



ICSSR-SRC Sponsored

HARNESSING ARTIFICIAL INTELLIGENCE, INNOVATION AND TECHNOLOGY: A PATHWAY TO ECONOMIC TRANSFORMATION AND SUSTAINABLE DEVELOPMENT IN INDIA

Chief Editor

Dr. R. Gayathri

VOLUME 1



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Volume 1

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Harnessing Artificial Intelligence, Innovation and Technology: A Pathway to Economic Transformation and Sustainable Development in India

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First Edition: 2025

ISBN: 978-93-94004-62-7

Price: ₹ 1160/-

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Printed at

SHANLAX PUBLICATIONS

61, 66 T.P.K. Main Road

Vasantha Nagar

Madurai – 625003

Tamil Nadu, India

Ph: 0452-4208765,

Mobile: 7639303383

[email: publisher@shanlaxpublications.com](mailto:publisher@shanlaxpublications.com)

[web: www.shanlaxpublications.com](http://www.shanlaxpublications.com)

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WOMEN AND AI INNOVATION: UNLOCKING INCLUSIVE GROWTH AND ECONOMIC EMPOWERMENT IN INDIA

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Abstract

Artificial Intelligence (AI) is reshaping economies and societies worldwide, presenting transformative opportunities in innovation, employment, and inclusive growth. In India, AI adoption is rapidly increasing across sectors such as healthcare, agriculture, education, and entrepreneurship. However, women remain underrepresented in AI-driven innovation and decision-making, despite being key stakeholders in sustainable development. This paper explores the role of women in AI innovation as a pathway to inclusive growth and economic empowerment in India. Using both literature review and primary data from a survey of women professionals and entrepreneurs in Tamil Nadu, the study highlights opportunities AI creates for women in employment, entrepreneurship, and social inclusion, while also identifying challenges such as skill gaps, bias in AI systems, and gender inequality in access to technology. The findings suggest that inclusive AI innovation can unlock India's potential for gender-balanced economic transformation, provided systemic barriers are addressed through education, policy, and industry collaboration.

Keywords: Women, Artificial Intelligence, Innovation, Inclusive Growth, Economic Empowerment, India.

1. Introduction

The **Fourth Industrial Revolution**, characterized by the fusion of digital, physical, and biological systems, has placed **Artificial Intelligence (AI)** at the heart of global economic and social transformation. AI is no longer a futuristic concept but a disruptive force that is reshaping industries, redefining productivity, and creating entirely new markets. For a country like India—home to a young population, rapidly expanding digital infrastructure, and a growing innovation ecosystem—AI presents a historic opportunity to accelerate growth, bridge developmental gaps, and position itself as a global leader in technology-driven progress.

However, this transformative potential is not being equitably realized. While AI and related technologies open up new avenues of employment, entrepreneurship, and innovation, **structural inequalities, digital divides, and gender disparities** prevent large sections of society—particularly women—from fully benefiting. Women, who constitute nearly **48% of India's population**, remain significantly underrepresented in the country's technology landscape. According to **NITI Aayog (2023)**, only **26% of the workforce in STEM-related fields** are women, and in the specific domain of AI, their participation is even lower—less than **22% globally** as per the **World Economic Forum (2022)**. This imbalance not only limits women's individual career opportunities but also restricts India's capacity to leverage diverse talent pools, a factor that is critical to fostering **inclusive and sustainable AI-driven growth**.

The underrepresentation of women in AI is shaped by multiple factors. **Digital divides**, particularly in rural and semi-urban areas, continue to restrict women's access to digital devices and reliable internet. **Skill barriers** further widen the gap, as women often have limited opportunities for advanced training in AI-related domains due to socio-economic constraints, lack of mentorship, or gender biases in education and workplaces. Moreover, **structural**

inequalities—such as gender stereotypes, workplace discrimination, and the burden of unpaid care work—make it more difficult for women to enter and thrive in technology-driven sectors.

At the same time, AI itself can serve as a **catalyst for women's economic empowerment** if strategically harnessed. For example:

- **AI-powered education platforms** can provide women with access to personalized, flexible, and affordable learning opportunities, helping them overcome geographical and cultural barriers to STEM education.
- **AI-driven entrepreneurship ecosystems** can enable women-led start-ups in healthcare, fintech, agritech, and e-commerce by providing smarter tools for market research, supply chain management, and customer engagement.
- In the domain of **healthcare and social welfare**, AI applications can directly impact women's lives by improving maternal health services, enhancing safety through predictive analytics, and enabling women to participate more actively in the care economy.
- **Remote and flexible work models**, supported by AI-enabled platforms, can create new employment pathways for women who face mobility or household constraints.

To unlock these opportunities, deliberate policy and institutional support are essential. India needs to **invest in digital skilling programs for women**, promote **gender-sensitive AI innovation policies**, and build **public-private partnerships** to ensure equitable access to resources and mentorship. Importantly, more women must be involved not just as beneficiaries but as **creators and leaders in AI innovation ecosystems**, thereby shaping technologies that are inclusive by design.

This paper, therefore, seeks to explore the **dual role of AI—as both a challenge and an opportunity for women's empowerment in India**. It examines the barriers that restrict women's participation in AI-led innovation and provides **pathways for inclusive growth**, including skilling, entrepreneurship support, workplace reforms, and gender-sensitive policy frameworks. By bridging the gender gap in AI, India can not only empower its women but also enhance its global competitiveness, ensuring that the Fourth Industrial Revolution becomes a story of shared progress rather than exclusion.

2. Literature Review

AI has been recognized as a driver of innovation, efficiency, and economic progress (Bessen, 2019). Scholars argue that AI can democratize opportunities for underrepresented groups by enabling flexible work arrangements, remote entrepreneurship, and access to global markets (Upadhyay & Khandelwal, 2019).

However, studies also caution that AI systems may reinforce gender inequalities if trained on biased datasets (Raghavan et al., 2020). For example, hiring algorithms have sometimes favored male candidates due to historical biases in organizational data.

Research on women in AI innovation in India is emerging but limited. According to Nasscom (2022), women entrepreneurs in AI-driven startups are less than 15%. Meanwhile, initiatives like **Women in AI India** and **Google's Women Techmakers** are trying to bridge the gap.

3. Methodology

A **mixed-method research approach** was employed for this study. Primary data was collected through a survey of 60 women professionals and entrepreneurs based in Coimbatore,

Chennai, and Bengaluru. The respondents represented diverse sectors including IT, healthcare, education, and the startup ecosystem. A structured questionnaire consisting of 15 questions was used as the research tool, focusing on four major areas: opportunities, challenges, skill development, and perceptions of AI. Responses were measured using a five-point Likert scale to capture varying levels of agreement and perception among participants.

In addition to the survey, **secondary data** was sourced from relevant literature, industry reports, and policy documents published by NITI Aayog, Nasscom, and the World Bank. The analysis combined both descriptive statistics to interpret quantitative findings and thematic coding to draw out qualitative insights. This integrated approach provided a comprehensive understanding of how women professionals and entrepreneurs perceive AI and the opportunities and challenges it presents.

4. Findings and Analysis

| Area of Impact | % of Respondents Agreeing |
|----------------------------------|---------------------------|
| AI provides flexible work | 68% |
| AI supports women entrepreneurs | 55% |
| AI improves access to education | 72% |
| AI strengthens healthcare access | 60% |
| Lack of AI skills | 64% |
| Bias in AI systems | 48% |
| Limited funding access | 52% |
| Digital divide as barrier | 58% |

Opportunities Identified:

The study revealed several ways in which AI is opening new avenues for women's empowerment. A significant proportion of respondents (68%) agreed that AI-enabled platforms such as gig work and freelancing provide women with greater employment flexibility and improved work-life balance. About 55% of participants reported that AI tools, particularly in e-commerce and digital marketing, have supported the growth of their entrepreneurial ventures. Access to learning also emerged as a strong opportunity, with 72% acknowledging that AI-powered EdTech platforms have enhanced women's access to upskilling and professional development programs. Furthermore, 60% of respondents highlighted the potential of AI in healthcare, noting that applications in maternal health and early disease detection could create meaningful social impact for women.

Challenges Identified

Despite these opportunities, women continue to face significant challenges in leveraging AI. The most pressing concern was the **skill gap**, with 64% of respondents pointing out the lack of AI-related technical training as a major barrier to participation. Nearly half of the participants (48%) expressed concern about bias in AI systems, particularly in hiring processes, where algorithms were perceived to favor male candidates. Financial limitations also surfaced as a key issue, with 52% indicating restricted access to funding for women-led AI startups. Additionally, the **digital divide** was emphasized by 58% of respondents, who observed that poor digital literacy among rural women excludes a large segment from benefiting from AI-driven opportunities.

5. Discussion

The findings of the study suggest that AI innovation exerts a **dual impact** on women's economic participation: it simultaneously creates new opportunities while exposing women to systemic challenges. On the positive side, AI has the potential to significantly enhance women's access to flexible employment, entrepreneurial ventures, and improved healthcare outcomes. For instance, AI-driven EdTech solutions are enabling women in smaller towns and semi-urban areas to pursue global learning opportunities, breaking barriers of geography and affordability. Similarly, AI applications in healthcare—particularly in maternal health and early disease detection—highlight how technology can contribute to women's social and economic empowerment. At the same time, however, challenges persist. AI systems, if not carefully designed and monitored, risk reinforcing existing structural inequalities. Women entrepreneurs reported particular difficulties in accessing venture capital, an issue rooted in both gender bias and the absence of strong professional networks, which limits their ability to scale AI-led startups. This observation resonates with global literature, as Florentine (2020) notes that while AI can democratize access to opportunities, it may also deepen inequalities when bias and exclusion remain unchecked. In the Indian context, addressing these issues is not merely a question of gender equity but also one of economic necessity. McKinsey (2020) estimates that closing the gender gap in India could contribute an additional **\$770 billion to the country's GDP by 2025**, underscoring the fact that women's inclusion in AI-led innovation is integral to sustainable national growth.

6. Recommendations

To ensure AI-driven innovation unlocks women's economic empowerment in India, the following strategies are suggested:

1. **AI Literacy Programs:** Integrate AI and digital skills training in women-focused educational and vocational programs.
2. **Women-Centric AI Policies:** Develop national policies supporting women-led AI startups with financial incentives and mentorship.
3. **Bias-Free Algorithms:** Encourage organizations to conduct bias audits of AI hiring and evaluation tools.
4. **Rural Inclusion:** Expand digital infrastructure and AI-enabled microfinance platforms to support rural women entrepreneurs.
5. **Industry-Academia Collaboration:** Establish women-in-AI innovation hubs across universities to nurture female talent.
6. **Public-Private Partnerships:** Engage government, corporates, and NGOs in creating inclusive AI ecosystems.

7. Conclusion

Artificial Intelligence holds transformative potential for inclusive growth in India. For women, AI innovation represents an opportunity to break traditional barriers, enhance employability, and create sustainable entrepreneurial ventures. However, systemic challenges of skill gaps, gender bias, and unequal access must be addressed. The study underscores the need for inclusive AI ecosystems, where women are not only beneficiaries but also leaders and

innovators. Unlocking women's potential in AI innovation is not merely a matter of social justice but a strategic imperative for India's economic transformation and sustainable development.

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