

Empowering Women Entrepreneurs in India: Harnessing the Role of Green Finance in Promoting Gender-Inclusive Growth, Sustainable Business Models, and Socio- Economic Development

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Abstract:

This study explores the transformative potential of green finance in empowering women entrepreneurs in India, emphasizing both the opportunities it creates and the challenges it presents. While women-led micro, small, and medium enterprises (MSMEs) make up a substantial portion of the entrepreneurial landscape, they remain significantly underfunded, receiving only 5.2% of enterprise credit from public sector banks. Green finance, through instruments like green loans and targeted schemes such as Stand-Up India, provides a pathway for women to lead eco-friendly ventures in sectors like renewable energy, waste management, and sustainable agriculture. However, systemic barriers—including gender biases, lack of financial literacy, societal norms, and limited access to green finance knowledge—impede women’s full participation in this growing field. The study combines secondary data analysis, literature reviews, and case studies to underscore the critical need for gender-sensitive financial systems, capacity-building initiatives, and policy support to enhance women’s entrepreneurial potential in the green economy. By bridging existing gaps and fostering inclusive financial ecosystems, green finance can serve as a catalyst for both gender equity and environmental sustainability in India.

Keywords: Women Entrepreneurship, Green Finance, Sustainable Development, Financial Inclusion

Introduction:

Green finance encompasses a broad spectrum of financial activities designed to support and accelerate the transition toward a more sustainable and environmentally friendly economy. At its core, green finance involves the strategic allocation of capital to initiatives that contribute to sustainable environmental objectives. These initiatives include, but are not limited to, investments in renewable energy sources such as solar, wind, and hydro power; enhancements in energy efficiency across industries and infrastructure; pollution control and waste management; and measures aimed at bolstering climate resilience in vulnerable communities and ecosystems.

This evolving financial approach not only prioritizes ecological impact but also integrates Environmental, Social, and Governance (ESG) criteria into decision-making processes. These ESG factors ensure that financial returns are pursued in tandem with ethical, social, and environmental responsibilities. Green

finance tools and instruments—such as green bonds, sustainable loans, carbon credits, and impact investment vehicles—enable investors and institutions to direct funds into projects that aim to mitigate climate change and support a low-carbon economy.

Moreover, green finance plays a pivotal role in aligning economic growth with the goals of sustainable development. Governments establish regulatory frameworks and provide incentives; financial institutions design innovative products and assess climate-related risks; and businesses adopt sustainable practices and reporting standards. Together, these stakeholders contribute to embedding green finance within broader economic and policy frameworks. By doing so, they not only foster environmental preservation and climate resilience but also ensure long-term financial stability, inclusive growth, and a more sustainable future for all.

According to United Nations Environment Programme (UNEP), “Green finance is the flow of financial resources toward sustainable development projects that ensure environmental protection, economic growth, and social well-being while addressing climate-related risks”.

Women empowerment and women entrepreneurship are deeply interconnected, as the pursuit of financial independence significantly enhances women’s roles and status within society. When women are empowered to start and lead businesses, they not only create pathways to economic stability for themselves but also develop greater self-confidence, leadership skills, and decision-making power in both personal and professional spheres. Entrepreneurship becomes a powerful vehicle for empowerment, allowing women to challenge traditional gender roles, break socio-economic barriers, and contribute meaningfully to their communities and the economy at large.

Supporting women entrepreneurs through targeted education, access to capital, mentorship programs, business networks, and favorable policies is essential for accelerating both gender equality and sustainable economic development. When women are equipped with the tools and resources to thrive in business, they become catalysts for innovation, employment generation, and inclusive growth. A society that prioritizes and nurtures women-led enterprises reaps wide-reaching benefits—not only by diversifying its entrepreneurial landscape but also by promoting social resilience, poverty reduction, and long-term prosperity.

At a broader level, women empowerment encompasses the process of enhancing women’s social, economic, political, and legal capacities, enabling them to participate fully and equally in all aspects of life. It involves ensuring that women have access to quality education, healthcare, financial services, legal protections, and leadership opportunities. True empowerment means creating environments where women can make independent decisions, voice their opinions without fear, and pursue their ambitions without discrimination or structural constraints.

Ultimately, empowering women—particularly through entrepreneurship—is not just a matter of social justice but a strategic imperative for holistic development. It lays the foundation for more equitable, innovative, and resilient societies, where both women and men have equal opportunities to succeed and lead.

Review of literature:

This study explores how financial literacy influences the connection between women’s empowerment and the effectiveness of green microfinance initiatives. Through variance-based Structural Equation Modeling (SEM), the findings reveal that both women’s empowerment and financial literacy have a significant positive impact on green microfinance outcomes. Importantly, financial literacy is found to play a partial

mediating role, suggesting that empowered women are more likely to succeed in green microfinance when equipped with financial knowledge and skills. The study also introduces local wisdom-based financial literacy as a culturally grounded and practical method for embedding empowerment strategies into community-led development efforts. These insights underscore the importance of designing gender-sensitive policies that prioritize financial education to strengthen the reach, impact, and sustainability of green microfinance programs (Cheng-Wen Lee et al, 2022).

This paper examines the shift from conventional capital systems toward sustainable financing models, with a particular focus on green microfinance as a strategic means of empowering women-led micro-enterprises in the energy sector. By embedding environmental values into the structure of financial services, green financing not only supports eco-friendly businesses but also promotes financial inclusion for underserved women entrepreneurs. The study identifies essential measures for facilitating a gender-responsive financial transition, such as increasing awareness of green business opportunities, improving financial literacy through practical training like business proposal development, and implementing government-backed mentorship programs tailored to women. These interventions aim to bridge the gender gap in access to finance while encouraging the growth of environmentally conscious enterprises. Ultimately, green financing contributes to the creation of a resilient and inclusive entrepreneurial ecosystem that harmonizes economic advancement with ecological stewardship (Ni Nyoman Clara Listya Dewi et al, 2023).

This chapter explores the transformative role of Fintech in advancing financial inclusion and empowerment for women in India, particularly in the wake of the COVID-19 pandemic. Through a survey of 230 women from Delhi NCR, the research assesses various aspects such as financial literacy, decision-making power, security, and career growth, revealing that Fintech has significantly enhanced women's financial awareness and opened up new professional opportunities. The study highlights how Fintech platforms have played a pivotal role in increasing women's financial independence, providing them with access to a range of financial tools, such as digital wallets, online banking, and investment options, which were previously inaccessible to many. As a result, Fintech has not only reduced financial vulnerability but also empowered women to take control of their financial futures, contributing to greater economic participation and gender equality. Ultimately, the findings suggest that Fintech is a key driver of long-term economic growth and sustained gender empowerment, helping women overcome traditional barriers to financial services and promoting greater economic resilience in post-pandemic India (Ajay Sidana et al, 2023).

This study investigates the relationship between financial inclusion and women's economic empowerment, highlighting its critical importance in achieving long-term sustainable development goals. Drawing on survey data collected from women in northern India and analyzed through structural equation modeling, the research uncovers a strong positive correlation between access to financial services and improvements in women's earnings, savings behavior, and asset ownership. The findings emphasize that active engagement with formal financial systems—such as bank accounts, credit facilities, and insurance—plays a pivotal role in enhancing women's autonomy and economic decision-making power. These outcomes underline the urgent need for inclusive banking systems that are gender-sensitive, accessible, and tailored to women's unique needs and challenges. The study offers practical guidance for policymakers and development organizations to design targeted interventions that foster financial inclusion as a pathway to women's empowerment and broader socio-economic growth (Mohsin Showkat et al, 2024).

This research investigates the connection between Green Finance (GF) and Gender Equality (GE) within the context of sustainable development, uncovering a significant gap in the integration of gender equality into green finance frameworks. By analyzing 125 studies published between 2004 and 2024, the research reveals that women's empowerment plays a crucial role in advancing green finance initiatives, while gender diversity within organizations contributes to improved environmental management and stronger corporate performance. The findings underscore the importance of developing gender-sensitive financing models that not only address environmental goals but also foster gender equity within the finance sector. The study also highlights the need for deeper exploration of cultural factors that influence both green finance and gender equality, as these can affect how policies and programs are implemented across different regions. Ultimately, the research calls for more concerted efforts to align GF and GE with the Sustainable Development Goals (SDGs), ensuring that both environmental and gender-related objectives are prioritized in global sustainability efforts (Fu-Hsaun Chen, 2024).

Objective of the study;

The objectives of this study are to explore the significant role of green finance in fostering women entrepreneurship in India, particularly how it can empower women to lead sustainable and eco-friendly businesses. It aims to assess the various opportunities that green financing presents for women entrepreneurs, such as access to capital, government incentives, and the growing demand for environmentally conscious products and services. Additionally, the study seeks to evaluate the challenges women face in accessing green finance, including barriers like limited financial literacy, gender biases in lending practices, and the lack of tailored financial products. Ultimately, the study aims to provide insights into how these opportunities and challenges can be addressed to create a more inclusive and sustainable entrepreneurial ecosystem for women in India.

Methodology:

This study is both descriptive and exponential in nature, focusing on providing a comprehensive overview of the subject while also exploring how certain trends and factors have developed and are likely to evolve over time. The descriptive approach allows the study to systematically present the characteristics, patterns, and key elements of the topic, offering an in-depth understanding without manipulating any variables. The exponential aspect highlights the growth and potential future trajectory of these trends, emphasizing their long-term impact. The study is entirely based on secondary data, which has been meticulously collected from a range of credible and authoritative sources, including journals, academic articles, e-magazines, books, websites, and annual reports from both public and private sector organizations. This variety of secondary data sources ensures a comprehensive examination of the topic, combining theoretical insights with practical, real-world examples. By relying on this extensive body of existing literature and reports, the study is able to draw on a wide range of perspectives and insights, enriching its analysis and providing valuable conclusions based on well-established information.

Synopsis of the study:

India's green finance industry is experiencing significant growth, fueled by both government initiatives and private sector efforts aimed at promoting sustainable development and tackling climate change. A notable example is the expansion of India's green bond market, where companies such as ReNew Power and the Indian Renewable Energy Development Agency (IREDA) have issued green bonds to raise capital

for funding renewable energy projects, thus attracting investors interested in environmentally conscious investments. To further support this transition, the government has launched key initiatives like the National Clean Energy Fund (NCEF), which aims to fund renewable energy projects and improve energy efficiency across the country. In addition, financial institutions like the State Bank of India (SBI) are offering green loans to businesses focused on clean energy, sustainable infrastructure, and waste management, thereby encouraging environmentally friendly practices within the private sector. These financial products are essential in driving India's efforts to reduce carbon emissions and make progress toward its climate goals. However, despite these positive strides, more investment is required to close the financing gap and ensure India's successful transition to a low-carbon economy, emphasizing the need for continued public and private sector collaboration.

In 2024, Vaishali Nigam Sinha led the ReNew Foundation's Solar Technician Training initiative, which aimed to empower rural women by equipping them with technical skills to become solar technicians. This program provided training in the clean energy sector, thus fostering a sense of independence and contributing to the growth of sustainable energy solutions in rural areas. Also in 2024, a women-led team at Eco Femme produced and distributed over 1 million organic, washable cloth pads, preventing more than 75 million disposable pads from contributing to landfill waste. This initiative not only promoted sustainable menstruation practices but also created a meaningful impact on environmental conservation by reducing plastic waste.

In the same year, Jabir Karat's Green Worms partnered with women in self-help groups to expand their waste management services, providing waste collection, recovery, and recycling solutions. The initiative resulted in the creation of over 320 jobs, helping nearly 3,000 women entrepreneurs engage in eco-friendly business practices. Sonal Shukla's Econscious TM, a start-up launched during the pandemic in 2023, became a leader in waste recycling by transforming plastic waste into eco-friendly furniture. This venture not only helped reduce plastic waste but also promoted sustainable production practices in urban areas like New Delhi.

In 2023, Meera, a beneficiary of Satin Creditcare Microfinance, received financing support from the DFC and USAID, which enabled her to run a small, sustainable business in Haryana. This partnership underscored the importance of providing financial resources to women entrepreneurs to foster economic independence and environmental sustainability. The same year, a collaborative initiative called GroW – Greening of Finance by Women was launched, bringing together organizations like AFD, SIDBI, and Shakti Sustainable Energy Foundation. This network focuses on enhancing women's leadership and participation in green and climate finance, aiming to foster a more inclusive and sustainable financial system.

In 2022, GroW formed a strategic partnership with the Women Entrepreneurship Platform (WEP), bringing together key stakeholders under the NITI Aayog initiative to further support women entrepreneurs in the green sector. This collaboration aimed to increase access to finance, mentorship, and networks for women involved in sustainable business practices. In 2021, Sairee Chahal introduced the Mahila Money Prepaid Card in collaboration with Visa and Transcorp. This prepaid card was designed to make financial resources more accessible for women entrepreneurs, enabling them to manage funds more efficiently and support their sustainable business endeavors.

Finally, in 2020, Aparna Ramaswamy launched Eco Femme, a company that produces organic, reusable cloth menstrual pads. By promoting sustainable menstruation practices, Eco Femme helped address the issue of menstrual waste while offering women a healthier and eco-friendly alternative to conventional

products. These initiatives collectively showcase the significant role of women in driving sustainability through entrepreneurship, supporting both gender equality and environmental conservation.

Data analysis, interpretation & findings:

Table No. 1: State-wise Women Entrepreneurs in India

State/UT	2020-21	2021-22	2022-23	2023-24 (till Aug, 2023)	Total (till Aug, 2023)
Andhra Pradesh	12,836	34,691	70,928	34,970	5,53,003
Arunachal Pradesh	160	690	1,459	431	6,799
Assam	2,912	20,447	37,562	15,224	1,36,255
Bihar	14,515	38,543	53,517	18,331	8,82,231
Chhattisgarh	4,189	9,645	18,160	7,207	2,05,522
Goa	1,129	1,864	3,765	1,444	13,981
Gujarat	37,507	54,746	78,690	33,828	4,76,328
Haryana	12,585	24,578	41,962	20,591	2,02,718
Himachal Pradesh	1,891	4,596	8,804	3,162	25,248
Jammu and Kashmir	3,008	13,352	24,398	15,465	75,210
Jharkhand	5,806	14,088	33,858	9,310	2,90,312
Karnataka	29,788	57,588	96,315	35,171	5,17,726
Kerala	14,732	25,243	50,261	16,815	3,32,032
Madhya Pradesh	14,333	30,282	53,103	20,441	8,37,165
Maharashtra	1,23,341	1,91,492	2,65,171	95,872	13,38,925
Manipur	4,037	5,183	9,887	1,271	41,955
Meghalaya	196	642	2,308	1,154	7,956
Mizoram	421	1,516	4,176	1,483	15,983
Nagaland	194	1,109	3,047	1,408	17,734
Odisha	7,852	20,752	38,279	14,632	3,30,426
Punjab	13,579	28,636	58,038	34,053	2,35,420
Rajasthan	29,500	46,266	69,259	29,693	3,98,079
Sikkim	87	600	1,032	521	3,611
Tamil Nadu	70,501	1,27,325	2,01,679	79,530	9,90,165
Telangana	23,218	35,459	56,126	26,272	5,06,171
Tripura	227	799	4,075	3,246	1,24,199
Uttar Pradesh	30,611	58,574	1,01,032	81,503	3,60,009
Uttarakhand	4,140	8,539	14,093	5,542	8,20,461
West Bengal	9,419	25,618	47,330	28,588	18,13,630
Andaman and Nicobar Islands	462	738	990	305	3,184
Chandigarh	824	1,524	1,925	966	7,504
Delhi	13,464	21,882	31,647	12,160	1,39,519
Ladakh	81	354	512	383	1,901
Lakshadweep	5	20	58	11	107

Puducherry	1,051	2,294	3,464	1,356	20,719
Dadra and Nagar Haveli and Daman and Diu	453	700	930	376	4,218
Total	4,89,054	9,10,375	14,87,840	6,52,715	1,17,36,406

Source: MSME¹, NABARD² & Ministry of Micro, Small and Medium Enterprises, Government of India

The table provides detailed state-wise data on women-owned Micro, Small, and Medium Enterprises (MSMEs) in India, based on Udyam registration for the years 2020–21 to 2023–24 (up to August 2023). It highlights a significant rise in women entrepreneurship over this four-year period, with total registrations reaching an impressive 1,17,36,406. Maharashtra leads with the highest number of women-owned MSMEs, recording over 13.38 lakh registrations. Tamil Nadu follows with 9.90 lakh, and West Bengal ranks third with 18.13 lakh registrations. Uttar Pradesh, Karnataka, and Madhya Pradesh also show substantial figures, each surpassing three lakh registrations. This upward trend reflects the effectiveness of digital registration platforms and growing awareness among women entrepreneurs. States like Bihar (8.82 lakh) and Gujarat (4.76 lakh) also recorded a strong rise in registrations. Telangana and Rajasthan crossed five and nearly four lakh registrations, respectively, showing the strength of southern and western states in promoting entrepreneurship. The data reveals consistent year-on-year growth in registrations across most regions.

Interestingly, even in north-eastern and smaller states such as Manipur, Mizoram, and Nagaland, participation in entrepreneurship by women is on the rise, though the total numbers remain modest. For instance, Mizoram saw an increase from just 421 in 2020–21 to 4,176 in 2022–23. Similarly, Nagaland rose from 194 to 3,047 in the same period. Union Territories like Delhi (1.39 lakh) and Puducherry (20,719) also show steady growth in women-owned MSMEs. States such as Jharkhand and Chhattisgarh, though often less represented in national statistics, witnessed positive trends with over two lakh registrations combined. The impact of policy initiatives, improved digital infrastructure, and targeted financial support is evident in these figures. The data underscores the growing role of women in India's entrepreneurial ecosystem, especially in green and sustainable ventures. However, states like Arunachal Pradesh, Sikkim, and Lakshadweep report very low numbers, indicating a need for localized support strategies.

Another observation is the massive growth during 2022–23, where most states recorded their highest registration numbers. This surge may be attributed to post-COVID-19 recovery policies and increased digital outreach. For example, Tamil Nadu registered over two lakh women-owned MSMEs in 2022–23 alone. Delhi, Punjab, and Odisha also witnessed sharp increases in the same year. The 2023–24 data, although partial (up to August), already shows substantial figures, suggesting the upward momentum is continuing. Moreover, partnerships between public and private sectors, such as credit access and capacity-building programs, seem to be translating into real outcomes. The use of technology through platforms like Udyam Registration Portal has made the process more accessible for women across rural and urban India. This granular state-level data serves as a valuable tool for policymakers to identify gaps and replicate successful models. In conclusion, while India has made considerable strides in promoting

¹ Ministry of Micro, Small and Medium Enterprises

² National Bank for Agriculture and Rural Development

women-led enterprises, the focus should now be on sustaining this growth through inclusive, region-specific interventions.

Opportunities:

Green finance offers women entrepreneurs access to capital specifically aimed at environmentally sustainable ventures, helping them overcome traditional funding barriers. It enables them to innovate and grow in areas such as renewable energy, sustainable agriculture, and waste reduction, aligning their businesses with global environmental goals. Training and capacity-building programs linked to green financing further empower women by enhancing their skills in eco-technologies, sustainable practices, and financial management. The rising consumer demand for eco-friendly products creates a lucrative market for women-led green businesses, which can thrive with the support of targeted financial resources. Green finance also fosters valuable networking opportunities with like-minded investors, organizations, and entrepreneurs, encouraging collaboration and innovation. Ultimately, women-led green ventures can drive both environmental and social impact, improving local livelihoods while contributing to a sustainable economy.

Challenges:

Women entrepreneurs in India face significant challenges in accessing green finance due to gender biases, lack of collateral, and limited credit histories, which are worsened by the perceived risks associated with sustainable ventures. In rural areas, many women lack awareness of green finance options and government support due to poor outreach and limited access to information. This information gap prevents them from leveraging available resources to grow eco-friendly businesses. Additionally, the lack of infrastructure, training, and mentorship in green sectors makes it difficult for women to adopt sustainable practices or scale their ventures effectively. Green projects are often viewed as high-risk and long-term investments, which discourages traditional investors, especially when the ventures are led by women. Deep-rooted societal norms and gender inequality further restrict women's participation in entrepreneurship, limiting their access to decision-making platforms, networks, and funding opportunities critical for success in the green economy.

Conclusion:

Green finance is a crucial tool for empowering women entrepreneurs in India, offering both promising opportunities and complex challenges. Although women-owned MSMEs make up about 20% of the sector, they receive only 5.2% of the outstanding credit from public sector banks, underscoring a significant funding gap. Schemes like Stand-Up India have made progress by providing loans specifically for women and marginalized groups, with over 80% of beneficiaries being women. However, women in green sectors face additional obstacles, such as restrictive societal norms, lack of documentation, limited finances, and insufficient access to technical and business expertise. These barriers hinder their ability to innovate and expand sustainable ventures. To fully unlock the potential of women-led green businesses, coordinated efforts from policymakers, financial institutions, and support organizations are needed to close the funding gap and build a supportive ecosystem that promotes both economic empowerment and environmental sustainability.

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