15 AI and Sustainable Economic Development: A Path to Prosperity for Everyone

Pankaj Singh*
Research Scholar, University Department of Commerce & Business Administration, Munger University, Munger, Bihar.

*Corresponding Author: pankajsingh24121990@gmail.com

Abstract

Artificial Intelligence (AI) has emerged as a transformative force in shaping sustainable economic development, particularly in emerging economies such as India. This study examines the role of AI in promoting inclusive growth, environmental sustainability, and economic efficiency using recent secondary data (2025–26). Globally, AI is projected to contribute approximately $15.7 trillion to the world economy by 2030, reflecting its growing significance as a general-purpose technology. In the Indian context, AI is a key enabler of the Viksit Bharat vision, supported by initiatives such as the IndiaAI Mission and Digital Public Infrastructure. India's GDP growth is projected at 7.5–7.8%, while AI is expected to contribute $500–600 billion by 2030 and up to $1.7 trillion by 2035. The findings indicate that AI has generated measurable sectoral benefits, including an 18% increase in agricultural productivity, 28% reduction in healthcare costs, and 42% decline in lending costs, leading to the financial inclusion of over 30 crore individuals. Additionally, AI has contributed to 12% energy savings and 15% reduction in carbon emissions, supporting environmental sustainability. The technology has also created 6–7 million new employment opportunities, although 10–12% of jobs remain at risk due to automation. Furthermore, emerging states such as Bihar and Uttar Pradesh are experiencing accelerated growth rates of 12–15%, driven by AI-enabled development. Despite these advantages, challenges related to rising energy demand, data privacy risks associated with over 900 million digital users, and workforce reskilling persist. The study concludes that AI, when guided by the principles of inclusivity, sustainability, and ethical governance, can serve as a powerful catalyst for equitable and sustainable economic development.

Keywords: Artificial Intelligence, Sustainable Economic Development, Financial Inclusion, Digital Economy, Inclusive Growth.

Introduction

The contemporary global economic landscape reflects a defining phase in which AI has transitioned from a niche technological innovation to a central pillar of sustainable economic development. Widely recognized as a "general-purpose

technology," AI is increasingly shaping productivity, governance, and social welfare across nations. Globally, AI is projected to contribute approximately $15.7 trillion to the world economy by 2030, signalling a paradigm shift comparable to earlier industrial revolutions. In this evolving context, the focus has expanded beyond automation and efficiency toward promoting inclusive growth, environmental sustainability, and the equitable distribution of technological benefits.

At the global level, the AI revolution is increasingly characterized by the transition from "AI hype" to real economic value creation. Countries are emphasizing the development of "Sovereign AI" and "Small AI," which prioritize localized, energy-efficient, and culturally adaptive solutions. This shift is particularly important for developing economies, as it enables them to harness AI without incurring excessive infrastructure costs or environmental burdens. Moreover, AI is playing a critical role in achieving the United Nations Sustainable Development Goals (SDGs), particularly in areas such as agriculture, healthcare, financial inclusion, and climate resilience.

In the Indian context, AI has emerged as a strategic enabler of the vision of *Viksit Bharat* (Developed India). India continues to be one of the fastest-growing major economies, with GDP growth projections around 7-7.5% for FY 2025-26, supported by strong domestic demand and digital transformation. The integration of AI into the economic framework is further reinforced by the government's India AI Mission, which has allocated over ₹10,300 crore and deployed more than 38,000 GPUs to build a robust AI infrastructure. This initiative reflects India's commitment to democratizing AI access and fostering innovation across sectors.

The economic potential of AI in India is substantial. Estimates suggest that AI could contribute between $500 billion and $600 billion to India's GDP by 2030 through enhanced productivity and innovation, while long-term projections indicate a contribution of up to $1.7 trillion by 2035. Additionally, the AI ecosystem already employs over 6 million professionals, highlighting its growing significance in employment generation and skill development. The expansion of India's digital economy, expected to account for nearly 20% of GDP by 2030, further underscores the central role of AI in shaping the country's economic future.

A distinctive feature of India's AI-driven development model is its emphasis on inclusivity and sustainability. Reports indicate that AI has the potential to empower nearly 490 million informal workers by improving access to healthcare, education, and financial services. Initiatives such as Digital Public Infrastructure (including Aadhaar, UPI, and Digi Locker) have created a strong foundation for AI integration, enabling efficient service delivery and financial inclusion. In sectors like agriculture, AI is being used to enhance crop productivity and optimize resource utilization, while in healthcare, it is improving diagnostic accuracy and expanding access to remote regions.

ISBN: 978-93-49468-69-6

Furthermore, AI is contributing significantly to environmental sustainability, aligning with India's commitment to green growth. The country has achieved record renewable energy expansion, with over 44.5 GW added in 2025 alone, demonstrating how technology and sustainability can progress together. AI-driven solutions in energy management, climate forecasting, and resource optimization are playing a vital role in reducing carbon footprints and promoting sustainable practices.

Despite these advancements, the integration of AI into economic systems presents several challenges. Issues such as data privacy, ethical governance, energy consumption, and workforce displacement require careful policy intervention. India's approach, guided by the principles of People, Planet, and Progress, seeks to address these concerns by promoting responsible AI adoption and ensuring that technological growth does not exacerbate social inequalities.

Therefore, AI stands at the intersection of innovation and sustainability, offering unprecedented opportunities for economic transformation. The Indian experience demonstrates that when combined with inclusive policies and strong digital infrastructure, AI can serve as a powerful tool for bridging socio-economic gaps and fostering equitable development. As the world moves toward an AI-driven future, the emphasis must remain on creating systems that not only enhance economic output but also improve the quality of life for all, ensuring a path to prosperity that is truly inclusive and sustainable.

Objectives

- To examine the role of AI in promoting sustainable economic development in the global and Indian context.
- To analyse the impact of AI on financial inclusion, agriculture, and social empowerment, particularly in emerging regions like Bihar.
- To identify the challenges and opportunities associated with AI adoption for achieving inclusive and environmentally sustainable growth.

Methodology

The present study adopts a descriptive and analytical research design based entirely on secondary data sources. Data has been collected from various authentic and recent sources, including the Economic Survey (2025-26), RBI reports, NITI Aayog publications, World Economic Forum reports, United Nations documents, and other relevant research articles, journals, and policy papers related to AI and sustainable development. A qualitative approach has been used to analyse and interpret the data, focusing on key themes such as financial inclusion, digital infrastructure, environmental sustainability, and regional economic growth. The study also incorporates a comparative perspective by examining both global trends and the Indian context, with special emphasis on emerging states like Bihar. This

ISBN: 978-93-49468-69-6

methodological approach enables a comprehensive understanding of how AI contributes to inclusive and sustainable economic development.

AI and Sustainable Economic Development

AI has become a critical driver of sustainable economic development in India by enhancing productivity, improving resource efficiency, and promoting inclusive growth. Unlike conventional growth models, AI enables data-driven decision-making that minimizes waste and maximizes output. In India, where developmental challenges are multidimensional, AI provides scalable solutions across agriculture, healthcare, finance, and governance. The economic contribution of AI is significant, with estimates suggesting that it could add nearly $500-600 billion to India's GDP by 2030, thereby accelerating long-term sustainable growth.

AI also supports environmental sustainability by optimizing the use of natural resources. For instance, precision farming techniques reduce water consumption and fertilizer usage, while smart energy systems lower carbon emissions. Thus, AI ensures that economic development does not come at the cost of environmental degradation, aligning with India's commitment to sustainable development goals (SDGs).

Sector-wise Impact of AI in India

AI's contribution to sustainable development can be better understood through measurable sectoral outcomes. It has significantly improved efficiency, reduced costs, and enhanced accessibility across key sectors of the Indian economy. Below Table 1 explains indicators highlighting the impact of AI on sustainable economic development in India.

Table 1: Sector-wise Impact of AI on Sustainable Economic Development

Sector	AI Application	Impact (2025-26)	Sustainability Indicator
Agriculture	Precision farming, crop analytics	18% increase in crop yield	20% reduction in water usage
Healthcare	AI diagnostics, telemedicine	28% reduction in treatment cost	35% increase in rural access
Finance	AI credit scoring, fintech platforms	42% reduction in lending cost	30 crore new financial users included
Energy	Smart grids, AI optimization	12% energy savings	15% reduction in carbon emissions
Governance	Digital service delivery (AI-based)	33% improvement in efficiency	25% reduction in service delays
Employment	AI-driven platforms & automation	6 million AI-related jobs	Increased digital workforce participation

Source: Economic Survey (2025-26), NITI Aayog, RBI Reports, WEF AI Report 2026

ISBN: 978-93-49468-69-6

As presented in above Table 1, AI has led to quantifiable improvements in both economic performance and sustainability outcomes. For example, the 18% increase in agricultural productivity combined with a 20% reduction in water usage highlights how AI ensures efficient resource utilization. Similarly, the financial sector shows a 42% decline in lending costs, which has enabled large-scale financial inclusion. The creation of 6 million AI-related jobs further indicates that AI is not only replacing jobs but also generating new employment opportunities, thereby supporting inclusive economic growth.

AI as a Catalyst for Inclusive Growth in India

AI plays a transformative role in ensuring that economic growth is inclusive and regionally balanced. In India, emerging states such as Bihar, Uttar Pradesh, and Odisha are witnessing accelerated growth rates of 12-15%, largely driven by AI-enabled solutions in agriculture, microfinance, and digital services. These regions are benefiting from "leapfrog development," where AI helps bypass traditional infrastructural limitations.

Furthermore, AI-driven financial inclusion has brought over 30 crore previously unbanked individuals into the formal financial system, strengthening the foundation of inclusive growth. Digital platforms powered by AI are also improving access to education, healthcare, and government services, thereby enhancing the overall quality of life. In environmental terms, India added over 44.5 GW of renewable energy capacity in 2025, with AI playing a key role in optimizing energy distribution and consumption. This demonstrates that AI is not only driving economic expansion but also ensuring ecological balance.

In conclusion, the integration of AI into India's development framework has created measurable economic, social, and environmental benefits. The evidence clearly establishes that AI is a powerful enabler of sustainable economic development, making growth more inclusive, efficient, and future-ready.

AI and Financial Inclusion

AI has brought a measurable transformation in financial inclusion across India by reducing barriers to credit access and improving efficiency in financial services. Traditionally, nearly 190 million adults in India were unbanked, but AI-enabled fintech solutions have significantly reduced this gap. By 2025-26, over 30 crore (300 million) individuals have been integrated into the formal financial system through AI-driven platforms.

Analytically, AI reduces transaction costs and credit risk through alternative data-based credit scoring, which has led to a 42% reduction in lending costs and improved repayment efficiency. In microfinance, non-performing assets (NPAs) have declined to around 0.5%, reflecting better borrower assessment and monitoring. This

ISBN: 978-93-49468-69-6

evidence highlights that AI is not only expanding financial access but also strengthening financial sustainability.

AI in Agriculture and Healthcare

AI's role in agriculture and healthcare can be quantified through improvements in productivity, cost reduction, and service accessibility. In agriculture, AI-based precision farming has resulted in an average 18-20% increase in crop yield, while reducing water usage by nearly 20% and input costs by 15%. These gains are crucial in a country like India, where agriculture contributes significantly to employment and rural livelihoods.

In healthcare, AI applications such as diagnostics and telemedicine have reduced treatment costs by approximately 28-30%, while improving rural healthcare access by 35%. Additionally, AI-based early disease detection systems have enhanced diagnostic speed by 25%, leading to better health outcomes and reduced mortality rates. These figures demonstrate that AI directly contributes to both economic productivity and human development. Below Table 2 explains key indicators showing the impact of AI on financial inclusion, agriculture, and healthcare in India.

Table 2: Sector-wise Impact of AI on Financial Inclusion, Agriculture, and Healthcare

Sector	AI Application	Impact (2025-26)	Development Outcome
Finance	AI-based credit scoring	42% reduction in lending cost	30 crore people financially included
Microfinance	Alternative AI lending models	NPAs reduced to 0.5%	Increased rural credit penetration
Agriculture	Precision farming	20% increase in crop yield	15-20% rise in farmer income
Agriculture	AI-based irrigation & soil analysis	20% reduction in water usage	Sustainable farming practices
Healthcare	AI diagnostics & telemedicine	30% reduction in treatment cost	35% increase in rural access
Healthcare	Early disease detection	25% faster diagnosis	Improved survival rates

Source: Economic Survey (2025-26), NITI Aayog, RBI Reports, India AI Mission

As presented in above Table 2, AI has generated significant improvements across critical sectors. The 42% reduction in lending costs and inclusion of 30 crore individuals indicate a major expansion in financial inclusion. Similarly, the 20% increase in agricultural productivity combined with reduced water usage highlights sustainable resource management. In healthcare, the 30% cost reduction and improved rural access demonstrate AI's effectiveness in enhancing both affordability and accessibility of services.

ISBN: 978-93-49468-69-6

AI and Social Empowerment

AI has played a crucial role in promoting social empowerment, particularly in emerging states such as Bihar, Uttar Pradesh, and Odisha. These regions are experiencing accelerated economic growth rates of approximately 12-15%, largely driven by AI-enabled interventions in microfinance, agriculture, and digital services. In Bihar, AI-based microfinance systems have significantly improved credit access, leading to higher self-employment and income generation. The state has recorded one of the lowest NPA levels at 0.5%, indicating strong repayment behaviour among newly included borrowers. Additionally, AI-driven digital platforms have contributed to employment generation, with India's AI sector employing over 6 million professionals.

From an analytical perspective, these trends indicate that AI is facilitating "leapfrog development," where less-developed regions are growing at a faster pace by adopting advanced technologies. By bridging gaps in access to finance, healthcare, and agricultural resources, AI is ensuring that economic growth is inclusive and regionally balanced. In conclusion, the evidence clearly establishes that AI is a powerful tool for enhancing financial inclusion, improving agricultural productivity, and promoting social empowerment in India. Its data-driven approach not only increases efficiency but also ensures equitable distribution of economic benefits, making it a cornerstone of sustainable development.

Crucial Challenges in AI Adoption

AI adoption in India presents measurable challenges that directly influence sustainable economic development. One of the most significant concerns is energy consumption, with AI-related computational demand increasing by approximately 12-15% annually. This creates pressure on India's power infrastructure and may conflict with sustainability goals if not supported by renewable energy.

Another major issue is data governance, as India now has over 90 crore digital users, generating vast volumes of personal and financial data. The absence of strong regulatory enforcement increases risks related to data misuse and cyber threats. Furthermore, employment disruption is a growing concern, with estimates indicating that nearly 10-12% of existing jobs may be affected by automation in the coming years. These indicators highlight that while AI accelerates growth, it also introduces structural risks that require policy attention.

Quantitative Opportunities of AI for Inclusive Growth

Despite these challenges, AI offers strong evidence of its potential to drive inclusive and sustainable growth in India. AI-enabled financial technologies have brought over 30 crore individuals into the formal financial system, significantly improving financial inclusion. In agriculture, AI-driven tools have increased productivity by 18-20%, while also reducing input costs and resource usage.

ISBN: 978-93-49468-69-6

In the employment sector, AI is expected to generate approximately 6-7 million new jobs, particularly in areas such as data analytics, machine learning, and digital services. Additionally, India added around 44.5 GW of renewable energy capacity in 2025, where AI-based optimization systems are improving efficiency and reducing transmission losses. These figures demonstrate that AI is not only a technological innovation but also a catalyst for economic expansion and sustainability. Below Table 3 explains key indicators showing the challenges and opportunities of AI adoption in India.

Table 3: Crucial Indicators of Challenges and Opportunities of AI for Inclusive and Sustainable Growth

Dimension	Indicator	Data (2025-26)	Development Implication
Energy	Growth in AI energy demand	12-15% increase annually	Pressure on sustainability goals
Data	Total digital users	Over 90 crores users	Increased need for data protection
Employment (Risk)	Jobs affected by automation	10-12% workforce	Need for reskilling and adaptation
Employment (Gain)	New AI-related jobs	6-7 million jobs	Expansion of digital employment
Finance	Financial inclusion via AI	Over 30 crores people	Inclusive economic participation
Agriculture	Increase in productivity	18-20% growth	Higher farmer income and food security
Energy	Renewable capacity addition (2025)	44.5 GW	Support for green and sustainable growth

Source: Economic Survey (2025-26), RBI Reports, NITI Aayog, India AI Mission

As presented in above Table 3, AI adoption in India reflects a dual impact characterized by both risks and opportunities. The 12-15% rise in energy demand contrasts with the addition of 44.5 GW renewable capacity, indicating a transition toward sustainable energy integration. Similarly, while 10-12% of jobs are at risk, the creation of 6-7 million new jobs suggest a shift in employment patterns rather than absolute loss. The inclusion of over 30 crore individuals into the financial system highlights AI's strong role in promoting inclusive growth.

Strategic Measures for Sustainable AI Development

To balance these challenges and opportunities, India must adopt strategic measures. Investment in green AI technologies can reduce energy consumption and align AI growth with environmental goals. Strengthening data protection laws is essential to safeguard the data of over 90 crore users. Additionally, large-scale skill development programs are necessary to address the 10-12% workforce disruption and prepare individuals for emerging job roles.

ISBN: 978-93-49468-69-6

Therefore, evidence clearly demonstrates that AI has the potential to significantly advance sustainable economic development in India. However, its success depends on effectively managing the associated challenges while maximizing its inclusive and environmental benefits.

Results and Discussion

The findings indicate that AI has emerged as a significant driver of sustainable economic development in India, generating measurable improvements across economic, social, and environmental dimensions during 2025–26.

Sector-wise results (Table 1) reveal notable gains in productivity and efficiency. In agriculture, AI-based precision farming has led to an 18% increase in crop yield and a 20% reduction in water usage, reflecting sustainable practices. In healthcare, AI-driven diagnostics and telemedicine have reduced treatment costs by 28% and increased rural access by 35%, improving service delivery.

In the financial sector, AI has resulted in a 42% reduction in lending costs, enabling the inclusion of over 30 crore (300 million) individuals into the formal financial system, thereby strengthening financial inclusion. In energy, AI applications have achieved 12% energy savings and a 15% reduction in carbon emissions. Governance has also improved, with efficiency rising by 33% and service delays declining by 25%.

The employment impact shows a structural shift. While 10–12% of jobs are at risk due to automation, AI has created 6–7 million new jobs, indicating transformation rather than net job loss.

Further evidence (Table 2) shows that non-performing assets have declined to around 0.5% in microfinance, while farmer incomes have increased by 15–20%. In healthcare, AI has improved outcomes through 25% faster diagnosis. Additionally, emerging states such as Bihar, Uttar Pradesh, and Odisha have recorded growth rates of 12–15%, driven by AI-enabled development.

However, challenges persist. AI-related energy demand is rising by 12–15% annually, and over 90 crore (900 million) digital users raise concerns about data privacy and cybersecurity. These issues require strong regulatory and policy frameworks.

Despite these challenges, the findings strongly support AI's role in sustainable development. The addition of 44.5 GW of renewable energy capacity in 2025, supported by AI systems, highlights its contribution to environmental sustainability.

Overall, the results confirm that AI-driven growth in India is characterized by efficiency, inclusion, and sustainability, establishing AI as a transformative force for inclusive and sustainable economic development.

ISBN: 978-93-49468-69-6

Conclusion

The study reveals that AI has emerged as a transformative force in advancing sustainable economic development in India by simultaneously enhancing economic efficiency, promoting social inclusion, and supporting environmental sustainability. The findings reveal that AI-driven interventions have improved productivity across key sectors such as agriculture, healthcare, and finance, while expanding access to essential services. The inclusion of over 30 crore individuals into the formal financial system and the generation of 6–7 million employment opportunities highlight AI's significant role in fostering inclusive growth and reducing regional disparities. Furthermore, AI has contributed to sustainable resource utilization through improved agricultural output and energy efficiency. However, challenges related to rising energy demand, data privacy, and workforce reskilling necessitate strong policy interventions. Overall, the study concludes that AI holds immense potential to reshape India's development trajectory, provided that its adoption is guided by principles of inclusivity, sustainability, and ethical governance to ensure balanced and long-term economic progress.

References

1. Ray, R., & Dave, D. (2025). Tackling Waste, Enhancing Wealth: Circular Economy Solutions for Fulfilling the Green Development Agenda and Sustainable Development Goals: An Indian Perspective. In *The Contribution of Life Cycle Analyses and Circular Economy to the Sustainable Development Goals* (pp. 177-212). Cham: Springer Nature Switzerland.
2. AlSagri, H. S., & Sohail, S. S. (2024). Evaluating the role of Artificial Intelligence in sustainable development goals with an emphasis on "quality education". *Discover Sustainability*, *5*(1), 458.
3. Khan, M. S., Umer, H., & Faruqe, F. (2024). Artificial intelligence for low-income countries. *Humanities and Social Sciences Communications*, *11*(1), 1-13.
4. Mahajan, R., Kumar, S., Lim, W. M., & Sareen, M. (2024). The role of business and management in driving the sustainable development goals (SDGs): Current insights and future directions from a systematic review. *Business Strategy and the Environment*, *33*(5), 4493-4529.
5. Mishra, D., Kandpal, V., Agarwal, N., & Srivastava, B. (2024). Financial inclusion and its ripple effects on socio-economic development: a comprehensive review. *Journal of Risk and Financial Management*, *17*(3), 105.
6. Trabelsi, M. A. (2024). The impact of artificial intelligence on economic development. *Journal of Electronic Business & Digital Economics*, *3*(2), 142-155.

ISBN: 978-93-49468-69-6

7. Nenavath, S., & Mishra, S. (2023). Impact of green finance and fintech on sustainable economic growth: Empirical evidence from India. *Heliyon*, *9*(5).

8. Rane, N. (2023). Roles and challenges of ChatGPT and similar generative artificial intelligence for achieving the sustainable development goals (SDGs). *Available at SSRN 4603244*.

9. Makridis, C. A., & Mishra, S. (2022). Artificial intelligence as a service, economic growth, and well-being. *Journal of Service Research*, *25*(4), 505-520.

10. Shahab, S., & Anjum, M. (2022). Solid waste management scenario in India and illegal dump detection using deep learning: an AI approach towards the sustainable waste management. *Sustainability*, *14*(23), 15896.

11. Hammer, A., & Karmakar, S. (2021). Automation, AI and the future of work in India. *Employee Relations: The International Journal*, *43*(6), 1327-1341.

12. Mishra, L. (2021). Corporate social responsibility and sustainable development goals: A study of Indian companies. *Journal of Public Affairs*, *21*(1), e2147.

13. Mishra, H., & Maheshwari, P. (2020). Achieving sustainable development goals through Fourth Industrial Revolution: An Indian perspective. *Indian Journal of Commerce and Management Studies*, *11*(2), 63-75.

14. Srivastava, S. K. (2018). Artificial Intelligence: way forward for India. *JISTEM-Journal of Information Systems and Technology Management*, *15*, e201815004.

15. Lele, U., & Goswami, S. (2017). The fourth industrial revolution, agricultural and rural innovation, and implications for public policy and investments: a case of India. *Agricultural Economics*, *48*(S1), 87-100.

16. Singh, S. K. (2012). Urban transport in India: issues, challenges, and the way forward. *European Transport/Trasporti Europei (2012) Issue*, *52*.

17. Sahoo, P., & Dash, R. K. (2009). Infrastructure development and economic growth in India. *Journal of the Asia Pacific economy*, *14*(4), 351-365.

18. Susar, D., & Aquaro, V. (2019). Artificial intelligence: Opportunities and challenges for the public sector. In *Proceedings of the 12th international conference on theory and practice of electronic governance* (pp. 418-426).

☯☯☯

ISBN: 978-93-49468-69-6