

# AN INDIAN PERSPECTIVE TO THE SUSTAINABLE DEVELOPMENT GOALS IN THE AGE OF A.I.: A LITERATURE REVIEW

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## Abstract

The 2030 Agenda for Sustainable Development Goals (SDG) are 17 goals that all United Nations Members adopted in 2015<sup>1</sup>. Sustainable Development can be defined as ‘**development which meets the needs of the present without compromising the ability of future generations to meet their own needs**’<sup>2</sup>. A tremendous responsibility lies on the shoulder of the present generation to keep planet earth a better place for our generations to come. With this in view, all UN member states adopted these sets of 17 goals in 2015. These goals range from No Poverty, Zero Hunger, and gender equality to partnerships to achieve these goals. Each SDG has been defined and given various targets to complete. All significant stakeholders strongly believe that achieving these goals will make the earth better for our future generations. The World has also been profoundly affected by the growth of various technological advancements like Artificial Intelligence, Quantum Computing, robotics, IoT, and Blockchain, to name a few. These technological disruptions have multiple effects on how the world is changing for tomorrow. Artificial Intelligence (A.I.) is the technology of providing intelligence to non-living objects or machines. Since 1950, after various A.I. winters, Artificial Intelligence technology has started delivering results in the last two decades. There has been tremendous growth in A.I., and nation-states compete to learn and earn the maximum dividend from this technology. There is a requirement to understand how this growth of technology may affect the achievement of the SDGs. This review paper looks into the role technology of Artificial Intelligence may play in achieving the SDGs from an Indian Perspective. The report will review the various available literature on the subject to understand the positive and negative effects of Artificial Intelligence on the path toward achieving the SDGs for India. The paper will review the available literature and recommend various future courses of research in this field.

**Keywords:** Artificial Intelligence, Sustainable Development Goals, Emerging Disruptive Technologies, Poverty, Education, Climate, India

<sup>1</sup><https://sdgs.un.org/goals>

<sup>2</sup><https://www.monash.edu/msdi/about/sustainable-development/what-is-it>

## INTRODUCTION

*“Without technology humanity has-no future but we have to be careful that we do not become so mechanised that we forgot our human feelings.”*

*- Dalai Lama<sup>1</sup>*

Technology has constantly been reinventing human life. From the discovery of fire to the invention of the wheel, human civilisation has always undergone tremendous metamorphosis due to the advent of technology. Technologies like nuclear power have also been the cause of numerous deaths. Each technology has its boon or bane and primarily depends on the user.

21<sup>st</sup> Century has seen massive growth in the technology of Artificial Intelligence, where the development of the cognitive thought process of non-living things is undertaken. A.I. is the process of providing intelligence to inanimate objects, call it robots, machines etc. The growth of this technology has seen massive crest and troughs; however, today, it stands at a juncture where even subject matter experts fear the future. Whether this technology of A.I. can be good for humankind or not has been raised in various forums. This review investigates the use of A.I. in achieving the Sustainable Development Goals as enumerated by the UN from an Indian perspective.

## Background

*“AI will unlock the unique potential of each person and will empower them to contribute more effectively to the society.”*

- Shri Narendra Modi, PM of India

The 2030 Agenda for Sustainable Development Goals (SDG) are 17 goals that all United Nations Members adopted in 2015<sup>2</sup>. Sustainable Development can be defined as ‘**development which meets the needs of the present without compromising the ability of future generations to meet their own needs**’<sup>3</sup>. A tremendous responsibility lies on the shoulder of the present age to keep planet earth a better place for our generations to come. With this in view, all UN member states adopted these 17 goals in 2015. These goals range from No Poverty, Zero Hunger, and gender equality to partnerships to achieve these goals. Each SDG has been defined and given various targets to complete. All significant stakeholders believe that achieving these goals will improve the earth for future generations.

The World has also been profoundly affected by the growth of various technological advancements like Artificial Intelligence, Quantum Computing, robotics, IoT, and Blockchain, to name a few. These technological disruptions affect how the world is changing for tomorrow. Artificial Intelligence (A.I.) is the technology of providing intelligence to non-living objects or machines. Since 1950, Artificial Intelligence technology has started delivering results in the last two decades after various A.I. winters. There has been tremendous growth in A.I., and nation-states compete to learn and earn the maximum dividend from this technology. There is a requirement to understand how this technology growth may affect the SDGs' achievement. This review paper looks into the role technology of Artificial Intelligence may play in achieving the SDGs from an Indian Perspective. The report will review the various available literature on the subject to understand the positive and negative effects of Artificial Intelligence on the path toward achieving the SDGs for India. The paper will review the available literature and recommend various future research courses in this field.

The sustainable development goals were defined and adopted in the year 2015. These are goals to make the world a better place to live for our generations to come. The discussions and negotiations on these goals started in January 2015 and culminated in Aug 2015. The final document titled "Transforming our World: the 2030 agenda for sustainable development" was adopted in Sep 2015. The Indicators review was undertaken last in Mar 2020, and the following review is planned for 2025.

The SDGs presently have 17 goals, 169 Targets and 232 Indicators.

### Research Questions

The literature review was carried out to answer the following Research Questions regarding the Indian perspective on the use of A.I. in achieving the SDGs. The research questions guiding this literature review were:-

- What are SDGs, and what is the genesis of SDGs?
- What is the role A.I. can play in achieving the SDGs?
- What role can A.I. play in SDG achievements from an Indian Perspective?

### METHODOLOGY OF THE LITERATURE REVIEW

The literature review kept three aspects in mind, the advent of A.I. Technology, Sustainable Development goals and the effect on India. Various scholarly databases were searched with the keywords Artificial Intelligence, SDG, and India. Different white papers, industry documents, and policy documents were also looked into. One of the most important repositories of data was the website, indiaai.gov.in, which has a repository of various documents related to implementing A.I. in India. After careful analysis of multiple sources, a total of 23 articles/ papers/ policy documents were selected for the literature review. An analysis of the same is given in the following Table.

Ser No	Title	Authors	Year	Access ed On	Type	Sdg	Indian Persp ective	Page Length
1	Adoption of AI Inevitable to Achieve Sustainable Development Goals	NA	05-Jul-21	12/05/22	POST-CONFERENCE REPORT	ALL SDGS	YES	5
2	Artificial Intelligence (AI) and Poverty Reduction in the Fourth Industrial Revolution (4IR)	David Mhlanga	16-Sept-20	13/05/22	RESEARCH PAPER	POVERTY	NO	16
3	Agenda 2030 for Sustainable Development: A powerful global framework	Chantal Line Carpentier & Hannah Braun	12-Mar-20	12/05/22	RESEARCH PAPER	ALL SDGS	NO	11

4	AI in the Public Service: From Principles to Practice	Oxford Commission on AI & Good Governance	Dec-21	13/05/22	RESEARCH PAPER	PUBLIC SERVICE	NO	22
5	A panoramic view and SWOT analysis of artificial intelligence for achieving the sustainable development goals by 2030: progress and prospects	Iván Palomares et al	11-Jun-21	27/04/22	RESEARCH PAPER	ALL SDGS	NO	31
6	Artificial Intelligence and Gender Equality	UNESCO GLOBAL DIALOGUE	Aug-20	13/05/22	KEY FINDINGS OF A GLOBAL DIALOGUE	GENDER EQUALITY	NO	54
7	Artificial Intelligence and Sustainable Development Goals	A BELLAPU	06-Feb-21	23/04/22	WEBPAGE	ALL SDGS	MAY BE	3
8	The alliance between artificial intelligence and sustainable development	NA		24/04/22	webpage	ALL SDGS	MAY BE	7
9	No Planet B: How Can Businesses and Technology Help Save the World?	ORACLE-SAVANT A	Feb-22	13/05/22	INDUSTRY REPORT	ALL SDGS	MAY BE	17
10	Education and AI	SUHCAI	Feb-22	14/05/22	Report by an organisation	EDUCATION	MAY BE	23
11	How AI can help fight poverty?	L R Roepe	14-Nov-18	24/04/44	Perspective by Tech Organisation	POVERTY	NO	3

12	How AI can help in achieving the Sustainable Development Goals?	S Miteva	22-Mar-22	13/05/22	WEB PAGE	ALL SDGS	NO	
13	How can AI help in achieving the UN's sustainable development goals?	J Reilly	10-May-22	13/05/22	webpage	ALL SDGS	NO	17
14	Implications of AI on the Indian Economy	NASSCO M	24-Jul-20	13/05/22	INDUSTRY REPORT	ECONOMY	YES	3
15	Mapping Poverty through Data Integration and Artificial Intelligence	ADB	Dec-20	13/05/22	INDUSTRY REPORT	POVERTY	YES	55
16	Notes From The AI Frontier Applying AI For Social Good	McKinsey	Dec-18	13/05/22	Discussion Paper	ALL SDGS	NO	52
17	The AI gambit: leveraging artificial intelligence to combat climate change—opportunities, challenges, and recommendations	Josh cowls, Andreas Tsamados, Mariarosaria Taddeo, Luciano Floridi	06/09/21	13/05/22	Research Paper	CLIMATE	NO	25
18	Climate AI : How artificial intelligence can power your climate action strategy	CAPGEMINI		13/05/22	INDUSTRY REPORT	CLIMATE	NO	

19	Responsible AI for the Indian justice system – A strategy paper	VIDHI LEGAL POLICY	15/04/21	13/05/22	RESEARCH PAPER	JUSTICE	YES	
20	Role of AI in achieving sustainable development goals	J Nathaniel	04/05/21	23/04/22	WEB PAGE	ALL SDGS	NO	
21	The role of artificial intelligence in achieving the Sustainable Development Goals	Vinuesa, et al	2020	23/04/22	RESEARCH PAPER	ALL SDGS	NO	10
22	The role of artificial intelligence in sustainable finance	Musleh Al-Sartawi, A. M., Hussainey, K., & Razzaque, A.	2022	23/04/22	RESEARCH PAPER	SUSTAINABLE FINANCE	NO	7
23	Harnessing artificial intelligence to accelerate the energy transition	WORLD ECONOMIC FORUM	01-Sept-21	13/05/22	WHITE PAPER	ENERGY	NO	25

The list of 23 documents above was selected after carefully analysing the titles, going through the abstracts, reading the executive summary, relevance to the research questions and applicability to the Indian perspective. The 23 documents consist of various web pages, whitepapers, policy documents, industry briefs, project workshop reports, research papers, discussion papers, views by tech organisations, reports by organisation, key findings of global dialogues etc.

## DISCUSSIONS

After finalising the list of articles, a thematic review was conducted by combining the basic themes of each SDG. The documents were further analysed based on the effect of SDGs. out of 23 papers, 11 discussed all SDGs and the impact of A.I. on them. Two of them discussed poverty, one about energy, two about economics and sustainable finance, two about gender equality, two about climate, one about education, one about public services, and one about justice. Six of the documents were having direct perspective on India, four of them indirectly

had some relationship to the Indian Perspective, and 13 documents looked into the overall effect of A.I. and SDG.

## SDGs

There are 17 Sustainable Development Goals. These are No Poverty, Zero Hunger, Good Health and Well-being, Quality Education, Gender Equality, Clean Water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Industry, Innovation, and Infrastructure, Reducing Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land, Peace, Justice, and Strong Institutions Partnerships for the Goals.

Vinuesa et al., in their paper “The role of artificial intelligence in achieving the Sustainable Development Goals”, assessed A. I in the achievement of SDGs. The authors used a consensus-based expert elicitation process and found that AI could help achieve 134 targets but may inhibit 59 targets. The authors also concluded that regulatory insights, policies and oversights are needed to support the exhilarating growth of this technology of A.I. to enable sustainable development. If technology development is not reined with good policies, it may result in gaps in safety, data security, privacy, transparency and ethical standards. (Vinuesa,et.al 2020). The authors have divided the SDGs into three categories, Society, Economy and Environment and analysed whether A.I. can act as an enabler or inhibitor in each of the 17 goals.

Palomares et al., in their paper, “A panoramic view and SWOT analysis of artificial intelligence for achieving the sustainable development goals by 2030: progress and prospects”, carried out a SWOT analysis of A.I. for achieving SDGs, thereby studying the role of A.I. in pursuance or hindrance of achievements of SDGs. The paper has classified SDGs into three dimensions and six perspectives. These are economic, social and environmental dimensions and views of life, social development, resources, economic and technological development, equality and the natural environment. Then the authors have carried out a SWOT analysis of each SDG, thereby enumerating the Strengths, weaknesses, opportunities and threats of A.I. in achieving those SDGs. The paper highlighted five key elements and priorities which should be globally understood to implement and achieve SDGs by 2030. The report highlighted the role that A.I. will play in digital transformation and achievement of SDGs, the importance of data in the virtual world and how achieving the SDGs are essential at the societal level. ( Paloares et al., 2021)

In their paper, “Agenda 2030 for Sustainable Development: A powerful global framework” Carpentier and Braun discussed SDGs' progress from 2015 onwards to 2019. In the paper, the authors have discussed how UNCTAD (United Nations Conference on Trade and Development) is supporting the process of achieving the SDGs. The article discusses the role of MSMEs and entrepreneurship in achieving the SDGs. The report highlights how big data and artificial intelligence provide opportunities for the financial sector to help achieve the SDGs. The paper highlights the requirements of innovative approaches that are socially inclusive and environmentally benign to achieve the SDGs. The report highlights the need to



align core business objectives and operations to sustainable development. (Carpentier and Braun, 2020)

In the post Conference report of four days international symposium on “Artificial Intelligence for Social Good”, organised by Amrita Vishwa Vidyapeetham, during June 30-July 3, 2021, it was highlighted that aligning A.I. with SDGs is one of the ways that benefit of this technology can reach the maximum number of people. The conference highlighted the use of A.I. in Accessibility, Agriculture, Autonomous Vehicles, Healthcare and Well-being, Safety & Surveillance and Smart Environments. It was also highlighted that A.I. would improve natural intelligence and decision-making capabilities. The need for investment in data security and inclusivity areas was also highlighted. ("Adoption of AI inevitable to achieve sustainable development goals": Experts," 2021)

A Bellapu, in her article, “Artificial Intelligence and Sustainable Development Goals”, highlights areas where A.I. is already helping in achieving the SDGs. The report highlights how education has been made more accessible due to the use of A.I. The report also highlights how A.I. is helping visually challenged students to get educated. In the field of agriculture, A.I. assists in the detection of diseases in plants. According to the author, in healthcare, A.I. can assist in processing vast amounts of data and helping in faster treatment.

A.I. helps in disaster management too by minimising the effects of the disaster by correct prediction and preventive actions. (Bellapu, 2021)

In the report, “The alliance between artificial intelligence and sustainable development”, the contributors highlight how better use of Artificial Intelligence can contribute to SDGs by predicting errors and planning SDGs more effectively. The article highlights how combining A.I. with sustainable development will help all industries to design a better planet. The article highlights the use case of A.I. in traffic management, which can facilitate mobility and reduces environmental impact. The report also highlights the use of A.I. to build a sustainable economy. In agriculture, the technology of A.I. can be used to predict crop needs. A.I. can also help in intelligent manufacturing by error prediction. ("Artificial intelligence and sustainable development," n.d.)

In the 2022 ESG Global Study by Oracle Savanta, the authors and contributors discuss how businesses and technology can help save the world? In this research, Oracle has partnered with Pamela Rucker, CIO Advisor and Instructor for Harvard Professional Development, and Savanta Research to survey more than 11,000 people (consumers and business leaders) across 15 global markets to answer the question of how technology will affect the ESG (Environmental, Social and Governance efforts). According to the report, 93% of people believe sustainability and social factors are essential for our future generation, and 78% are dissatisfied with the progress of businesses on these initiatives. The report highlighted the opinions of 91% of business leaders facing significant challenges in making progress on sustainability and ESG initiatives. 96% of business leaders also admit that human bias and emotion often distract them from the end goal. An essential aspect of the report was the view of the people that 70 % of them are willing to end their relationship with a brand that does not take sustainability



seriously. If organisations demonstrate their progress on environmental and social issues, 87 % of people would be more willing to pay a premium for their products and services, and 83 % would invest in them. The report also highlights that combining human and artificial intelligence may bring more meaningful changes to the world. (“No Planet B: How Can Businesses and Technology Help Save the World?”, 2022)

The 2022 report “How A.I. can help in achieving the SDGs, by S Miteva highlights how A.I. can help in circular economy and sustainable living. The report highlights that A.I. can be used across all 17 SDGs benefitting millions of people worldwide. The report highlights the role of A.I. in areas such as healthcare, agriculture, schooling and transport. It highlights the role of A.I. in leveraging vast quantities of data to provide actionable intelligence and faster decision-making. The report highlights the case of renewable distributed electricity grids integrated with A.I., safer supply chain, environmental control etc. The report highlights research by PwC UK, which predicts up to a 4% reduction in the emission of GHG by 2030 due to the use of A.I. The report has highlighted the role of A.I. in environmental protection, energy solutions, health issues, improving agriculture and fighting hunger. The report concludes by emphasising that A.I. can be a powerful tool and make a positive impact. (How AI can help in achieving the Sustainable Development Goals? 2022)

The article, “How Can AI Help in Achieving the UN’s Sustainable Development Goals?” John Riley highlights the seventeen SDGs' seventeen goals. He further highlights that the biggest challenge in achieving the SDGs is its broad scope and interconnected nature, which inhibits standalone achievements of the goals. The author then highlights how these challenges will propel new opportunities. The three pillars of sustainable development, according to the author, are social, environmental and economic. The author states, “AI can help meet the SDGs because it augments, rather than replaces, our intelligence and capabilities. Any actions humans take to achieve the SDGs can be augmented with artificial intelligence.” According to the author, various ways A.I. can help achieve SDG are decreasing carbon, fighting poverty, improving fraud detection, assessing legislation impacts, improving economic efficiencies, job creation, environmental preservation, understanding climate change and supporting low carbon systems. The author also highlights how A.I. Can hinder SDGs, increase energy footprints, the fear of biased A.I., and rising income inequality. The author concludes by emphasising that though the future of A.I. is bright, transparency and consent would be two areas to focus upon to have maximum gains from this technology. (“How can AI help in achieving the UN’s sustainable development goals? “, 2022)

In their report, “Notes from the AI frontier: Applying AI for social good,” Mckinsey Global Institute explains that A.I. can contribute to tackling some of the significant societal challenges of the world. The report assesses the capabilities of this technology that are currently most applicable for such societal challenges and identifies areas where their utilisation would be most potent. The paper also identifies various limiting factors and risks to be addressed and mitigated using this technology. The report has analysed 160 A.I. social impact use cases and identified ten domains where the utilisation of A.I. can have a large-scale impact. The paper

discusses various A.I. capabilities such as computer vision, natural language processing and structured deep learning that have substantial potential uses for social good. The report highlights the use of these capabilities in health and hunger, education, security, equality and inclusion. The bottlenecks that are needed to be overcome to scale up A.I. for social good are data accessibility and talent. The paper further enumerates the role to be played by both private and public sectors in ensuring A.I. achieves its goal for social good. (“Notes from the AI frontier: Applying AI for social good,” 2018)

Juan Nathaniel discusses the importance of SDGs by explaining them as a collection of 17 interlinked global goals designed as a “blueprint to achieve a better and more sustainable future for all.” The author argues that though A.I. will help the potential adoption of EVs and smart appliances and improve the efficiency and reliability of electric generations, it can also be computationally expensive as the need for energy of A.I. may lead to increased pollution. The author also warns that the use of A.I. may increase inequality within society. The author also highlights the risk of opaque A.I. systems, which may increase the cases of racism, xenophobic tendencies etc. The author concludes by saying that identifying the risks that A.I. poses should be studied so that the gains in using A.I. are equitable and sustainable. (“Role of AI in achieving sustainable development goals”, 2021)

## Poverty

David Mhlanga, in the paper “Artificial Intelligence (AI) and Poverty Reduction in the Fourth Industrial Revolution (4IR)”, discusses the role A.I. can play in alleviating poverty. The author uses secondary research data to investigate A.I.'s effect on poverty in the fourth industrial revolution. The author utilises unobtrusive research techniques and content analysis to study the impact of A.I. on poverty. The author emphasises that A.I. technologies can be crucial in achieving the SDGs. The author highlights the use case of Stanford University in mapping poverty using satellite images. The author also discusses how A.I. can impact agriculture in rural areas, the impact of A.I. in education, and the role of A.I. in digital financial inclusion. The author concludes by saying that more investment is needed to scale the A.I. for maximum benefit and social good. (Mhlanga, 2020)

In the industry insight of “How AI can help fight poverty?” the contributors highlight the role of Machine Learning and A.I. to help alleviate a global food crisis. The author highlights the role of researchers at Stanford University and Carnegie Mellon towards this goal.

The author highlights how researchers at Carnegie Mellon are working with U.S. farmers to grow high-value crops using M.L., robots and drones. Stanford scientists are working on locating areas of poverty through high-resolution satellite imagery. (“How AI can help fight poverty?” 2018)

The Asian Development Bank, in their industry report “Mapping Poverty through Data Integration and Artificial Intelligence”, highlights the scope of mapping poverty with the help of digital data. In the report, two pilot economies, Thailand and the Philippines have been taken as case studies, and mapping of the data through traditional methods of data collection and digital techniques have been matched. The report emphasised that innovations in digital

technology present exciting opportunities to embrace a new paradigm of sourcing data for development purposes. Though not a perfect substitute for the traditional data sources, they represent the actual data. Thereby making integration of data an effective way to make the most of conventional and innovative data sources. The report explores the feasibility of a poverty estimation method with the help of satellite imagery in daylight and nightlight to estimate poverty. The report summarises that applying integrated study methodology to specific datasets from these two economies has been “encouraging”. The report suggests that the NSOs can use digital technology to streamline the data collection. (“Mapping Poverty through Data Integration and Artificial Intelligence”, 2020)

### **Economy & Sustainable Finance**

In the NASSCOM report “Implications of AI on the Indian Economy”, A.I. has been highlighted as a GPT (General Purpose Technology) which lends itself to a varied field of application. Technology has both direct and indirect contributions to the economy. The report results have found a positive and significant relationship between the firms using this technology and total factor productivity growth. The estimated TFP growth stands at 0.05%. The return to GDP in the near term due to the use of A.I. is at 2.5%. The report also highlights the social implications of A.I. applications which may impact the economy. (“Implications of AI on the Indian Economy”, 2020)

Musleh et al., in their paper, highlight that A.I. has the potential to address societal problems, including sustainability. In the era of A.I., societies will be dependent on big data, social media, and data science and knowledge management to achieve sustainability. The authors highlight that relevant literature indicates a rise in awareness of A.I. and sustainable development investments. The paper concludes by emphasising that though A.I. will play a role in sustainable finance, regulations are needed to handle the technology. (Musleh et al., 2022)

### **Climate**

In the Industry report of Capgemini, the researchers worked to answer the question of how A.I. can help accelerate our response to climate change. The paper analysed over 70 used cases for climate change and identified the ten most impactful ones. Few of the used cases involved tracking GHG emissions and tracing GHG leakages at industrial sites, improving the energy efficiency of facilities, new products to reduce waste and emissions, and A.I. in reducing wastages of food and route optimisation. The report also highlighted that A.I.-enabled used cases are already decreasing GHG emissions and are accelerating climate action. Finally, the report suggests six critical action areas for the organisation to leverage A.I.’s full climate action potential. (How artificial intelligence can power your climate action strategy? 2022).

Cowls et al., in their work, have analysed the role A.I. could play in combating global climate change. The paper identified two critical opportunities that A.I. may offer: to expand the current understanding of climate change and fight the climate crisis. The author explains that the use of A.I. also raises social and ethical challenges and the climate change due to the emission of GHG generated by the use of A.I. The author suggests the need for responsive, evidence-based and effective governance to utilise A.I. effectively for climate change. The paper presents 13

recommendations to identify and harness the opportunities of A.I. for fighting climate change and reducing its effect on the environment.

### **Education**

In the HAI Stanford University-industry brief, the contributors highlight the effect of A.I. research on the education sector. Peter Norvig has said, “Education is one domain where AI research has great potential to develop solutions that improve the daily experiences of students and lifelong learners. We've shown that machine learning systems can automate part of the role of a skilled human tutor, allowing the human tutor to concentrate on what they do best. This is one demonstration of how technology can help broaden access to high-quality and personalised education. AI technology does this, not by removing humans from the equation, but rather by putting them at the centre and giving them tools to be more effective” The report highlights that Industry, academia and government are going to play an essential role in the research of A.I. in education. According to the report, A.I. can help in personalised and adaptive learning, natural language interactions, augmented teaching, learning sciences and learning infrastructure. The growth in A.I. in education may increase the reach of education to all, thereby helping achieve sustainable development goals. (Education and AI, 2022)

### **Energy**

The Whitepaper by World Economic Forum on Harnessing Artificial Intelligence to accelerate Energy transition released in September 2021 aims to gather consensus and provide public support for using AI to best ensure a low-cost energy transition. The whitepaper discusses the issues as the most critical applications of A.I. for accelerating the energy transitions, recommends nine principles for A.I. for energy transition and recommends actions by essential stakeholders of the public and private sectors. The various potential for A.I. for energy transitions are optimising and efficiently integrating variable renewable energy resources into the power grid to support autonomous electricity distribution systems. A.I., according to the paper, can also accelerate the search for performance materials that support clean energy and storage technologies. Though limited usage presently is being done of A.I. in energy transition, it is suggested that more excellent opportunities exist in future to accelerate the global energy transition. (Harnessing artificial intelligence to accelerate the energy transition, 2022)

### **Gender Equality**

UNESCO launched a global dialogue on A.I. and gender equality, and the report's key findings were produced as a whitepaper. The paper discusses the use of A.I. in gender equality. The purpose of the dialogue was to identify issues, challenges and various good practices to overcome the gender bias found in A.I., improve the global representation of women in technical roles and create robust gender-inclusive A.I. principles. The report suggested a framework for gender equality and argues for the need to establish a systems approach to achieve gender equality in terms of A.I., generate A.I. ethical principles and what role gender equality will play in them, and discusses various strategies to operationalise A.I. and gender equality principles and finally develop a multi-stakeholder action plan. (A.I. and gender equality, key findings of a global dialogue, 2022).

## Public Service

Oxford Commission on A.I. and good governance have published a research paper highlighting A.I.'s role in public services. According to the report, the initial data indicates that there may be severe challenges while governments worldwide apply A.I. in public service. However, with challenges come opportunities in which cooperation can ensure that A.I. systems are used for good governance and help resolve various public problems. The three critical questions that the report answered were, The nodal authority to guide public service A.I. steps to be taken to build public service A.I. for good governance and to develop trust in public service A.I.; the report suggests that for A.I. to be used in the public interest there are various objectives to be met, these are, A.I. must be inclusive, procurement of A.I. to be guided by an informed public agency, implementation of A.I. to be purposeful and accountability of A.I. systems to the stakeholders. The three recommendations in the paper are a partnership between government, industry and civil society for advancing research on public service A.I., thereby building an international scientific body for advancing research and an arbitral body for adjudicating disputes. The report also advises national governments to develop the capacity of their public services by engaging with the technology of A.I. The trust in the A.I. must also be strengthened through public education campaigns after educating them on the risks and rewards of using A.I. Finally, the report advocates three immediate actions conducting feasibility studies, consulting with various stakeholders and planning for the engagement of A.I. for public services. (AI in the Public Service: From Principles to Practice, 2021)

## Justice

Vidhi Legal Policy, in their strategy paper, has highlighted how A.I. can be used responsibly for the Indian Justice system. The report is organised into four parts; firstly, the article discusses the scope of A.I. in the Indian Legal System with the help of a global survey. The article discusses various used cases that have come to the fore in other countries with the advent of emerging technologies. Thirdly, the report highlights the long-term and short-term challenges that may be posed by the integration of A.I. with the justice system. Finally, the report suggests the long-term strategy and short-term steps to be followed to facilitate the use of A.I. in the Indian Legal System. The article discusses how A.I. can be used to improve administrative efficiency and decision-making processes in the Indian Justice system. The challenges highlighted are ensuring transparency and accountability, preventing biases and creating a decision support system to supplement human judgement. The roadmap suggested by the paper includes conceptualising the integration in the justice system, setting operational support to enable integration and phase-wise deployment of A.I. in the Indian Judicial system. (Responsible AI for the Indian justice system – A strategy paper, 2021)

## SDGs and Indian Perspective

The review of these 23 papers suggests the tremendous scope of the implementation of A.I. in achieving the 17 SDGs. Though A.I. will accelerate the achievement of most of the goals, few goals may be inhibited by the use of A.I. The analysis of the above documents suggests that many used cases can be utilised in India to achieve the SDGs. The mapping of poverty data for



Thailand can similarly be replicated in India, and insights can be drawn from it. Likewise, the role A.I. can play in climate change management is another area where used cases, highlighted by the documents above, can be utilised.

### Further Scope of Research

This review has attempted to correlate the use of A.I. in achieving various SDGs. Further, each SDG may be taken individually as a research area, and the used cases can be mapped. Additionally, based on the success of the used cases in their respective countries same can be planned to be implemented in India.

### CONCLUSION

This review has analysed the role of the technology of A.I. in the achievements of the 17 SDGs. As discussed in the study, there is tremendous scope for the application of A.I. in various sectors that can assist in the achievements of the SDGs. A.I., due to its inherent character of consuming computational power and electricity, will also inhibit the achievement of a few goals. The aim in the case of use of this technology should be to plan and recommend ways in the issues where A.I. can accelerate the achievements of the goals, to apply ingenuity to identify the areas where it will inhibit and reduce the scope of inhibition. Various papers have highlighted a significant aspect of the fear associated with using A.I., including bias, privacy, data security, etc. These aspects need to be reviewed holistically before any A.I.-based technologies are implemented. Formulating policy and regulations on the use of A.I. will also remain essential.

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