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**Development Drivers of Informal Waste Collection in Ibadan, Nigeria**  
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**Abstract:** *This paper examined the factors influencing the emergence and expansion of informal waste collection in waste management sector of Ibadan, the Oyo State capital. Snowball sampling technique was used to identify and sample 253 informal waste collectors across the five municipal local government areas in the city. A pretested structure questionnaire was used to obtain information from the sampled informal waste collectors. Data collected were analysed using Relative Importance Index (RII), 8 x 8 correlation matrix and factor analysis. Eight major factors were identified as influencing the emergence and expansion of informal waste collection. RII showed that in ranked order of importance, they are: poverty; unavailability of better job; profitability; demand for waste management service; low start-up capital; ease of entry; pressure from parents and guardians and low-skill requirement. The correlation matrix indicated that all the factors correlated positively with one another. The Kaiser-Meyer-Olkin Measure of Sample Adequacy (KMO) value of 0.573 and Bartlett's Test of Sphericity of  $p \leq 0.001$  established the adequacy of the variables loaded for the analysis. It is concluded that policies and programmes that will enhance integration of IWCs to municipal waste management scheme of the city and check child labour in the sector will go a long way in making the sector more effective in municipal waste management.*

**Keywords:** Informal waste collectors, Factors, Municipal Local Governments, Waste management

**Introduction**

Waste management in the last two decades has witnessed the entrance and unexpected surge in the number of informal waste collectors in many urban centres in Nigeria. The term informal waste collectors refer to people who make a living by collecting waste from house to house using unorthodox operational equipment such as pushcart, horse cart, wheelbarrow or head pan, shovel or garden fork. They are found in the high density residential neighbourhoods, in the dumps and in the municipal waste collection points (Spies, 2010; Medina, 2011; Wahab and Ola, 2016). IWCs work under deplorable conditions with much exposure to hazardous, contaminated and toxic materials (Wachukwu, Mbata and Nyenke, 2010). They also suffer harassment, social stigmatisation, political exclusion and other injustices in the environments in which they operate (Gerdes and Gunsilius, 2010). IWCs

are considered as the poorest of the poor and treated with serious disregard. They are sometimes seen as nuisance to society and to waste management authorities in the case of municipal solid waste management (UN-Habitat, 2010). Their work in most cases are criminalised and not recognised as a contribution to ecological sustainability and resilience (Fahmi and Sutton, 2006, Wilson *et al.* 2006; Schindler *et al.*, 2012). They are mostly made up of the marginal groups and migrants who constitute the urban poor (Sharholy *et al.*, 2008).

Informal waste collection is strenuous and risky, exposing workers to varying degree of injuries and ill-health (Samarth, 2014). Scheinberg (2011) noted that due to contact with toxic substances, health care wastes, fecal matter, body parts, used syringes and other materials in the waste stream, IWCs are highly vulnerable to chemical and biological health risks. They are also faced



with ergonomic problems due to the physically taxing nature of the work, and psychological and social disadvantages stemming from their low social status (Eisenberg, 2009). As informal workers, IWCs are largely denied access to social benefits such as health insurance, pensions and unemployment insurance (McLean, 2000). Zelalem (2006) equally observed that physical debilitation, lack of education to accurately assess risks, emotional disabilities and income imperatives prevent IWCs from protecting themselves. Despite the enormous challenges of informal waste collection as highlighted above, what possibly could have influenced the emergence and expansion of this waste management subsector? This is the question this paper seeks to address using Ibadan, the capital city of Oyo State as the case study..

#### **Materials and Methods**

The setting of this study was Ibadan, the capital of Oyo State, in the Southwest geopolitical zone of Nigeria. Ibadan is located between longitude  $7^{\circ}20'E$  and  $7^{\circ}40'E$  and latitude  $3^{\circ}35'$  and  $4^{\circ}10'$ . It is 145 km north-east of Lagos and 345km south-west of Abuja, the Federal Capital. The 2019 population of Ibadan using 2.83% growth rate (National Population Commission (NPC), 2007) was estimated at about 3.5 million. Ibadan is made up of eleven local government areas (LGAs) out of which five are municipalities, namely: Ibadan North-East; Ibadan North; Ibadan South-East; Ibadan South-West; Ibadan North-West. The Oyo State Waste Management Authority (OYOWMA) is the statutory body for waste management in the city. In addition, private refuse companies were licensed by the authority to complement its efforts in waste collection, particularly in the low density areas of the city (OYOWMA, 2013). The informal private sector is very active in solid waste management particularly in the largely inaccessible waste-ridden core areas

of the city, given their own types of equipment.

Both descriptive and exploratory research designs were adopted and both primary and secondary data were sourced for the study. Primary data were obtained from the identified informal waste collectors in the five (5) municipal local government areas in the city. As a result of difficulty in obtaining ready data on the number of informal waste collectors in the city due to their non-registration with the government and non-existence of informal waste collectors' association, the researchers with the help of ten field assistants carried out an enumeration of the informal waste collectors using snowball sampling approach. Consequently, 253 informal waste collectors were identified in the five local government areas. All of them were consequently sampled. A pretested structure questionnaire was used to obtain information from the respondents. The questionnaire was designed to obtain information on the respondents' reasons (in order of importance) for engaging in informal waste collection. The questionnaire was prepared in English and administered by trained enumerators who could translate the questions into the native language of the respondents who did not understand English. All the 253 copies of the questionnaire administered were satisfactorily filled and returned for analysis.

The data collected then were cleaned, organized, and entered into SPSS version 21 software for further processing. The factors influencing labour entrance into the informal waste collection sector in the study area were assessed through Relative Importance Index (RII). For this study, eight (8) variables that could influence labour entrance into the informal waste collection sector were identified. These are: poverty; unavailability of better job; demand for the service; ease of entry; low start-up capital;



low-skill requirement; profitability; and pressure from parents and guardians. It is believed that the level of agreement of the IWCs would indicate the level of influence these variables have on people's decision to enter the informal waste collection sector in the study area. These variables were measured by asking the sampled informal waste collectors to rank the variables in order of significance on a scale of 1 to 8 with 8 representing very significant and 1 not significant. The Relative Importance Index (RII) technique was adopted to achieve a quantitative measurement of the variables. RII is a technique of analysis that rates factors against a scale in order to assess the significance of each factor. The scale is then transformed into RII for each factor in order to determine the ranking of the different factors. RII is computed using the following formula:

$$RII = \frac{\sum W}{AN}$$

(1)  
Where:  $\sum W$  = sum of weighting (value) given to each factor by the respondents ranging from 1 to 8 in this study (Table 1).

A = the highest weight (i.e. 8 in this study).

N = total number of respondents (i.e. 253)

Furthermore, 8x8 Correlation Matrix and Factor Analysis were used to statistically measure the factors influencing the emergence and expansion of informal waste collection in municipal waste management sector of Ibadan. Ethical issues were given due consideration, with regard to the purpose of the study, contents of the research instrument, acceptance of respondents' right to privacy, and confidentiality of the data. Also, the informed consent and willingness of the

respondents to answer question was obtained.

## Results and Discussions

### Analysis of the Factors Influencing Emergence and Expansion of Informal Waste Collection

As explained earlier, Relative Importance Index (RII) was used to analysed the factors influencing the emergence and expansion of informal waste collection in municipal waste management sector of Ibadan. The results of the analysis are presented in Table 1.

Results of the analysis as shown in Table 1 indicates that in rank order, poverty with RII of 0.886 is the most significant factor influencing the entrance of labour into the informal waste collection sector. This is followed by unavailability of better jobs with RII of 0.781. Profitability of the job takes third in the ranking of the factors with RII of 0.615 while Demand for the service (RII 0.523), Low start-up capital (RII 0.487), Ease of entry (RII 0.458) and pressure from parents/guardians (RII 0.366) ranked fourth, fifth, sixth and seventh respectively. Low-skill requirement is the least significant factor affecting labour entrance into informal waste collection sector with RII of 0.149.

Table 1: Relative Importance Index of Factors Affecting Entrance into Informal Waste Collection

Factor s	N (Total number of respondent s)	ΣW (Sum of weighting given to each factor by respondent s)	RI I	Rankin g
Poverty	253	1851	0.915	1 <sup>st</sup>
Unavailability of better jobs	253	1629	0.805	2 <sup>nd</sup>
Profitability of informal waste collection	253	1284	0.634	3 <sup>rd</sup>
Demand for the service	253	1092	0.540	4 <sup>th</sup>
Low start-up capital	253	1017	0.502	5 <sup>th</sup>
Ease of entry Pressure from parents and guardians	253	956	0.472	6 <sup>th</sup>
Low-skill requirement	253	764	0.377	7 <sup>nd</sup>
		312	0.154	8 <sup>th</sup>

### Bivariate Analysis of Variables Influencing Emergence and Expansion of Informal Waste Collection

A 8x8 correlation matrix of the variables that could influence labour entrance into the informal waste collection sector was computed. The correlation coefficients of these variables are presented in Table 2. The correlation coefficient ( $r = 0.306$ ;  $p < 0.001$ ) suggested that the correlation between low start-up capital and poverty was positive. Also, a correlation coefficient ( $r = 0.635$ ;  $p < 0.001$ ) revealed that there existed a positive correlation between ease of entry and low start-up capital. The correlation coefficient ( $r = 0.751$ ;  $p < 0.001$ ) indicated a strong positive correlation between pressure from parents and poverty. Furthermore, there existed a positive correlation ( $r = 0.185$ ;  $p < 0.001$ ) between demand for service and pressure from parents. The correlation coefficient between unavailability of better

jobs and demand for service was positively low ( $r = 0.083$ ;  $p < 0.001$ ); in addition, the correlation coefficient ( $r = 0.621$ ;  $p < 0.001$ ) revealed that there exist a positive correlation between profitability and demand for service. Lastly, the correlation coefficient ( $r = 0.572$ ;  $p < 0.001$ ) established that the correlation that the correlation between low skill requirement and ease of entry was positive.

Table 2: Correlation Matrix (8x8)

Variable	A	B	C	D
E	F	G	H	
A	1.000			
B	*0.306	1.000		
C	0.042	*0.635	1.000	
D	*0.751	0.143	**0.032	1.000
E	-0.416	-0.077	**0.002	*0.185
F	1.000			
G	0.282	**0.013	0.015	0.026
H	*0.083	1.000		
	-0.011	**0.003	0.228	0.181
	*0.621	-0.002	1.000	
	-0.134	-0.225	*0.572	0.047
	0.164	-0.360	0.425	1.000

\*Correlation significant at 0.001 level.

\*\*Correlation significant at 0.005 level.

Source: Authors' field survey, 2016

**Note:** A – Poverty; B – Low start-up capital; C – Ease of entry; D – Pressure from parents; E – Demand for service; F – Unavailability of better jobs; G – Profitability H – Low skill requirement

### Factor Analysis of Variables Influencing Emergence and Expansion of Informal Waste Collection

The eight (8) variables that could influence the emergence and expansion of informal waste collection were loaded for factor analysis to extract the components for the



factors influencing emergence and expansion of informal waste collection. As stated earlier, these factors include poverty; unavailability of better job; demand for the service; ease of entry; low start-up capital; low-skill requirement; profitability; and pressure from parents and guardians. The Kaiser-Meyer-Olkin Measure of Sample Adequacy (KMO) value of 0.573 and Bartlett's Test of Sphericity of  $p \leq 0.001$  established the adequacy of the variables loaded for the analysis (Table 3).

**Table 3: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sample Adequacy		0.573
Bartlett's Test of Approx. Chi-Square	Sphericity	1.146E3
Df		61
Sig.		0.000

### Discussions

A number of factors were found to influence the emergence and flourishing of the informal waste collection in Ibadan. These are: poverty; unavailability of better job; profitability; demand for the service; low start-up capital; ease of entry; pressure from parents and guardians and low-skill requirement. Application of the Relative Importance Index indicates poverty and attempt to escape the austere economic situation characterizing the incidence of poverty as the major factor responsible for the emergence and growth sector. UN-Habitat (2009) put poverty level in Nigeria at 65% and urban poverty at 54%. Thus, 54% of urban dwellers live below the poverty line of \$2 (USD) per day. This indicates that the incomes of the majority of urban settlers are mostly too low even for subsistence living. This situation has also

been compounded by the increase in inflation level. The Central Bank of Nigeria (CBN) (2013) put the inflation level in Nigeria at 8.9%. Inflation not only affects the ability of urban residents to afford decent meals and clothing but also their ability to afford decent accommodation. Therefore, attempts to eke out means of livelihood at all cost appear to have influenced their decision to join informal waste collection business.

Non-availability of better jobs is the second most important factors affecting influx of labour into the sector. Employment problem has become one of the key issues in the agenda of governments at all levels – federal, state and local. This fact is corroborated by a Central Bank of Nigeria report that unemployment rate in the country has increased from 21% to 24% (CBN, 2013). It is pertinent to note that unemployment problem is particularly acute in the urban centers due to persistence rural-urban migration usually influenced by the fantasy of "the city answereth all problems" bedeviling the rural populace, particularly on modern employment. The inability of these migrants to secure gainful employment and the attempts to survive the harsh economic realities of the city usually influence their entrance into informal waste collection business.

The result of RII also presents profitability of the business as the third important factor affecting the growth of the informal waste service sector. The potential economic benefit offered by the sector has made some people to take up the job on a full-time basis. The fact that an informal waste collector realizes an average of N20,000 (5.7 USD) per month (Wahab and Ola, 2016) which is well above the much touted national minimum wage makes the sector attractive to job seekers. It should be noted that the national minimum wage has not



trickled down to most states and local governments in the country.

Another factor influencing labour movement into the informal waste collection sector is the high demand for waste collection service in the city. Literature is replete with discussions on the poor performance of formal sector in municipal waste management. According to Wahab and Ola (2017), of 1,491 tons of waste generated in Ibadan daily only; 52.6% of the waste is evacuated by the municipal waste management agency and private refuse contractors. Thus, 47.4% of the wastes are left uncollected. Most of the uncollected wastes are generated in the high density residential neighbourhoods that are not captured in the waste collection arrangements of the formal system. One of the reasons for the seemingly neglect of these neighbourhoods is the lack of vehicular access to most of them as they are characterized by narrow streets and chaotic housing development. There is, therefore, high demand for IWCs in these neglected neighbourhoods because of their ability to penetrate these neighbourhoods due to the nature of their waste evacuation (Cart/Wheel barrow). Also, the UN-HABITAT (2010) posited that informal waste management in developing countries results from and is supported by the low performances of municipal authorities in terms of provision of efficient waste management systems. For instance, in Male (the capital city of Maldives), the informal waste collectors provide sanitation services to inhabitants instead of the municipality (Medina, 2005b). Low start-up capital is the fifth major factor engineering labour participation in informal waste collection as indicated by the result of RII. Since informal waste collection can be done with rented operational equipment such as wheel barrow or cart and shovel, it is therefore possible to launch the business with about N300 (less than one US Dollar).

In a study of informal waste collectors in Ibadan by Ola (2016), it was reported that the cost of renting a cart and shovel was N200 and N50 respectively. This low capital requirement provides impetus for participation in informal waste collection.

Ease of entry into the informal waste collection sector is the sixth major factor influencing the decision of IWCs to join the waste management business as indicated by the result of Relative Importance Index. It is established from the literature that informal waste management sector in most Latin American countries has been so structured in such a way that registration with waste collectors associations is required for entering the sector (Medina, 2005a; Samson, 2010; Sembiring and Nitivattananon, 2010) while in many African countries including Nigeria, free entry into the sector is guarantee (Samson, 2009; Zhou and Chi, 2010; Sandhu, 2012; Katusiimeh, Burger, and Mol, 2013). This finding appears to confirm the assertions of the later group of scholars that there is no barrier to entering or exiting informal waste sector in most third world cities.

Another factor influencing labour movement into the informal waste collection sector is the persistent pressure from parents/guardians on their children or wards to take up the job. This accounts for a number of teenagers including school children engaging in the job. It has been emphasized by a number of scholars that child labour is one of the major problems of informal waste collection and parents are the worst culprits in this regard. For instance, ILO (2004) estimates put the number of child labourers aged 5 to 17 years worldwide at 256 million, of which some 171 million work in hazardous situations. About 110 million are below the age of 12. The report further stated that parents were largely responsible for this trend because parents cannot afford to send their children



to school and by removing the children from work and putting them in school, does often not work, because the parents will lose necessary family income (ILO, 2004). As reported by UNICEF (2009), in the whole of Brazil, 45,000 children were involved in scavenging. In Bangalore (India) scavenging is the single largest job occupying 24% of the street children (Huysman, 1994; Medina, 1997). In Jordan official estimates put the number of children involved in informal waste collection at 32000 but other unofficial figures indicates that over 53000 children are actually working in the informal waste sector (Aljaradin, Persson and Sood, 2015)

Low-skill requirement to engage in informal waste collection was ranked eighth as the factor influencing participation in the sector. Informal waste collection is permissive of any category of labour because it does not require any specialized knowledge or skills in launching. This accounts for the influx of labour, particularly those with little skills and those with skills in other trade but unable to make headways in their previous trade. World Bank (2017) noted low technical and entrepreneurial skills among the IWCs in many developing countries which it believes are hampering their optimal productivity and important factors in the sustainability of informal sector intervention in waste management. The report, therefore, posits that IWCs require adequate support from government and waste management authorities, in conducting additional trainings on financial management, managerial know-how and marketing strategies in order to enhance the competitiveness of labour-intensive small-scale activities. Also, conclusion from earlier study by Rogerson (2001) indicated that IWCs are mostly recent migrants from rural areas with no education or technical skills but in search of employment in the urban centers

## Conclusion

The study has established the major factors influencing the emergence and expansion of informal waste collection in Ibadan. Based on the findings from this study and evidence from the literature it can be concluded that informal waste collection has come to stay as an economic undertaking, not only in Nigeria but other developing countries because of the inability of the formal sector to effectively deal with municipal waste presently. Also, signs, policy directions and availability of limited resources to fully undertake comprehensive and effective municipal waste management point to the fact that the likelihood of achieving total and efficient municipal waste management by the formal sector in the nearest future are not guarantee. Considering the role of informal waste sector in improving city livability, environmental cleanliness and expansion of urban employment sector, it is important for Oyo State Government and the five municipal local governments in Ibadan, to evolve policies that will facilitate integration of IWCs to municipal waste management scheme of the city.

However, the issue of child labour in the sector needs to be properly addressed by the government, Non-Governmental Organisations (NGOs) and neighbourhood associations. This can be done through massive public awareness programme in the print and electronic media as well as town hall meetings to sensitise parents/guardians on the need to enroll their children/wards in school and not consider them as income generating tools. Appropriate sanctions should be applied to erring parents after adequate awareness programme has been conducted.

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