



## AN ANALYTICAL REVIEW OF AI'S CONTRIBUTION TO ACHIEVE SUSTAINABLE ENVIRONMENT

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### **Abstract:**

Business, corporate procedures, and political policy are all experiencing tremendous advancements with the application of artificial intelligence (AI). Industry, governments, and society have all been significantly disrupted and enabled by deep learning-capable robotics and machine intelligence. They are also able to punch a larger impact of global sustainability. When artificial intelligence (AI) affects our society, it may predict either an utopian vision in which humans and robots live in peace or a dismal future marked by war, famine, and suffering. This article investigates how AI can help achieve the Sustainable Development Goals (SDGs) of the United Nations (UN) or prevent social unrest, environmental degradation, and economic uncertainty. It makes some early conclusions about management training and the job of managing businesses in the midst of quick technical and social change. This study combines the perspectives of business strategy and public policy in order to analyse the effects of AI on sustainable development with a focus on the advancement of the SDGs. The development of managerial skills and leadership for global sustainability is also addressed.

Keywords: Artificial Intelligence, Sustainable development, SDGs, Water crisis, sanitation.

### **1. Introduction**

Artificial intelligence (AI), once confined to dystopian worlds imagined by science fiction authors and film makers, is becoming a reality in our contemporary high-tech societies. Each of the numerous definitions of AI has undergone several revisions over time. Currently, the majority of definitions claim that AI solves difficult cognitive issues connected to human intelligence or that AI is more accessible to mass public via Smartphone and other

technology, or even that AI recognises problems and creates solutions that advance technology and society. Nonetheless, the fundamental goal of AI has always been to build tools that can think reasonable similar to humans or even better (Marr, 2018).

The use of AI in business and industry is becoming more widespread. It has the power to completely alter how we research, learn, live, interact, and work. The potential benefits to society and the economy are enormous. (National Artificial Intelligence ..., 2016). As we advocate for the future of sustainable development, the 17 Sustainable Development Goals (SDGs) are setting the development agenda for the countries around the globe. AI is also rapidly opening up a new frontier in the areas of business, corporate practices, and government policy. Deep learning has enabled machine and robotic intelligence to resolving cognitive issues that are typically related to human intelligence. Gradually, AI is replacing people in this field of expertise by producing outcomes that are more accurate, efficient, and effective. Homo-sapiens will not be completely supplanted at once but rather through time (Harari, 2017).

Certain cities and nations will benefit intellectually and financially from the development of AI, while others will fall behind. The creation and implementation of the legal and regulatory frameworks and the mechanisms intended to regulate AI have already been outpaced by the technology's quick development (Munoz & Naqvi, 2018). The majority of professionals who create these frameworks and procedures conceive in terms of academic research cycles or political cycles, which can be as brief as 20 years (Harari, 2017).

Putting into the words of Stephen Hawking, physicist and cosmologist, humans won't be able to compete with the intellectual machines with their slow biological systems (Goralski & Górniak-Kocikowska, 2017, 2018; Goralski & O'Connor, 2018; Penn, 2017). The residents of developed countries are in fear of losing jobs with application of AI in all the sectors, while the residents of underdeveloping countries are seeing this as an opportunity to break the vicious poverty cycle (Lohr, 2018).

## **2. Advancing AI in an Age of Sustainable Development**

According to Jeffrey Sachs, a professor of health policy and management at Columbia University, the world is entering a new era known as the Age of Sustainable Development. During this time, all countries must work together to address some of the most difficult issues, such as persistent extreme poverty, social exclusion, economic injustice, poor governance, and environmental degradation (Sachs, 2015). He put out a paradigm for examining sustainable development through the four pillars of economic development, social development, environmental protection, and good governance at the UN World Summit on Sustainable Development (WSSD) in Johannesburg in 2002. These four elements are each separate pillars that reinforce one another, but they are all necessary for global sustainable development (World Summit of Sustainable Development [WSSD], 2002, p. 2). Yet, because AI is such a fresh, dynamic, and constantly growing phenomenon, its effects on the job of promoting the SDGs are only now becoming apparent and have not yet undergone extensive study. The development of artificial intelligence from its beginnings to the present day has been the subject of extensive investigation. The volume of study has increased as a result of the experimental integration of AI into theory, thought processes, and workable solutions to issues by innovators across a variety of fields, as reported in industry trade magazines and academic journal articles. An

sudden spike in AI investment occurred at first, then after receiving limited returns, it decreased, increased, and declined in a pattern that appeared occasionally throughout the history of AI (Munoz & Naqvi, 2018). AI has experienced both triumph and failure on a roller coaster.

The application of AI is at its budding stage in India. Giving machines the ability to emulate human behaviour, particularly cognitive skills, is the goal of artificial intelligence (Artificial Intelligence, 2018). It can be characterized as a discipline created to support people in their everyday activities. The best way to define artificial intelligence (AI) is as computerized systems that use knowledge, reasoning, and communication to support intelligent decision-making by mimicked machines. In a layman's language, artificial intelligence (AI) is the process of giving robots a human-like level of intelligence. For ease of understanding AI, can be easily categorized into two categories. One, the weak AI which is designed to perform some specific task like printing, motion lights, deposit and withdrawal of cash etc., While the other category is termed as the strong AI which can experience emotions and even consciousness. AI, data mining and machine learning are frequently used interchangeably. Machine learning is one of the AI subset tools that endows machines with the ability to learn from experience, despite the fact that all three of these technologies are connected and yet unique from one another. Data mining locates and examines datasets to detect hidden patterns, producing pertinent information for the learning experience of gadgets.

As bio-humanoid roboticists, like the lifelike robots developed by David Hanson, Ben Goertzel, and other pioneers in the field, grow more widespread and accepted, artificial general intelligence (AGI) is getting closer to being a reality (Goralski & Górnica-Kocikowska, 2017, 2018; Goralski & O'Connor, 2018). These ground-breaking inventors aim to develop OpenCog, a database that would compile all bio-humanoid robots' collective knowledge into a single repository that could be instantly transmitted to all bio-humanoid robots. The body of AI knowledge would be cumulative and spread equally (Goralski & O'Connor, 2018). While AGI, could result in significant job loss due to increased production and distribution efficiency.

On the opposite end of the spectrum, some individuals think that increased AI use would lead to solutions for the issues of wealth inequality, which is connected to SDG #10 (Reduced Inequalities). It is naive to think that individuals who develop and possess the next generation of AI technology will divide the profits broadly rather than narrowly by boosting their own wealth, given that the benefits of greater production and efficiency increases have not always been dispersed equitably. The concentration of wealth and widening of the divide between the wealthy and the poor might result from this.

### **3.AI and economic outcomes:**

The technical benefits that AI provides might help the Economics group of SDGs meet a lot of its goals. Acemoglu and Restrepo (2018) note a net positive impact of AI-enabled technology linked to higher productivity, but the literature also reveals potential

negative impacts, primarily linked to greater inequality (Cockburn, I., Henderson, R. & Stern, S.2018;). The Economy group of the SDGs is at risk of increased economic inequality due to the introduction of new inequalities in low- and middle-income countries. This could have a negative impact on SDGs 8, 9, and 10 (Bissio, 2018).

#### **4. Artificial intelligence and the SDGs**

The SDGs have used artificial intelligence in a variety of ways, first through experimentation and subsequently in sustainable management and leadership initiatives. This research paper takes into three aspects for analysis:

- a) AI and Agriculture
- b) AI and the Water Crisis
- c) AI, Sanitation and Health

#### **5. AI and Agriculture**

In addition to organising historical data for farmers' use, AI-enabled technology is now being used in Indian agriculture, one of the oldest and most important professions, to improve crop monitoring, weed, pest, and insect control, soil health, higher crop yields, and overall crop growing conditions. This technology has also improved many other food supply chain activities. (Faggella, 2020). In addition to analysing the agricultural data to minimise the negative effects, the deployment of AI-enabled solutions will aid in the detection of plant diseases, the speedy forecasting of climatic changes, and the smart response. Together with changing how food grains are produced on farms, which may cut carbon footprints by 20%, it is essential in regulating any undesirable environmental conditions (Gupta, Vemireddy, & Pingali, 2019). Even at the local level, the AI-enabled system may be used to deliver more precise early warnings for air quality (Saran, 2019). It can be used successfully in 13 sectors to lower the global agriculture sector's carbon footprint (Vincent, 2019). By providing training to farmers, applying AI technology will turn blue-collar occupations into white-collar ones rather than eliminating manual or human jobs.

#### **6. AI and the Water Crisis**

The world is facing a water crisis. The population of the globe faces a serious threat to its health and welfare due to a scarcity of water supplies. The processes of the worldwide water preservation and conservation are positively supported by the growing technology for water collection, management, and recycling. The future of water resource conservation is laid out with the help of artificial intelligence methods like machine and deep learning (Bihu Suchetana, Biplav Srivastava, Hari Prabhat Gupta, and Manabendra Saharia. 2023). Water utilities all around the world are discovering innovative methods to enhance how they manage water by leveraging the power of artificial intelligence algorithms. Since many decades ago, artificial intelligence has been helpful in many ways, from anticipating water

flow to estimating the amount of water required to fulfil the demands of various users. In the last several years, there has been a significant advancement in this technology. Learning about information thinking is a part of this process, followed by correction and conclusion (N. V. Ingle, S. D. Sable, D. P. Ghadge and S. Mane,2022)

## **7. AI, Sanitation and Health**

For the past decade, there has been a tremendous technological change in our culture, and electronic products are now widely used. The quantity of E-waste created annually has significantly increased due to the rise in electronic device development and the rising intrinsic need to buy the newest technology. In 2020, India produced 3.2 million tonnes of electronic garbage, with major metropolises like Mumbai, Delhi, and Bangalore at the top of the list. Nowadays, each contemporary city must manage and recycle e-waste properly to be sustainable. While methods for collecting E-waste from businesses and industries have received attention, there are few options for collecting E-waste from private homes. The authors (Shreyas Madhav A, Rajaraman R, Harini S, Kiliroor CC.;2022) suggest developing a mobile robot that can be attached to existing municipal garbage trucks and uses transfer learning to identify typical electronic wastes. Using its arm-based lift and storage mechanism, the robot goes about, detects electronic trash, and executes segregation of the detected material. For classifying the E-wastes, a convolutional neural network-based identification method has been used, and it achieves 96% accuracy. This is a ground-breaking effort to collect and sort E-waste from homes and people, especially in India.

Recognized as a powerful tool in Industry 4.0, artificial intelligence has been used extensively in this pandemic, including analyzing the difficult healthcare data, minimizing the impact of the infodemic, assisting in discovering the best treatments, and analyzing the symptoms of suspects using medical imaging such as computed tomography scans and X-ray imaging for virus detection (Sandhu R., Sood S.K., Kaur G; 2015). By the development of ICT, it offers the paradigm of automated operations, flexibility in product design, and quick, high-quality manufacturing. Technologies related to Industry 4.0 have the potential to enhance information exploitation and create cutting-edge health frameworks. It mainly depends on disruptive technologies like 3D printing, the Internet of Things (IoT), artificial intelligence, and big data analytics (Javaid M., Haleem A.; 2019).

## **8. Conclusion**

AI offers a wide range of applications that have the potential to revolutionize the goal of sustainable development, which will include numerous players from various nations, cultures, and industries. Businesses from all across the globe have been urged to contribute to attaining the SDGs through the UN Global Compact. The explanation mentioned above demonstrate how powerfully. In addition to fostering economic growth AI may also help address the impacts of our production and consumption on society, government buildings and the environment. The inventors, activists, and global development advocates who use AI-enabled

technologies have advanced to the cutting edge of the field of sustainable development. Their innovations have improved industry and sector efficiency, assisted in the preservation of priceless, non-renewable resources, spread knowledge and expertise, closed global resource and technological gaps, and assisted in the formation of successful multi-sector partnerships (between governments, business, civil society, and citizens) that support global sustainability.

The SDGs provide an ambitious vision for a sustainable future, but they must be put into action in the face of strong and entrenched forces. These vary from people's indifference, lethargy, and ignorance to governments' lack of political will and resources, companies' pursuit of short-term profit, nation-states' short-sighted concentration on particular national interests, and the abandonment of the global common good. For global sustainability and the future of mankind on this planet, we will need the commitment of a variety of public and private sector organizations, national government and civil society groups. Nevertheless, they would also benefit from utilizing a completely new set of resources and tools that artificial intelligence has made available.

The introduction of SDGs represents a huge commercial potential for the developing AI sector. A lot of people around the world can benefit from the rapid pace of technological advancement thanks to AI, which can produce data for more effective intervention targeting, reduces waste and losses in production and consumption, develops new applications that will completely transform industries and professions and offers better connectivity and lower costs. (Clean Water AI).

Nonetheless, it may be necessary to pay a fee and take certain risks in order to embrace and institutionalize these SDG-advancing ideas and activities. AI has two opposing sides. It may include intricate traps and difficulties that need to be carefully examined and handled in order to limit their unfavorable effects. With activities that will exacerbate the worst effects of global warming, pollution, unrestrained consumption, and irresponsible manufacturing processes to feed the society of constant growth endemic to the capitalist global economic order of today, its life-affirming and sustainability-promoting applications could also be used for evil.

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