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AI Empowerment of India's Informal Women Workers for Inclusive Digital Growth and Gender Equality

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Recent Developments:

- The growing adoption of **Artificial Intelligence (AI)** in India has renewed discussions on ensuring that technological productivity gains reach informal women workers, who constitute a significant part of the country's labour force.
- Without **gender-responsive AI governance and inclusive technology design**, rapid digital expansion may deepen existing inequalities by excluding women facing barriers related to language, mobility, digital literacy and access to resources.
- India's broader AI strategy, including the **IndiaAI Mission**, multilingual digital platforms and emerging AI governance frameworks, highlights the need to ensure that technological transformation supports inclusive growth and the vision of **Viksit Bharat 2047**.

Understanding AI and India's Informal Women Workforce:

Role of Gender-Responsive Artificial Intelligence:

- Integrating **Artificial Intelligence** with India's informal female workforce involves using technologies such as real-time advisory systems, natural language processing and automated decision-support tools to improve productivity in agriculture, domestic work and micro-enterprises.
- A gender-responsive AI approach focuses on designing technologies according to women's specific needs, including regional languages, local livelihood patterns, limited mobility and unequal access to economic resources.
- Instead of replacing human labour, inclusive AI can democratise economic opportunities by providing women workers with better access to information, markets, financial services and skill development.

Key Data and Statistics:

- Approximately **82% of employed women in India** are engaged in the informal sector, including agriculture, home-based production, domestic work and small-scale enterprises.
- According to the **Periodic Labour Force Survey (PLFS) 2023–24**, around **76.9% of rural working women** are involved in agriculture, making them a major potential user group for AI-based agricultural advisory services.
- A **2024 study** on the multilingual AI platform **Farmer.Chat**, conducted across **12 states**, found that **61% of female users** experienced improved quality of life within **45 days**, while female engagement rates were **2 to 3 times higher** than male users.
- These findings indicate that properly designed AI tools can significantly improve women's access to knowledge, productivity-enhancing services and livelihood opportunities.

Potential of AI in Women-Led Informal Economy:

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Agriculture and Rural Livelihood Transformation:

- Women farmers often face challenges related to limited access to agricultural information, credit facilities, markets and extension services, which can be addressed through AI-enabled advisory platforms.
- Voice-based AI tools can provide women farmers with personalised information related to crop management, weather forecasts, pest control, market prices and government schemes in their preferred languages.
- AI-based systems can reduce information gaps by delivering timely recommendations without requiring advanced digital literacy.
- In rural areas, AI can support women-led self-help groups and micro-enterprises by improving financial planning, market access and business decision-making.

Digital Public Infrastructure Support:

- India has developed important digital foundations, including the **IndiaAI Mission**, the **Bhashini multilingual translation platform** and national AI governance initiatives, which can support inclusive AI adoption.
- Multilingual digital infrastructure can help overcome language barriers by enabling women workers to interact with technology in regional languages.
- Public digital platforms can become effective tools for improving access to welfare schemes, financial services, agricultural support and entrepreneurship opportunities.

Governance Priorities for Women-Centric AI Adoption:

Ensuring Fairness and Accountability in AI Systems:

- The government should introduce mandatory **Gender Impact Assessments** for AI systems affecting economic welfare to examine whether outcomes differ across gender, caste, location and disability groups.
- AI governance frameworks should ensure that automated decisions related to credit access, employment opportunities and welfare delivery do not reinforce existing social inequalities.
- Public expenditure on AI should follow **Gender-Responsive AI Budgeting** by evaluating whether investments address barriers related to language, safety, affordability and accessibility.
- Transparent AI systems are essential because unexplained automated decisions can reduce trust among vulnerable communities.

Building Digital Skills and Safety Mechanisms:

- AI literacy programmes should be integrated into existing community-based initiatives such as **Deendayal Antyodaya Yojana–National Rural Livelihood Mission (DAY-NRLM)**, **Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY)**, **Skill India** and **Mission Shakti's Sakhi networks**.
- Community-level training should focus on practical outcomes such as accessing government services, using digital platforms, improving livelihoods and adopting AI-based tools.
- Digital safety should become a fundamental requirement for women's participation in AI-enabled economic activities.
- Effective implementation of the **Information Technology (Amendment) Rules, 2021** and mandatory identification of AI-generated synthetic content can help protect women from technology-enabled gender-based violence.

Challenges Associated with AI Adoption Among Informal Women Workers:

Algorithmic Bias and Lack of Transparency:

- AI systems trained on incomplete or unrepresentative datasets may reproduce existing gender stereotypes, social discrimination and economic exclusion.

- Algorithmic decision-making in areas such as employment selection, financial services and welfare distribution can negatively affect marginalised women if adequate safeguards are absent.
- The **black-box nature** of some AI systems creates difficulties in understanding how decisions are made, reducing accountability and public trust.

Digital Divide and Online Safety Concerns:

- Many informal women workers face barriers due to limited digital literacy, lack of access to smartphones, poor internet connectivity and regional language limitations.
- Conventional digital interfaces often fail to consider women's time constraints, household responsibilities and specific livelihood conditions.
- Online harassment, deepfakes and non-consensual digital content can discourage women from participating actively in digital economic spaces.
- Technology-related violence can create a **digital chilling effect**, where fear of misuse prevents women from adopting beneficial digital tools.

Way Forward for Inclusive AI Transformation:

Strengthening Gender-Responsive AI Ecosystem:

- Government procurement policies should require AI platforms to include gender-responsive testing, regional language support and explainable decision-making mechanisms.
- AI systems should be evaluated not only on technical efficiency but also on their social impact, accessibility and ability to reduce inequalities.
- Expanding multilingual AI models based on **Bhashini** can enable women farmers and entrepreneurs to receive customised advice regarding crops, credit facilities and market opportunities.

Community-Based Digital Empowerment:

- Self-help groups and local community institutions should become important channels for AI literacy, digital training and technology adoption among informal women workers.
- Skill development programmes should focus on measurable outcomes, including improved income opportunities, better access to services and increased participation in digital markets.
- Inter-ministerial cooperation should strengthen cyber safety mechanisms and establish quick grievance redressal systems in regional languages, following recommendations related to women's digital safety.

Value Addition for UPSC:

Prelims Facts:

- **Artificial Intelligence** refers to the capability of machines to perform tasks that generally require human intelligence, including learning, reasoning and decision-making.
- The **IndiaAI Mission** aims to develop a comprehensive AI ecosystem in India through infrastructure development, innovation support and responsible AI adoption.
- **Bhashini** is a multilingual digital language platform aimed at enabling access to digital services in Indian languages.
- Women's empowerment through technology is linked with **Sustainable Development Goal 5 (Gender Equality)** and **Sustainable Development Goal 8 (Decent Work and Economic Growth)**.

Mains Answer Enrichment:

- **GS Paper II:** AI governance requires balancing technological innovation with transparency, accountability, privacy protection and social justice.

- **GS Paper III:** AI can enhance agricultural productivity, promote digital economy, improve financial inclusion and support employment generation.
- **Essay Linkage:** The success of India's AI transformation will depend on whether technological benefits reach vulnerable groups, especially women at the base of the economic pyramid.

Conclusion:

- The integration of **gender-responsive Artificial Intelligence** with India's informal women workforce can transform technology into a powerful instrument of inclusive growth.
- However, achieving this potential requires accessible digital infrastructure, responsible AI governance, community-based skill development and strong protection against digital harms.
- By ensuring that women workers are not merely consumers but active participants in the AI ecosystem, India can make technological advancement a pathway towards economic empowerment and sustainable development