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Residents' Perception on Central Storage of Solid Wastes in Ilorin Metropolis, Kwara State, Nigeria

Research Article

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Abstract

Background: Solid waste management in Nigeria has been a major concern to stakeholders due to inefficient collection and unsafe disposal. In Ilorin, the capital of Kwara state, the problem of wastes is becoming alarming because the more these wastes are evacuated the more they are generated on a daily basis. Thus, the issue of central storage of solid waste situation in Ilorin to say the least is becoming quite distressing.

Objectives: This study addressed issues relating to waste management and perception of residence to central waste storage in Ilorin metropolis.

Methods: A cross-sectional study was conducted among the residents in the three local government that constitute Ilorin metropolis, residents living close to central wastes storages in Ilorin metropolis are purposively chosen and the registered wastes contractors with the Kwara State Environmental Protection Agency (KWASEPA). In accomplishing these objectives, both primary and secondary data sources were used. The primary data were collected via questionnaires and field observations. Secondary data were extracted from different published and unpublished materials. 120 households located on the main road and close to central wastes storage bins and 30 wastes contractors are administered with questionnaires. The data were analyzed using statistical package for social science (SPSS version 23) for descriptive and inferential at 5% level of significance.

Results: The operational capacities of wastes contractors showed a low capacity as 66.7% (20) operate with single rickety truck. Dumpsites accessibility and insufficiency is an impediment as the dumpsite was found to be too far and largely inaccessible. Condition of wastes spillage from the central storage and storage on the road meridians are draw backs to effective wastes management and majority of respondents 66.7% are unhappy.

Conclusion: It was discovered that central wastes storage system in Ilorin metropolis was not effective with constant incidence of wastes spillages and storage on road meridians. Therefore, capacity and competence should be considered in wastes management contract award, provision of more central wastes storage, establishing wastes transfer station, provision of adequate dumpsites at different local government, public enlightenment, regular trainings for wastes consultant, provision of loans for wastes consultants for acquisition of trucks and proper monitoring by regulatory agency will ensure a clean and sanitary environment in the metropolis.

Keywords: Central wastes storage; Dumpsites; Wastes contractors; Kwara State Environmental Protection Agency; Nigeria

Introduction

Wastes are all things we consider unfit, unwanted and discarded due to economic reasons or ignorance of alternative technologies to re-use them [1,2]. According to Adegoke [3], wastes are substances and materials that are disposed of or are required to be disposed of according to the provision of National Law. Wastes are abandoned as useless, yet if incorrectly processed, stored, transported, or dumped, they have the potential to cause death, sickness, or harm to humans or ruin the environment [4]. As a result, garbage is a byproduct of life, and its creation is worldwide. Individual, familial, municipal, industrial, and developmental activities all generate waste [5-12]. Because garbage is created on a regular basis, it is also thrown away indiscriminately in certain locations, with complete disregard for the environment or immediate surroundings, such as land, sewers, or water bodies [13-22]. Organic components are naturally destroyed and returned to the life cycle. The inorganic or non-biodegradable components, on the other hand, it remains as residues for days or weeks depending on their chemical composition, and some of them become hazardous [23-31]. The problem is exacerbated by the fact that current science and technology contribute to the release of thousands of new consumer items onto the market via discoveries and inventions. As a result, we have problems in protecting the planet's delicate ecosystems [9,10,32]. Waste control and management are treated seriously in modern cultures. Waste is a severe challenge in a developing country like Nigeria due to a lack of awareness of its nature and the skills required to handle it properly. While industrialized nations are expanding their understanding and conscience about minimizing, reusing, and recycling garbage, certain countries, such as Australia and New Zealand, are heading toward zero waste to landfill. With anti-climate change slogans and efforts from concerned environmentalists and civic societies, no-burn technologies are becoming the norm [33,34]. In Nigeria, the typical inhabitant generates 0.43kg of solid garbage every day. Organic waste accounts for 60 to 80 percent of total garbage, with plastics/nylon and scrap metal being the most recyclable elements [35,36]. Waste management has been one of the major urban management challenges in Sub Saharan African countries and Nigeria is no exception. The challenges of management of solid waste which had turned some major cities into ugly sights to behold and resulted in the poor aesthetic appeal of those cities are the result of poor mastering of concepts, approaches and techniques [37]. Imam *et al.* [38], reported that piles of waste are dumped by the roadside and other open spaces, posing an environmental risk. Ogbonna *et al.* [39], observed that cities are divided into sections for the local contractors. However, inefficiency still thrives due to the lack of coordination by the Government and the lack of expertise on waste management issues by the environmental agencies.

Methods

Study Area

The study area is the city of Ilorin which is the largest urban center in Kwara State. It is also the capital of Kwara State. Ilorin city occupies an area of 89km^2 and lies between the latitude 8.1333 and longitude 4.8833 along equator (Figure 1). Ilorin metropolis is composed of three local government areas; Ilorin West, Ilorin East, and Ilorin South. Ilorin city is the commercial and administrative center of the state [40-42]. The population of Ilorin according to 2006 census is 777,667 and this study covers all the three Local Government Councils.
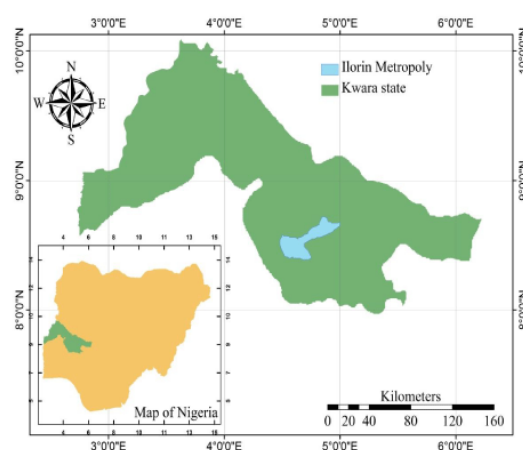

Figure 1: Map of Kwara State showing the study area.

Study Population

The study population are residents living close to central wastes storage and wastes management contractors working in Ilorin metropolis which is the capital city of Kwara State, Nigeria.

Sampling Techniques

The sampling technique employed in this study is the purposive sampling technique. Only households identified as located in areas where there are central wastes storages bins and waste management contractors registered with government are selected for the study.

Data Instrument

A semi-structured, interviewer administered questionnaires were used to elicit information on the socio-demographics and perception about central wastes storage in the city. The instrument was pre-tested using 12 households at Tanke area from residents along central wastes storage places. Each question was translated into the local languages for those that could not read English, to help the respondents to give true and accurate answers.

Data Analysis

Data was analyzed using SPSS 23, using descriptive statistic such as mean, frequencies, charts and graphs.

Ethical Approval

Ethical clearance for this study was obtained from the Kwara State Ministry of Health Ethical Review Committee. Informed consent of participants were sought before taking part in the study.

Results and Discussion

Socio-Demographic Characteristics of respondents

Here we present the results of the distribution of residents based on their age, marital status, educational level and tribal status respectively.

The Table 1 above shows results from wastes scavengers' socio-demographic data. Also, Figure 2 is the map of distribution of central wastes bins and number of bins within Ilorin metropolis, this covered three local government areas that made up the metropolis namely Ilorin west, Ilorin south and Ilorin east. The least number of central wastes bin at a place is 1 bin which occur in seven locations while the highest number of bins are 6 central wastes bins which are just two areas. Table (2) above show distribution of residents' types and perception on effectiveness of central wastes storage and disposal. The residents who took part in the study cut across almost all strata of the society from residential, business premises, hospitality industries, and those that produce special wastes like hospitals, pharmacies, and diagnostic centres classified as others. The distribution is such that households constitute that majority with (65) representatives which is equivalent to 54.2% of the total respondents' population size. Business premises and offices are next in terms of population with (27) representatives, constituting 22.5%. The next premise is termed others and this includes all areas that generate special waste and those under this

Table 1: Demographic Characteristics of the Respondents

| Variables	Frequency	Percentages
Sex		
Male	46	38.3
Female	74	61.7
Age		
10-20 years	16	13.3
21-30 years	30	25.0
31-40 years	34	28.3
41years-above	40	53.4
Marital status		
Single	20	16.7
Married	82	68.3
Divorced	6	5.0
Widow/Widower	12	10.0
Tribe		
Hausa	31	25.9
Yoruba	60	50.0
Igbo	19	15.8
Others	10	8.3
Religion		
Christianity	32	26.7
Islam	86	71.7
Others	2	1.6
Highest level of education		
No formal	14	11.7
Primary	55	45.8
Secondary	38	31.7
Tertiary	13	10.8
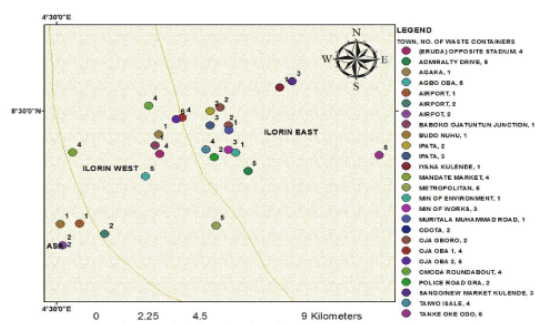
Figure 2: Map of distribution of central wastes bins and number of bins within Ilorin metropolis

category are the hospital, clinics, pharmacies and diagnostic centres. Finally, others comprise (17) representatives who make up 14.2% of the total population. On the closeness of central storage bins to premises, it was

Table 2: Effectiveness of central wastes storage and Disposal

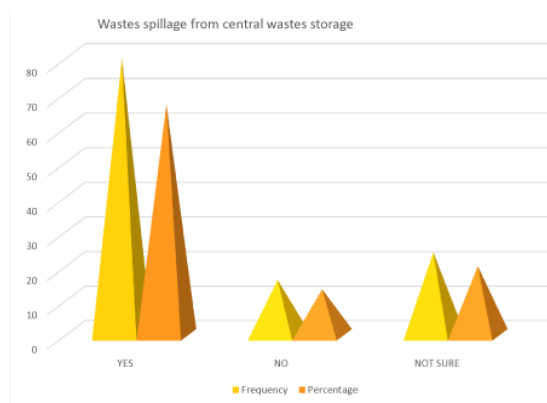| Premises Type	Frequency	Percentage
Household	65	54.2
Hotel/Eatry	11	9.2
Business Premise/Offices	27	22.5
Others	17	14.2
Total	**120**	**100**
Central Storage Too Close	**Frequency**	**Percentage**
Yes	34	28.3
No	86	71.7
Total	**120**	**100**
Storage Adequate	**Frequency**	**Percentage**
Yes	18	15
No	79	65.8
I Am Not Sure	23	18.7
Total	**120**	**100**

Figure 3: Wastes spillage from central wastes storage

revealed that majority of the central storage bins are not located close to premises as 86 of respondents which was 71.77% of respondents stated that the central wastes storage bins are not located too close to their premises while 34 respondents which was 28.3% revealed that the central wastes storage bins are located too close to their residence. On adequacy of the central wastes' storage bins, majority of residents believed the wastes storage bins are not adequate in quantity as 79 of the respondents which was 65.8% of the respondents while 23 which 18.7% are not sure and those that stated that the central wastes storage bins are adequate are just 18 which was 15% of the respondents. Figure 3 is a chart showing occurrence of wastes spillage from central wastes storage bins across the metropolis. Majority of the residents indicated occurrence of wastes spillage in the central waste's storage point near them. The total number of 80 households, which is 66.7%

of the respondents, revealed wastes spillages in the central storage in their areas. Those who are not sure of wastes spillages in their areas are 24, constituting 20% of the respondents. The number of respondents said there are no wastes spillages from central wastes storage in their areas are 16 which were 13.3% of the respondents. Figure 4 shows the environmental health concerns of central wastes storage each cluster is representing unique environmental health issues observable by the residents in the central wastes storage system in the metropolis. The first environmental health issue is flies' infestation; questions are asked from the residents on flies' infestation occurrences in their area. The results showed that the majority of the residents, 65% of them, which is equivalent to 78 households out of 120 households, have concerns concerning flies' infestation because of fear of disease transmission. On the other hand, some of the households are indifferent to the issue of flies' infestation and indicated that they are not sure if those flies pose any danger to them or their neighbourhoods. The respondents in this category constitute 20% of the respondents, which is equivalent to 24 households out of the total 120 respondents. The least categories believed that flies infestation could not constitute any health risks to them or their neighbourhoods. These groups comprise 15% of the total respondents, equivalent to 18 households. Also, among the observable issues of environmental health concern in the central wastes storage system is terrible odour from the central wastes storage areas that affect residents and passersby. Odour nuisance is another environmental health issue examined from questions asked from respondents. The information received showed that 60% of 72 households responded that odour nuisance constitutes a threat to the health of the residents and passersby. The remaining household that are not sure if the odour nuisance constitutes environmental health risk to the residents constitute 20% of the households which is equivalent to 24 respondents and this is similar to the number that opined that odour nuisance has no negative implication to the households and passerby which was also 20% of the respondents which amount to 24 households. Improper waste storage has been known to depreciate the aesthetic value of the environment and constitute a visual nuisance to the residents and visitors. Residents were asked of their perception of the central wastes storage in terms of depreciation of aesthetic value of the environment. The responses of the households to the questions as presented in figure 4 above showing that majority of the people,
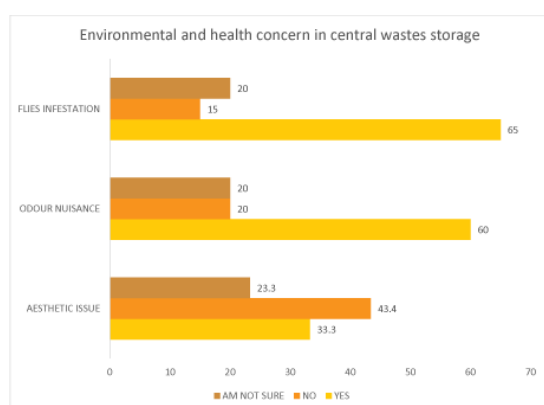
Citation: Raufu YO, Olayinka AS and Olawale SH. Residents' Perception on Central Storage of Solid Wastes in Ilorin Metropolis, Kwara State, Nigeria. ES J Public Health. 2022; 3(1): 1012.

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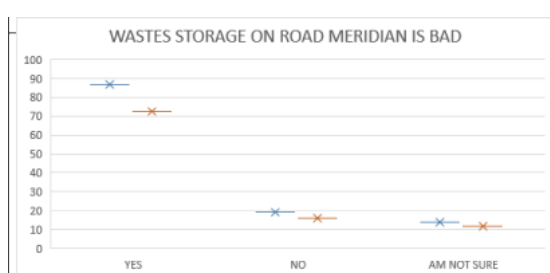**Figure 4:** Environmental health concerns of central wastes storage

Figure 5: Wastes storage on road meridian in Ilorin metropolis
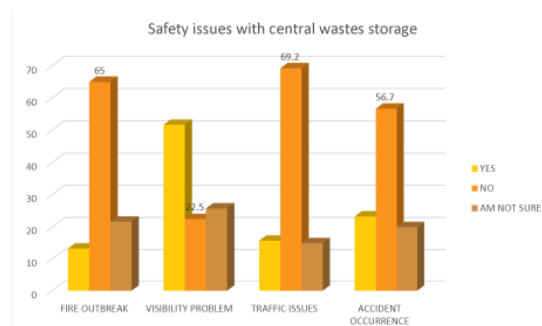

Figure 6: Safety concerns of central wastes storage

43.4%, do not feel that central wastes storage constitute a visual nuisance, inform depreciation of the aesthetic values of the environment. On the other hand, those that feel the central waste storage devalue the city's aesthetic appeal are 33.3% of the population, which amount to 40 households out of the total 120 households. The remaining 23.3% are not sure if the central wastes storage depreciates the aesthetic values of the environment or not. Figure 5 above present wastes storage on road meridian in Ilorin metropolis. The occurrence of wastes storage on the road divider or road meridian is becoming a new normal in the metropolis. Therefore, the researcher made enquiries from the residents to have their opinion on the practice. The result from the households is presented in figure 5 above.

However, most residents opined that such practice is terrible and that can be seen from their responses because 87 out of 120 households constituting 72.5% of the population thought the practice was terrible. The numbers of residents who see nothing wrong in storing wastes on the road meridian are 19 out of 120 households, constituting 15.8% of the total population. Thus, those who cannot say if the practice is good or bad are classed as am not sure group; they are the minority among the respondents with 14 out of the 120 households, equivalent to 11.7% of the responding households. Figure 6 shows Safety concerns of central wastes storage in the metropolis. Central wastes storages are usually known to constitute some traffic issues, especially by way of wastes overflow that usually obstruct traffic flow; the researcher asked some pertinent safety questions from the respondents. The answers to some safety questions are presented in the chart below. According to the respondents, fire outbreak incidence is a very rare occurrence with 13.3% occurrence. The majority of households stated that they have not experienced fire outbreaks, while 65% of households said they have not seen or heard of any fire outbreak. The third group of respondents is households who are unsure of seeing or hearing of any fire incidents arising from central waste storage. Furthermore, visibility issues arising from central wastes storage across the streets in the metropolis has been of safety concern. Therefore, the residents across the metropolis were asked about visibility problems. On visibility issues, most households close to central wastes storage agreed that there are visibility issues with central wastes storage. The respondents who agreed that there is a problem of poor visibility due to central wastes storage are 51.7% of the total population while those who are not sure if central wastes storage constitutes visibility issue are next with 25.8% of the population. Finally, the last group opined that central wastes storage did not constitute a visibility problem at any point in time. Those that stated that central wastes storage does not constitute a visibility problem are 22.5% of the total household involved in the study. Another safety concern raised in the questionnaire is traffic congestion problems. This is usually experienced due to overflow or spillage of wastes from the central wastes storage and during waste evacuation along the major streets in the metropolis. The residents' perception of traffic congestion was revealed as presented in the chart above on the third stack of bars. Generally, most residents, constituting 69.2%, consider central wastes storage as no major cause of traffic problems in their areas. On the other

hand, those who believe that central wastes storage is a major cause of traffic problems in their areas are just 15.8% and those that are not sure if central wastes storage constitutes traffic nuisance are a little less, which is 15% of the total respondents. The last safety issue examined was the occurrence of accidents due to the position of the central wastes' storage. The respondents, mostly 56.7%, stated they had not seen or heard of any accident resulting from the location of the central wastes storage close to their residence. On the other hand, those that stated that they have experienced or witnessed the occurrence of accidents resulting from the position of the central wastes storage are 23.3% of the households and the remaining 20% of the population are not sure if they have heard or experienced the occurrence of accidents as a result of the position of the central wastes storage in their areas.

Summarily, it was found that central wastes storage distributions were insufficient and majorly found in high-brow areas and the highest number of wastes bins found in a location were 6 and the least being 1 and other places don't have at all. This is in agreement with the findings of Batool [44] and Joseph [45] that stated that unavailability or insufficiency of dumpsters and poor transportation is a main drawback for efficient wastes management. Lack of sufficient waste collecting points was found as barrier by Nachalida *et al.*, [46]. Also, wastes spillage from the central storage is one of the draw backs of the system and majority of the residents 66.7% are unhappy with it while only 13.3% of respondents don't see spillage as a problem. This agreed with Kaoje *et al.* [47], on wastes storage situation in Sokoto state, 94.1% of resident are worried how solid waste litters the metropolis. On the storage of wastes on the road meridian and by the road sides, majority of respondents 72.5% opined that it is a bad practice. Fagariba and Song [48], also concluded that inadequate access to these waste bins as one of the main barriers. Issues relating to environmental health and safety concern of residents show majority of residents close to central wastes storage are concerned about flies' infestation with 63% respondents and follow by odour nuisance while aesthetic is the least of their concern. This was also identified by Steven [49], who associated central wastes storage with flies' nuisance and transmission of diseases and odours.

Conclusion

In recent years, the topic of environmental management and protection has taken on a worldwide scale. It has become more crucial that man's physical actions and activities favourably meet with necessary environmental norms and laws for the general well-being of people and society. To that purpose, different laws have been adopted at various times and are typically aimed at assuring sufficient management and preservation of the physical habitat, provided that good environmental management is legislatively driven. Thus, the public perception of solid waste management methods in Ilorin metropolis was researched in relation to central wastes storage in the metropolis, and it was discovered that citizens felt the existing wastes management practice could not handle the city's wastes problem. Therefore, adequate provision of central wastes storage to prevent traffic obstruction, spillages, accidents and devaluation of aesthetic of the environment is recommended. Also, provision of adequate dumpsites at each local government should be considered and proper management of the dumpsite must be ensured. Establishment of transfer stations to ease the travel time of wastes companies. Material Recovery facility should be established to recover recyclables from the waste and boost the economy through wastes to wealth.

Ethics approval

Ethical approval was granted from the Kwara State Ministry of Health Ethical Review Committee. Informed consent was obtained from each respondent.

Residents' consent

Obtained

Data Availability

Data used to support the findings of this study are included within the article.

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