

The Role of Artificial Intelligence in Enhancing Women's Economic Participation: Opportunities and Challenges for Sustainable Development

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ABSTRACT

Artificial Intelligence (AI) is reshaping global labor markets and creating new opportunities for women's economic participation, while also raising concerns about inequality and exclusion. This study examines the role of AI in enhancing women's economic participation in relation to Sustainable Development Goal 5 (gender equality), focusing on opportunities, challenges, and policy implications. Using a qualitative, descriptive, and exploratory research design based on secondary data, the study synthesizes findings from peer-reviewed literature and reports by international organizations. The analysis reveals that AI expands women's access to employment, entrepreneurship, and digital platforms through flexible work arrangements, improved market access, and AI-enabled business tools. It also highlights indirect benefits through AI applications in health and education, which reduce unpaid care burdens. However, the study identifies significant challenges, including algorithmic bias, occupational displacement, wage disparities, and precarious gig work conditions. Structural barriers such as limited digital skills, inadequate infrastructure, and restricted financial access further constrain women's ability to benefit from AI-driven transformation. The findings emphasize that AI's impact on gender equality is not inherent but shaped by governance frameworks and socio-economic contexts. The study concludes that inclusive AI policies, digital capacity-building, and gender-responsive governance are essential to ensure that AI contributes effectively to sustainable and equitable development outcomes for women.

Keywords: *Artificial Intelligence; Women's Economic Participation; Gender Equality; Digital Inclusion; Sustainable Development Goal 5*

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Introduction:

Artificial Intelligence (AI) is rapidly transforming global economies by reshaping labor markets, redefining skill requirements, and creating new forms of digital employment. Within this transformation, its implications for gender equality and women's economic participation have become a critical area of inquiry, particularly in relation to Sustainable Development Goal 5 (SDG 5). AI-driven technologies such as automation, machine learning, and digital platforms are generating new opportunities for employment,

entrepreneurship, and flexible work arrangements, which may support women's increased participation in economic activities. At the same time, concerns persist that AI may reinforce existing structural inequalities through algorithmic bias, unequal access to digital resources, and occupational displacement.

In developing country contexts, where gender disparities in education, employment, and digital access remain pronounced, the role of AI becomes even more complex. While AI has the potential to

reduce barriers related to mobility, time constraints, and market access, it may also deepen inequalities if women are excluded from digital infrastructure, skills development, and decision-making processes in technology design. This dual nature of AI—as both an enabler and a potential reproducer of inequality—necessitates a critical examination of its impact on women’s economic empowerment.

This research paper, therefore, explores the opportunities and challenges of AI in enhancing women’s economic participation, with a focus on inclusive and sustainable development outcomes.

Review of Literature

Artificial Intelligence (AI) is increasingly recognized as a transformative force in reshaping labor markets and advancing Sustainable Development Goal 5 (gender equality). Recent scholarship highlights both the opportunities AI creates for women’s economic participation and the structural challenges that may reinforce existing inequalities. The literature presents a nuanced understanding of AI as an ambivalent technology—capable of empowerment but also of exclusion depending on design, access, and governance. A key theme across studies is AI’s potential to expand women’s access to education, employment, and entrepreneurship. The OECD, UNESCO, and Inter-American Development Bank (2022) emphasize that AI-driven automation and digital platforms can open new forms of flexible and remote work, which may particularly benefit women balancing unpaid care responsibilities. Similarly, Weng et al. (2025) show that AI tools such as predictive analytics, customer behavior modeling, and automated marketing systems are increasingly enabling women entrepreneurs to scale businesses, improve decision-making, and access global markets. These findings suggest that AI can function as an enabler of economic inclusion when appropriately deployed. In the context of sustainable development, AI

applications in health, education, and social services also indirectly support women’s workforce participation. Lau et al. (2023) demonstrate that AI-driven healthcare innovations improve maternal health outcomes and reduce time burdens associated with care work, thereby enhancing women’s capacity to engage in economic activities. Marín-Palacios (2025) similarly argues that AI can contribute to gender equality under the SDGs by improving access to public services and reducing structural barriers, particularly in developing economies. However, the literature also highlights significant risks. One major concern is algorithmic bias and gender disparity in AI systems. Shams et al. (2023) identify persistent underrepresentation of women in AI development and datasets, which can lead to biased hiring algorithms and unequal labor market outcomes. This is reinforced by Stecker et al. (2026), who argue that AI systems may reproduce and amplify historical gender inequalities if not governed by inclusive design principles. The gendered impacts of AI in the labor market are also evident in the gig economy. Hattab and Charni (2026) show that while AI-enabled platforms provide income-generating opportunities, they often reinforce precarity, low wages, and limited labor protections for women workers. Similarly, Omokhabi (2026) notes that unequal access to digital skills, infrastructure, and finance continues to exclude many women—particularly in low-income contexts—from fully benefiting from AI-driven economic transformation. Another important dimension is participation in AI development itself. Birhane et al. (2022) emphasize the need for participatory AI systems that include marginalized groups, arguing that meaningful inclusion of women in AI governance and design processes is essential to ensuring equitable outcomes. Without such inclusion, AI risks being shaped predominantly by male-dominated institutions, further entrenching structural inequalities.

Research Gap:

Overall, existing literature provides strong theoretical and conceptual foundations on AI and women's economic participation, but it lacks **context-specific, intersectional, and longitudinal empirical evidence**, particularly from developing countries. There is also limited understanding of sectoral differences, governance effectiveness, and measurable outcomes of AI-driven interventions for women's empowerment. Addressing these gaps is essential for developing inclusive and sustainable AI policies aligned with SDG 5.

Objective of study :

- 1. To examine the extent to which Artificial Intelligence enhances women's economic participation** through access to employment, entrepreneurship, and digital platforms, particularly in developing country contexts.
- 2. To analyze the gendered impacts of AI-driven labor market transformations**, with a focus on employment quality, wage disparities, job security, and participation in the gig economy.
- 3. To assess the role of digital skills, infrastructure, and access to resources in shaping women's ability to benefit from AI technologies**, highlighting structural barriers to inclusion.
- 4. To evaluate the effectiveness of AI governance and policy frameworks in promoting gender equality**, with specific attention to inclusivity in AI design, data representation, and decision-making processes.

Research Design:

This study adopts a **qualitative, descriptive, and exploratory research design** based exclusively on **secondary data sources**. The design is appropriate because the study seeks to synthesize existing knowledge on Artificial Intelligence (AI) and women's economic participation rather than generate primary empirical data.

The research follows a **systematic literature-based design**, aiming to critically examine,

compare, and integrate findings from peer-reviewed journal articles, policy reports, international organization publications, and credible working papers. The focus is on identifying patterns, contradictions, and gaps in the existing body of knowledge related to AI, gender equality, and sustainable development (SDG 5).

Given the interdisciplinary nature of the topic—spanning economics, gender studies, digital transformation, and development studies—the study also adopts a **thematic analytical framework** to organize and interpret the literature.

Research Methodology:

The study is entirely based on **secondary data**. No primary data (such as surveys, interviews, or field observations) is collected.

Secondary data sources include:

- Peer-reviewed journal articles from databases such as Scopus, Web of Science, Google Scholar
- Reports from international organizations (e.g., OECD, UNESCO, World Bank, International Labour Organization)
- Policy briefs and working papers from development agencies and research institutes
- Conference papers and academic books relevant to AI, gender equality, and labor markets

Results and Discussion:

This study synthesizes existing literature on Artificial Intelligence (AI) and women's economic participation, focusing on opportunities, constraints, and governance implications in relation to Sustainable Development Goal 5 (gender equality). The analysis is organized around the four research objectives: (i) AI-driven economic participation, (ii) gendered labor market impacts, (iii) structural enablers and barriers, and (iv) governance and policy effectiveness. The findings highlight AI as a dual-edged transformation force that simultaneously expands opportunities for women while reproducing structural inequalities when embedded in unequal socio-economic systems.

1. AI as an Enabler of Women's Economic Participation

The literature consistently indicates that AI has expanded pathways for women's economic participation, particularly through digital platforms, remote work systems, and entrepreneurial ecosystems. Studies such as OECD, UNESCO, and Inter-American Development Bank (2022) demonstrate that AI-enabled automation and platform-based work arrangements reduce spatial and temporal constraints, allowing women to engage in paid work while managing unpaid care responsibilities. This flexibility is particularly relevant in developing economies where women's labor force participation is often constrained by domestic roles and mobility restrictions.

Empirical insights from Weng et al. (2025) further show that AI-powered business tools—such as predictive analytics, customer segmentation, and automated marketing—enhance women entrepreneurs' ability to scale operations and access wider markets. These technologies reduce entry barriers for small and medium enterprises (SMEs) led by women by lowering transaction costs and improving decision-making efficiency. Similarly, AI-supported financial technologies (FinTech) are increasingly improving women's access to credit through alternative credit scoring systems, although this benefit remains uneven across regions.

In addition, AI applications in health and education indirectly contribute to women's economic participation. Lau et al. (2023) highlight that AI-driven healthcare systems improve maternal health outcomes and reduce time burdens associated with caregiving responsibilities. This creates a multiplier effect by increasing women's availability for paid employment. Collectively, these findings suggest that AI can function as an enabling infrastructure for women's inclusion in the digital economy when embedded within supportive institutional frameworks.

2. Gendered Impacts of AI-Driven Labor Market Transformation

Despite these opportunities, the literature reveals significant gendered inequalities in AI-driven labor

market transitions. One major finding is that AI-induced automation disproportionately affects occupations with high female employment, particularly in administrative, clerical, and routine service roles. This structural shift increases the risk of job displacement for women, especially in low- and middle-income countries where re-skilling systems are weak.

Hattab and Charni (2026) emphasize that while gig economy platforms facilitated by AI offer income opportunities for women, they simultaneously reinforce precarious employment conditions characterized by low wages, lack of social protection, and algorithmic management. Women workers in platform-based jobs often experience unstable income flows and limited bargaining power due to opaque algorithmic evaluation systems.

Furthermore, wage disparities persist in AI-mediated labor markets. Algorithmic decision-making systems used in recruitment and performance evaluation may unintentionally embed historical gender biases, leading to unequal pay and promotion opportunities. Stecker et al. (2026) argue that AI systems trained on biased datasets tend to replicate gendered patterns of exclusion, particularly in high-skilled technical and managerial positions.

3. Structural Barriers: Skills, Infrastructure, and Access Constraints

A key finding across the literature is that women's ability to benefit from AI is strongly conditioned by structural factors, particularly digital skills, infrastructure access, and financial inclusion. Omokhabi (2026) highlights that women in low-income contexts face significant digital divides, including limited access to smartphones, internet connectivity, and digital literacy training. These constraints significantly reduce their participation in AI-enabled economic opportunities.

The literature also emphasizes the gender gap in STEM education and AI-related skill development. Women remain underrepresented in technical fields, limiting their participation not only

as users of AI systems but also as developers and decision-makers shaping these technologies. Shams et al. (2023) note that this underrepresentation contributes to biased AI design outcomes, as male-dominated development teams may lack gender-sensitive perspectives.

Financial exclusion further compounds these barriers. Women entrepreneurs often face difficulties accessing credit to invest in digital tools, infrastructure, and training necessary for AI adoption. As a result, the benefits of AI are disproportionately captured by women in higher-income and urban contexts, while rural and marginalized women remain excluded.

4. Governance, Inclusion, and Policy Effectiveness

The literature underscores the critical role of governance frameworks in shaping the gendered outcomes of AI. Birhane et al. (2022) advocate for participatory AI systems that include women and marginalized groups in design, development, and decision-making processes. Inclusive governance is identified as essential to mitigating algorithmic bias and ensuring equitable outcomes.

However, current policy frameworks remain fragmented and insufficiently gender-responsive. While international organizations such as UNESCO and the OECD have developed ethical AI guidelines, implementation gaps persist at national and institutional levels. Many AI governance systems lack enforceable mechanisms for ensuring gender representation in datasets, algorithm design, and oversight bodies.

Marín-Palacios (2025) argues that although AI has potential to advance SDG 5, its effectiveness depends on integrating gender equality principles into national AI strategies, including transparency requirements, bias audits, and inclusive innovation policies. Without such measures, AI risks reinforcing existing inequalities under the guise of technological neutrality.

5. Synthesis of Findings and Research Gap

Addressed Overall, the synthesis reveals three major findings:

- 1. AI expands economic opportunities for women**, particularly through flexible work, entrepreneurship tools, and improved access to services.
- 2. AI simultaneously reproduces and transforms gender inequalities**, especially through biased algorithms, precarious gig work, and occupational displacement.
- 3. Structural inequalities—rather than technology itself—determine outcomes**, with digital skills, infrastructure, and governance acting as key mediating factors.

These findings directly address the research gap identified in the literature. While prior studies have largely focused on conceptual discussions of AI and gender equality, this review highlights the lack of context-specific and intersectional evidence, particularly in developing countries. The analysis also reveals limited empirical evaluation of AI governance effectiveness and insufficient understanding of sector-specific impacts.

Recommendations

Based on the findings of this study on Artificial Intelligence (AI) and women's economic participation in relation to Sustainable Development Goal 5 (SDG 5), the following recommendations are proposed to enhance inclusive and equitable outcomes:

1. Strengthen gender-responsive AI governance frameworks

Governments and regulatory bodies should integrate explicit gender equality principles into national AI strategies. This includes mandatory bias audits of AI systems, transparency requirements in algorithmic decision-making, and gender representation in AI ethics boards. Without enforceable governance mechanisms, AI systems risk reproducing structural inequalities.

2. Promote women's participation in AI development and decision-making

There is a need to increase the representation of women in STEM education, AI research, and

technology leadership roles. Scholarships, mentorship programs, and targeted recruitment in AI-related fields can help reduce the gender gap in AI design and ensure more inclusive technological outcomes.

3. Expand digital skills training and lifelong learning programs for women

Governments, NGOs, and private sector actors should invest in large-scale digital literacy and AI-skills training programs, especially targeting rural and low-income women. These programs should include practical skills in data literacy, digital entrepreneurship, and platform-based work to improve employability in AI-driven economies.

4. Improve digital infrastructure and access in marginalized regions

Bridging the digital divide is essential for inclusive AI benefits. Investments should focus on expanding affordable internet connectivity, increasing access to smartphones and digital tools, and improving electricity and broadband infrastructure in rural and underserved areas.

5. Ensure decent work standards in AI-enabled gig and platform economies

Regulatory frameworks should address the precarious nature of AI-mediated gig work by enforcing minimum wage protections, social security coverage, grievance mechanisms, and transparency in algorithmic management systems. This is critical to preventing exploitation of women workers in platform-based jobs.

6. Support women entrepreneurs in adopting AI technologies

Targeted financial support, including low-interest loans, grants, and digital innovation funds, should be provided to women-led SMEs. In addition, business incubators and AI-enabled enterprise support services can help women

leverage tools such as predictive analytics, digital marketing, and FinTech solutions.

7. Conduct context-specific and intersectional research on AI and gender

Future research should focus on developing countries, rural populations, and marginalized groups to generate more nuanced evidence. Longitudinal studies are needed to assess the long-term impacts of AI on women's employment, income security, and empowerment across different sectors.

8. Integrate gender considerations into AI policy and SDG implementation frameworks

National development plans and AI strategies should explicitly align with SDG 5 by embedding gender indicators, monitoring mechanisms, and accountability structures to track progress in women's economic inclusion.

These recommendations collectively emphasize that AI can contribute meaningfully to women's economic empowerment only when accompanied by inclusive governance, targeted capacity-building, and structural investments in digital equity.

Conclusion:

The results demonstrate that AI is neither inherently empowering nor exclusionary; rather, it is a socio-technical system shaped by institutional, economic, and governance structures. For AI to meaningfully enhance women's economic participation in alignment with SDG 5, policy interventions must prioritize digital inclusion, gender-sensitive AI design, and equitable access to education and infrastructure. Without these measures, AI risks amplifying existing inequalities under new technological forms, thereby limiting its contribution to sustainable and inclusive development.

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