

Role of Artificial Intelligence (AI) in Sustainable Development

Review of Professional Management:
A Journal of Management
23(1) 7–8, 2025
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DOI: 10.1177/09728686251351396
rpm.ndimdelhi.org



Artificial intelligence (AI) is revolutionising many fields and has the potential to support sustainable development when applied responsibly and ethically. It is increasingly being leveraged by many countries as a powerful tool to address climate change. AI contributes to monitoring real-time greenhouse gas emissions through satellite imagery. AI can improve energy efficiency, optimise renewable energy usage, track deforestation, predict natural disasters, and can improve urban climate resilience. In the field of agriculture, it can predict weather patterns, early detection of plant diseases, and pests, improve irrigation and fertilisation and contribute to enhanced crop yields to mitigate poverty and hunger. It is used to enhance quality of education, diversity and inclusion, promote health awareness and build partnership across organisations and geographies.

An extensive study published by Vinuesa, Azizpour, Leite, et. al. (2020) reports that AI can have both positive as well as negative impact on sustainable development goals (SDGs) comprising 17 goals, 169 targets in the internationally agreed agenda of 2030. They have identified, quantified and diagrammatically presented both positive and negative impacts into three broad categories, namely, *society*, *economy* and *environment*. Based on their research they posit that AI, with technological advancements, may contribute positively to 134 targets, whereas 59 targets may have negative effects.

In the societal category, according to the study, AI can contribute to the provision of Food (SDG 2), Health (SDG 3) and Quality Education (SDG 4), Gender Equality (SDG 5), Clean Water and Sanitation (SDG 6), and Affordable and Clean Energy (SDG 7) and help maintain Sustainable Communities (SDG 11). In the economic category, the study has included Decent Work and Economic Growth (SDG 8), Industry, Innovation, and Infrastructure (SDG 9), Reduced Inequality (SDG 10), Responsible Consumption and Production (SDG 12) and Partnerships for the Goals (SDG 17) where AI can serve as an enabler. Their environment category consists of Climate Action, (SDG 14), Life Below Water (SDG 14) and Life on Land (SDG 15) where AI can facilitate a positive role.

However, there could be challenges in implementing AI as countries differ with regard to development of AI and related technologies, availability of computational resources, cultural values and norms. Also, AI powered tools require energy which generates greenhouse gas (GHG) emissions from computing, energy and water consumption, and e-waste production affecting environment.

While using AI, ethical considerations, transparency and democratic values would require considerable attention to guard against self-interest or perpetuation of biases. National Artificial Intelligence Advisory Committee (NAIAC) of US (Oct.2023) has identified, inter alia, ‘unintended circumstances, and circumvention of safety measures’ as potential threats posed by AI. Mostly positive impact of AI is highlighted in the business and work contexts; however, skilling and reskilling are needed to prepare employees for future roles and prevent detrimental effect of AI related technologies on workforce. To take care of negative impacts of AI, a regulatory framework would be helpful. To assess the long-term impact of AI on economic, social and environmental aspects, more research need to be undertaken as development and use of AI is still evolving for the sustainable development goals.

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