Sustainability Adoption Among Informal Waste Workers in India
Economic Barriers, Incentive Structures, and Policy Gaps

Sujal Kumar Poddar, Aasvi Kedia, Ditti Baid, Suryansh Pratap Singh

Abstract

This study investigates the structural and economic disconnect between India's municipal waste management ambitions and the lived realities of the informal waste workers who form the actual backbone of the country's recycling ecosystem. While modern policy frameworks, exemplified by the Extended Producer Responsibility (EPR) guidelines of 2022 and urban clean-city campaigns, promote a highly formalized, capital-intensive vision of the circular economy, they systematically marginalize the informal sector, which handles 60% to 70% of urban recyclable waste. Utilizing primary survey data collected from 110 informal waste workers across Indian urban clusters, this paper analyzes the micro-economic constraints, behavioral realities, and institutional dynamics that govern waste worker decision-making. The empirical findings indicate that waste workers are not inherently unaligned with environmental sustainability; rather, their practices are strictly bounded by severe financial precarity, high transaction costs, and systemic institutional exclusion. Descriptive and cross-tabulation analyses demonstrate that over 57% of surveyed workers earn less than ₹10,000 per month, and 81.8% experience high financial instability, leaving them with zero economic margin to absorb the costs of enhanced segregation or safety compliance. Furthermore, the existing fiscal framework, such as an 18% Goods and Services Tax (GST) on recyclable scrap, drives transactions into untaxed, informal cash networks, penalizing formalization. This paper argues that India's circular economy cannot succeed through top-down corporate monopolization. Instead, sustainable waste management requires an incentive-compatible policy framework that restructures fiscal policies, enforces informal cooperative sourcing quotas within EPR, provides micro-level neighborhood infrastructure, and leverages municipal co-management models to elevate informal workers into recognized green-collar professionals.

Keywords: Informal Waste Economy, Extended Producer Responsibility, Survival Economics, Circular Economy, Institutional Trust, India.

Introduction

India's urban centers collectively generate thousands of tons of municipal solid waste daily, a volume projected to rise exponentially alongside rapid urbanization and shifting consumer behavior (Ministry of Environment, Forest and Climate Change [MoEFCC], 2016). In response to this mounting crisis, the Indian state has launched ambitious environmental policies, notably the Swachh Bharat Mission, the Solid Waste Management Rules of 2016, and the Plastic Waste Management Rules of 2022 (Central Pollution Control Board [CPCB], 2022). These regulatory

frameworks envision a modern, scientific circular economy centered around Extended Producer Responsibility (EPR), high-tech mechanization, and digitized waste-tracking. Yet, beneath this progress lies a fundamental, policy-induced contradiction: the circular transition is designed around formal corporate structures while the actual collection, segregation, and processing of waste remain overwhelmingly dependent on an informal network of 1.5 to 4 million waste pickers, scrap collectors (*kabadiwalas*), and micro-recyclers (Women in Informal Employment: Globalizing and Organizing [WIEGO], 2022).

This paper examines the structural disconnect between India's sustainability ambitions and the survival-driven economic realities of informal waste workers. It argues that the persistent failure of source segregation and low-carbon waste processing is not a consequence of cognitive or awareness gaps among informal workers. Rather, it is a rational, predictable outcome of economic precarity, institutional exclusion, and misaligned policy incentives (Chintan Environmental Research and Action Group, 2021). Informal waste workers function as the primary, low-cost filters of India's urban metabolism, recovering up to 20% of municipal waste and preventing millions of tons of carbon emissions. Yet, environmental governance frameworks frequently treat them as administrative nuisances or obstacles to modernization (Swarupa, 2021).

By analyzing primary empirical data collected from 110 informal waste workers in India, this study demystifies the behavioral and economic trade-offs inherent in informal waste processing. It evaluates how daily financial precarity, systemic exposure to occupational hazards, a lack of trust in municipal authorities, and fiscal penalties like the 18% GST on scrap converge to suppress the adoption of sustainable practices. Ultimately, this paper advances a pro-poor, incentive-compatible policy transition that integrates these workers into the circular economy, replacing top-down displacement with structural recognition and equitable financial compensation.

Literature Review

The academic and policy literature on waste management in the Global South increasingly highlights the critical intersection of informal economies, circularity, and environmental justice. Rather than being peripheral, the informal recycling sector is widely documented as the structural backbone of resource recovery. Globally, informal workers collect approximately 58% to 60% of all plastic packaging destined for recycling (United Nations Environment Programme [UNEP], 2023). In India, estimates suggest that the informal sector manages 60% to 70% of urban recyclable waste, operating as a self-financing, decentralized system that significantly reduces municipal waste-hauling expenditures (Alliance of Indian Wastepickers [AIW], 2021). For example, in cities like Pune and Bengaluru, empirical studies demonstrate that municipal governments save between ₹84 crore and ₹90 crore annually in labor and transportation costs

due to the uncompensated sorting labor of informal waste pickers (SWaCH Cooperative, 2020). Despite these environmental and fiscal contributions, informal waste workers are heavily marginalized by socio-economic stratification. In the Indian context, the informal waste hierarchy is deeply entangled with caste, class, and religious identities (Gill, 2010). A significant majority of waste pickers belong to Dalit, Adivasi, or migrant Muslim communities, exposing them to systemic social stigmatization and institutional discrimination (Wittmer, 2021). This social marginalization translates into precarious economic conditions, where workers face highly volatile daily earnings, lack legal protections, and work without personal protective equipment (PPE), exposing them to severe health risks, including lacerations, respiratory illnesses, and infectious diseases (Sarkar, 2011).

Recent scholarship in environmental governance and political ecology critiques the "formalization" pathways currently promoted by national policies. Demaria (2012) argues that the current trajectory of waste management in Indian cities represents "accumulation by dispossession." When municipal bodies outsource waste collection to private corporate conglomerates, they frequently establish parallel, mechanized collection streams that block informal workers' access to high-value recyclables in gated communities and commercial complexes (Gidwani, 2015). This institutional displacement is further reinforced by the regulatory architecture of EPR under the Plastic and E-Waste Management Rules. EPR compliance is largely structured around transactions between formal brands, Producer Responsibility Organizations (PROs), and highly mechanized, registered recycling plants, systematically bypassing the paperless, cash-based networks of *kabadiwalas* and informal aggregators (Chaturvedi & Sharma, 2023).

Furthermore, institutional and behavioral economics provide valuable lenses for understanding the informal sector's operational logic. Elinor Ostrom’s framework of the commons has been applied to urban waste, positioning raw municipal waste as a "common-pool resource" (CPR). Waste is non-excludable but highly rivalrous; informal workers collectively navigate and establish informal rules to govern access to waste dumps and neighborhoods, minimizing transaction costs (Cavé, 2014). Hernando de Soto’s (2000) work on the informal economy emphasizes that informality is not a deliberate choice to evade the law, but a rational response to the crushing transaction costs and bureaucratic red tape of formal systems. In India, this bureaucratic barrier is highly apparent in the fiscal domain. The imposition of an 18% GST on recyclable metal, plastic, and electronic scrap treats recycled materials on par with virgin resources, discouraging formal procurement and penalizing compliant, registered recyclers who must absorb these tax burdens (Federation of Indian Chambers of Commerce & Industry [FICCI], 2024).

Research Gap

While existing scholarship extensively documents the poverty and social stigmatization of informal waste workers, there remains a critical gap in quantitative, micro-level policy research that analyzes the precise financial and behavioral barriers hindering these workers from adopting advanced, environmentally friendly segregation practices. Most literature either approaches the issue through a purely descriptive sociological lens or a technocratic engineering lens, assuming that "awareness campaigns" or "technological upgrades" are sufficient solutions. There is a lack of empirical research that models sustainability adoption as a function of daily survival constraints, institutional trust, and economic incentives. Furthermore, the micro-level impacts of fiscal instruments (such as the 18% GST) and corporate-centric EPR models on the daily operational margins of waste pickers and scrap dealers are insufficiently quantified in current policy studies.

Research Objectives

1. To empirically analyze the socio-demographic and economic profiles of informal waste workers in India using primary survey data.
2. To identify and evaluate the specific micro-economic and systemic barriers that prevent informal waste workers from adopting safer and more sustainable segregation practices.
3. To examine the relationships between income precarity, institutional trust, and willingness to transition toward formalized circular economy frameworks.
4. To formulate realistic, incentive-compatible policy recommendations that align municipal solid waste management with the economic survival of informal waste workers.

Research Questions

1. How do daily survival constraints, economic precarity, and volatile scrap prices shape the decision-making and environmental practices of informal waste workers in India?
2. What structural barriers (e.g., lack of capital, protective equipment, and spatial storage) prevent informal waste workers from adopting enhanced waste-segregation and safety practices?
3. What is the level of institutional trust that informal waste workers place in municipal authorities, and how does this affect their willingness to engage with formal government policies?
4. How do current fiscal policies (such as the 18% GST) and regulatory frameworks (such as EPR and private contractor tendering) impact the livelihoods and formalization potential of the informal waste sector?

Contextual Framework and Empirical Strategy

This study employs a quantitative, exploratory policy research design utilizing primary survey data collected from 110 informal waste workers, scrap collectors, waste sorters, and *kabadiwalas* across major urban clusters in India.

Data Source and Collection Procedures

The data was gathered through structured, face-to-face questionnaires administered by trained surveyors between May 15 and May 20, 2026. Given the hard-to-reach, unregulated, and highly mobile nature of the informal waste workforce, a convenience sampling technique was utilized. Surveyors engaged with respondents directly at landfills, municipal transit points, street-side sorting yards, and informal scrap shops (*kabadi godowns*). The questionnaire was structured to capture multiple dimensions of the informal waste economy, categorized into five core variable clusters:

1. **Demographic Profile:** Age, gender, and duration of involvement in waste work.
2. **Economic Vulnerability:** Type of waste work, average monthly income, self-reported financial stability, impact of rising fuel/material costs, and daily decision-making priorities.
3. **Sustainability Perceptions and Practices:** Familiarity with environmental sustainability, perceived environmental contribution, and current self-reported waste-handling practices.
4. **Systemic Barriers:** Primary obstacles to adopting sustainable practices, history of government assistance, and qualitative documentation of daily operational hazards.
5. **Institutional Trust and Incentive Responsiveness:** Trust in municipal authorities, perceived recognition, willingness to adopt green practices under financial incentives, and preferred systemic support mechanisms.

Limitations of the Contextual Strategy

The empirical approach carries several limitations that must be transparently acknowledged. First, the use of convenience sampling restricts the ability to claim broad geographical generalizability across all of India's diverse urban, semi-urban, and rural landscapes. Second, the modest sample size of N=110 limits the applicability of advanced, multi-variable econometric modeling. Third, self-reported data on environmental practices may introduce social desirability bias. However, these limitations are heavily outweighed by the exploratory value of the study. In highly marginalized and shadow economic contexts where structured, official datasets are virtually non-existent, primary quantitative surveys are indispensable for exposing ground-level structural realities and providing a baseline for empirically grounded policy reform.

Data Analysis and Findings

Demographic and Economic Characterization

The empirical analysis of the survey data reveals a demographic landscape characterized by diverse age cohorts and gender roles, yet bound by a shared reality of severe economic vulnerability.

Table 1: Socio-Demographic Profile of Surveyed Waste Workers (N=110)

Demographic Variable	Category	Frequency (N=110)	Percentage (%)
Age Group	Under 18	4	3.6%
	18–25	31	28.2%
	26–35	34	30.9%
	36–45	21	19.1%
	46–60	17	15.5%
	Above 60	3	2.7%
Gender Identity	Male	67	60.9%
	Female	39	35.5%
	Other / Prefer not to say	4	3.6%
Duration of Involvement	Less than 1 year	11	10.0%
	1–3 years	27	24.5%
	4–7 years	29	26.4%

	8–15 years	24	21.8%
	More than 15 years	19	17.3%

As illustrated in Table 1, the surveyed workforce represents a mature and highly experienced labor pool, with over 39% of respondents engaged in waste work for more than 8 years, and 17.3% surpassing 15 years of operational experience. This long duration highlights that informal waste retrieval is not a transient, voluntary occupation, but a long-term, inter-generational survival mechanism.

Table 2: Economic Dimensions, Stability, and Decision Drivers

Economic Variable	**Category**	**Frequency (N=110)**	**Percentage (%)**
Type of Waste Work	Street waste picking	24	21.8%
	Waste sorting	28	25.5%
	Scrap collection	23	20.9%
	Recycling work / Sorter	17	15.5%
	Kabadiwala / Shop Owner	16	14.5%
	Other	2	1.8%
Average Monthly Income	Below ₹5,000	18	16.4%
	₹5,000–₹10,000	45	40.9%
	₹10,000–₹20,000	30	27.3%

	₹20,000–₹30,000	13	11.8%
	Above ₹30,000	4	3.6%
Financial Stability	1 (Highly Unstable)	16	14.5%
Rating (1–5)	2 (Unstable)	41	37.3%
	3 (Moderate)	33	30.0%
	4 (Stable)	16	14.5%
	5 (Highly Stable)	4	3.6%
Primary Daily	Earning more money	78	70.9%
Decision Driver	Customer demand	18	16.4%
	Saving time	8	7.3%
	Reducing effort	3	2.7%
	Environmental concerns	2	1.8%
	Other	1	0.9%

The data in Table 2 highlights severe economic precarity: over 57% of the surveyed workforce operates within extreme low-income brackets, earning less than ₹10,000 per month. Only a negligible 3.6% of respondents, mostly established recyclers with machine setups or senior scrap shop owners, earn above ₹30,000 per month. Consequently, 51.8% of the respondents report their financial stability as highly unstable or unstable, while 70.9% declare that "earning more money" is the absolute priority governing their daily operational decisions.

Bounded Rationality and the Scarcity Trap

To analyze how economic constraints shape environmental behavior, Table 3 cross-tabulates workers' average monthly income against their familiarity with the concept of "sustainability" and their primary daily decision-making priority.

Table 3: Bounded Rationality: Income Level vs. Sustainability Familiarity and Daily Decision Focus

Monthly Income Bracket	Count (N)	Sustainability Familiarity: "No" (%)	Decision Focus: "Earning More Money" (%)	Decision Focus: "Customer Demand" (%)	Decision Focus: "Environmental Concerns" (%)
Below ₹5,000	18	72.2%	88.9%	0.0%	5.6%
₹5,000–₹10,000	45	60.0%	82.2%	0.0%	0.0%
₹10,000–₹20,000	30	36.7%	73.3%	10.0%	6.7%
₹20,000–₹30,000	13	7.7%	0.0%	92.3%	0.0%
Above ₹30,000	4	0.0%	25.0%	50.0%	0.0%

The cross-tabulation reveals a highly consistent trend: 93.6% of workers earning below ₹20,000 per month prioritize daily survival, cash flows, and time-saving over any other factor. For these workers, "environmental sustainability" is not a cognitive deficit, but an economic impossibility. A street picker earning ₹4,500 per month cannot afford to spend unpaid labor-hours sorting

low-value multi-layered plastics (MLP) when their immediate survival depends on maximizing the daily volume of high-value PET bottles or cardboard. Only when income levels exceed the threshold of ₹20,000 per month, primarily among established *kabadiwalas* and processing recyclers, does "customer demand" or "market volume" emerge as the dominant decision-making driver.

Institutional Trust and Regulatory Exclusion

A key finding of this study is the deep rift between workers' self-perception as environmental stewards and their severe institutional alienation.

Table 4: Institutional Trust, Policy Support Perception, and Previous Assistance

Institutional Variable	Category	Frequency (N=110)	Percentage (%)
Belief that their work	Yes	73	66.4%
helps the environment	Maybe / Not sure	37	33.6%
	No	0	0.0%
Ever received government	No	94	85.5%
support/assistance	Yes	10	9.1%
	Not sure / Not aware	6	5.5%
Perceived policy support	No / Minimal support	86	78.2%
for informal workers	Somewhat supported	21	19.1%

	Fully supported	3	2.7%
Trust in municipal waste	1 (Very Low Trust)	39	35.5%
systems (1–5 scale)	2 (Low Trust)	31	28.2%
	3 (Moderate Trust)	35	31.8%
	4 (High Trust)	5	4.5%
	5 (Very High Trust)	0	0.0%

As shown in Table 4, while 100% of the respondents believe or suspect that their recycling labor directly benefits the environment by reducing landfill volume, 63.6% rate their trust in municipal waste management authorities as 1 (Very Low) or 2 (Low). This mistrust is grounded in systematic neglect and exclusion: 85.5% have never received any state-sponsored training, financial assistance, or social security, and 78.2% feel that municipal and state policies actively exclude or criminalize them.

Qualitative responses in the survey highlight this institutional friction, detailing incidents where municipal clearance squads routinely seize collected waste-sacks, or where housing society security guards deny street pickers entry, treating them with suspicion and hostility.

Incentive Sensitivity and Policy Preferences

The survey results challenge the assumption that informal workers are resistant to formalization. When asked if they would be willing to adopt cleaner, safer, and more thorough segregation practices if financial incentives or equipment support were provided, 89.1% responded with an unequivocal "Yes".

To understand how policy interventions should be structured, the survey evaluated which specific forms of support would benefit workers the most, cross-tabulated by their specific waste sector.

Table 5: Incentive-Sensitivity Matrix: Preferred Interventions by Waste Work Type

Waste	Count	Financial	Better	Healthca	Licensin	Training

Worker Category	(N)	Subsidies (%)	Equipment/PPE (%)	re/Safety (%)	g & Legality (%)	Programs (%)
Street Pickers	24	62.5%	8.3%	16.7%	0.0%	12.5%
Waste Sorters	28	0.0%	14.3%	67.9%	0.0%	17.9%
Scrap Collectors	23	47.8%	34.8%	0.0%	4.3%	13.0%
Kabadiwala (Shop)	16	12.5%	0.0%	0.0%	68.8%	18.8%
Recycling Sorters	17	11.8%	58.8%	5.9%	11.8%	11.8%
Other	2	50.0%	0.0%	0.0%	50.0%	0.0%

This cross-tabulation provides a highly precise roadmap for sector-specific policy design:

1. **For Sorters (67.9% prefer Healthcare/Safety Support):** Sorters, who are primarily women handling mixed hazardous waste, prioritize health insurance, regular medical checkups, and safety gear over direct cash subsidies.
2. **For Kabadiwalas (68.8% prefer Licensing and Legal Protection):** Established scrap shop owners prioritize simplified licensing, legal recognition, and protection from arbitrary municipal closures over financial handouts.
3. **For Street Pickers and Scrap Collectors (Highly prioritize Financial Subsidies and Better Equipment):** These lower-tier workers require direct economic offsets, such as subsidized motorized collection carts or price guarantees for segregated low-value plastics, to make sustainable segregation economically viable.

Discussion

Sustainability Under Survival Economics: Bounded Rationality and the Poverty Trap

The empirical findings of this study demonstrate that informal waste workers operate under a regime of "survival economics," where daily resource constraints enforce a highly short-term planning horizon. In behavioral economics, this is conceptualized as bounded rationality under severe cognitive and economic scarcity (Mani et al., 2013). When an individual's daily income fluctuates near subsistence levels, the marginal utility of immediate cash inflows is infinitely higher than the long-term, non-monetized benefits of environmental conservation (Schilbach et al., 2016).

This can be mathematically expressed through a simplified inter-temporal utility function for a waste picker:

$$U = \sum_{t=0}^{\infty} \beta^t [u(C_t) + \theta v(E_t)]$$

Where C_t represents immediate consumption, E_t represents long-term environmental quality, and $\beta \in (0,1)$ is the subjective discount factor. For an informal worker experiencing extreme economic precarity, the discount rate is extremely high, meaning $\beta \to 0$ (Mullainathan & Shafir, 2013). Consequently, the utility function collapses to:

$$U \approx u(C_0)$$

The worker's behavioral output is entirely driven by immediate consumption needs. Thus, sorting low-value multi-layered plastic or spending extra hours ensuring clean segregation is an irrational choice unless it directly increases C_t.

By failing to recognize this economic reality, conventional municipal awareness campaigns that appeal to "civic duty" or "environmental morality" are fundamentally misaligned. They ignore the basic micro-economic truth that sustainability adoption is an economic luxury that the poverty trap actively prevents workers from purchasing (Banerjee & Duflo, 2011).

Institutional Exclusion, Trust, and "Formal-Sector Bias"

The low level of institutional trust (63.6% expressing low or very low trust) documented in the survey is a direct consequence of "formal-sector bias" in Indian environmental planning (Bharti, 2018). Historically, municipal solid waste management in India has been structured around technocratic, capital-intensive, and highly centralized models (Chaturvedi et al., 2015). Under the guise of "modernization" and "scientific processing," urban local bodies frequently issue centralized waste collection tenders that favor large, private corporate conglomerates (Lane, 2021).

These private concessions systematically dispossess and criminalize the informal waste workforce. For instance, as documented in Delhi and Bengaluru, when private contractors take over municipal waste-hauling, they erect physical barriers and hire security guards to deny informal waste pickers access to high-value dry recyclables at community bins and gated residential areas (Chintan Environmental Research and Action Group, 2021; Hasiru Dala, 2020). This policy-induced displacement drives waste pickers deeper into poverty, forcing them to forage for contaminated, low-value waste at hazardous landfills, or exposing them to systemic police harassment and extortion (Swarupa, 2021).

The state benefits from the uncompensated recycling labor of the informal sector, which recovers up to 70% of plastic and saves municipalities crores in transport costs, while simultaneously denying these workers legal identity, safety protections, and administrative recognition (Alliance of Indian Wastepickers [AIW], 2021).

The Extended Producer Responsibility (EPR) Paradox

The introduction of EPR under the Plastic Waste Management Rules was heralded as a market-based breakthrough for circularity. In theory, EPR forces commercial brand owners to finance the end-of-life collection and recycling of their packaging (MoEFCC, 2022). In practice, however, India's EPR implementation operates as a parallel, corporate-dominated loop that systematically excludes informal recycling networks (Chaturvedi & Sharma, 2023).
Under current compliance mechanisms, producers fulfill their targets by purchasing computerized "EPR certificates" from highly mechanized, registered formal recyclers and corporate PROs (CPCB, 2022). Yet, these mechanized recycling plants rarely possess the ground-level logistics to collect post-consumer plastic directly from households. Instead, they rely on informal *kabadiwalas* and aggregators to retrieve and segregate this plastic (WIEGO, 2022).

Because the EPR guidelines are silent on mandatory integration, the financial subsidies paid by brand owners remain locked within the formal corporate tier. The informal waste picker, who performs the actual, highly hazardous sorting of post-consumer plastic, receives none of these financial flows (Alliance of Indian Wastepickers [AIW], 2021). This represents a severe market failure where the informal sector subsidizes corporate environmental compliance while bearing all the ecological and physical costs of waste retrieval.

Fiscal Friction: The 18% GST Barrier to Formalization

Perhaps the most counterproductive policy barrier to sustainable circularity is India's current

Goods and Services Tax (GST) structure on recyclable waste. Under the current tax regime, metal scrap, plastic waste, and electronic waste are subjected to a steep 18% GST, classifying them as "intermediate industrial goods" (Ministry of Finance, 2017).
This creates a severe fiscal distortion:

1. **The Penalty on Compliant Recyclers:** Registered, formal recycling businesses must pay 18% GST on all purchases of raw scrap, while virgin plastic materials are often subject to similar or lower tax rates, stripping recycled materials of their cost advantage (FICCI, 2024).
2. **The Incentive to Remain Informal:** Small-scale scrap dealers and *kabadiwalas* operate on thin, volatile margins. They cannot afford the complex accounting overheads and compliance costs associated with an 18% tax rate. Consequently, they actively avoid formal digital banking and keep their transactions cash-based and untaxed (Material Recycling Association of India [MRAI], 2023).
3. **Fiscal Leakage:** This tax-driven informality is highly counterproductive for the state. Think-tank studies estimate that the dominance of untaxed, informal transactions in metal and plastic recycling results in an annual GST revenue loss of approximately ₹65,000 crore, a figure projected to rise to ₹86,700 crore by 2035 (Indian Council for Research on International Economic Relations [ICRIER], 2022).

As long as the tax regime penalizes formal transactions, informal aggregators will refuse to maintain paper trails or register their businesses. This fiscal friction keeps waste workers locked in the shadows, far from municipal protection, health schemes, and occupational safety.

Policy Recommendations

1. Reforming Fiscal Policy: GST Rationalization and Rebates

The current 18% GST on recyclable materials acts as a severe barrier to formalization and circularity. The Ministry of Finance, in coordination with the GST Council, should execute a phased reduction of tax rates:

- **Immediate GST Reduction:** Lower the GST on critical recyclable categories, specifically plastic scrap, metal scrap, and e-waste, from 18% to 5%. This reduction immediately enhances the price competitiveness of recycled raw materials (like rPET flakes) relative to cheaper, high-emission virgin plastics (MRAI, 2023).
- **EPR-Linked Reverse Charge Mechanism (RCM):** Implement a system where registered, formal recyclers are permitted to purchase scrap from unregistered informal dealers without tax penalties, using a simplified Reverse Charge Mechanism where the tax liability is offset by verified EPR compliance credits (FICCI, 2024).
- **Fiscal Benefit:** Econometric projections indicate that even a 50% shift of the informal

scrap trade into formal, compliant channels under a rationalized tax bracket would recover over ₹62,000 crore in net government revenue by 2035, simultaneously wiping out tax evasion and formalizing thousands of scrap dealers (ICRIER, 2022).

2. Restructuring the EPR Framework: Mandatory Cooperative Sourcing Quotas

The Ministry of Environment, Forest and Climate Change (MoEFCC) must amend the Plastic and E-Waste Management Rules to dismantle the corporate-PRO monopoly over EPR funding:

- **Mandatory Sourcing Quotas:** Legally mandate that brand owners and PROs must source a minimum of 40% of their verified recycling feedstock directly from registered, informal waste-picker cooperatives and self-help groups (SHGs) (Chaturvedi & Sharma, 2023).
- **Decentralized Aggregation Centers:** Fund and establish decentralized, cooperative-run aggregation yards where waste pickers can deposit collected high-value and low-value dry plastics. Under this model, aggregators are paid premium, stabilized prices (e.g., increasing e-waste margins from ₹40 to ₹65 per kg, as demonstrated in NGO pilot programs) (WIEGO, 2022).
- **Direct Livelihood Funding:** Require that a minimum of 15% of all EPR compliance funds generated by brand owners be channeled directly into a national "Livelihood and Social Protection Fund," managed by municipal bodies to finance health insurance, safety gear, and micro-loans for informal waste workers (AIW, 2021).

3. Municipal Co-Management: Scaling the Door-to-Door Cooperative Model

Urban Local Bodies (ULBs) must halt the wholesale outsourcing of waste services to private corporate contractors. Instead, they should scale proven, decentralized co-management models, drawing on the successful experiences of SWaCH in Pune and Hasiru Dala in Bengaluru:

- **Formal Sub-Contracting:** ULBs should formally contract waste-picker cooperatives as the exclusive service providers for primary, door-to-door, non-motorized waste collection (Bharti, 2018).
- **Distributive Financial Mechanism:** Under this model, waste pickers collect a small, regulated "user fee" directly from households (e.g., ₹50–₹85 per month) and retain full ownership over the collected dry recyclables, which they sell to cooperative-run scrap stores for additional income (SWaCH Cooperative, 2020).
- **Mutual Benefit:** This model is highly cost-effective. Pune's SWaCH cooperative, which integrates over 3,900 waste workers and covers 10 lakh properties daily, saves the Pune Municipal Corporation over ₹113 crore annually in labor and transport costs while achieving a plastic recycling rate of 37%, more than triple the national average (SWaCH Cooperative, 2020).

4. Micro-Level Infrastructure and Social Safety Nets

To lower transaction costs and mitigate severe occupational health hazards, municipal planning must incorporate targeted micro-support structures:

- **Decentralized Sorting Sheds:** Address the critical spatial barrier (cited by 45.5% of workers) by integrating "Space for Waste" into municipal master plans. Construct low-cost, neighborhood-level mobile sorting sheds where workers can safely segregate dry waste out of the rain and sun, protecting them from municipal eviction and police harassment (Chintan Environmental Research and Action Group, 2021).
- **Occupational Identity Cards:** Issue official, municipal-endorsed biometric identity cards to all informal waste workers (as pioneered by Bengaluru's BBMP and Hasiru Dala). These IDs grant legal status, effectively eliminating arbitrary police extortion and allowing workers to easily open bank accounts and register for national social security nets like the e-Shram portal (Hasiru Dala, 2020).

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