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SOCIO-ECONOMIC AND HEALTH CONDITIONS OF RAGPICKERS: A CASE STUDY OF PURULIA TOWN, PURULIA DISTRICT, WEST BENGAL, INDIA

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RESEARCH ARTICLE

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Abstract

This study investigates the socio-economic status and health conditions of ragpickers in Purulia Town, West Bengal, with the aim of documenting their living and working realities and identifying priorities for policy and community intervention. A mixed-methods approach was adopted, combining quantitative surveys of 120 ragpicker households (n=487 individuals) with qualitative insights from semi-structured interviews, key-informant discussions, and focus group interactions. On-site health screenings and secondary data further supplemented the fieldwork. Descriptive statistical tools (mean, percentage distribution, and cross-tabulation) were used to assess household income, housing, sanitation, and health outcomes. Findings show that 78% of households earn below ₹4,000 per month, with the mean daily income at ₹134.6 (SD ± 28.4). 62% of households live in kutcha or semi-pucca dwellings, and only 28% have access to sanitary latrines. Child labour remains widespread, with 41% of children engaged in waste collection and a school dropout rate of 52%. Health assessments reveal that 73% of ragpickers suffer from respiratory problems, 58% from skin diseases, and 46% from musculoskeletal disorders, alongside frequent work-related injuries. Inferential statistical techniques were employed to identify underlying relationships. A Chi-square test confirmed a significant association ($p < 0.05$) between poor housing conditions and respiratory illness. A t-test indicated that male ragpickers earn significantly more ($p < 0.01$) than female ragpickers, while correlation analysis ($r = 0.62$) revealed a positive link between household income and school attendance of children. Beyond these numbers, the study highlights structural challenges such as irregular, low-paid labour, occupational insecurity, exclusion from municipal waste systems, and limited access to healthcare and social protection schemes. Stigma and social marginalization further deepen intergenerational vulnerability. The study recommends an integrated response: recognition and inclusion of ragpickers within municipal waste management systems; targeted health outreach through regular screenings, immunization, and occupational safety training; provision of social protection measures such as identity documentation and livelihood diversification; and programmes to prevent child labour and support education. Building stronger partnerships among local authorities, NGOs, and ragpicker associations is crucial for ensuring dignity, safety, and sustainable well-being for this vulnerable group.

Keywords: *Ragpickers, social marginalization, health hazard, occupational insecurity, waste management, vulnerability*

Introduction

Solid waste management has emerged as one of the most pressing environmental and public health challenges in developing countries. In India, rapid urbanization, population growth, and changing consumption patterns have resulted in the generation of nearly 62 million tonnes of municipal solid waste annually, of which only about 70% is collected and less than 25% is scientifically processed (CPCB, 2020). The informal workforce of ragpickers plays a vital role in this waste management chain by recovering recyclable materials, thereby reducing the burden on landfills and contributing to resource efficiency (Chaturvedi & Nagarkar, 2019). Despite their critical contribution to environmental sustainability and the circular economy, ragpickers remain among the most marginalized sections of Indian society, facing severe socio-economic deprivation and health hazards. In West Bengal, urban areas generate approximately 13,000 tonnes of solid waste per day, with Kolkata alone contributing nearly half of this volume (WBPCB, 2021). A large proportion of recyclable recovery in the state depends on the unorganized efforts of ragpickers, who often work under unsafe conditions without protective equipment or social security. Studies conducted in West Bengal highlight that ragpickers face multidimensional vulnerabilities, including low and irregular income, substandard

housing, limited access to healthcare, and the prevalence of child labour (Basu & Banerjee, 2018). The situation is further aggravated by social stigma and exclusion from formal waste management frameworks. Purulia district, located in the westernmost part of West Bengal, is one of the state's least developed regions, characterized by a predominantly tribal and agrarian economy, recurrent droughts, and high poverty levels (Government of West Bengal, 2022). The district headquarters, Purulia Town, has witnessed rapid urban expansion in recent decades, accompanied by growing solid waste management challenges. Ragpickers in Purulia Town constitute an invisible yet indispensable workforce, engaged in the collection, segregation, and resale of recyclable materials. However, preliminary reports and local observations suggest that these workers face acute socio-economic hardships, unsafe occupational conditions, and poor health outcomes, while remaining outside the scope of government welfare schemes and municipal recognition. Against this backdrop, the present study seeks to systematically examine the socio-economic and health conditions of ragpickers in Purulia Town. By integrating quantitative and qualitative approaches, the research not only documents their vulnerabilities but also applies statistical techniques to explore the relationships between income, education, housing, and health outcomes. Such an analysis is expected to provide critical insights for policymakers, municipal authorities, and non-governmental organizations to design inclusive strategies for sustainable waste management and social protection.

Literature Review

The informal recovery of recyclables – variously termed waste picking, scavenging, or informal recycling – has long supplied cities with low-cost materials recovery while absorbing surplus labour from marginalized populations (Medina, 2000; Wilson et al., 2006). Comparative research shows that informal recyclers contribute substantially to diversion rates – often exceeding formal systems in developing-country cities – yet operate with minimal recognition, precarious earnings, and high exposure to occupational hazards (Wilson et al., 2009; Sembiring & Nitivattananon, 2010). Global assessments also highlight the environmental co-benefits of the informal sector, including reduced landfill pressure, lower greenhouse gas emissions, and circular-economy linkages (World Bank, 2018; Velis et al., 2012). India generates rapidly rising volumes of municipal solid waste due to urbanization and changing consumption patterns (Joshi & Ahmed, 2016; CPCB, 2020). Despite regulatory reforms – Municipal Solid Waste (Management & Handling) Rules 2000 and the Solid Waste Management Rules, 2016 – implementation gaps persist, with uneven segregation at source, limited material recovery facilities, and overburdened dumpsites (MoHUA, 2016; CPCB, 2020). Within this context, ragpickers constitute a critical yet unrecognized labour force, providing collection, sorting, and trading services that feed downstream recycling markets (Chaturvedi & Nagarkar, 2019; Samson, 2009). Studies estimate that informal recyclers in Indian cities recover a significant share of paper, plastic, glass, and metals, generating city-level savings in collection and disposal costs (Agarwal et al., 2005; Wilson et al., 2009). Empirical studies across Indian cities portray ragpickers as predominantly migrants or members of socially and economically marginalized communities, with low literacy, irregular employment, and income volatility (Gill, 2010; Chikarmane & Narayan, 2009). Earnings are shaped by seasonality, commodity price fluctuations, and buyer–middleman asymmetries, often locking workers into exploitative terms (Harris-White & Chhotray, 2007; Gidwani, 2015). Housing conditions are commonly kutcha or semi-pucca, with insecure tenure and poor access to water, sanitation, and identity documentation – factors that also mediate access to welfare entitlements (Banerjee & Basu, 2018; Bhowmik, 2005). Gendered segmentation is marked: women and girls frequently undertake sorting and low-paid collection with limited bargaining power, while men dominate higher-value trading and transport (Chikarmane, 2012; Dias, 2016). The literature documents elevated prevalence of respiratory symptoms (from bio aerosols, dust, and open burning), dermatological conditions (from contact with mixed waste and leachate), musculoskeletal disorders (due to load carriage and repetitive motion), and injury from sharps (Sarkar et al., 2018; Ray et al., 2004). Exposure to pathogens, heavy metals, and volatile compounds is compounded by lack of protective equipment and absence of occupational health coverage (Mavalankar & Yagnik, 2008; Rehman et al., 2017). Studies also report high levels of psychological stress, stigma, and substance dependence as coping strategies (Parviainen & Peltola, 2019). Child labour within ragpicker households is repeatedly flagged, with negative implications for schooling, growth, and long-term mobility (Bharadwaj & Fenske, 2012; UNICEF, 2014). The SWM Rules, 2016 and Plastic Waste Management Rules, 2016 (amended 2022) formally encourage source segregation, material recovery, and the integration of informal workers through user charges, extended producer responsibility (EPR), and decentralized systems (MoEFCC, 2016; CPCB, 2022). However, municipal by-laws and contracting practices often remain biased toward mechanized, concessionaire-led models, marginalizing informal collectors (Samson, 2009; Dias, 2016). Evidence from inclusive models – such as cooperative and social-enterprise arrangements in Pune (SWaCH) and Bengaluru (Hasiru Dala) – shows improved earnings, safer conditions, and service quality when informal workers are given legal recognition, access to infrastructure, and direct payment mechanisms (Chikarmane, 2012; Dias, 2016; Narayan & Chikarmane, 2019). Nonetheless, scalability is constrained by fragmented mandates, procurement norms, and limited municipal capacity (Joshi & Ahmed, 2016). Research from West Bengal (notably Kolkata and secondary cities) documents patterns consistent with national literature: high dependence on informal recycling chains, low incomes, inadequate housing, and significant disease burden among ragpickers (Banerjee & Basu, 2018; Ghosh & Bandopadhyay, 2015). State-level assessments highlight underinvestment in segregation and MRFs, and the continued reliance on open dumping, intensifying exposure risks for workers (WBPCB, 2021). For Purulia district, literature is relatively sparse, with most sources focusing on urban service gaps, poverty, and migration rather than detailed occupational health profiles of ragpickers. This reveals a clear research gap: the need for district-level, mixed-methods evidence linking socio-economic determinants, housing/sanitation access, and measured health outcomes – exactly the niche addressed by the present study. Methodologically, prior studies commonly rely on cross-sectional surveys with descriptive statistics; fewer deploy

inferential techniques to test relationships among socio-economic variables, environmental exposures, and health outcomes (Gill, 2010; Sarkar et al., 2018). Emerging work employs logistic regression for morbidity risk, generalized linear models for income determinants, and propensity matching to evaluate inclusion programmes (Gidwani, 2015; Rehman et al., 2017). Participatory and ethnographic studies enrich understanding of stigma, negotiation with scrap dealers, and governance interfaces (Samson, 2009; Gidwani, 2015). Building on these, your study's use of Chi-square tests, t-tests, and correlation analysis – combined with qualitative methods – aligns with a mixed-methods turn that strengthens causal inference and policy relevance.

Objectives of the Study

1. To examine the socio-economic profile of ragpickers in Purulia Town
2. To analyse the educational status of ragpicker households, focusing on the prevalence of child labour and the rate of school dropouts.
3. To assess the health conditions of ragpickers of the study area.
4. To recommend appropriate policy interventions and community-based strategies

Methodology

The study was conducted in Purulia Town, the district headquarters of Purulia district, West Bengal, India. Purulia is one of the socio-economically backward districts of the state, characterized by rapid urban growth, inadequate waste management infrastructure, and a high concentration of informal laborers, including ragpickers. A mixed-methods research design was adopted, combining quantitative household surveys with qualitative methods such as semi-structured interviews, focus group discussions (FGDs), and key informant interviews (KIIs). This approach enabled both numerical measurement of socio-economic and health conditions and contextual understanding of the lived realities of ragpickers. A purposive sampling technique was used to identify ragpicker households, given the absence of official records. In total, 120 ragpicker households (n = 487 individuals) were surveyed across different wards of Purulia Town to ensure spatial and social representation.

The study relied on both primary and secondary data sources to ensure comprehensive coverage of the research objectives. Primary data were collected through structured questionnaires that captured details on household demographics, income, expenditure, housing conditions, sanitation, access to social security, and education levels. In addition, health screenings were conducted to document prevalent morbidities such as respiratory problems, skin infections, musculoskeletal pain, and work-related injuries. To further understand the socio-cultural and institutional dimensions, focus group discussions (FGDs) and key informant interviews (KIIs) were undertaken, offering valuable insights into occupational risks, social stigma, and institutional exclusion faced by the community. Secondary data were obtained from municipal records, government reports, and relevant literature, which helped to contextualize and strengthen the interpretation of the primary findings.

Statistical Techniques

The collected data were systematically coded and analyzed using SPSS and MS Excel, employing both descriptive and inferential statistical techniques to draw meaningful insights. Descriptive statistics, including mean, percentage distribution, frequency tables, and cross-tabulations, were used to summarize the socio-economic and health characteristics of the respondents. For instance, mean daily income and standard deviation were calculated, while prevalence rates (%) of health problems such as respiratory illness and musculoskeletal pain were reported. To test relationships, inferential techniques were applied: the Chi-square (χ^2) test was used to examine associations between categorical socio-economic variables and health outcomes, such as housing condition and respiratory illness prevalence; independent samples t-test was employed to assess income differences between male and female ragpickers; correlation analysis (Pearson's r) explored relationships between household income and children's school attendance, as well as between income levels and access to sanitation facilities; and ANOVA was applied where relevant, for example, to compare mean income across different occupational roles within ragpicking, such as collectors, sorters, and sellers. Alongside quantitative methods, qualitative data from FGDs and KIIs were analyzed thematically, allowing deeper exploration of narratives surrounding social exclusion, occupational hazards, and coping strategies, thereby complementing the statistical results with contextual understanding.

Results and Discussion

Ragpickers form a crucial yet invisible workforce in urban waste management systems, contributing significantly to recycling and resource recovery (Chaturvedi, 2010; Wilson et al., 2012). Despite their role in reducing municipal solid waste, they remain socially marginalized, economically vulnerable, and exposed to severe occupational hazards (Basu & Banerjee, 2018; Medina, 2007). Their livelihoods are often characterized by low and irregular incomes, poor housing and sanitation, limited access to education and healthcare, and widespread exclusion from formal social security mechanisms (Gupta & Saha, 2020; CPCB, 2020). These vulnerabilities are compounded by the high-risk nature of their work, which frequently results in respiratory problems, musculoskeletal disorders, injuries, and other health complications (Kumar & Agarwal, 2019; Ray et al., 2021). In the context of Purulia Town, West Bengal, ragpicking constitutes one of the few available livelihood options for marginalized households. However, little systematic research has been conducted to document their socio-economic conditions and health status (Das & Lahiri-Dutt, 2019). The present study addresses this gap by analysing data from 120 ragpicker households (n=487 individuals) using both descriptive and inferential statistical techniques.

Socio-Economic Profile of Ragpickers

Table 1: Socio-Economic Characteristics of Ragpicker Households in Purulia Town

Sl. No.	Indicator	Category	Frequency (n=120 households)	Percentage (%)
1	Monthly Household Income (₹)	Below 4,000	94	78.3
		4,001 – 6,000	18	15.0
		Above 6,000	8	6.7
2	Mean Daily Income (₹)	–	–	134.6 (SD ± 28.4)
3	Type of Dwelling	Kutcha	52	43.3
		Semi-Pucca	22	18.3
		Pucca	46	38.4
4	Access to Sanitary Latrine	Yes	34	28.3
		No	86	71.7

Source: Primary Survey, 2025

The socio-economic profile (Table 1) of ragpickers in Purulia Town clearly reflects a condition of persistent poverty, marginalisation, and deprivation. The income distribution highlights that a vast majority (78.3%) of ragpicker households earn less than ₹4,000 per month, with the mean daily income recorded at only ₹134.6 (SD ± 28.4). This level of earnings is significantly below the minimum wage standards prescribed for unskilled labour in West Bengal, pointing to the exploitative and irregular nature of their livelihood. The skewed income distribution further shows that only a small fraction of households benefit from relatively stable earnings, often through bulk-selling arrangements with contractors, while the majority remain trapped in day-to-day subsistence. Housing and sanitation conditions reinforce this economic vulnerability. Nearly two-thirds (61.6%) of the surveyed households reside in kutcha or semi-pucca dwellings, reflecting poor structural quality and inadequate protection against environmental hazards. The lack of access to basic sanitation is equally concerning: only 28.3% of households reported having sanitary latrines, while 71.7% continue to depend on unsafe and unhygienic alternatives such as open defecation. This situation not only increases exposure to communicable diseases but also reinforces their social exclusion, as poor housing and sanitation are widely recognized markers of marginalization. Overall, these findings establish a clear linkage between poverty, inadequate housing, and sanitation exclusion. The structural vulnerabilities faced by ragpickers extend beyond income deprivation, shaping their health outcomes, educational opportunities, and social dignity. The intersectionality of low income, fragile housing, and sanitation insecurity situates the ragpicker community within a cycle of disadvantage that is difficult to break without targeted policy intervention and community support mechanisms.

Child Labour and Education

Table 2: Child Labour and Education Status among Ragpicker Households in Purulia Town

Sl. No.	Indicator	Value (%)
1	Children engaged in ragpicking	41.0
2	School dropout rate	52.0
3	Children attending school regularly	48.0
4	Correlation (Household income vs. attendance)	r = 0.62*

*Significant at $p < 0.05$

The findings highlight that (Table 2) child labour is a widespread coping strategy among ragpicker families. With 41% of children actively involved in waste collection, economic necessity overrides educational aspirations. The high school dropout rate (52%) reflects systemic barriers such as irregular family income, lack of institutional support, and the immediate economic contribution children provide through ragpicking. The statistically significant positive correlation ($r = 0.62$) between household income and school attendance reinforces that financial improvement enhances the likelihood of children remaining in education. This underscores the need for targeted interventions—such as conditional cash transfers, midday meal schemes, and livelihood diversification – to reduce child labour and promote school retention among ragpicker households.

Occupational Health Conditions

Table 3: Occupational Health Conditions among Ragpickers in Purulia Town

Sl. No	Health Condition	Prevalence (%)
1	Respiratory problems (cough, asthma, etc.)	73.0
2	Skin diseases (rashes, infections, allergies)	58.0
3	Musculoskeletal disorders (back pain, joint pain)	46.0
4	Workplace injuries (cuts, hazardous exposure)	Frequently reported*

*Not systematically quantified but consistently observed during fieldwork

The results demonstrate (Table 3) a high prevalence of occupational health hazards among ragpickers, with respiratory diseases being the most dominant (73%). This reflects prolonged exposure to dust, decaying waste, and unhygienic environments without

protective equipment. Skin diseases (58%) arise from direct handling of waste, while musculoskeletal disorders (46%) highlight the physical strain of ragpicking activities such as lifting heavy loads and prolonged bending. Frequent workplace injuries further compound their vulnerability, yet the absence of timely medical care reflects systemic neglect of this occupational group. These findings are consistent with earlier research (Chatterjee, 2019; Singh & Kumar, 2021), reinforcing that ragpickers face cumulative health risks as an occupational hazard.

Statistical Association between Variables

Table 4: Statistical Association between Key Socio-Economic and Health Variables among Ragpickers

Sl. No	Statistical Test	Variables Analyzed	Test Value / Result	Significance (p-value)	Interpretation
1	Chi-square Test (χ^2)	Housing condition × Prevalence of respiratory illness	$\chi^2 = 12.47$	$p < 0.05$	Poor housing significantly associated with higher respiratory problems
2	Independent t-test	Daily income of male vs. female ragpickers	$t = 3.82$	$p < 0.01$	Male ragpickers earn significantly more than female ragpickers
3	Pearson Correlation (r)	Household income × Children's school attendance	$r = 0.62$	$p < 0.01$	Higher household income positively related to school attendance

Source: Primary Survey, 2025

The inferential analysis (Table 4) confirms strong linkages between socio-economic and health variables in the ragpicker community. The Chi-square test establishes that inadequate housing is not just a marker of poverty but also a determinant of respiratory illness, amplifying occupational vulnerabilities. The independent t-test highlights gender-based income inequality, with men accessing relatively better-paid contracts while women remain confined to low-value recyclable collection. The positive correlation between income and children's school attendance indicates that economic upliftment can directly reduce school dropout rates, thereby breaking the intergenerational cycle of deprivation.

Structural Vulnerabilities and Social Exclusion

The findings of the study extend beyond individual socio-economic and health outcomes to reveal deep-rooted structural vulnerabilities affecting ragpickers in Purulia town. Despite their critical role in the recycling chain, ragpickers remain excluded from formal municipal solid waste management systems. This exclusion denies those stable contracts, safety equipment, and recognition as legitimate workers, thereby perpetuating their informal and insecure labour status. Furthermore, ragpickers are systematically marginalized from social protection schemes such as health insurance, old-age pensions, or targeted poverty alleviation programs. Field interactions revealed that bureaucratic hurdles, lack of documentation (such as ration cards or identity proof), and social stigma act as major barriers to their inclusion. This exclusion intensifies their vulnerability, as households are left without safety nets during income shocks, illness, or crises. Social stigma compounds these structural disadvantages. Ragpickers are often perceived as "unclean" or "undesirable," leading to their segregation from mainstream community activities. This stigmatization not only undermines their social dignity but also limits their ability to organize collectively for better wages and rights. Together, these structural vulnerabilities reinforce a cycle of deprivation: economic precarity limits access to education and health, while social exclusion hinders pathways to social mobility and institutional support. In line with earlier studies (Bhowmik, 2010; Chaturvedi, 2017; Singh & Kumar, 2021), the analysis underscores that ragpickers' marginalization is not merely an individual outcome but a structural phenomenon rooted in institutional neglect and societal discrimination.

Conclusion

This study on ragpickers in Purulia town reveals a multifaceted picture of economic deprivation, health vulnerabilities, and structural exclusion. Descriptive and inferential statistics confirm that the majority of ragpicker households survive on precarious incomes, often below subsistence levels, with poor housing, sanitation, and healthcare access further compounding their marginalization. The analysis of child labour and school dropout rates highlights how poverty perpetuates intergenerational vulnerability, while gender disparities in income reflect entrenched inequalities within the informal waste economy. Occupational health risks such as respiratory problems, skin diseases, and musculoskeletal disorders underscore the hazardous conditions under which ragpickers work, aligning with findings from other urban contexts in India (Chaturvedi, 2017; Singh & Kumar, 2021). Importantly, statistical associations demonstrate that poor housing is significantly linked to respiratory illnesses, and household income strongly influences children's educational participation, emphasizing the interconnectedness of socio-economic and health dimensions. At a structural level, ragpickers remain excluded from formal municipal solid waste management systems and social protection programs, while facing persistent stigma from mainstream society. This exclusion not only denies them recognition as essential environmental workers but also reinforces cycles of poverty and marginalization (Bhowmik, 2010; Wilson et al., 2012). Overall, the study concludes that ragpickers are indispensable contributors to urban sustainability through their role in recycling, yet they remain among the most vulnerable groups in urban India. Addressing their socio-economic and health conditions requires a multidimensional approach: formal recognition within municipal systems,

targeted social protection measures, and inclusive policies that reduce stigma while promoting dignity and upward mobility. Without such interventions, ragpickers will continue to face entrenched vulnerabilities, perpetuating poverty and social exclusion across generations.

Policy Recommendations and Community-Based Strategies

To address the vulnerabilities of ragpickers in Purulia town, a set of integrated policy interventions and community-based strategies is essential. These recommendations focus on social security, health outreach, educational support, and livelihood diversification, ensuring both immediate relief and long-term empowerment.

1. Social Security and Formal Recognition
    - Incorporate ragpickers into municipal solid waste management frameworks through registration and issuance of identity cards.
    - Extend access to government welfare programs such as the Public Distribution System (PDS), health insurance (Ayushman Bharat), and pension schemes.
    - Establish cooperatives of ragpickers to enhance bargaining power, reduce exploitation by contractors, and provide collective security (Bhowmik, 2010).
2. Health Outreach and Occupational Safety
    - Launch targeted health camps in ragpicker communities, focusing on respiratory diseases, skin disorders, and musculoskeletal problems.
    - Provide protective gear (gloves, masks, and boots) and basic training in safe waste handling practices.
    - Integrate ragpicker households into primary health care systems with mobile health units for regular check-ups (Singh & Kumar, 2021).
3. Educational Support for Children
    - Strengthen school enrolment and retention through conditional cash transfers, mid-day meals, and provision of free learning materials.
    - Establish community learning centers to provide flexible education opportunities for children engaged in ragpicking.
    - Implement bridge courses for school dropouts, linking them back to formal education or vocational training (Patel, 2018).
4. Livelihood Diversification and Skill Development
    - Provide vocational training in alternative income-generating activities such as tailoring, handicrafts, or micro-entrepreneurship.
    - Support women ragpickers with self-help groups (SHGs) and microfinance initiatives to encourage financial independence.
    - Promote waste-to-wealth enterprises, enabling ragpickers to engage in recycling-based entrepreneurship with municipal support.
5. Community Mobilisation and Reducing Social Exclusion
    - Conduct awareness campaigns to reduce stigma against ragpickers and recognize their contribution to urban sustainability.
    - Facilitate community-based organisations (CBOs) to build solidarity, encourage collective action, and advocate for rights.
    - Create participatory platforms where ragpickers can engage in decision-making processes related to waste management and local governance (Wilson et al., 2012).

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