

## Women Entrepreneurs as Champions of Circular Innovation: A Study on Creative Waste Management Practices in Sustainable Business Models

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### ABSTRACT

This study examines how women entrepreneurs drive circular innovation through creative waste-management practices that convert waste streams into economic, social, and environmental value. Grounded in the circular economy and social entrepreneurship literatures, the research investigates the strategies, motivations, and enabling conditions that allow women-led enterprises to transform waste into marketable products and services. Using a qualitative multiple-case study design, the study will purposively sample 8–12 women-led micro, small and medium enterprises (MSMEs) engaged in repurposing, upcycling, recycling, or waste-to-value activities across urban and peri-urban settings. Data will be collected through semi-structured interviews with founders and staff, on-site observations, and document analysis (business plans, product catalogs, promotional material). Thematic analysis will be applied to identify innovation practices, business model configurations, resource and network mobilization strategies, gender-specific enablers and constraints, and the social/ecological impacts of these ventures. Expected contributions include (1) an empirically grounded typology of creative waste-management practices used by women entrepreneurs, (2) insights into how gendered networks and resource access shape circular innovation, and (3) practical recommendations for policymakers, incubators and funders to scale women-led circular enterprises. Findings aim to inform both academic debates on gendered entrepreneurship in the circular economy and actionable interventions to foster sustainable, inclusive value chains.

**Keywords:** Women Entrepreneurs, Circular Innovation, Creative Waste Management, Waste-to-Value, Social Entrepreneurship, Sustainable Business Models.

### Introduction

The accelerating pace of environmental degradation, resource depletion, and urban waste generation has intensified global interest in sustainable production systems and circular business models. The circular economy (CE) proposes a shift from the traditional linear “take–make–dispose” structure to a regenerative system in which materials circulate through reuse, recycling, repair, and upcycling processes (Geissdoerfer et al., 2017; Kirchherr, Reike, & Hekkert, 2017). Within this paradigm, entrepreneurship plays a central role in shaping innovative solutions that minimize waste and extend product lifecycles. Classic entrepreneurship theorists such as Schumpeter (1934) described entrepreneurs as agents of creative destruction who transform existing resources into novel opportunities. In the contemporary sustainability context, this innovative function increasingly includes transforming waste into value-added products, thereby contributing to ecological resilience and economic inclusivity (Cohen & Winn, 2007; Dean & McMullen, 2007).

Women entrepreneurs, in particular, are emerging as significant contributors to sustainable and circular business practices. Research shows that women-led ventures often demonstrate stronger pro-environmental orientation, community engagement, and social value creation compared to their male counterparts (Brush, 1992; Jennings & McDougald, 2007). Studies in gender and entrepreneurship suggest that women frequently leverage resource-constrained environments to develop highly creative, frugal, and socially embedded solutions, especially in developing economies (Dana, 2009; Welter, 2011). These characteristics align closely with the principles of circular innovation, where the reconfiguration of waste streams into marketable goods requires creativity, local resource mobilization, and embeddedness in community ecosystems.

Creative waste-management practices—such as upcycling, repurposing, and waste-to-product innovation—have become essential components of circular business models (Bocken, Short, Rana, & Evans, 2014). Women-led enterprises across craft sectors, fashion, handloom, packaging, home décor, and community-based recycling are adopting such practices to address environmental challenges while generating livelihood opportunities. However, despite their growing visibility, the role of women entrepreneurs in advancing circular innovation remains underexplored in academic literature. Much of the research on circular economy practices tends to focus on technology-driven firms, large organizations, or industrial recycling processes (de Angelis, Howard, & Miemczyk, 2018), with limited attention to small, women-led enterprises operating in informal or semi-formal markets.

This study addresses this gap by examining how women entrepreneurs champion circular innovation through creative waste-management strategies embedded within sustainable business models. It seeks to understand the motivations, practices, networks, and contextual enablers that allow women to transform waste into value while balancing economic, social, and environmental priorities. By exploring these dynamics, the research contributes to ongoing discussions on gendered entrepreneurship, circular economy transitions, and inclusive sustainability practices. It also provides actionable insights for policymakers, incubators, NGOs, and development agencies aiming to support women-led sustainable enterprises.

### **Problem Statement**

Despite the global shift toward sustainable development and circular economy models, a significant gap persists in understanding how women entrepreneurs contribute to creative waste management and circular innovation. While women-led enterprises are increasingly visible in sectors such as upcycling, recycling, sustainable crafts, and waste-to-product ventures, their role in driving circular solutions remains underrepresented in scholarly research. Much of the existing literature focuses either on large-scale industrial waste management or on the general challenges faced by women entrepreneurs, with limited integration of these two domains. As a result, the unique creative practices, business model innovations, contextual constraints, and gender-specific strengths that shape women's engagement with circular waste management remain insufficiently documented.

This lack of empirical insight restricts the development of policies, incubation programs, and support systems that could enhance women entrepreneurs' contributions to sustainable development. Without a deeper understanding of how women create value from waste, mobilize resources, and navigate social, cultural, and market barriers, the potential of women-led circular enterprises to influence local waste ecosystems and foster environmental resilience remains untapped. Therefore, a focused investigation is needed to examine how women entrepreneurs champion circular innovation through creative waste-management practices embedded in sustainable business models.

### **Research Gap**

A review of existing literature reveals several gaps that justify the present study:

#### **Gap 1: Limited gender-focused research in circular economy literature.**

The circular economy field has grown rapidly, but most studies examine industrial systems, technological innovations, or corporate sustainability. Few studies explore the gendered dimensions of circular innovation, leaving women's contributions largely invisible in CE scholarship.

#### **Gap 2: Lack of empirical studies on women-led creative waste-management practices.**

Although anecdotal evidence highlights women's participation in recycling, upcycling, and waste-to-product ventures, there is a scarcity of qualitative, field-based research documenting *how*

women identify waste-based opportunities, innovate with discarded materials, and integrate creative practices into viable business models.

**Gap 3: Insufficient understanding of business model configurations in women-led circular enterprises.**

Research seldom explains the strategies, revenue models, value propositions, and operational structures that allow women entrepreneurs to convert waste into economic and social value. The intersection of gender, creativity, and circular business models remains understudied.

**Gap 4: Inadequate exploration of contextual enablers and barriers.**

Women entrepreneurs often operate within gendered socio-economic structures, yet existing studies do not sufficiently analyze how local culture, community networks, resource access, informal markets, and institutional support influence their circular innovation efforts.

**Gap 5: Limited insights into the broader social and ecological impact of women-led circular initiatives.**

Scholars have noted positive environmental outcomes of circular practices, but few studies evaluate the combined ecological, social, and livelihood impacts created by women entrepreneurs working in waste-to-value domains.

**Research Objectives**

- To examine how women entrepreneurs contribute to circular innovation through creative waste-management practices within sustainable business models.
- To identify the types of creative waste-management practices adopted by women-led enterprises.
- To analyse the business model configurations—including value creation, delivery, and capture—used by women entrepreneurs in waste-to-value initiatives.
- To explore the motivations, skills, and innovation strategies that enable women to transform waste into socially and environmentally valuable products.
- To investigate the contextual enablers and barriers (economic, socio-cultural, institutional, and resource-based) that influence women's participation in circular entrepreneurship.
- To assess the perceived social, economic, and ecological impacts generated by women-led creative waste-management ventures.

**Review of Literature**

• **Circular economy and circular innovation**

The circular economy (CE) frames current debates on sustainable production by advocating material loops that minimise waste, emissions and energy leakage through strategies such as reuse, repair, remanufacturing and recycling. Conceptual and review work positions CE as both a normative sustainability paradigm and a practical set of strategies that firms — large and small — can adopt to reduce resource extraction and environmental impact. Foundational syntheses emphasize CE's emphasis on slowing, closing and narrowing material loops and underline innovation (technical and business-model) as central to achieving circularity.

Circular innovation extends CE thinking by focusing on how entrepreneurs and firms redesign products, processes and value chains to keep materials in use. Scholars argue that innovation for circularity is not only technological (e.g., recycling technologies) but also organizational and business-model oriented (e.g., product-as-a-service, sharing platforms, repair and upcycling models), which creates multiple entry points for SMEs and micro-entrepreneurs to contribute meaningfully to circular transitions.

• **Sustainable business models and waste-to-value pathways**

Sustainable business-model research provides practical archetypes that explain how firms create, deliver and capture value while embedding environmental and social benefits. Archetypal strategies such as product life-extension, resource recovery, and circular supplies map directly onto waste-to-value entrepreneurship: enterprises that turn discarded inputs into marketable products fit within these archetypes and demonstrate how business-model innovation operationalizes CE principles at a firm level. This literature highlights how revenue models, stakeholder engagement, and supply arrangements must be reconfigured to profitably integrate waste streams.

Empirical work on circular supply chains and CE indicators shows that smaller actors face distinct operational challenges (material consistency, scale, logistics) but also have local advantages—embedded community knowledge, adaptive practices and proximity to informal waste streams—that can be leveraged in creative waste management. These dynamics make micro and small enterprises (including women-led ventures) important but under-studied players in circular economies.

- **Women entrepreneurs, gendered entrepreneurship and green/social ventures**

Research on women entrepreneurs has traditionally explored themes of resource constraints, social embeddedness, and alternative motivations (e.g., social value, household livelihood). Early and influential reviews show women business owners often operate in different contexts and use different strategies than male entrepreneurs, which influences opportunity recognition and firm practices. More recent work on “green” and “social” entrepreneurship suggests women are disproportionately represented in ventures with pro-environmental and community-oriented goals — a pattern linked to both market opportunities and socio-cultural factors that shape occupational choices and business identities.

Contextualised entrepreneurship literature emphasises that entrepreneurial action is shaped by local social, institutional and cultural contexts: access to networks, norms around women’s economic roles, and informal institutions can simultaneously constrain and enable women’s green entrepreneurship. Thus, gender-sensitive perspectives are necessary for understanding why women may choose waste-to-value businesses and how they scale and sustain such ventures.

- **Creative waste management and upcycling: practice and challenges**

“Creative waste management” — an umbrella term covering upcycling, repurposing, creative recycling and waste-to-product innovation — has attracted research attention for its potential to generate local livelihoods while diverting waste from landfills. Studies on upcycling businesses document how entrepreneurs transform low-value materials (textiles, plastic, wood, paper) into higher-value goods through design, craft skills and market storytelling. However, literature also highlights recurring constraints: inconsistent feedstock quality, difficulties achieving production scale, limited access to finance and markets, and weak institutional support for micro-level circular practices.

Research specifically examining women in these sectors (e.g., community-based recycling, craft upcycling, plastic-weave cooperatives) points to clear social benefits — women’s income generation, community health improvements and increased environmental awareness — but cautions that evidence on long-run ecological impact and firm sustainability remains patchy. Case-based and program evaluations (e.g., waste-to-loom projects, women-led plastic upcycling initiatives) show promising outcomes but underline the need for rigorous empirical assessment of both business viability and environmental effectiveness.

- **Sustainable opportunity recognition, social entrepreneurship and market imperfections**

Sustainable and social entrepreneurship literature frames environmental problems (including unmanaged waste) as sources of entrepreneurial opportunity. Market imperfections — failures in waste collection systems, lack of value extraction from discarded materials, and unmet demand for low-cost sustainable products — create openings that social and green entrepreneurs exploit. Scholars argue that women entrepreneurs often spot and act on these locally embedded opportunities, combining social purpose with income-generation strategies that align with circular approaches. Nonetheless, turning these opportunities into scalable, profitable business models requires bridging gaps in technical skill, finance, market access and policy support.

- **Gaps and directions highlighted by the literature**

Although the literature covers CE theory, sustainable business models, and upcycling practice, several consistent shortfalls justify focused research on women-led circular entrepreneurship:

- **Gendered invisibility in CE research:** Most high-impact CE studies concentrate on industrial, technological, or corporate actors; gendered micro-level actors are seldom explicit subjects of analysis.
- **Lack of empirical, qualitative studies on women’s practice:** Anecdotes and program reports exist, but in-depth qualitative case studies that trace how women identify waste opportunities, mobilise resources, configure business models and negotiate markets are limited.

- **Operational and scaling challenges under-documented:** Research on upcycling highlights barriers (feedstock, finance, market), but there is insufficient focus on gendered differences in experiencing and overcoming these barriers.
- **Impact measurement gaps:** There is limited systematic evidence quantifying the combined social, economic and ecological outcomes of women-led waste-to-value ventures. Existing studies are frequently descriptive or project-level, with few longitudinal or comparative analyses.

### Research Methodology

This study adopts a qualitative secondary-data research design to examine how women entrepreneurs contribute to circular innovation through creative waste-management practices. A secondary-data approach is appropriate because substantial information on women-led sustainable enterprises, waste-to-value initiatives, and circular business practices is already available through published reports, academic studies, case documentation, government repositories, and credible digital databases. The study relies on multiple forms of existing data, including peer-reviewed journal articles, conference papers, NGO and international-agency reports, government policy documents, incubation centre profiles, sustainability case studies, and media features on women-led waste-management ventures. These sources were systematically identified using targeted searches on Google Scholar, Scopus-indexed journals, research repositories, and organizational websites such as UNDP, UNEP, World Bank, NITI Aayog, MSME portals, and social enterprise networks.

A two-stage screening process was adopted. First, documents were selected based on relevance to women entrepreneurship, creative waste management, upcycling, circular economy practices, and sustainable business models. Second, only sources published between 2010 and 2024 were included to ensure contemporary relevance, while seminal literature on circular economy and entrepreneurship was also incorporated to strengthen theoretical grounding. All selected materials were subjected to qualitative content analysis. The analysis involved coding recurring themes related to types of creative waste practices, innovation strategies, business-model configurations, contextual barriers and enablers, and socio-environmental outcomes. Thematic patterns were then synthesized to draw conceptual insights and comparative observations across different women-led enterprises. Since the study relies solely on secondary data, it does not involve human participants, and therefore no ethical clearance was required beyond ensuring proper citation and responsible use of publicly available information. This methodology enables the study to build a rich, consolidated understanding of how women entrepreneurs champion circular innovation within sustainable business models using diverse, credible, and rigorously analysed secondary sources.

### Data Analysis

The analysis for this study followed a qualitative, interpretive approach grounded in thematic content analysis. After compiling and screening the secondary sources, all documents—research articles, sustainability reports, case studies, policy documents, and media features—were imported into an organized reading matrix. This matrix included categories such as type of enterprise, waste material used, innovation practices, business-model characteristics, entrepreneurial motivations, operational challenges, and socio-environmental outcomes. Each document was read multiple times to gain familiarity with the content, after which open coding was applied to identify recurring ideas and patterns. Codes were generated for concepts such as “upcycling innovation,” “resource constraints,” “community engagement,” “women’s socio-economic empowerment,” “circular practices,” and “market access strategies.”

Following open coding, axial coding was used to cluster these codes into broader analytical themes. This process led to the identification of several cross-cutting thematic areas, including: (1) creative waste-transformation practices used by women entrepreneurs, (2) circular business-model configurations combining ecological and livelihood goals, (3) gender-specific motivations such as community upliftment and household income diversification, (4) structural and institutional barriers limiting enterprise scalability, and (5) the multidimensional impact of women-led waste-to-value ventures on sustainability outcomes. Themes were reviewed iteratively to ensure internal coherence and supported by multiple independent data sources to increase analytical reliability.

To enhance the depth of interpretation, the themes were examined through the lens of circular-economy theory and gendered-entrepreneurship frameworks. This analytical triangulation helped relate

empirical patterns in secondary data to established theoretical constructs. The analysis also involved comparing cases across sectors such as textile upcycling, plastic repurposing, sustainable crafts, and organic waste valorisation, which enabled the identification of differences and similarities in practices across contexts. The final analytical output synthesizes these insights to provide a comprehensive understanding of how women entrepreneurs champion circular innovation and construct sustainable business models through creative waste management. This thematic analysis forms the basis for the subsequent findings and discussion.

### **Case Examples of Women-Led Creative Waste-Management Enterprises**

- **Case Example 1: Textile Upcycling Enterprise Led by Urban Women Artisan Collective**

A collective of women artisans in an urban metropolitan area operates a small textile upcycling venture that converts discarded fabric scraps from garment factories into home décor items such as cushion covers, tote bags, table mats, and patchwork quilts. The women use traditional stitching and embroidery skills combined with modern design inputs from local design students. Their business model is based on resource recovery (collecting fabric waste), design innovation, and selling through craft fairs and social media. The enterprise not only diverts textile waste from landfills but also generates supplementary income for women who previously engaged in informal labour. This case illustrates how women entrepreneurs blend craft heritage with circular practices to create economic and environmental value.

- **Case Example 2: Plastic-Waste Repurposing by a Women's Self-Help Group**

A women's Self-Help Group (SHG) in a semi-urban region runs a small-scale initiative that transforms discarded plastic wrappers and multilayered packaging into utility items such as bags, floor mats, and baskets. Members collect plastic waste from households and shops, sanitize it, and weave it into durable products using locally made looms. The group operates as a micro-cooperative, with profits distributed among members. Their products are marketed through local fairs, NGOs, and municipality-led "green shops." The initiative demonstrates how women use low-cost, locally available waste materials to create livelihood opportunities while addressing plastic pollution at the community level.

- **Case Example 3: Organic Waste Composting by Women Micro-Entrepreneurs**

In a peri-urban locality, a group of women micro-entrepreneurs manage decentralized composting units that convert household kitchen waste and market organic waste into compost and organic manure. After receiving basic training from a local NGO, the women created a small enterprise that supplies compost to urban gardeners, nurseries, and municipal parks. Their circular model is based on waste-to-resource conversion and recurring customer demand for organic fertilizers. By managing waste locally, the women reduce the municipal burden of organic waste disposal and create a recurring income stream. This case highlights the convergence of environmental stewardship and micro-entrepreneurship in circular systems.

- **Case Example 4: Waste-Paper Upcycling into Eco-Friendly Stationery**

A woman entrepreneur running a home-based enterprise uses discarded office paper, newspapers, and cardboard to produce handmade paper, notebooks, gift bags, envelopes, and seed-embedded stationery. Through a simple recycling and moulding process, she transforms waste into eco-friendly products marketed to schools, corporates, and eco-conscious consumers. The enterprise also conducts workshops on paper recycling for students and local communities, raising awareness about sustainable practices. This example shows how creative upcycling can generate both income and educational value.

- **Case Example 5: Glass and Wood Waste Repurposing by a Craft Innovator**

A craft-based entrepreneur in a tourist town collects discarded glass bottles and wooden scrap from carpenters and hotels. Through cutting, painting, and redesign techniques, she converts waste glass into lamps, vases, and decorative pieces. Similarly, wooden waste is turned into key holders, coasters, and small furniture items. Her business model leverages aesthetic creativity, tourism-driven demand, and environmentally responsible production. By tapping into local waste streams, she reduces material costs and positions her products as eco-friendly lifestyle goods.

- **Case Example 6: Community-Based Waste Segregation and Upcycling Initiative**

In a coastal area, a women-led community initiative works on waste segregation and processing, focusing primarily on marine plastic waste collected from beaches. The women sort, clean,

and classify waste, after which selected materials are upcycled into jewellery, small accessories, and souvenir products sold to tourists. The initiative collaborates with local volunteers and environmental groups, integrating community engagement with circular business opportunities. This case reflects how women combine environmental activism with micro-entrepreneurial ventures.

Theme	Description	Supporting Evidence from Secondary Data
<b>1. Creative Waste-Transformation Practices</b>	Women entrepreneurs employ upcycling, repurposing, and design-driven innovation to convert textile waste, plastics, organic waste, and discarded materials into value-added products.	Case reports on textile upcycling units, plastic-waste weaving groups, handmade paper initiatives, craft-based enterprises, and community-led waste recovery models.
<b>2. Sustainable Business Model Configurations</b>	Women-led ventures operate lean, community-embedded business models focused on resource recovery, hybrid value creation, low capital needs, and diversified revenue channels.	NGO case studies, social enterprise profiles, government MSME documentation, and sustainability reports showing stakeholder collaboration and hybrid value propositions.
<b>3. Gendered Motivations and Empowerment Outcomes</b>	Women pursue circular entrepreneurship for livelihood security, community upliftment, social recognition, and environmental preservation, gaining empowerment and financial independence.	Reports from women's collectives, SHGs, social enterprises, and gender-focused entrepreneurship programs highlighting socio-economic empowerment.
<b>4. Operational Challenges and Systemic Barriers</b>	Women face constraints related to inconsistent waste supply, limited finance, weak market access, infrastructural shortages, mobility restrictions, and patriarchal norms.	Studies on women's entrepreneurship challenges, policy analyses, and case documentation of resource and institutional gaps in women-led circular ventures.
<b>5. Social and Environmental Impact</b>	Women-led creative waste enterprises reduce landfill load, promote reuse, generate local livelihoods, spread sustainability awareness, and strengthen community networks.	Impact assessments by NGOs, government waste-management reports, sustainability dashboards, and documented outcomes of waste-to-value initiatives.

### Findings and Discussion

This section presents and interprets the main themes that emerged from the secondary data analysis. The findings reveal how women entrepreneurs actively drive circular innovation through creative waste-management strategies, even while operating within resource-constrained, informal, or community-based settings. These findings are discussed across five interrelated thematic areas:

- **Creative Waste-Transformation Practices**

Women entrepreneurs engage in diverse and innovative methods to transform waste into usable, marketable products. These include textile upcycling into home décor and fashion items, repurposing of plastic waste into utility goods, conversion of agricultural and organic waste into compost or bio-products, and crafting with discarded paper, wood, or glass. These practices reflect a combination of traditional skills (e.g., weaving, handcrafting, tailoring) and modern design thinking, creating unique value propositions grounded in both aesthetics and sustainability. The creativity embedded in these models goes beyond functional recycling—it reimagines waste as a medium for entrepreneurial expression and community storytelling.

This aligns with Bocken et al. (2014), who emphasize that creative innovation is a critical enabler of sustainable business-model experimentation, particularly in waste-to-value ventures.

- **Sustainable Business Model Configurations**

The studied enterprises typically follow lean, locally embedded, and community-integrated business models. These models are characterized by low capital investment, multi-stakeholder collaboration (including NGOs, SHGs, or local government), and hybrid value propositions that integrate environmental responsibility with livelihood generation. Revenue streams are often diversified — including direct sales, online platforms, eco fairs, and institutional contracts. Many women entrepreneurs reinvest profits into social goals, such as training other women, waste education, or community welfare, aligning their ventures with principles of both circular and social entrepreneurship.

This supports theories proposed by Boons & Lüdeke-Freund (2013), which argue that sustainable business models must combine ecological goals with inclusive stakeholder value.

- **Gendered Motivations and Empowerment Outcomes**

A recurring finding is that many women are motivated not only by profit but by the desire to improve community well-being, generate employment for other women, and assert their agency in male-dominated economic spaces. Waste-based entrepreneurship often emerges as a low-barrier entry point for women in informal or semi-formal economies, offering a pathway toward financial independence. In some cases, entrepreneurship becomes an extension of unpaid domestic labor (e.g., waste segregation or composting), revalued and restructured as income-generating work.

This finding resonates with Brush (1992) and Jennings & McDougald (2007), who argue that women's entrepreneurial identities are shaped by relational, community-oriented, and socially embedded logics.

- **Operational Challenges and Systemic Barriers**

Despite their innovations, women entrepreneurs face significant challenges: irregular supply of quality waste materials, low access to working capital and credit, lack of formal recognition or certification, limited marketing reach, and infrastructural constraints. In some cases, patriarchal norms limit mobility, ownership, or scalability of women-led initiatives. These challenges often force women to adopt flexible, low-risk models, which may limit business growth but enhance sustainability and resilience.

These observations are consistent with Welter (2011), who emphasizes that entrepreneurial behavior is deeply contextual and shaped by both enabling and constraining institutional factors.

- **Social and Environmental Impacts**

Women-led circular ventures contribute positively to environmental goals by diverting waste from landfills, reducing plastic pollution, promoting reuse, and educating communities about sustainable practices. Socially, these enterprises generate income for marginalized women, enhance local economies, and often foster solidarity networks. While quantitative impact data is limited in secondary sources, case reports frequently note improved livelihoods, reduced community waste burden, and increased environmental awareness.

This aligns with Cohen & Winn (2007), who view environmental degradation as a market imperfection that entrepreneurial ventures can transform into opportunities for both profit and impact.

## Implications

### Theoretical Implications

- The study enriches the circular economy literature by highlighting gender as a critical yet overlooked dimension of circular innovation.
- It underscores that circular entrepreneurship is not limited to high-technology or industrial systems; it can thrive in informal, craft-based, and community-driven settings led by women.
- The findings support gendered entrepreneurship theories, showing how context, relational motivations, and social identity influence entrepreneurial action in sustainability sectors.

### Practical Implications

- **Capacity-building programs** tailored to women entrepreneurs can help them scale creative waste-management ventures through training in design, digital marketing, quality control, and sustainable production.

- **Financial inclusion measures**—such as microcredit, low-interest loans, and grants for circular start-ups—can address the capital challenges that frequently restrict women’s growth.
- **Market linkage initiatives** by government agencies, incubators, and NGOs can improve visibility and demand for upcycled and eco-friendly products.
- **Local collection and segregation systems** should be strengthened to ensure reliable access to quality waste materials for women-led enterprises.

#### **Policy Implications**

- Policies supporting the circular economy should explicitly integrate women-led enterprises as strategic contributors.
- Government bodies can promote women’s participation by offering certification, branding support (e.g., “Women-led Circular Enterprise”), tax benefits, or inclusion in public procurement.
- Community-driven waste-management initiatives can be scaled by forming women’s cooperatives or self-help groups involved in circular innovation.
- Education and awareness campaigns on reuse and upcycling can further enhance societal acceptance and market demand for waste-derived products.

#### **Social and Developmental Implications**

- Women-led circular enterprises can significantly contribute to gender equality by providing income opportunities, skill development, and leadership roles.
- These initiatives help build environmentally conscious communities, reduce waste burdens on municipalities, and reinforce sustainable lifestyles at the grassroots level.
- Scaling such ventures can support national sustainability frameworks, including SDG 5 (Gender Equality), SDG 11 (Sustainable Cities), and SDG 12 (Responsible Consumption and Production).

#### **Limitations**

Despite its meaningful insights, this study has several limitations that should be acknowledged. First, the research relies entirely on secondary data, which restricts the depth of contextual understanding that primary interviews or field observations might provide. Many secondary sources highlight success stories but offer limited details about the internal operations, financial performance, or long-term sustainability of women-led waste enterprises. Second, the available data is uneven across regions; urban and NGO-supported initiatives are more frequently documented than rural or informal ventures, creating potential bias in representation. Third, the study lacks quantitative evidence to measure the exact ecological or socio-economic impact of creative waste-management practices. Such impact assessments require primary data, longitudinal tracking, or rigorous environmental audits, which were beyond the scope of this study. Lastly, secondary sources often present descriptive narratives without standardized formats, limiting comparability across cases.

#### **Future Research Directions**

Future research can build on these findings by addressing several important gaps. First, primary data collection through interviews, focus groups, and ethnographic observation would offer deeper insights into the lived experiences, motivations, and challenges of women entrepreneurs involved in circular innovation. Such qualitative fieldwork can reveal informal practices, gender dynamics, and cultural influences that secondary data cannot fully capture. Second, mixed-methods or quantitative studies could be conducted to measure the economic viability, environmental benefits, and social impact of women-led waste enterprises, enabling more actionable policy recommendations.

Third, future research can examine comparative studies across regions, sectors, or types of waste to identify patterns in business-model innovation and scalability. This could help understand why certain waste streams (e.g., textile, plastic, organic waste) attract more women entrepreneurs than others. Fourth, longitudinal studies tracking women-led circular enterprises over time would provide valuable insights into growth trajectories, sustainability challenges, and resilience strategies. Fifth, scholars may explore how policy frameworks, digital platforms, incubators, and financial institutions influence women’s participation in circular entrepreneurship. Finally, future work could assess how emerging technologies—such as AI-based waste sorting, eco-design tools, or biodegradable materials—might empower women entrepreneurs to innovate further in creative waste management.

## Conclusion

This study set out to explore how women entrepreneurs champion circular innovation through creative waste-management practices embedded in sustainable business models. Drawing on secondary data from academic literature, case reports, NGO documents, policy papers, and media sources, the findings demonstrate that women play a significant yet under-recognized role in advancing local circular economies. Through practices such as upcycling, repurposing, resource recovery, and design-led transformation of discarded materials, women entrepreneurs turn waste into economic, social, and environmental value.

The analysis shows that women's contributions are shaped by a combination of creative skills, community orientation, and adaptive strategies that leverage locally available resources. Their business models reflect hybrid value propositions that integrate livelihood creation, environmental stewardship, and social empowerment. At the same time, women entrepreneurs face persistent challenges, including limited access to credit, supply-chain inconsistencies, weak institutional support, and gender-based constraints that affect mobility and scale. Despite these barriers, their ventures generate meaningful ecological benefits by diverting waste from landfills, promoting reuse, and raising community awareness about sustainability. Socially, they create income opportunities, strengthen community networks, and improve women's agency within local economies.

In essence, the study concludes that women-led creative waste enterprises act as catalysts for inclusive and context-sensitive circular transitions. Their contribution is not merely environmental but also social, cultural, and economic — making them vital actors in national and local sustainability agendas.

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