrumentality of artificial intelligence, recently innovated Climate Informatics has been launched as one of the most flourished icon witnessing the metamorphic trend of weather forecasting which bases its credibility on predicting the extreme events which might have tremendous impact on human lives as well as the quality of ecological balance.¹³ It is pertinent to note that climate and weather study science clan already possess handful of collected data and also progressing on daily basis to have gathered more by putting the machine learning AI-driven tool at the vicinity of tests to sustain the expected requirements. Hence, the arrival of artificial intelligence provides the better opportunities in solving the challenges pertaining to the limited accessibility and usability on a greater scale by providing the smooth accessibility and usability for scientific decision making process. Public agencies including the UK Met Office and NASA, and private-sector actors such as IBM and Microsoft, are using AI and machine learning to enhance the performance and efficiency of weather and climate models.¹⁴

¹³ Monteleoni, C., et al, ‘Climate Informatics, Computational Intelligent Data Analysis for Sustainable Development; Data Mining and Knowledge Discovery Series’ (2013) <<http://faculty.cs.gwu.edu/~cmontel/ciBookChapter.pdf>> Accessed 15 June, 2021

¹⁴ Jones, N., ‘How Machine Learning Could Help to Improve Climate Forecasts, Nature’ <<http://www.nature.com/news/how-machine-learning-could-help-to-improve-climate-forecasts-1.22503>> Accessed 15 June, 2021



Weather and disaster resilience

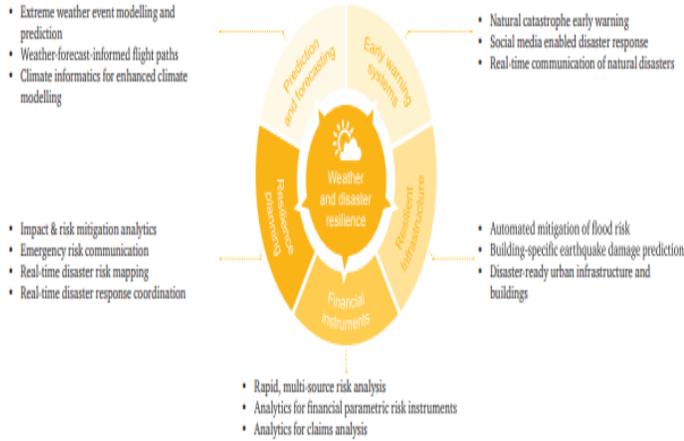


Figure 4: Efficiency of AI for improving the Environment | Source: PWC

e. Suburbanized Water

Ameliorating of water resource management by the synchronization of artificial intelligence has been brought the optimization by machine and deep learning. Interestingly, more advanced-inaugurated stage of artificial intelligence has taken the water conservation mechanism up to a more flourished level wherein it all set to append the machine learning attributes with the local resources as well as the decentralized water system.

A Way Forward

All the more, the arrival of artificial intelligence has prominently deepened its roots in the daily lives of human beings. Nevertheless, this is not denying the fact that with the increasing passion for the innovative trend, security-transparency-creditworthiness issues have taken birth simultaneously with such upsurge. Thus, scholars and the scientists have cautiously been advised to assure the data secrecy in the realm of artificial intelligence as well as to

carve out the novel security measures so as to undermine the negative aspect of this innovative thrill. Besides, the escalating demands of robotic solutions and the mechanized data study pertaining to the ecological imbalances and imperfections cry out for the exaggerated participation of MNCs, educational entities and the public departments too for providing the suffice funding to promote the arena of research and development in the concerned field. Therefore, this approach would profoundly be considered as the success one in order to bring out on surface the potential solutions to the emerging challenges of robotic aptitude. Furthermore, there is a need to devolve sufficient number of efficient and capable technologists so as to provide splendid training to the personnel concerned. Data is one of the primary drivers of AI solutions, and thus appropriate handling of data, ensuring privacy and security is of prime importance. Challenges include data usage without consent, risk of identification of individuals through data, data selection bias and the resulting discrimination of AI models, and asymmetry in data aggregation. The paper suggests establishing data protection frameworks and sectorial regulatory frameworks, and promotion of adoption of international standards.
