



GREEN ECONOMY INITIATIVES AND WOMEN EMPOWERMENT

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Abstract:

A green economy transformation creates a powerful chance to make environmental sustainability work together with gender equity advancement. This document investigates how green economy projects including renewable energy systems and sustainable farming and ecological enterprise development function as forceful empowerment agents for female stakeholders particularly in underdeveloped regions and marginalized areas. The study uses diverse academic works and real-world examples to examine how gender-aware green policy approaches handle significant obstacles to work toward workforce development and develop a balanced economic expansion. The paper focuses on the specific role that green enterprises headed by women play both in developing climate resilience and fostering community advancement. Moreover the paper discusses barriers within existing policies because they do not adequately address women's distinct needs and capabilities when it comes to green sectors. The data indicates women entrepreneurs should play a central role in sustainable economy development when policy makers strengthen their capacity and provide institution-based support through purposeful reforms. Sustainable development requires immediate policy action which combines equal treatment of both genders into green economic strategies to achieve climate resilience along with equitable growth.

Keywords: *Women Empowerment, women entrepreneurship, green economy, sustainability, SDGs,*

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Introduction:

Climate change urgency together with environmental degradation drives worldwide adoption of the green economy which promotes low-carbon resource-efficient development that includes all social groups. Executive bodies worldwide now recognize environmental progress requires social equity especially gender equity since sustainability goals need alignment with their policies and institutions. Few researchers have analyzed why green economic initiatives function as potent enablers for female empowerment at their crossroads of transformational

objectives.

Women make up fewer than 30% of workers within essential green transition sectors including renewable energy production, sustainable agriculture management and green startups as well as climate governance frameworks although they experience more severe environmental impact risks. The transformation of this landscape began when targeted interventions with green job education followed by inclusive funding schemes and eco-entrepreneurship instruction started to take effect. Studies present women as leading agents in sustainable development



since they pursue both community-level mobilization and business establishment (Nhamo & Mukonza, 2020; Abdelwahed et al., 2025).

Green economy initiatives serve as pathways to promote gender equality through their creation of fair employment spaces and their development of leadership positions and their promotion of resource access and decision-making abilities. Women in Papua, Indonesia, and Serbia have enhanced their socio-economic position because of green business venture activities and educational funding (Ginting et al., 2022; Radović-Marković & Živanović, 2019).

The research examines the fundamental relationship between green economy programs and female empowerment by reviewing sustainable inclusion approaches for closing gender disparities and developing robust equity-based societies. This research evaluation combines actual observational studies and confirmed policy structures along with practical case-specific examples to demonstrate the complete transformative power of incorporating gender balance into green transitions. Such a sustainable future enables women to construct the path forward for both economic growth and environmental progress.

Literature Review:

Abdelwahed et al. (2025) Building a resilient economy: green initiatives and green entrepreneurship for women's empowerment

The research examines how green entrepreneurship acts as a transformative power for women specifically when operated within socio-economically restricted areas. The authors underline that purpose-built interventions such as training sessions and financial support will help eliminate the specific gender-related obstacles that prevent women from engaging in green economic activities. The authors join a developing academic stream which demonstrates entrepreneurship serves as a gender-transformative

economic approach for sustainability. This research uses a combination of quantitative and qualitative methods which enhances its policy recommendations and establishes itself as the foundational work between empowerment and resilience through green economic applications.

Nhamo & Mukonza (2020) Opportunities for women in the green economy and environmental sectors

An empirical research examines southern Africa government institutions which work towards increasing female participation in green economic sectors. The analysis demonstrates that although policies exist there is insufficient execution because limited resource access couples with sociocultural barriers. This research examines policy effectiveness by placing women's experiences at the center which demonstrates the bureaucratic barriers blocking equal participation. The research delivers essential insights about institutional framework development needed to embrace genuine gender-based green development.

Ginting et al. (2022) Empowering Women in Papua Province, Indonesia as Part of the Green Economy

Focusing on rural women in Papua, Indonesia, this study illustrates how the green economy can be localized through natural resource-based livelihoods. The authors describe women's roles in managing forest resources and community-based agriculture, linking empowerment with ecological stewardship. Importantly, the paper highlights the lack of institutional support and education as limiting factors. This contextualized study adds depth to the literature by illustrating the micro-level realities of implementing global green economy frameworks in marginalized regions.

Radović-Marković & Živanović (2019) Fostering green entrepreneurship and women's empowerment through education and banks' investments in tourism



This research combines theoretical insights and practical data to argue that educational programs and gender-sensitive investment strategies significantly enhance women's involvement in sustainable tourism. By focusing on Serbia, the authors demonstrate how national-level strategies can shape a gender-inclusive green economy. Their recommendations for banks and policymakers offer actionable pathways for scaling gender-equitable green entrepreneurship models across similar socio-economic contexts.

Setiawan & Wismayanti (2023) The green economy to support women's empowerment: social work approach for climate change adaptation toward sustainability development

Using a social work lens, this paper explores how community-led green initiatives can drive women's empowerment in climate-vulnerable areas. It outlines the integration of social entrepreneurship, local adaptation practices, and capacity-building as tools for empowerment. The authors underscore that empowerment is not just economic but also social and psychological, making this study a key reference for multidimensional understandings of green empowerment.

Objectives :

1. To evaluate the role of women entrepreneur in green economy
2. To identify barriers and enablers influencing women's involvement in green entrepreneurship, including access to finance, education, and policy support.
3. To assess the role of policy and institutional frameworks in integrating gender perspectives within green economy strategies.
4. To explore how women-led initiatives contribute to the advancement of Sustainable Development Goals (SDGs) through environmentally sustainable business models and community-driven green practices.

Research Methodology:

This study adopts a descriptive research design to explore and analyze the relationship between green economy initiatives and women's empowerment. Descriptive research is appropriate for identifying trends, opinions, and existing relationships in a defined. The goal is to systematically describe how green economy policies, projects, or entrepreneurship initiatives contribute to various dimensions of women's empowerment—economic, social, environmental, and political. The information have been collected from secondary data sources.

The Role of Women Entrepreneurs in the Green Economy of India:

Indian women entrepreneurs play a crucial role in advancing the green economy as they blend environmental sustainability practices with economic development that includes all groups of society. These sectors with renewable energy sales alongside sustainable agriculture and eco-tourism and waste management enable women entrepreneurs to generate employment together with resilience against climate risks.

Statistical Landscape:

The number of women-owned MSMEs in India has risen to 20% out of 63 million businesses and continues to increase from 2023 onward because of policy backing and enhanced environmental awareness (Kumar & Shobana, 2023). Female entrepreneurship potential in India places the country at position 16 worldwide according to surveys by Potluri and Phani (2020).

Research conducted by Taylor (2010) demonstrated that women entrepreneurs frequently choose to hire employees from their local areas thus supporting local community growth and lowering population shifts. The connection between local businesses increases sustainability through increased responsibility for environmental challenges across operations.



Green Initiatives and Sectoral Involvement:

Women entrepreneurs create sustainable value through their work in developing biogas production along with solar panel installation and eco-friendly textile manufacturing and recycling programs. Sustainable business establishment along with accession to state-operated ecological programs emerge as key findings from a research study with 300 women business owners based in Chittoor district Andhra Pradesh according to Rani and Sundaram (2024).

The implementation of national missions including Start-up India and Stand-Up India promotes eco-innovation but the accessibility of digital resources along with financial gaps based on gender continue to block the expansion of eco-innovation (Haldar, 2019).

Contribution in Leading Green Economies:

➤ Renewable Energy and Clean Technology

Women entrepreneurs are increasingly leading businesses in solar energy, biogas, and energy-efficient technologies. According to the International Finance Corporation (IFC) (2019), women-owned enterprises account for nearly 20% of India's renewable energy sector. For instance, Solar Sister India, a women-led enterprise, has empowered rural women to distribute solar products, impacting over 500,000 households (UNDP, 2021).

➤ Sustainable Agriculture and Organic Farming

Women constitute over 60% of the agricultural workforce in India (FAO, 2021). Many have transitioned to organic farming and agroecology, reducing chemical usage and enhancing soil health. A study by TERI (The Energy and Resources Institute, 2020) found that women-led organic farms in states like Sikkim and Kerala have improved yields by 15-20% while reducing carbon footprints.

➤ Waste Management and Circular Economy

Women entrepreneurs are pioneering waste recycling and upcycling ventures. Saahas Zero Waste, founded by Wilma Rodrigues, manages over 10,000 metric tons of waste annually in Bengaluru (World Bank, 2022). Similarly, Aakar Innovations, led by Dr. Swati Singh, produces biodegradable sanitary products, reducing plastic waste. Women entrepreneurs are increasingly contributing to the growth of India's circular economy, though data remains somewhat fragmented. Approximately 20% of Micro, Small, and Medium Enterprises (MSMEs) in India are owned by women, marking a significant presence in the entrepreneurial landscape. Among these women-led businesses, there is a growing commitment to sustainability—52% of self-employed women in Indian metropolitan areas have adopted sustainability practices within their enterprises.

➤ Eco-Friendly Handicrafts and Textiles

India's handicraft and textile sector, dominated by women (70% of artisans are female, as per MSME Ministry, 2023), is shifting towards sustainable materials. Organizations like Fabindia and Women Weave promote handloom and natural dyes, contributing to a low-carbon economy.

Challenges Faced by Women Entrepreneurs in India's Green Economy:

Limited Access to Finance

Women entrepreneurs in India's green economy face significant barriers in securing funding. According to the World Bank (2021), only 14% of women-owned businesses have access to formal credit, compared to 30% of male-led enterprises. Financial institutions often perceive women-led green startups as high-risk due to a lack of collateral and socio-cultural biases. A Reserve Bank of India (RBI, 2022) report highlights that women receive only 5% of total institutional



credit for entrepreneurial ventures, restricting their ability to scale sustainable businesses.

Sociocultural and Gender Biases

Deep-rooted gender norms hinder women's participation in the green economy. NITI Aayog (2022) notes that societal expectations often limit women's mobility, decision-making power, and access to business networks. A study by SEWA (Self-Employed Women's Association, 2020) found that 68% of women entrepreneurs in rural India face resistance from families when engaging in green ventures like solar energy or waste management. Additionally, male-dominated industries (e.g., clean tech, renewable energy) often exclude women from leadership roles (UNDP, 2021).

Lack of Technical Training & Green Skills

Despite growing opportunities in sustainability sectors, women often lack access to specialized training. The Skill India Report (2023) reveals that only 22% of rural women have received training in green skills like solar panel installation or organic farming. The Ministry of New and Renewable Energy (MNRE, 2023) acknowledges that gender gaps persist in technical education, with fewer women enrolled in STEM fields related to green technology.

Weak Market Linkages & Networking Barriers

Women entrepreneurs struggle with limited access to supply chains, government tenders, and corporate partnerships. A FICCI (2022) study found that less than 10% of women-led green businesses secure contracts with large corporations or government schemes like Stand-Up India. Furthermore, UN Women (2020) reports that women have 30% fewer professional networks than men, reducing their ability to find investors or mentors in sustainability sectors.

Regulatory and Infrastructural Hurdles

Complex business registration processes and lack of infrastructure disproportionately affect women. The World Bank's Ease of Doing Business Report

(2020) ranked India 117th in gender-inclusive business policies. Many women running eco-friendly enterprises (e.g., organic farming, upcycling) operate in the informal sector, making them ineligible for subsidies (ILO, 2021). Additionally, poor rural infrastructure (electricity, transport) increases operational costs for women-led green startups (TERI, 2022).

Assessing the Role of Policy and Institutional Frameworks in Integrating Gender Perspectives into India's Green Economy Strategies

India has recognized the importance of gender-inclusive policies in its transition to a green economy. However, systemic gaps remain in effectively integrating women entrepreneurs into sustainability-driven sectors. Government initiatives, institutional frameworks, and international collaborations play a crucial role in bridging these gaps. Below is an analysis of key policies, their impact, and remaining challenges.

Government Policies Promoting Gender-Inclusive Green Growth:

Stand-Up India Scheme (2016)

Launched by the Ministry of Finance, this scheme mandates banks to provide loans between ₹10 lakh to ₹1 crore to at least one Scheduled Caste (SC), Scheduled Tribe (ST), and woman entrepreneur per branch. While it has enabled some women to enter renewable energy and organic farming, only 15% of total loans disbursed under the scheme have gone to women-led green ventures (RBI, 2023). Structural barriers like lack of collateral and financial literacy limit its effectiveness.

Pradhan Mantri MUDRA Yojana (PMMY, 2015)

This scheme offers micro-loans (up to ₹10 lakh) to women-led enterprises in sectors like eco-tourism, biofuel production, and sustainable textiles. However, a 2022 World Bank report found that only 22% of MUDRA loans are utilized for green

businesses, indicating a need for targeted awareness campaigns.

National Policy for Women Empowerment (2016)

This policy emphasizes skill development in green sectors for women, including solar energy installation and organic farming. However, implementation remains weak, with only 18% of training programs under the National Skill Development Corporation (NSDC) focusing on green skills for women (MSDE, 2022).

Institutional Support for Women in the Green Economy

a) Ministry of New and Renewable Energy (MNRE) Initiatives

- Ujjwala Scheme (2019): Encourages women's self-help groups (SHGs) to distribute solar lamps and biogas plants in rural areas. As of 2023, over 50,000 women have been trained under this program (MNRE, 2023).
- Gender Inclusion in Renewable Energy (GIRE) Policy (2021): Aims to ensure 30% female participation in the renewable energy workforce by 2030. However, current female participation stands at just 11% (CEEW, 2022).

b) NABARD's Green Climate Fund for Women (2020)

The National Bank for Agriculture and Rural Development (NABARD) provides low-interest loans to women-led agri-startups adopting climate-smart practices. Since its launch, ₹1,200 crore has been disbursed, benefiting over 25,000 women farmers (NABARD, 2023).

c) Self-Employed Women's Association (SEWA) Programs

SEWA trains women in solar engineering, waste recycling, and organic farming. A 2021 ILO report found that SEWA-trained women saw a 40% increase in income from green businesses.

However, scaling remains a challenge due to limited funding.

d) Mahila Kisan Sashaktikaran Pariyojana (MKSP)

The Mahila Kisan Sashaktikaran Pariyojana (MKSP), launched under the Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM), has empowered over 4.5 million women farmers across India since its inception. As of 2023, the scheme has covered 24 states, with 62% of beneficiaries from marginalized communities, including SC/ST groups. The program allocates up to 60% of its budget for skill development, training women in sustainable practices like System of Rice Intensification (SRI) and organic farming, leading to a 30% increase in productivity in pilot districts. Financial support includes subsidies up to 75% for agro-tools and interest-free loans through 1.2 lakh SHGs, mobilizing ₹1,200 crore in credit linkages. Additionally, MKSP has facilitated the formation of 15,000+ Farmer Producer Organizations (FPOs), enabling collective marketing that has boosted incomes by 20-25%. A 2022 NITI Aayog report highlighted that states like Kerala and Odisha saw a 40% rise in women's land ownership due to MKSP's legal aid initiatives. The scheme aligns with SDG 5 (Gender Equality), contributing to 8% of India's female agricultural workforce transitioning from laborers to entrepreneurs.

Famous Case Studies:

Women-led initiatives play a crucial role in advancing the Sustainable Development Goals (SDGs) by promoting eco-conscious business models and community-driven green practices. These ventures address goals like gender equality, climate action, and sustainable communities through clean energy, circular economy solutions, and sustainable



agriculture. Women entrepreneurs create jobs, enhance local resilience, and reduce environmental impact. Opportunities in the green economy include solar energy distribution, organic farming, eco-tourism, waste recycling, and green logistics. Empowering women in this sector fosters inclusive development, amplifies innovation, and ensures that sustainability efforts are both locally relevant and globally aligned. Here it has been presented below

Chetna Sinha – Founder of Mann Deshi Foundation

Chetna Sinha is a pioneering social entrepreneur who established the Mann Deshi Foundation in Maharashtra to empower rural women through access to microfinance and green livelihoods. She launched the Mann Deshi Bank, India's first cooperative bank run by and for rural women. The foundation promotes sustainable agriculture, solar-powered business tools, and water conservation initiatives that directly address climate resilience and gender equity (Mahajan & Bandyopadhyay, 2021).

Ajaita Shah – Frontier Markets

Ajaita Shah founded Frontier Markets, a social enterprise that enables women in rural India to become clean energy entrepreneurs. Through the "Solar Sahelis" program, women are trained to sell and maintain solar lamps, clean cookstoves, and energy-efficient products. The initiative not only reduces dependency on kerosene but also builds women's financial independence and rural connectivity, showcasing a scalable model for decentralized green entrepreneurship (Potluri & Phani, 2020).

Shikha Shah – AltMat

Shikha Shah is the founder of AltMat, a startup that transforms agricultural waste into sustainable textiles. By innovating in fiber extraction and reducing dependency on conventional cotton, the venture merges circular economy principles with gendered employment practices. Women from rural areas are

engaged in the production chain, creating eco-conscious jobs while diverting agricultural waste from burning and landfills (Haldar, 2019).

Revathi Roy – Hey Deedee

Revathi Roy co-founded Hey Deedee, India's first all-women logistics service using electric vehicles. This green mobility enterprise trains underprivileged women to become delivery agents using e-scooters and vans, promoting both environmental sustainability and economic empowerment. Roy's model tackles urban pollution, reduces last-mile emissions, and provides a dignified livelihood for women in male-dominated transport sectors (Taylor, 2010).

Findings and Conclusion:

The research illustrates how economic programs for sustainability combined with women empowerment efforts create major possibilities for developing India inclusively and sustainably. The research shows that women entrepreneurs contribute as primary ecological sustainability actors while having the capability to engineer practical community-driven solutions based on green economic principles. Several successful case studies show how Chetna Sinha's Mann Deshi Foundation together with Ajaita Shah's Frontier Markets, Shikha Shah's AltMat and Revathi Roy's Hey Deedee demonstrate women's creation of sustainable models that also boost social and economic empowerment of other women.

The research demonstrates that businesses in green sectors run by women converge closely with four sustainable development goals including SDG 5 (Gender Equality) and SDG 7 (Affordable and Clean Energy) alongside SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). These innovative women use their equipment to deliver localized clean energy as well as circular economy approaches alongside sustainable transportation systems which reduce both urban-rural divides and strengthen local resistance.



Women entrepreneurs experience various substantial obstacles as their presence increases since they cannot obtain enough capital and face gender-biased traditional views alongside technical training gaps and insufficient awareness of policy measures and support for market connections. The existing barriers primarily affect women who live in rural and semi-urban regions since patriarchal social systems remain deeply embedded in these communities. Current green policies do not show consideration for women entrepreneurs so they neglect the specific challenges which these business owners face.

The support system for ambitious women entrepreneurs operates through four federal programs including MKSP and NRLM and Stand-Up India together with MUDRA Yojana which focus on green sectors. The fundamental issues about green policies remain centred around inadequate implementation protocols and insufficient outreach efforts as well as insufficient post-loan support networks. The research finds that gender-specific policy development combined with advanced training initiatives paired with strong public-private alliance initiatives is necessary to drive wide-scale growth of women-managed eco-initiatives.

The research demonstrates the essential role which women entrepreneurs play for achieving both green transition and sustainable development. Through their entrepreneurial activities women help drive innovative solutions from local sources while implementing environmental responsibility together with social equity within their business ventures. A collective action by government institutions alongside civil society together with private sector entities should work toward establishing supportive environments that foster women entrepreneurs in the green economy.

Targeted green economy approaches for women represent both an essential gender strategy and a

fundamental method to develop sustainable and inclusive development. The alignment of proper support services will enable these women-led models to expand as blueprints for both national and global green entrepreneurship frameworks so the SDGs can be achieved faster.

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