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Mode of Operations, Determinant Factors, and Safety Improvement Strategies for Informal Waste Collectors in Ilaro, Ogun State, Nigeria

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Abstract

This study examined the mode of operations, factors responsible for informal waste collection, and strategies for improving health and occupational safety among informal waste collectors in Ilaro, Ogun State, Nigeria. The study was necessitated by the unregulated nature of informal waste collection in the study area, where workers operate without formal recognition, occupational training, or institutional support. A descriptive cross-sectional survey design was adopted, and 42 informal waste collection workers were selected through snowball and purposive sampling techniques from collection points across Ilaro. Structured questionnaires were administered and data analyzed using descriptive statistics and inferential statistics. Findings revealed that carts were the primary collection equipment used by 52.4% of respondents, while 35.7% collected waste with bare hands. All respondents (100%) collected waste exclusively for resale, and 78.6% were paid for household waste collection. None of the respondents were registered with any waste collection association. Source of livelihood was identified as the most important factor driving informal waste collection (mean = 4.9), followed by ease of entry (mean = 4.8), poverty (mean = 4.3), low education (mean = 4.3), and unemployment (mean = 3.8). No respondent had received any pre-employment training, and 83.3% reported no provision of personal protective equipment at their workplaces. The study concludes that informal waste collection in Ilaro operates under structurally deficient conditions that perpetuate occupational vulnerability. It is recommended that government and relevant stakeholders formalize the sector through official recognition, provision of protective equipment, capacity building, and economic empowerment of informal waste collectors.

Keywords: Mode of operations, Informal waste collection, Socio-economic factors, Occupational safety strategies, Personal protective equipment.

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Introduction

Informal waste collection constitutes a significant component of urban waste management systems in developing countries, particularly in Nigerian cities where formal waste management infrastructure is limited. The informal waste collection sector, which includes scavengers, garbage collectors, mobile garbage purchasers, and scrap traders, plays a substantial role in waste management even though it operates in an unregistered, unrestrained, and unregulated manner (Nwaka, 2005). In many Nigerian cities, the informal sector is the main supplier of waste collection services, frequently supporting governments' initiatives in waste management (Imam et al., 2008).

Despite its contributions, the informal waste collection sector faces numerous challenges globally. Workers lack protective equipment, experience discrimination and harassment from officials and the public, endure low self-esteem and stigmatization, and operate under poor and inadequately regulated conditions (Scheinberg et al., 2011; Aparcana, 2017).

Understanding the operational modes and the factors that drive workers into this occupation is essential for designing effective interventions. In Ilaro, waste workers are required to lift heavy overloaded bins and perform manual garbage shoveling and sweeping, exposing them to physical, chemical, and biological hazards. Staffing shortages lead to workers being assigned tasks that exceed their capabilities, and they frequently disregard correct lifting and waste handling protocols.

There has not been sufficient empirical documentation of how informal waste collectors in Ilaro conduct their operations, what factors draw and retain them in this occupation, or what strategies currently exist or could be recommended to improve their health and safety. This study addresses these gaps by examining the mode of operations, factors responsible, and strategies for occupational safety improvement among informal waste collectors in the study area.

The main objective of this study was to examine the mode of operations, factors responsible for informal waste collection, and strategies for improving health and occupational safety in Ilaro, Ogun State. The specific objectives were: to examine the mode of operations by the waste collectors in Ilaro Ogun State; to examine the factors responsible for informal waste collection in Ilaro Ogun State; and suggest strategies for improving health and occupational safety in Ilaro Ogun State.

Mode of Operations in Informal Waste Collection

Informal waste collection typically involves the manual handling of recyclable waste at dumpsites, open dumps, street bins, and collector carts. Workers travel to places where local government transportation is unavailable and work up to 12 hours a day (Wilson et al., 2006). The informal waste collection process involves collection, sorting, processing including shredding and washing, packing, compacting, shipping and selling to recycling facilities. Workers use pushcarts, tricycles, donkey carts, horse carts, or pickup trucks to collect garbage in various cities across Asia and Latin America. In Nigeria, waste pickers and scavengers use similar tools adapted to their local context, including handcarts and motorcycles. All operations are commercially motivated, with workers collecting waste primarily for resale to middlemen or final recycling destinations.

Socio-Economic and Institutional Factors Driving Informal Waste Collection

The main reasons people work as informal workers is to make money and in certain situations to make a living (Porter, 2002). Poverty, unemployment, income shocks push people into low-barrier, daily cash activities like waste picking and collection. The value of recyclable waste fluctuates and is determined by the recycling market and the employer of middlemen. Informal waste collection occurs in developing countries because of low levels of economic development; poor wages and low prices for products and services create viable profit margins from collecting and selling waste materials (Medina, 2000). Migrants status, low formal education, stigma reduce options for formal work and access to health services. Weak or underfunded municipal services and limited door-to-door collection leave recoverable materials in public places or dumps, creating opportunity niches. Lack of legal recognition and exclusion from social protection can push workers to riskier locations (Dias, 2016).

Occupational Health and Safety Intervention Strategies

Occupational health and safety (OHS) interventions in the informal sector are often informal or non-existent. Interventions typically include provision of PPE (gloves, masks, and boots), vaccination programs, safety awareness, and health monitoring. In Brazil, the cooperative model used by waste workers includes health education and safety awareness campaigns that significantly reduce workplace injuries (Dias, 2011). NGOs in India have implemented health check-ups and first aid training among waste workers, leading to improved health outcomes (Chikarmane & Narayan, 2005). Government support is essential for the protection and improvement of informal waste workers and includes formal recognition of waste workers, inclusion in municipal waste management

plans, and policy and legal frameworks. In Nigeria, national policies like the National Environmental Sanitation and Waste Control Regulations, 2009 acknowledge the need for inclusive sanitation but often lack implementation mechanisms (NESREA, 2009).

Theoretical Framework

This study is anchored on the Sustainable Livelihood Framework, which explains how people use various assets including human, social, natural, physical, and financial capital to make a living while managing risk and maintaining long-term wellbeing (McLeod, 2001). Informal waste collection is often a livelihood strategy adopted by people with limited access to formal employment or education. The framework recognizes that several strategies can be used to answer the questions of what sustainable livelihoods are and how they can be realized, both ideally and practically. Sustainable livelihood can be viewed as a method of considering the goals, parameters and priorities of development to improve the progress made in the eradication of poverty (Roe, 1998). Applied to informal waste collection, the framework reveals that workers engage in waste picking as a response to deficits in human capital (low education, poor health), financial capital (poverty, unemployment), and physical capital (lack of equipment and infrastructure), and that meaningful interventions must address these dimensions simultaneously.

Methodology

This study adopted a descriptive cross-sectional survey design to examine the mode of operations, factors responsible for informal waste collection, and strategies for improving health and occupational safety in Ilaro, Ogun State, Nigeria. The study area is Ogun state in south western Nigeria with coordinates 700'N 3 35'E Created 1976 and a total land area of 16,980. 55km^2. The target population encompassed informal waste collection workers from identified collection points including Gbogidi, Express, Sabo, Udoji, Sayedero 1 and 2, Library, Onaegbo, and Lesley, with a preliminary total population of 122 workers. Snowball sampling was employed to recruit 42 respondents from among hard-to-reach informal workers, complemented by purposive sampling to select strategic locations where informal waste activities were concentrated. Data were collected through structured questionnaires organized into sections covering mode of operations, factors responsible for waste collection, and controls and strategies in place to reduce hazard and improve health. Both descriptive and inferential statistical techniques were applied, with frequencies, percentages, and mean scores used for analysis. A five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used for scaled responses on factors and strategies.

Results and Discussion

Table 1 presents findings on the mode of operations of informal waste collectors in Ilaro. The majority of workers use carts (52.4%), which suggests greater carrying capacity and ease of movement. On the other hand, 35.7% carry waste with their bare hands, exposing them directly to hazardous substances, while 11.9% use motorcycles for faster collection and transportation. Most respondents (78.6%) were paid for collection of waste from household bins while 21.4% were not paid. All respondents (100%) collect waste primarily for resale, indicating that the occupation is entirely economically motivated, driven by the need to generate income regardless of health risks involved.

Table 1: Mode of Operation

Variable	Frequency	Percent (%)
Equipment Used		
Cart	22	52.4
Hand	15	35.7
Motorcycle	5	11.9

Total	42	100.0
Paid/Unpaid Collection		
Yes	33	78.6
No	9	21.4
Total	42	100.0
Recyclable Waste		
Sell them	42	100.0
Registered with Any Organization		
No	42	100.0
Injury Type		
Burns	4	9.5
Perforation Wound	8	19.0
Cuts	28	66.7
Laceration	1	2.4
All of the above	1	2.4
Total	42	100.0
Cause of Injury		
During Sorting	42	100.0
Accident Rate		
Rarely	19	45.2
Weekly	11	26.2
Monthly	12	28.6
Total	42	100.0

Source: Field Survey

Respondents also collect waste from dumpsites, construction sites, and roadsides and transport waste to final destinations using trucks after proper segregation and packaging using compressor machines. None of the respondents is registered with any waste collection association as there is no such association available in Ilaro, indicating a complete absence of organized collective representation or institutional support for this workforce. The high rate of bare-hand collection (35.7%) is particularly alarming and consistent with the absence of PPE provision identified later in the study. Cuts constitute 66.7% of injury types, all occurring during sorting, and 26.2% of workers experience injuries weekly while 28.6% experience them monthly, reflecting chronic occupational exposure. Table 2 presents the factors responsible for workers' engagement in informal waste collection.

Table 2: Factors Responsible for Informal Waste Collection

Factor	SD	D	N	A	SA	Total	Mean	Rank
Source of Livelihood	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (9.5%)	38 (90.5%)	42 (100%)	4.9	1st
Ease of Entry	0 (0.0%)	0 (0.0%)	1 (2.4%)	4 (9.5%)	37 (88.1%)	42 (100%)	4.8	2nd
Poverty	0 (0.0%)	1 (2.4%)	1 (2.4%)	12 (28.6%)	28 (66.6%)	42 (100%)	4.3	3rd
Low Education	0 (0.0%)	2 (4.8%)	2 (4.8%)	10 (23.8%)	28 (66.6%)	42 (100%)	4.3	4th

Unemployment	0 (0.0%)	1 (2.4%)	0 (0.0%)	22 (52.4%)	19 (45.2%)	42 (100%)	3.8	5th
Waste Availability	0 (0.0%)	0 (0.0%)	4 (9.5%)	18 (42.9%)	20 (47.6%)	42 (100%)	2.7	6th
Family Work	20 (47.6%)	10 (23.8%)	8 (19.1%)	1 (2.4%)	3 (7.1%)	42 (100%)	1.9	7th
Overall Mean							4.2	

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree | Source: Field Survey

Table 2 showed the Mean analysis of factors responsible for internal waste collection, source of livelihood is the most important factor responsible for informal waste collection, ranked first with a mean of 4.9, as 90.5% strongly agreed and 9.5% agreed to this reason. This indicates that workers engage in the occupation primarily to earn money for their daily survival, which represents the basic driver of informal sector participation in low-income settings. Ease of entry was ranked second with a mean of 4.8, as 88.1% strongly agreed and 9.5% agreed; the availability of waste around collection areas and the absence of any binding laws make it easier to engage in the occupation.

Poverty, ranked third with a mean of 4.3, was confirmed by 66.6% who strongly agreed and 28.6% who agreed, identifying it as the most structurally persistent driver, particularly among Hausa migrant workers who comprise 66.7% of the study sample. Low education was ranked fourth (mean = 4.3), as 66.6% strongly agreed and 23.8% agreed, reflecting the reality that most workers are illiterate, limiting their access to safer and better-paying employment. Unemployment was ranked fifth (mean = 3.8), confirming that workers have little or no access to formal employment opportunities. Waste availability was ranked sixth (mean = 2.7), while family work was ranked seventh (mean = 1.9) and was largely rejected as a primary driver, with 47.6% strongly disagreeing and 23.8% disagreeing. The overall mean of 4.2 reflects a high collective weight of socio-economic and institutional factors driving workers into informal waste collection.

Table 3 presents data on the existing strategies and controls in place to reduce occupational hazards and improve the health of informal waste collectors.

Table 3: Strategies and Controls in Place to Reduce Hazard and Improve Health

Variable	Frequency	Percent (%)
Received Training Before Starting Job		
No	42	100.0
Frequency of Health Check-Ups		
Yes	1	2.4
No	41	97.6
Total	42	100.0
PPE Availability		
Yes	7	16.7
No	35	83.3
Total	42	100.0
PPE Usage		
Yes	5	11.9
No	37	88.1
Total	42	100.0
Reason for Not Using PPE		

Not used to it	24	57.1
Inconveniency	11	26.2
Just don't want to	7	16.7
Total	42	100.0

Source: Field Survey

The results reveal an almost complete absence of health and safety controls in the informal waste collection sector in Ilaro. No respondent (0%) received any training before engaging in the occupation, a finding attributed to waste availability and ease of entry that obviates formal induction procedures. Among all respondents, 97.6% do not usually carry out health checkups despite knowing that waste collection is unhealthy, while only 2.4% frequently carry out health checkups. This reflects both the inaccessibility of healthcare services and the economic pressure that discourages workers from taking time off for medical attention.

Despite knowing the occupation is unsafe and unhealthy without proper use of protective gear, 83.3% admitted that there is no provision for personal protective equipment at their collection points while only 16.7% reported having access to PPE. Even among those with access, 88.1% do not frequently use PPE while only 11.9% use it frequently. The most common reasons for non-use of PPE were unfamiliarity at 57.1%, inconvenience at 26.2%, and personal choice at 16.7%. This pattern is consistent with the Risk Perception Theory, which explains how workers prioritize immediate income over long-term health consequences, and with findings from similar studies in Nigeria and other developing countries. The current solution in place among the few compliant workers is continued use of PPE. Other identified solutions include communicating the importance of PPE to workers for their safety, government formulating and recognizing a formal waste collectors' association, and provision of necessary equipment to transport recyclable waste to the final destination.

Conclusion

The study concludes that informal waste collection in Ilaro operates under structurally deficient conditions that leave workers chronically vulnerable to occupational hazards. Workers predominantly use carts and bare hands to collect waste, operate exclusively for income from waste resale, and are entirely unregistered and institutionally unsupported. The occupation is driven primarily by structural socio-economic factors including source of livelihood, ease of entry, poverty, low education, and unemployment, which collectively trap workers in the sector despite awareness of health risks. The complete absence of pre-employment training, near-total lack of PPE provision, and negligible health check-up rates confirm that current conditions offer virtually no protective safeguards for workers. The informal sector remains invisible to formal governance structures, and this invisibility perpetuates preventable harm.

However, informal waste collectors play a critical and crucial role in urban waste management and recycling in Ilaro, yet they remain marginalized, underpaid, and exposed to preventable risks. The absence of government recognition and regulation, health safety provisions, and formal association structures further increase their vulnerability. Meaningful improvement requires structural intervention rather than individual-level behavioral change alone.

Recommendation

Government and waste management authorities should provide affordable personal protective equipment such as gloves, nose masks, aprons, and safety boots, with training and strict monitoring to ensure consistent usage. Informal waste workers should be formally recognized as part of the waste management system, and regulations should be established to improve their working conditions and integrate them into structured recycling systems. Training programs on safe waste handling, personal hygiene, and first aid should be introduced by local

government, non-governmental organizations, or community associations. Informal waste workers should be integrated into community-based health insurance schemes, and special occupational health clinics should be made accessible to them. Access to local financial institutions and cooperatives should be provided to help waste workers improve their tools, expand recycling activities, and to be able to purchase recyclable products from households at cheaper rates and sell to final destinations at higher income. Public health campaigns should be carried out to increase awareness of risks and encourage consistent use of PPE, hygiene practices, and health-seeking behavior. Community sensitization should reduce stigma and highlight the environmental contributions of waste workers, thereby improving their social status.

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