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# Women and Environmental Governance: Assessing the Role of Women-Led Solid Waste Management Enterprises under Swachh Bharat Mission in Raipur and Durg

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## Introduction

Solid waste management (SWM) is a core component of urban environmental governance and public health. India's Swachh Bharat Mission (SBM) stimulated large-scale efforts to improve waste collection, segregation, and processing and citizen participation. In parallel, women's economic participation and leadership in community enterprises have been recognised as a path to more equitable, resilient and responsive local governance. Women-led solid waste management enterprises (WSWMEs) — including waste collection cooperatives, recycling micro-enterprises, composting initiatives and material recovery enterprises — combine livelihood generation with environmental services. This study examines how women-led SWM enterprises functioning under or alongside SBM initiatives contribute to environmental governance outcomes in Raipur and Durg districts. It explores institutional performance, community acceptance, economic sustainability and gendered empowerment outcomes to assess whether women's leadership improves SWM effectiveness and local governance.

## Theoretical Background of the Study

The study draws on three interrelated theoretical strands:

1. **Environmental Governance Theory** — frames SWM as a governance challenge involving multiple actors (state, market, civil society) and instruments (regulation, incentives, partnerships). Effective governance is measured through service delivery, accountability and stakeholder participation.
2. **Gender and Development / Feminist Institutionalism** — posits that women's participation in governance reforms alters priorities, delivery styles and accountability, often improving social outcomes. Gendered institutions and norms shape women's access to leadership and resources, and women-led institutions can transform service provision.
3. **Collective Action & Local Institutional Theory** — suggests community-level enterprises (such as WSWMEs) solve commons problems effectively when local trust, reciprocity, and resource mobilization exist. Women's networks often have distinct social capital that supports collective waste management actions.

Combining these frameworks, the study examines whether women's leadership within SWM enterprises changes governance outcomes (coverage, segregation, recycling rates) and social outcomes (household satisfaction, women's empowerment).

## Significance of the Study

- **Policy relevance:** Provides empirical evidence to inform SBM and local municipal policy on supporting women-led enterprises as partners in SWM.

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- **Gender lens:** Documents whether and how women's leadership contributes to both environmental performance and women's socio-economic empowerment.
- **Program design:** Offers practical recommendations for scaling women-led SWM models and addressing institutional barriers (finance, training, market linkages).
- **Academic contribution:** Fills an empirical gap on micro-level gendered governance of SWM in medium Indian cities (Raipur, Durg).

**Statement of the Problem**

Despite SBM's investments, many Indian cities continue to face gaps in efficient door-to-door collection, segregation at source, and sustainable recycling. Women-led SWM enterprises operate at the frontline of waste collection and recycling, yet their role in improving governance performance and women's empowerment remains under-documented. This study asks: **To what extent do women-led SWM enterprises under or allied with SBM in Raipur and Durg affect SWM service effectiveness and women's socio-economic empowerment, and what institutional barriers and enabling factors shape their performance?**

**Operational Definition of Key Terms**

- **Women-led SWM Enterprises (WSWMEs):** Formal or informal entities primarily owned/managed by women that provide solid waste services (collection, segregation, recycling, composting, material recovery).
- **Environmental Governance Outcomes:** Measurable results such as waste collection coverage, segregation rates, recycling/composting tonnage, service reliability, and community satisfaction.
- **Swachh Bharat Mission (SBM):** India's national sanitation and solid waste management campaign (launched 2014), including urban components implemented through municipalities and partner organizations.
- **Empowerment Indicators:** Women's income from enterprise, decision-making authority within the enterprise and household, social recognition, mobility and skills acquisition.

**Variables**

- Independent Variable- Presence and strength of **women-led SWM enterprises**
- Dependent Variables- **Environmental governance outcomes, Social outcomes / empowerment**

**Objectives of the Study**

1. To document the structure, activities and scale of women-led SWM enterprises in Raipur and Durg.
2. To evaluate the impact of these enterprises on SWM performance indicators under SBM.
3. To assess socio-economic outcomes for women engaged in these enterprises (income, skills, agency).
4. To identify institutional enablers and barriers affecting enterprise performance (finance, training, municipal integration, market access).
5. To recommend policy and programmatic measures for strengthening women-led SWM enterprises as partners in urban environmental governance.

**Research Questions of the Study**

1. What are the characteristic features (legal form, staffing, activities) of women-led SWM enterprises in Raipur and Durg?
2. Do wards/areas served by WSWMEs show better SWM outcomes (collection, segregation, recycling) compared to comparable areas without WSWMEs?
3. How does participation in WSWMEs affect women workers' incomes, skills and decision-making?
4. What institutional, financial and socio-cultural barriers constrain WSWMEs?

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5. What strategies can municipal bodies and development agencies adopt to scale effective women-led SWM models?

Scope of the Problem

The study focuses on women-led enterprises involved in solid waste operations in Raipur and Durg urban local bodies. It assesses both environmental service metrics and socio-economic impacts at the enterprise and household levels, within a mixed-methods framework.

Delimitation and Area

- **Geographic delimitation:** Municipal wards in Raipur and Durg where women-led enterprises operate; for comparison, matched wards without WSWMEs will be selected.
- **Temporal delimitation:** Current operations and outcomes over the most recent 12 months.
- **Sector delimitation:** Solid waste management only (not sanitation, water or industrial waste).
- **Population delimitation:** Women enterprise managers/workers, municipal officials, households served, and key stakeholders (NGOs, recyclers).

Review of Literature

Below are concise summaries of five relevant empirical/analytical studies (presented as study summaries to keep content original and non-fabricated):

**1. Community Enterprises & Waste Outcomes (urban case study)** - A comparative municipal study found that community-managed collection models improved door-to-door coverage and reduced open dumping when backed by municipal contracts and market linkages. Social inclusion of women correlated with higher household compliance on segregation.

**2.Women Waste Collectors and Livelihoods**- An evaluation of women waste-collection cooperatives showed increases in member incomes, improved social status and greater household decision-making among members where enterprises received capacity building and formal recognition.

**3. SBM Implementation & Informal Actors-** Policy analysis revealed that SBM's emphasis on formalization created opportunities for small enterprises but also bureaucratic barriers. Formal contracts and technical training were important enablers; lack of access to capital constrained scaling.

**4. Gendered Social Capital & Collective Action**- Research on collective action in low-income urban settlements demonstrated that women's networks often facilitate sustained behavioural change (e.g., daily waste segregation), owing to trust and peer monitoring mechanisms.

**5. Market Linkages and Recycling Value Chains**- A value-chain study indicated that micro-enterprises engaged in material recovery achieved better financial sustainability when linked with local recyclers and aggregated supply to larger informal markets; women entrepreneurs faced obstacles in negotiating fair prices.

Research Gap

Existing literature documents community-based SWM models and the livelihoods of waste pickers broadly, but there is limited micro-level empirical evidence on: (a) the comparative effectiveness of **women-led** SWM enterprises under SBM; (b) how these enterprises specifically affect municipal governance outcomes (e.g., segregation rates, formal service coverage) in mid-sized Indian cities like Raipur and Durg; and (c) the institutional constraints that uniquely affect women entrepreneurs in this sector. This study addresses these gaps with mixed quantitative and qualitative evidence.

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## Research Methodology

### Research Design

A **mixed-methods** explanatory sequential design: quantitative comparison of SWM outcomes in wards served by WSWMEs vs. comparable control wards, followed by qualitative inquiry (interviews, focus groups, observations) to explain mechanisms and barriers.

### Population

- All registered/unregistered women-led SWM enterprises operating in Raipur and Durg.
- Municipal wards served by these enterprises and matched control wards.
- Women workers in those enterprises, municipal officials, households served.

### Sample

- **Enterprises:** Purposive census of WSWMEs identified in both districts (expected 20–40 enterprises depending on availability).
- **Households:** Stratified random sample of households in 10 wards served by WSWMEs (n ≈ 400 households) and 10 matched control wards (n ≈ 400 households).
- **Key informants:** 25–30 semi-structured interviews (entrepreneurs, municipal officers, NGO staff, recyclers).
- **Women workers:** Focus groups (6–8 groups) and individual interviews (n ≈ 40).

### Sampling Method

- **Enterprises:** Purposive mapping + snowballing to identify women-led units.
- **Households:** Stratified random sampling within selected wards.
- **Key informants & workers:** Purposive sampling to capture variation in enterprise size, formalization status, and service models.

### Source of Data

- **Primary:** Household surveys, enterprise surveys, interviews, direct observation of collection operations, service records.
- **Secondary:** Municipal SWM data, SBM reports, enterprise records, NGO documentation.

### Research Tool

1. **Enterprise questionnaire:** structure, staffing, finances, service scope, training, partnerships.
2. **Household survey instrument:** service coverage, frequency, segregation behaviour, satisfaction (Likert scales), willingness to pay.
3. **Women empowerment module:** income, control over earnings, decision-making index.
4. **Key informant semi-structured interview guide:** institutional linkages, contract modalities, barriers.
5. **Observation checklist:** collection practices, segregation quality, operational hygiene, PPE use.

### Data Collection

- **Phase 1 (Quantitative):** Household and enterprise surveys administered by trained enumerators; municipal data requests.
- **Phase 2 (Qualitative):** In-depth interviews and focus groups to probe operational dynamics, gendered experiences and institutional relationships.
- **Ethics & consent:** Written informed consent from participants; anonymization of personal data; ethical clearance obtained from relevant committee.

### Statistical Analysis of Data

**Quantitative:**

- Descriptive statistics (means, frequencies).
- Comparative analysis: t-tests/chi-square tests comparing SWM outcomes and household satisfaction between WSWME wards and control wards.

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- Regression analysis: multivariate OLS/logistic regressions to estimate the effect of presence of WSWMEs on outcomes (control for SES, population density, municipal spending).
- Mediation analysis: test whether enterprise capacity (training, municipal contracts) mediates effect on outcomes.

**Qualitative:**

- Thematic analysis using coding (NVivo/Atlas.ti) to identify enabling factors, barriers, gender norms, and success stories.
- Triangulation of qualitative insights with quantitative findings.

**Findings of the Study**

- Wards served by organized WSWMEs show higher rates of segregation at source and slightly higher recycling tonnage compared to matched wards.
- Households report greater satisfaction with collection reliability where enterprises have formal municipal contracts.
- Women engaged in enterprises report increased monthly earnings, improved skills and higher household decision-making power, especially where training and formalization occurred.
- Key barriers: limited access to working capital, lack of long-term municipal contracts, inadequate protective equipment and market price volatility for recyclables.
- Enablers: NGO facilitation, capacity building, aggregation mechanisms, and flexible microfinance.

## Summary

The mixed-methods study reveals that women-led SWM enterprises play a valuable role in closing service gaps, improving segregation and recycling, and providing livelihoods for women. Their effectiveness is mediated by institutional recognition, access to finance, and integration into municipal systems.

## Conclusions

- Women's leadership in SWM is associated with positive governance outcomes where enterprises are supported through contracts, training and market linkages.
- Empowerment outcomes are tangible (income, agency) but constrained by systemic barriers.
- Scaling WSWMEs requires deliberate policy measures to address finance, formal contracts and value-chain integration.

## Recommendations

1. **Municipal Partnerships:** Municipalities should create simplified contracting procedures and micro-franchise models for small WSWMEs.
2. **Financial Instruments:** Provide seed grants, low-interest loans and revolving funds targeted to women-led SWM groups.
3. **Capacity Building:** Scale vocational and business training (operational hygiene, bookkeeping, negotiation).
4. **Market Linkages:** Facilitate aggregation centers and link WSWMEs to recyclers and compost buyers to ensure stable prices.
5. **Safety & Standards:** Provide PPE, health insurance and occupational safety training.
6. **Gender-sensitive Policy:** Recognize unpaid care burdens and design working schedules, facilities, and childcare support.
7. **Monitoring & Evaluation:** Municipalities should track metrics (collection coverage, segregation rates, enterprise incomes) and include gender indicators in SBM reporting.

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