

## Environmental and Health Hazards Perception of Improper Domestic Waste Disposal in Ikorodu Local Council Development Areas, Lagos State, Nigeria

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### Abstract

*Domestic waste disposal constitutes a major environmental/public health concern in the global space, especially among emerging communities. Waste generation and management practices depend on people's lifestyle and on the population density. The World Health Organisation (WHO) often warns of the impending health and psychological hazards from environmental pollution, and the economic burden of its responsive mitigation/management practices. Improper waste disposal results in epidemic disease outbreaks that trigger serious health, environmental and economic (financial cost) implications among global communities. This study identified the solid waste management strategies adopted by residential households in Ikorodu rural suburb area of Lagos State, Nigeria, and evaluated the extent of environmental and economic effects of improper waste disposal on the surveyed households. Primary data were obtained from households' female spouses in the rural suburb households, using mixed methods - structured questionnaire and key informant interview (KII) - in a multistage sampling technique. Simple descriptive statistics and multinomial logit (MNL) model were used to analyse the study data. Most household spouses were married (52%); educated (49%); formal sector livelihood means participants (81%); and had a moderate household size (mean = 5 members). Burning of solid waste (62.5%) and dumping in pits (16.7%), open fields (7.5%), and nearby natural water bodies (13.3%) were rampant practices among residential houses; while liquid wastes were largely channelled to public drainage facilities and water bodies within the emerging local communities. Irregular visits of sanitation officials and public waste managers to the residential areas were reported, signalling high environmental and epidemic risk concerns. Mixed factors propelled household members' disposition to respiratory complications; environmental irritation, food/water contamination and ill-health, resulting from pests/rodents triggered by improper waste management practices. Communal use of waste evacuation facilities and orientation programmes among residents were recommended for mitigating the environmental/health hazards of improper waste disposal.*

**Keywords:** Environmental/health hazards, risk perception, domestic waste, improper waste and disposal

## Introduction

With less than 20% of world's generated waste recycled on annual basis, and over 30% of world's produced foods wasted, improper disposal of domestic waste, including illegal waste dumping, waste burning, landfills by solid waste, uncontrolled liquid waste spillages, has become a globally recognised public health challenge (Selin, 2013; UN Environment, 2017) and threatening environmental integrity, especially among emerging and developing nations (Sultanova et al., 2021; Mobosi, 2025). With Sustainable Development Goal 12 advocating for a drastic change in human consumption, production, and waste disposal patterns, waste disposal management has become extremely crucial for ensuring a sustainable future.

Previous studies have indicated high public awareness of environmental risks, often linking them to diseases such as malaria, cholera, and respiratory issues, alongside significant environmental degradation. For instance, a study by Ahmad et al. (2021) reported that leachate from landfills contains dangerous chemical substances in their various forms, and when they seep into the soil, they contaminate the subsoil and therefore adversely affect man and his cultivated crops and livestock in their natural habitats. The healthcare systems across most nations of the world bear heavy mental, psychological and economic burdens because water sources that are polluted can result in epidemic ailments that are capable of causing enduring human health problems (WHO, 2018).

A safe and clean environment is a gift of nature. It is an essential requirement for maintaining quality living standards in the face of the rapidly growing human population and natural resource over-exploitation, with its attendant increase in the demand for environmentally sustainable waste management practices and methods. Household dwellers in several developing nations are increasingly facing the problems of severe shortage of a healthy environment, as they record a marginal increase in infrastructural development and non-agricultural livelihood activities. Improper domestic waste management is thus a major challenge in several developing nations, leading to increasingly problematic health challenges and environmental issues (United Nations, 2000). Solid waste in this context refers to "any remnant matter that is no longer useful nor having economic benefits in its present state by the people who originally caused it". Poor waste management habits eliminate living organisms from their natural habitats and force several species into total extinction. Poor waste disposal practices contaminate and pollute the water, air and soil for man and his crops and livestock, and also contribute indirectly to greenhouse gas emissions, causing multifaceted health, environmental, and economic challenges for man (Kwun Omang et al., 2021).

The combination of domestic/industrial waste and pollutants in human residential and work environments results in mental, physical and psychological stress, as well as anxiety. The implementation of sanitation strategies and programmes for improving community health and minimising public waste can lead to enormous mental health benefits for men (Sclar et al., 2018). Residents of communities that properly manage their domestic waste normally exhibit higher quality and satisfactory living standards indices, while those in polluted and contaminated areas constantly express the feeling of despair, abandonment, and dissatisfaction, which causes social disconnections and reduces overall quality and longevity of life.

The definition of solid wastes is non-static; varying from place to place, depending on the general perception of the people concerned. In Burkina Faso, for instance, Kefande et al. (2013) define municipal waste as "solid, liquid or gas rubbish from the living homes, administrative buildings, recreational centres, resort rooms, or any other public installation receiving people". To the environmentalists, waste is a non-useful matter that can negatively impact people and their

environment. According to Misra & Pandey (2005), "a substance becomes a waste when it loses its usefulness and expectancy for further economic value". Solid wastes have been classified severally into different types by environmental scholars, depending on the sources they emanate from. Household wastes generally include municipal waste, industrial waste, and biomedical (or hospital) waste, which are intricately hazardous and infectious. On a general view however, the term "solid waste" have been scientifically defined as including any garbage, refuse, or sludge from waste treatment plants, water treatment plants, air pollution control facilities, or other forms of non-useful, discarded materials or substances; which may be in their solid, liquid, semi-solid, or gaseous forms, resulting from industrial, commercial, mining, and agricultural exploitative operations and activities (Da Silva et al., 2005). This definition of household wastes covers domestic, industrial, or agricultural wastes from daily operational activities.

Generally, proper waste disposal include the act of discharging, depositing, injecting, dumping, spilling, leaking, or placing unwanted solid and hazardous materials from domestic, industrial or agricultural activities into the water or land bodies, such that the wastes or any constituent part thereof, may not consequentially escape into the environment, emitted into the air, and (or) discharged into the ground or surface water bodies (Da Silva et al., 2005). Proper waste management, therefore, is any generally accepted set of provisions, procedures or processes for collecting, transporting and disposing of wastes in manners that are environmentally acceptable and safe for man and his crop/livestock (Phengxay et al., 2005).

In many developing nations, improper waste management is an emerging problem, but still largely uncontrollable due to insufficient availability of basic infrastructural facilities and/or services, such as portable water, sanitation equipment, modern waste collectors and evacuators; as well as limited resources and inadequate awareness and public orientation among the citizens. Other major constraints border on the lack of political will by the concerned authorities to confront the menace of an unhygienic environment and its associated challenges. Domestic and industrial wastes contribute significantly to the quantity of total wastes generated annually, and they pose an enormous threat to the human environment (Salequzzaman et al., 2009).

Waste generation and management practices mainly depend on the lifestyle of individuals and the population of people residing in a locality or region. Most households in developing countries generally generate a lesser amount of solid waste per capita due to their low income, living standards and limited purchasing power, leading to the established low rates of waste material generation compared to their more urbanised counterparts in the developed economy (Ferreira & Veiga, 2003). Previous studies in Nigeria, for instance, estimated waste generation of between 0.562 and 0.670 kg/person/day and as high as 1.68 kg/person/day (e.g. Olubukola, 2009). Nonetheless, the population of people in developing countries is large enough to contribute a quantum of solid and liquid waste materials sufficient to pose a public health and environmental pollution. The increasing rate of urbanisation and its attendant upsurge in domestic, industrial and socio-economic activities in Nigeria, for instance, results in a tremendous increase in urban waste generation, which exerts negative pressure on the environment in the form of solid, liquid and gaseous waste pollution. Just like in most developing nations, proper waste management has been a major source of health, environmental and economic concern in many parts of Nigeria over the years, until in recent times, the emerging economic opportunities in this sub-sector have continued to attract private-sector investments in partnership with government, within the framework of public-enacted environmental laws and public health policies.

Sustainable waste management has continued to generate increasing public health and environmental concerns due to its close association with the continued exposure of human lives to

potential hazards arising from communities, households and the surrounding industries (Tudor et al., 2005). As of now, considerable gaps still exist with respect to the assessment of healthcare waste management practices in Nigeria and other sub-Saharan African nations. The nature and quantity of solid wastes, as well as the institutional practice of waste management, including waste segregation and recycling, are often poorly researched and scarcely documented in several developing nations; despite their attendant health and environmental risks (Oke, 2008; Farzadika et al., 2009). As observed in the available meagre literature, however, there may not be much of a difference in the way and manner wastes generated in various health care institutions are managed in Nigeria. For instance, a study by Olubukola (2009) reported a similarity in the waste data and environmental waste management practices in two public health facilities in Lagos State, Nigeria, characterised by a lack of waste minimisation policies, poor waste segregation practices, lack of instructive posters on waste segregation and disposal within the facilities. It is also of serious concern that the level of awareness, particularly among health workers, regarding healthcare waste has not been adequately documented.

Healthcare wastes are in a special category because they often contain harmful materials that may trigger ill-health among those who are exposed to them. Several studies have indicated that the inappropriate handling and disposal of healthcare wastes pose health risks to health workers who oftentimes may be directly exposed, and to people near healthcare facilities, particularly children, and scavengers who may become exposed to infectious wastes and a higher range of transmissible diseases (Adegbita et al., 2010). For instance, the World Health Organisation was reported to have estimated about 8 to 16 million new cases of Hepatitis B virus (HBV), 2.3 to 4.7 million cases of Hepatitis-C Virus (HCV) and 80,000 to 160,000 cases of human immunodeficiency virus (HIV) each year due to unsafe injections and mostly due to improper waste management systems (Townend & Cheeseman, 2005).

Waste accumulation creates breeding spaces for disease-carrying vectors, which include mosquitoes above all others. Malaria and dengue fever become more common in environments where waste materials are improperly disposed of because the standing liquid creates suitable conditions for replication (Jambeck et al., 2015). The diseases from poor waste management practices affect most severely vulnerable populations, especially those who live in areas without healthcare access (Sims et al., 2017; Manguin et al., 2016). Those who produce minimal pollution suffer the most severe impact from its consequences.

Although reliable data on the quality and nature of solid wastes and their management techniques have remained a major challenge in many developing countries of the world, it is believed that several hundred tons of such wastes are deposited on open dumpsites and surrounding environments, often alongside non-hazardous solid waste materials (Alagoz & Kocasoy, 2007). A near total absence of institutional arrangements for solid waste management in Nigeria has also been previously reported (e.g., Coker et al., 2009), with an attendant increase in the risks of public place injuries and infections (Abah & Ohimain, 2010). The population groups at risk from the unscientific disposal of solid waste materials include vulnerable households close to public dumpsites (especially those comprising pre-school children); public health/waste disposal workers; factory workers producing toxic and infectious materials, and mostly poor households whose water supply sources have been contaminated, either due to waste dumping or leakages from land-filled sites. This research was carried out to identify the solid waste management strategies adopted by residential households, and to evaluate the extent of households' perception of the environmental/health risk associated with improper waste management practices in Ikorodu suburb area of Lagos State, Nigeria.

## **Research Methodology**

### **The Study Area**

The study was carried out in Ikorodu suburb area of Lagos State, Nigeria, being an emerging municipal city in the outskirts of the Lagos metropolis. Lying on a plateau, the ancient Ikorodu town is 5.3 square kilometres from North to South. Situated in the North East axis of the main Lagos metropolis at an approximated distance of 36km north of the city, the Ikorodu municipal lies 30 31 East of the Greenwich and 60 751 North of the equator, and shares boundary with Ogijo community in Ogun State in the north; bounded in the south by the length spread of the Lagos lagoon; and shares eastern boundary with Agbowo-Ikosi in the Epe division of the State. Ikorodu Municipal City had an estimated population size of 535,619 as at the 2006 national census. Geographically, major towns within Ikorodu Local Council Development Areas (LCDAs) include Ijomu, Aga, Ijede, Bayeku, Igbogbo, Ogolonto, Imota, and the Agricultural settlement area (popularly called 'Agric'), among others.

The LCDAs encompass the suburban communities that surround the main Ikorodu Local Government Area, and they are known for their substantial farm land suitable for arable crops (mainly maize, melon and vegetables), livestock rearing, and mild capture fishing, leading most of the rural folks to engage in farming activities as their primary occupation. Trading, crafting, and non-farm commercial merchandising have also gained substantial economic prominence within the study area in recent years. Culturally, Ikorodu people are promoters of traditional festivals and culture, as a notable Ijebu-speaking area of Lagos State that shares close borders with the Remo clan from Ogun State.

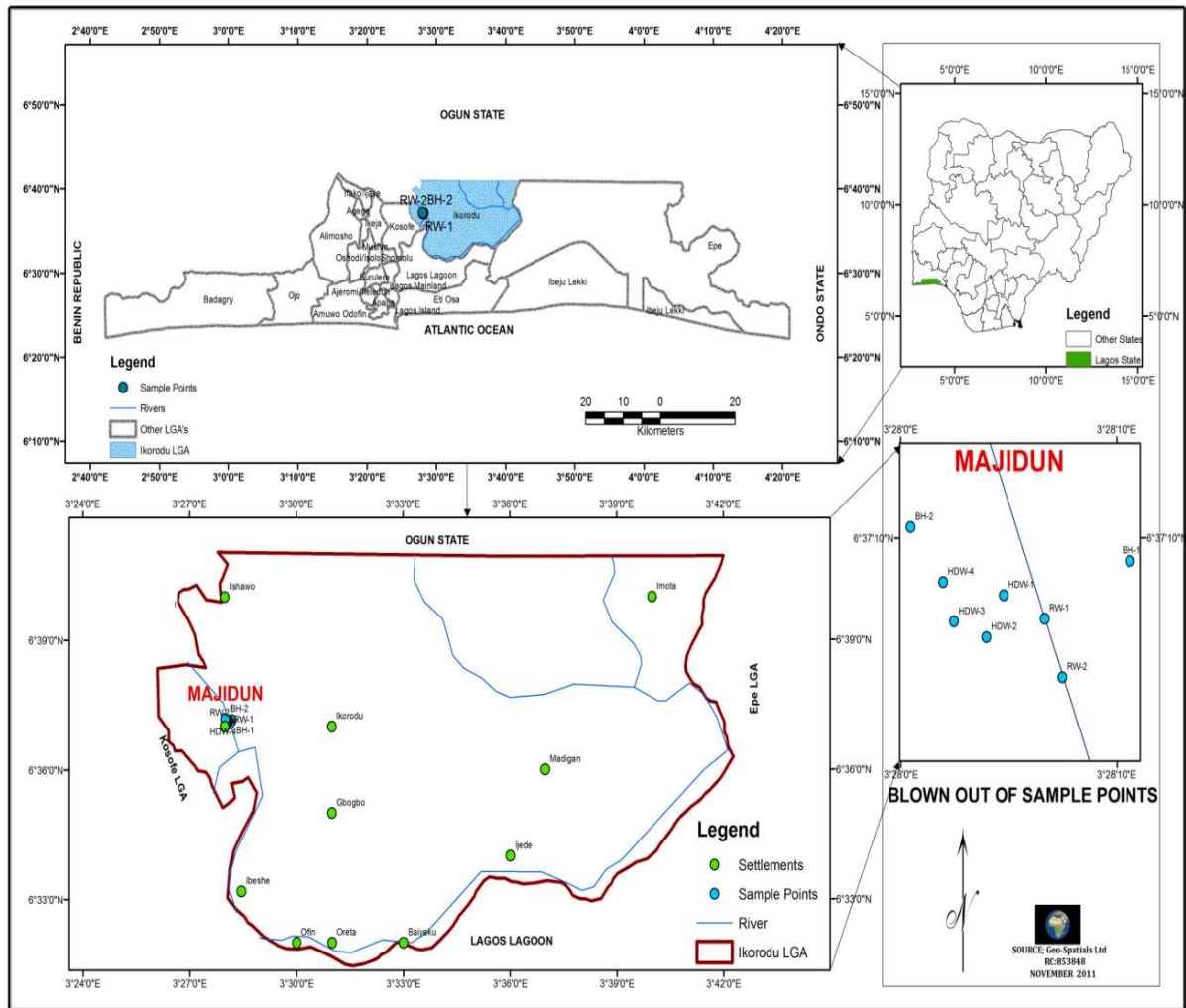


Fig 3.1: Map of Lagos State showing Ikorodu Area of Lagos State, Nigeria

### Data Collection and Sampling Techniques

The primary data for this study were collected directly from household members using a structured questionnaire, in a multi-stage random sampling technique. To provide the basis for a heterogeneous sample across both the rural suburb communities in the study area, data were obtained across the two Local Council Development Areas covering the rural suburb region of Ikorodu Division. The division was purposely selected for the rural economy-based study, among four (4) other divisions in Lagos State, because of its characteristic land-based mixed economy. At the first stage, two (2) Local Council Development Areas (Imota and Ijede) were selected from the division, having a relatively higher concentration of rural households. At the second stage, communities in the two (2) LCDAs were categorised into clusters based on their relative proximity. Selected communities from each LCDAs included Liadi, Oko-Ito, and Gberigbe (Imota<sup>1</sup>); and Abule-Oko, Igbe, Ginti, Ilupeju, Egbin, and Oke-Eletu (Ijede<sup>2</sup>). Consequently, representative rural households were selected from across the different clusters, and sample households were drawn from across by the snowball technique, to arrive at a total of 120 respondents that were used for this study. Apart from those that bordered on the demographic characteristics of the households,

data were specifically obtained on the disposal techniques engaged in handling household solid and liquid waste disposal.

### Analytical Techniques

Descriptive and inferential statistics were used to describe the demographic characteristics of the households and to profile the common domestic waste disposal techniques adopted in the study area.

### Factors Influencing Households' Environmental/Health Hazards Perception of Improper Waste Disposal Practices

To determine the factors that influence household's perception of the environmental/health risk associated with improper waste management practices in the surveyed residential area, a multinomial logit (MNL) model was fitted to the data due to its ability to handle polychotomous responses. Generally, this model is considered appropriate when the response takes on multiple possible values, which in this case, represent the shades of environmental and health hazard effects of improper domestic wastes disposal as perceived by households in the study area. The MNL model is implicitly expressed as:

$$\Pr(Y_i = ijkl) = \frac{e^{AX_{ij}\lambda}}{\sum_{k=0}^3 e^{AX_{ij}\lambda}} \quad (i)$$

The explicit form of the MNL model as applied in this model is:

$$Y_i = \alpha_i + \beta_{1i}X_1 + \beta_{2i}X_2 + \dots + \beta_{14i}X_{14} + \varepsilon_i \quad (ii)$$

$$Y_j = \alpha_j + \beta_{1j}X_1 + \beta_{2j}X_2 + \dots + \beta_{14j}X_{14} + \varepsilon_j \quad (iii)$$

$$Y_k = \alpha_k + \beta_{1k}X_1 + \beta_{2k}X_2 + \dots + \beta_{14k}X_{14} + \varepsilon_k \quad (iv)$$

$$Y_l = \alpha_l + \beta_{1l}X_1 + \beta_{2l}X_2 + \dots + \beta_{14l}X_{14} + \varepsilon_l \quad (v)$$

The general perceptions of the households' heads attributed to improper domestic waste disposal practices revolved around environmental and health hazards (or risks). These concerns were grouped as including (a). 'irritation/offensive odour' that constitutes air pollution (environmental effect); (b). 'respiratory nausea complications emanating from smoke/fumes' that result in restiveness (health effect); (c). 'liquid/solid waste reservoirs serving as breeding space for pests, rodents and carriers of infectious diseases' (health effects); and (d). possibility of contamination of surface, ground, and pipe-borne water as a result of improper domestic waste disposal or poor waste management (environmental/health effect).

Thus, the four (4) identified categories of the perceived environmental/health hazards (risk) associated with improper domestic waste discharge, as conceptualised in the waste management practices (WMP) model specified for this study, were:

$Y_1$ , if household head often associates 'offensive odour and environmental irritation' experienced by household members with improper domestic waste disposal on refuse/dump sites, represented by  $i$ ;

$Y_2$ , if household head often associates respiratory nausea complications and restiveness experienced by household members with smokes/fumes emanating from improper handling of domestic wastes (e.g. open burning of solid domestic waste, etc), represented by  $j$ ;

$Y_3$ , if household head often associates food/water contamination and ill-health with the prevalence of common pests and rodents (mosquitoes, roaches, mice) around the residential buildings, as an aftermath of improper domestic waste disposal, represented by  $k$ ; and;

$Y_4$ , if household head does not normally associate prevalent environmental or health concerns of household members with improper domestic waste disposal, represented by  $l$  (the base category response class).

$\alpha$  = the constant

$\beta_i$  = The predictor variable coefficient (parameters to be estimated)

$X_i$  = The observed predictor variable values (explanatory variables)

where:

$X_1$  = Educational level of household head (years)

$X_2$  = Household size (numbers)

$X_3$  = Type of liquid waste drainage facility used (1 = enclosed pipe; 0 = otherwise)

$X_4$  = Type of solid waste bin used (1= closed bin; 0 = otherwise)

$X_5$  = Method of domestic liquid waste disposal (1 = evacuation/burning; 0 = otherwise)

$X_6$  = Post-disposal treatment of domestic solid waste (1 = open air burning; 0 = otherwise)

$X_7$  = House location relatively within Ikorodu municipal town (1= rural area; 0 = otherwise)

$X_8$  = Distance of residential house to the nearest primary healthcare facility/clinic (km)

$X_9$  = Distance of residential house to the nearest community waste dumping site (km)

$X_{10}$  = Distance of residential house to the nearest community waste dumping site (km)

$X_{11}$  = Health risk awareness index of improper domestic waste disposal

$X_{12}$  = Environmental risk awareness index of improper domestic waste disposal

$X_{13}$  = Number of times community-based sanitation exercise is observed in a month

$X_{14}$  = Agency providing household solid waste evacuation (1= private-sector agency; 0 = otherwise)

$e_i$  = Random (stochastic) factor external to the model

The extent of households' awareness of the environmental/health hazard/risk perception associated with improper waste management practices, as well as other regulatory considerations on domestic waste disposal, was determined by constructing an aggregated index for each of the variables as follows:

$$SC_i = \frac{\sum M_i P_i}{4n} \quad (vi)$$

where:

$SC_i$  represents  $RIe_i$  and  $RIh_i$  = environmental and health hazard (risk) perception index, respectively.

\* $M_i$ \* = permanent residency of the respondent household head in the \* $i^{th}$ \* immediate community (1 if resident, and 0 if otherwise)

\* $P_i$ \* = extent of participation of the respondent household head in the environmental sanitation activities of the \* $i^{th}$ \* immediate community. This takes on values from 0 to 4.

0 = if respondent is not aware and does not feel concerned about the environmental or health hazard/risk of household domestic waste disposal, and its associated/probable outcomes/effects

1 = if the  $i^{th}$  respondent is aware but does not feel concerned about the environmental or health hazard/risk of household domestic waste disposal beyond 25% of its associated/probable outcomes/effects

2 = if the  $i^{th}$  respondent is aware but does not feel concerned about the environmental or health hazard/risk of household domestic waste disposal beyond 50% of its associated/probable outcomes/effects

3 = if the  $i^{th}$  respondent is aware but does not feel concerned about the environmental or health hazard/risk of household domestic waste disposal beyond 75% of its associated/probable outcomes/effects

4 = if the  $i^{th}$  respondent is aware and feels fully concerned about the environmental or health hazard/risk of household domestic waste disposal, and its associated/probable outcomes/effects

$n$  = number of prevalent environmental/health hazards (or risks) identified in the study area.

## Results and Discussion

### Socioeconomic Characteristics of the Sampled Residential Households

In Table 1, frequency, percentages, and mean values were used to profile the socioeconomic characteristics of the respondent households.

**Table 1: Socioeconomic Characteristics of the Respondent Households**

Socio-economics characteristics Category		Frequency	Percentage
Sex	Male	43	35.8
	Female	77	64.2
Marital status	Single	58	48.4
	Married	62	51.6
<i>Total</i>		<i>120</i>	<i>100.00</i>
Age (Mean value = 40 years)	< 30 years	59	49.2
	31 to 60 years	46	38.3
	60 years and above	15	12.5
<i>Total</i>		<i>120</i>	<i>100.00</i>
Primary occupation	Farming	3	2.5
	Trading	31	25.8
	Public/civil servant	29	24.2
	Private sector workers	57	47.5
<i>Total</i>		<i>120</i>	<i>100.00</i>
Formal education	No formal education	6	5.0
	Primary education	31	25.8
	Secondary Education	59	49.2
	Tertiary education	24	20.0
<i>Total</i>		<i>120</i>	<i>100.00</i>
Household size	1 to 3 members	25	20.8

Socio-economics characteristics Category		Frequency	Percentage
(Mean value = 5 members)	4 to 6 members	75	62.5
	> 6 members	20	16.7
<i>Total</i>		<i>120</i>	<i>100.00</i>

**Source:** Field survey, 2024.

Results of the socioeconomic characteristics of the respondent households were presented in Table 1. The majority (64.2%) of the respondents were female household heads/spouses, while barely 35.8% were males, implying that a reasonable number of the residential households preferred the female spouse to get engaged in the survey process as the custodians of household waste disposal information, rather than their male counterparts. The findings follow the hypothesis that household women/spouses readily demonstrate greater concern about the environmental health status of their household members than the male household heads (Hampel et al., 1996). The respondents were of average age 40 years; largely married (about 52%); fairly educated (about 49%) (Yooda, 2014); having an average household size of 5 members; and largely formal sector actors/workers (about 81%) (Addo et al., 2017).

### **Domestic Waste Management Strategies Adopted by the Respondent Residential Households**

From Table 2, two categories of domestic wastes (solid and liquid) were identified in the study area. Table 2 shows that 62.5% of the households burn their solid waste; 16.7% dump solid waste in pits and to fill potholes within the neighbourhood; 13.3% dump waste into nearby natural water bodies; while 7.5% dump refuse in open fields in the local areas. According to Jambeck et al. (2015), natural water bodies (marine environments) around towns, cities and emerging communities often become contaminated and unsafe for life preservation and consumption when non-degradable (solid) and liquid wastes and other toxic materials are dumped into them. The inorganic composition in the solid waste materials impacts negatively on the marine organisms through their vulnerability to chemical substance entanglement.

Open waste burning constitutes a major source of environmental hazards concern as it causes air pollution as a direct adverse consequence of improper domestic waste management practices. The smoke emission from uncontrolled waste burn-off leads to lung-related ailments; worsening pre-existing ill-health conditions, and may trigger higher magnitude of fatal health consequences (Lelieveld et al., 2015; Sultana, 2020).

**Table 2: Established Domestic Waste Management Strategies in Ikorodu LCDA**

Type	Method of waste disposal	Frequency	Percentage
Solid waste disposal	Excavations/ burning	75	62.5
	Filling of pit/pot holes	20	16.7
	Dumping into natural water bodies	16	13.3
	Open field disposal	9	7.5
	<i>Total</i>	<i>120</i>	<i>100.0</i>
Liquid waste disposal	Disposal into public places (surface areas, uncovered channels, water bodies, etc.)	79	65.8
	Disposal by flushing into closed septic tanks and drainage facilities	41	34.2
	<i>Total</i>	<i>120</i>	<i>100.0</i>

**Source:** Field survey, 2024

Table 2 further revealed how respondents dispose of their liquid waste. Most (65.8%) of the households empty liquid waste uncontrollably into public spaces (such as the open streets), while 34.2% flush it into controlled channels through the drainage facilities and septic tanks. This implies that the disposal of domestic liquid waste products by most households in the study area constitutes spillage, which is traditionally unlawful, resulting in public health hazards. According to the WHO (n.d.), liquid waste carelessly disposed of through irregular and unauthorised channels often find their way into underground water sources and bring about contamination of portable underground water and surface pollution of natural water bodies. Consumption of such toxic, contaminated water by community members increases the risk of contracting ailments and diseases, such as cholera and dysentery, which increases household mortality rates, especially among children and the aged. Lack of adequate sanitation/irrigation facilities and best practices measures in residential communities increases public health hazards/risk. Accordingly, proper disposal of liquid domestic wastes is very vital for ensuring public health (WHO, n.d.). The spread of waterborne illnesses caused by public water contamination occasioned by improper and unhygienic liquid waste disposal disrupts both personal existence and corporate societal survival, since it creates unproductive economic environments, reduced labour supply, output reduction, and human productivity (Etea et al., 2021).

**Table 3: Frequency of Domestic Waste Evacuation by Sanitation Officers in the Study Area**

Frequency of visits by sanitation officers	Frequency	Percentage
Undefined schedule visits by sanitation officials for domestic waste evacuation	86	71.7
Regular visits by sanitation officials	34	28.3
<i>Total</i>	<i>120</i>	<i>100.0</i>

**Source:** Field survey, 2024

Table 3 presents the reported schedule of sanitation officials' visits to residential households and public places for domestic waste evacuation in Ikorodu LCDA. The results show that only about 28% of the respondent households reported a regular visit from sanitation officials in their neighbourhood and public places (more often every month), while the majority (about 72%) of the respondent households reported unscheduled visits from the sanitation officials and public waste managers around the residential areas. The implication of these unguided behavioural practices and haphazard waste management systems is the possibility of a low environmental/health risks awareness threshold among residential households, with its resultant high tendency of enforced public health/environmental epidemic hazards concerns in the study area.

### **Factors Influencing Households' Environmental/Health Hazards/Risks Perception of Improper Waste Disposal Practices**

The MNL result of the factors influencing households' environmental/health hazards perception of improper waste management practices (WMP) is presented in Table 4. The probability of residential households not normally associating prevalent environmental or health concerns of members with improper handling of domestic waste formed the base category. Households whose heads were formally educated (0.114;  $p < 0.1$ ); those located within the rural sector of Ikorodu LCDA (3.348;  $p < 0.05$ ); those whose houses were relatively distant from the primary healthcare facility (0.500;  $p < 0.1$ ); and those that observed community sanitation exercises more often (0.250;  $p < 0.1$ ); had more probability of experiencing respiratory nausea complications and restiveness as a result of improper waste disposal; as earlier reported by Sultana (2020). Residential households with modern channels for dispensing their household liquid wastes, such as close septic tank systems (0.491;  $p < 0.1$ ); those whose houses were relatively far from the community primary healthcare facility (0.640;  $p < 0.05$ ); those frequently observing community sanitation exercises (0.247;  $p < 0.1$ ); and those that patronise community waste managers more often (1.922;  $p < 0.1$ ); would more likely experience food/water contamination and ill-health associated with the prevalence of pests and rodents within their residential houses in the community, against *a priori* expectation. Largely among residential households that would likely experience offensive odour and environmental irritation were those whose house were located far from the community primary health care facility (0.354;  $p < 0.05$ ); those that participated in community sanitation exercises more often (0.345;  $p < 0.1$ ); and those who mostly patronised the community waste evacuation services (1.922;  $p < 0.1$ ), against also *a priori* expectation. The reason for this observed contradictions may be due to the proximity of residential households, and the proximal inter-flow of the effects of their individual waste disposal activities within the interconnected land space (road networks), aerial space (atmosphere), and natural resources (surface land, water bodies, and nearby forest areas), as supported by the earlier findings of Femi et al. (2017), Sims et al. (2017) and WHO (2018) report.

**Table 4: Result of the MNL Maximum Likelihood Estimates of the Factors Influencing Households' Environmental/Health Hazards Perception of Improper Waste Management Practices**

Symbol Variables		Offensive Odour and Environmental Irritation	Food/water Contamination and Ill-Health Associated with Pests and Rodents Prevalence	Respiratory Nausea Complications and Restiveness
	Intercept	6.652 (0.998)	-13.637 (0.995)	-21.541 (0.994)
$X_1$	Education of household head	-0.037 (0.405)	-0.051 (0.364)	0.114* (0.047)
$X_2$	Household size	0.329 (0.178)	0.295 (0.301)	0.052 (0.871)
$X_3$	Liquid waste disposal facilities	-2.693* (0.040)	-0.666* (0.064)	0.454 (0.749)
$X_4$	Solid waste disposal facilities	-0.825* (0.073)	-1.057* (0.035)	0.355 (0.480)
$X_5$	Liquid waste disposal technique	0.522 (0.420)	1.491* (0.057)	-0.551 (0.450)
$X_6$	Solid waste disposal technique	40.728 (0.987)	26.943 (0.991)	48.851 (0.985)
$X_7$	Relative location of residence	0.461 (0.656)	1.093 (0.362)	3.348** (0.007)
$X_8$	Distance of house to primary healthcare facility	0.354** (0.029)	0.640*** (0.001)	0.500* (0.093)
$X_9$	Distance of house to community waste dumping site	13.414 (0.995)	-4.850*** (0.000)	8.967 (0.997)
$X_{10}$	Distance of house to community waste dumping site	-59.068 (0.977)	-15.119 (0.990)	-48.457 (0.979)
$X_{11}$	Environmental/health risk awareness index of improper waste disposal	-1.042** (0.005)	-1.336*** (0.001)	-1.427*** (0.000)
$X_{12}$	Environmental law awareness index	-0.212 (0.662)	-1.266* (0.019)	-0.381 (0.518)
$X_{13}$	Frequency of community sanitation exercises	0.345* (0.031)	0.247* (0.034)	0.250* (0.037)
$X_{14}$	Visit frequency of household waste evacuation agency	1.922* (0.034)	2.919** (0.007)	0.112 (0.926)
<b>Model characteristics</b>				
	Log-likelihood	-98.106		
	Number of observation	120		

Symbol Variables	Offensive Odour and Environmental Irritation	Food/water Contamination and Ill-Health Associated with Pests and Rodents Prevalence	Respiratory Nausea Complications and Restiveness
Likelihood Ratio (Chi-Square)	138.137		
Prob> chi2 (Sig.)]	0.000		

\*\*\*, \*\* and \* implying that variable was significant at the 1%, 5% and 10% levels, respectively.

**Source:** Result of data analysis (2024).

### Conclusion and Recommendations

Issues bordering on improper domestic waste disposal have defied known boundaries to go beyond mere air pollution concerns, to those of human health and environmental resource degradation. Improper waste management practices encompass all illegal means of waste dumping, burning, underground burying for solid waste materials, and landfilling options; as well as unapproved spillages, discharges and evacuations of liquid waste, in manners that pose environmental and health challenges to man, his animals, and the natural habitat. Despite the relative educational endowment and the formal sector livelihood engagement status of most residential households in Ikorodu LCDA, evidences of improper waste management practices were established among them; as they largely engaged in open air solid waste burning; filling of pits, potholes and gully with solid waste materials; and dumping/channeling of waste into open fields and nearby natural water bodies within the neighbouring vicinity in most of the emerging communities in the local areas.

To stem the spate of environmental and human health threats posed by the challenges of improper waste management practices in Ikorodu LCDA, the study recommended thus:

1. There is a need for more orientation for residential houses within the emerging communities towards the environmental/health hazards of improper waste disposal.
2. Due to the rapid residential and industrial evolution of the study area, deployment of waste collection bags/trash cans, drainage channels and other modern facilities for domestic waste evacuation should be made available to residential houses for uncompromised adoption/utilisation.

### References

- Abah, S. O., & Ohimain, E. I. (2010). Assessment of dumpsite rehabilitation potential using the integration risk based approach: A case study of Eneka, Nigeria. *World Applied Sciences Journal*, 8(4), 436-442.
- Addo, H. O., Dun-Dery, E. J., Afoakwa, E., Elizabeth, A., Ellen, A., & Rebecca, M. (2017). Correlates of domestic waste management and related health outcomes in Sunyani, Ghana: A protocol towards enhancing policy. *BMC Public Health*, 17, 1-10. <https://doi.org/10.1186/s12889-017-4537-8>.
- Adegbita, M. A., Nwafor, S. O., Afon, A., Abegunde, A. A., & Bamise, C. T. (2010). Assessment of dental waste management in a Nigerian tertiary hospital. *Waste Management & Research*, 28, 769-777.

- Ahmad, W., Alharthy, R. D., Zubair, M., Ahmed, M., Hameed, A., & Rafique, S. (2021). Toxic and heavy metals contamination assessment in soil and water to evaluate human health risk. *Scientific Reports*, *11*(1), Article 17006. <https://doi.org/10.1038/s41598-021-94616-4>.
- Alagoz, B. A. Z., & Kocasoy, G. (2007). Treatment and disposal alternatives for health-care waste in developing countries: A case study in Istanbul, Turkey. *Waste Management & Research*, *25*, 83-89.
- Coker, A. O., Sikiru, K. A., Sridhar, M. K. C., & Sangodoyin, A. Y. (2009). Characterization and management of solid hospital wastes in Ibadan, Nigeria. In J. Pickford (Ed.), *Integration development for water supply and sanitation: Proceedings of the 25th Annual Conference of WEDC* (pp. 331-334). WEDC.
- Da Silva, C. E., Hope, A. E., Ravanello, M. M., & Mello, N. (2005). Medical waste management in the south of Brazil. *Waste Management & Research*, *25*, 600 to 605.
- Etea, T., Girma, E., & Mamo, K. (2021). Risk perceptions and experiences of residents living nearby municipal solid waste open dumpsite in Ginchi town, Ethiopia: A qualitative study. *Risk Management and Healthcare Policy*, *14*, 2035-2044. <https://doi.org/10.2147/rmhp.s309295>.
- Farzadika, M., Moradi, A., & Mohammedi, M. S. (2009). Hospital waste management status in Iran: A case study in the teaching hospital of Iran University of Medical Sciences. *Waste Management & Research*, *27*, 384-389.
- Femi, R. T., Nongo, C., & Fasina, B. (2017). Social factors and waste disposal practices among residents of Akungba Akoko, Ondo State. *Journal of Asian Research*, *1*, 47-59. <https://doi.org/10.22158/jar.v1n1P47>.
- Ferreira, A. P., & Veiga, M. M. (2003). Hospital waste operation procedures: A case study in Brazil. *Waste Management & Research*, *21*, 377-382.
- Hampel, B., Boldero, J., & Holdsworth, R. (1996). Gender patterns in environmental consciousness among adolescents. *Australian and New Zealand Journal of Sociology*, *32*(1), 211-218.
- Jambeck, J. R., Geyer, R., Wilcox, C., Siegler, T. R., Perryman, M., Andrady, A., Narayan, R., & Law, K. L. (2015). Plastic waste inputs from land into the ocean. *Science*, *347*(6223), 768-771.
- Kefande, P., Segda, B. G., Nzihou, J. F., & Koulidati, J. (2013). Environmental impacts of waste management and health issues: A case study of the city of Kaya, Burkina Faso. *Journal of Environmental Protection*, *4*(10), 1080-1087.
- Kwun Omang, D. I., Egbe John, G., Alain Inah, S., & Owan Bisong, J. (2021). Public health implication of solid waste generated by households in Bekwarra Local Government Area. *African Health Sciences*, *21*, 1467-1473. <https://doi.org/10.4314/ahs.v21i3.58>
- Lelieveld, J., Evans, J. S., Fnais, M., Giannadaki, D., & Pozzer, A. (2015). The contribution of outdoor air pollution sources to premature mortality on a global scale. *Nature*, *525*(7569), 367-371.
- Manguin, S., Khasnatinov, M., Abdu, M., & Myint, O. (2016). Mosquitoes ecology and their importance to vector-borne diseases. *Tropical Medicine and Infectious Disease*, *1*(1), Article 10.
- Misra, V., & Pandey, S. D. (2005). Hazardous waste, impact on health and environment for development of better waste management strategies in future in India. *Environment International*, *31*(3), 417 to 431.

- Mobosi, K. A. (2025). Environmental and health implications of improper waste management in urban areas. *World Journal of Advanced Research and Reviews*, 25(3), 757 to 760.
- Oke, I. A. (2008). Management of immunization solid waste in Kano State, Nigeria. *Waste Management & Research*, 28, 2512 to 2521.
- Olubukola, B. O. (2009). *Comparative analysis of health care waste management practice in two general hospitals in Nigeria*. <http://www.eco-web.com/edi/index.htm>
- Phengxay, S., Okumura, J., Miyoshi, M., Sakisaki, K., Kuroiwa, C., & Phengxay, M. (2005). Healthcare waste management in Lao PDR: A case study. *Waste Management & Research*, 23, 571-581.
- Salequzzaman, M., Awal, S., & Alam, M. (2009). Willingness to pay for community-based solid waste management and its sustainability in Bangladesh. *Environment and Development Economics*, 12, 155-161.
- Sclar, G. D., Penakalapati, G., Caruso, B. A., Rehfuess, E. A., Garn, J. V., Alexander, K. T., Freeman, M. C., Boisson, S., Medlicott, K., & Clasen, T. (2018). Exploring the relationship between sanitation and mental and social well-being: A systematic review and qualitative synthesis. *Social Science & Medicine*, 217, 121-134. <https://doi.org/10.1016/j.socscimed.2018.09.016>.
- Selin, E. (2013). *Solid waste management and health effects: A qualitative study on awareness of risks and environmentally significant behavior in Mutomo, Kenya*. <https://www.diva-portal.org/smash/get/diva2:607360/FULLTEXT02.pdf>.
- Sims, S., Duong, T., & Johnson, T. (2017). Waste management and public health: Impacts and solutions. *Journal of Environmental Health*, 79(9), 22 to 31.
- Sultana, F. (2020). Embodied intersectionalities of urban citizenship: Water, infrastructure, and gender in the global south. *Annals of the American Association of Geographers*, 110, 1407 to 1424.
- Sultanova, D., Maliashova, A., & Gadelshina, S. (2021). Waste management as an element of sustainable development of the circular economy in the European Union. *E3S Web of Conferences*, 247, Article 01007. <https://doi.org/10.1051/e3sconf/202124701007>.
- Townend, W. K., & Cheeseman, C. R. (2005). Guidelines for the evaluation and assessment of the sustainable use of resources and of waste management at healthcare facilities. *Waste Management & Research*, 23, 398-408.
- Tudor, T. L., Noonan, C. L., & Jenkin, L. E. T. (2005). Healthcare waste management: A case study from the Cornwall NHS, UK. *Waste Management & Research*, 25, 606-615.
- UN Environment. (2017). *The global garbage crisis: No time to waste*. <https://www.unep.org/news-and-stories/press-release/global-garbage-crisis-no-time-waste>
- United Nations. (2000). *State of the environment in Asia and the Pacific 2000*. United Nations.
- World Health Organization. (2018). *Air pollution and health*. <https://www.who.int/news-room/fact-sheets/detail/air-pollution-and-health>.
- World Health Organization. (n.d.). *Sanitation*. <https://www.who.int/news-room/fact-sheets/detail/sanitation>
- Yoda, R. M., Chirawurah, D., & Adongo, P. B. (2014). Domestic waste disposal practice and perceptions of private sector waste management in urban Accra. *BMC Public Health*, 14, 1-10.