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Effects of Indiscriminate Solid Waste Disposal And Environmental Issues In Ibadan South West Local Government, Oyo State, Nigeria

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Abstract
This study investigates the effect of indiscriminate solid waste disposal and environmental issues associated with the management of solid waste in Ibadan South West Local Government, Nigeria. Primary and Secondary data were used for the study. Primary data were acquired through structured questionnaires administered to a sample of 300 respondents which was randomly selected from the each local government area. The Questionnaire was administered based on the data elicited from the respondents were analyzed through non-parametric method of Chi-square. Three (3) hypotheses were formulated for this study which was all rejected; showing that indiscriminate dump of Solid Waste had significant effects on Environment, Health, people's attitude and practice. Secondary data were acquired from desk review method; information on environmental issues emanating from poor management of indiscriminate solid waste was obtained from literatures that are relevant to the study. The results of the findings obviously show that several major streets, open spaces, and even water ways are been used as refuse dump sites within the local government. The major environmental issues resulting from improper disposal and poor management of solid waste in Ibadan South West local government are physical nuisance of the waste to the environment. Generally, the study shows that soil, air and water pollution in the study area are caused by both pathogenic and chemical elements from these large amount of solid waste that hit some of the market places, abandoned land/building and major streets. Therefore, this paper recommends that a strong legislation with severe penalty be put in place and there should be a continuous public enlightenment/education on the danger of indiscriminate waste to the general public. It is also recommended that available market be created for these waste that can be recycled.
Keywords: Indiscriminate Solid Waste, Non-Parametric, Environmental Issues, Chemical Elements, Harmful, Management, Refuse Dumps.

1.0 Introduction

This study appraised the indiscriminate solid waste disposal and the environmental issues relating to such disposal in Ibadan South West Local Government. Indiscriminate solid waste are regarded as discarded materials arising from operational activities taken place in different land use such as residential, commercial and industrial. Domestic or residential wastes are those that are collected from dwelling places on a regular basis, such waste include organic matter resulting from preparation and consummation of food, rags, nylon and ashes are the remains after various cooking and heating processes. The commercial wastes are those that arise from shops, supermarkets, market and others; they include paper carton, polythene bags and nylons. The industrial wastes are those waste materials that arise from industries; these could be solid, liquid, sludge or emotive title attached to them like toxic, hazardous and special waste. The industrial waste include metals, scraps, chips and grits from machine, shops, sawdust, paper pieces and glass (Omole and Alakinde 2013). Kenneth and Huie (1983) also classified solid waste into three categories, namely; garbage, ashes and rubbish. The garbage includes organic matter resulting from preparation and consumption of food. Ashes include remains from cooking and heating process and the rubbish may either take the form of combustible such as paper, rags, wood, leaves and weeds or non-combustible such as glass, plastic, polythene and metal materials.

Indiscriminate dumping refers to unlawful disposal of waste in undesignated spaces such as open or vacant land, sources of water and other areas (Achi et al. 2012; Okechukwu et al. 2012; Machete and Shale 2015). Indiscriminate dumping is a common and prevalent though risky practice, especially among developed and developing communities. Two separate studies conducted in Nigeria and Ghana came to the same conclusions: that approximately 80% of solid waste in African countries was disposed of through indiscriminate dumping (Ogwueleka 2009; Aziale and Asafo-Adjei 2013). The prevalence of indiscriminate dumping and its spread across African communities is therefore clear. However, although indiscriminate dumping is more prevalent in developing countries, developed countries are not an exception.

Currently, most developing countries appear to be failing to find their way around solid waste handling and management. Consequent upon the high prevalence of indiscriminate dumping, people from developing economies are at risk of myriad environmental and health hazards, such as air pollution, water pollution and bio-chemical poisoning of food supplies, resulting from indiscriminately dumped municipal and hazardous waste materials (Rahman et al. 2013).

Waste disposal could be described as indiscriminate when such materials are disposed of at locations that are unlawful and where it could result in or trigger environmental or health hazards to people and animals alike. For instance, refuse disposed in or around canals can hinder the free passage of rain water through such channels and hence cause the overflow of rain water beyond boundaries to damaging proportions. This is common whenever flooding occurs. Several studies have shown that solid waste generation rate is average of 0.5kg per person per day (Okpala, 1984). The generation rates for the African's major cities are estimated to range from 0.31 to 1.4kg per capital per day. This gives an average of 0.78kg (Achankang, 2003).

According to world Bank study, urban per capital waste management rate for most of the low-income countries will increase by approximately 0.2kg per day by 2025 because of relatively high annual growth rates of GNP and urban population (Chakrabarti and Ssarkhal, 2003).

Despite this, few of the populace is still served; where served, not all the refuse is collected in most cases. Due to the overwhelming volume of solid waste, the Ibadan City Council cannot single-handedly collect and dispose them. Consequently, the government has allowed private collection and disposal of these solid wastes on a commercial basis. It is alarming that problem of inefficient solid waste management still linger on after the incorporation of the private business men tagged 'waste contractors'. This leaves refuse containers filled to the brim and sill over and more importantly allowing the refuse enough time to decompose. These constitute health risk to the household. Improper collection and disposal leads to spread of communicable diseases, obnoxious conditions and spoils biosphere as a whole; for instance, respiratory infections and diarrhea diseases have been identified as the two major causes of death among the poorest 20% of the world countries ranked by national GDP per capital (Gwatkin and Guillot, 1999). The outbreak of these diseases has been attributed to area where solid waste is improperly collected and disposed.

The poorest populations mostly resort to sporadic and indiscriminate dumping of their waste into available plots of land, sidewalks, roadways, streams, channels and drainage areas. More than 70 percent of the refuse generated in the city is disposed of in this way. These refuse are good contaminants of streams, ground water especially shallow wells and the entire environment. Therefore, this study aimed at assessing the effect of indiscriminate solid waste disposal and the environmental issues in Ibadan South and make necessary recommendations on waste disposal and management practices to prevent further deterioration of the environment and the negative effects on the human population in Ibadan South West Local Government Area.

1.1 Research Question

During the survey conduct the following question were thrown to the respondent;

i. Do solid waste properly disposed within the Local Government?
ii. Are there any benefits that can be derived from waste?
iii. Does Solid waste a major environmental issue?
iv. Does the quality of waste disposal services satisfactory?
v. Does method of waste adopted work for the resident living within the Local Government?
vi. Is it good to bury waste than to burn it?

1.2 Aim and objectives

The aim of this study is to know the state of solid waste disposal, methods and environmental issues relating to such disposal.

1.3 The objectives of the study are;

1. To establish the current situation of solid waste disposal in Ibadan South West
2. To identify the method of waste disposal within the Local Government
3. To know the environmental issues associated with the management of solid waste.
4. To analyze the whether there is significant relationship between environment, health and peoples' attitude towards solid waste disposal
5. To know the contribution of the local and state on solid waste disposal

1.4 Statement of Problem

The Problem of Indiscriminate dumping of Solid Waste in the world at large has become extremely large and a dangerous issues in the society. Indiscriminate dumping of Solid Waste is can be found in all environments, both in urban and rural areas. Its consequences cannot be over emphasized. Open space, Major Street, Land,

abandoned buildings and waterways have been converted into refuse dumps sites by dwellers. These activities have lead to environmental degradation, air pollution, land pollution and harmful environment. Those who live close to area where dump sites are located suffer as a result of these problems. From the aforementioned above, this study aimed at investigating on the indiscriminate dump of Solid Waste in Ibadan South West local government.

1.5 Purpose of the Study

The purpose of this study is to investigate indiscriminate dump of Solid Waste and environmental issues in Ibadan South West local government.

1.6 Research Hypotheses

Formulated Hypotheses to guide this study are the following;

1. Indiscriminate dump of Solid waste has no significant effect on the Environment.

H_1: Indiscriminate Solid Waste prevention leads to better environment for the present and future, thereby leading to sustainable development

H_2: Indiscriminate dump of Solid waste disposal is a huge mess to the environment

H_3: Indiscriminate dump of Solid waste disposal reduces environmental values

H_4: Indiscriminate dump of Solid waste causes damage to soil through deposits of harmful chemicals and material

H_5: Indiscriminate dump of Solid waste blocks drainages which can lead to flood in the environment

2. Indiscriminate dump of Solid waste has no significant effect on Health of the individuals

H_1: Indiscriminate dump of Solid Waste causes infectious diseases among people

H_2: Indiscriminate dump of Solid Waste pollutes the atmosphere which causes air-borne diseases

H_3: Indiscriminate dump of Solid Waste is a breeding place for diseases vectors which transmit diseases

H_4: Indiscriminate dump of Solid Waste results to contamination of food and water

H_5: Indiscriminate dump of Solid Waste causes Cholera and Dysentery

3. Indiscriminate dump of solid waste has no significant relationship between people's attitude and practice.

H_1: Indiscriminate dump of Solid Waste arises because people cannot pay for the waste

H_2: Indiscriminate dump of Solid Waste is because of people's laziness

H_3: Indiscriminate dump of Solid Waste were dumped in abandoned lands

H_4: Indiscriminate dump of Solid Waste results as a result of non-implemented sanctions for violators

H_5: Indiscriminate dump of Solid Waste dumped on the waterways

2.0 Concept of Indiscriminate Solid Waste

Indiscriminate dumping is a common and prevalent though risky practice, especially among developed and developing communities. For example, a study in Nigeria found that 68% of the solid waste generated by communities was indiscriminately dumped, 20.8% disposed of through appropriate landfill sites and 10.7% burnt (Regassa, Sundaraa, and Seboka 2011; Adeniran, Adewole, and Olofa 2014).

Environmental health risks are made complex by the lack of classification of indiscriminately dumped waste. According to Demirbas (2011) and Musingafi et al. (2014) a number of criteria are employed to classify wastes into types, including their sources, physical state, material composition and the level of risks associated with waste substances. Indiscriminate dumping is a major environmental and public health hazard prevalent in most developing countries as this practice is still rife (Ogedengbe and Oyedele 2006; Akindutire and Alebiosu 2014). The formalization of households into high density settlements, together with inefficient refuse removal services, compound the indiscriminate dumping problem in most developing communities.

2.1 Concept of Environmental Health Impact

Human health and wellbeing rely on the quality of the surrounding environment (Oluranti and Omosalewa 2012; Rim-Rukeh 2012; Sankoh, Yan, and Tran 2013), and environmental health factors affect human health through multiple pathways, amongst which are exposure to biological, physical and chemical substances (Mathee 2011; Sankoh, Yan, and Tran 2013; Muchangos, Liu, and Li 2014). Indiscriminate dumping of solid waste allows, for example, the accumulation of metals in edible vegetables such as waterleaf, thus posing communities that collect these vegetables to environmental health risks. In a study conducted in Nigeria and Ghana, waterleaf plants were found to have very high concentration levels of lead, cadmium and zinc (Rim-Rukeh 2012). The study found that much of the toxic metal such as lead and cadmium enters the human body by direct ingestion of vegetables or other plants that absorb the metals from contaminated soils (Loboka et al. 2013; Olayinka and Adedeji 2014). Al-Jassir, Shaker, and Khaliq (2005) and Ali et al. (2014) conclude that these chemicals are very harmful because of their non-biodegradable nature and potential to accumulate in different body parts. Therefore,

environmental health risks posed by indiscriminate dumping can have immediate as well as delayed effects on both human health and the environment.

According to Palfreman (2014) in a study of several unplanned settlements in low-income areas of Dar es Salaam, Tanzania, the ministry of health reported 7000 cases of cholera between 1998 and 2005 which were associated with indiscriminate dumping of solid waste.

In Ghana, attempts made at controlling cholera outbreaks were not successful because no long-term approaches to proper solid waste disposal and provision of potable water have been implemented (Ashitey 2014).Improper solid waste management does not only have a negative impact on human health: it can also cause economic loss in the form of ill-health of citizens as a result of the outbreak of diseases.

One important example of municipal solid waste is plastic bags, which form a large component of such waste. At times they are burnt as a means of disposal or removal from the environment, and this result in the release of toxic heavy metals and the emission of greenhouse gases like dioxins and furans. These gases cause air pollution and contribute to global warming (Mangizvo 2012). Furthermore, plastics are capable of holding rain water for several days, thereby providing breeding habitats for mosquitoes. In some developing countries in Africa, such conditions have been blamed for the increasing incidence of malaria (Aziegbe 2007; Muchangos, Liu, and Li 2014).The uncontrolled dumping of unknown waste in any available open spaces and sites leaves the safety and health of humans, animals and the environment at risk.

More importantly, major environmental health risks often emanate from the co-disposal of municipal, health care and industrial waste in these dumps (Machete and Shale 2015). In most African countries, indiscriminately dumped solid waste is found in trenches, on roadsides, in or near rivers, on open lands or burnt (Din and Cohen 2013; Akindutire and Alebiosu 2014). Environmental consequences and risks associated with these practices, such as air pollution, flooding due to clogged storm water drains, land degradation, poor soil fertility, contamination of groundwater and surface water bodies, amongst many others, are widespread across the continent (Loboka et al. 2013; Ali et al. 2014). In addition, a relationship was found between the value of rental properties and dump sites where indiscriminate dumping of solid waste takes place, with most properties no longer being rented, resulting in economic losses for the property owners (Ogedengbe and Oyedele 2006; Oluranti and Omosalewa 2012).

2.2 Indiscriminate Solid Waste Management Systems

Generally municipal solid waste are dumped along some major streets, open space, abandoned house, median strip of the road, and some close to river, upon the fact that refuse bins/incinerator are provided by the state government in few areas and along the expressway and as well as major and minor roads of the metropolis. More than two-third of the residents do not use authorized dumpsites for their waste (Nabegu, 2013). Oyo state government is doing the best in ensuring that the indiscriminate solid waste are properly managed in all the local government in Ibadan, but the social-cultural characteristics of the residents are counterproductive. In addition, some areas are totally inaccessible for collection of these wastes because of poor urban planning and this cause for reason for some of the resident dumping refuse along the bridges in market places, abandoned land

The practice of disposing solid waste indiscriminately has a price to pay in terms of collection, transport and disposal costs and loss of valuable raw materials (recyclables, reusable and repairable) and the impact on the environment due to air, water and soil pollutions, and associated health risks that ultimately impact the economic sustainability. It was also observed that, even the residents that collect and transport the wastes to the collection/transport point from where the waste should be collected immediately, collection is not immediate and this creates not only unhygienic dumpsites but resistance from residents close to the collection points. Furthermore, the attitudes of some traders of Ibadan South West local government in management of municipal solid waste is poor; little or no individuals effort is accorded to the immediate dangers on humans and the environmental impacts it has on the environment. Programmes to disseminate knowledge and to improve behaviour patterns and attitudes regarding waste management are therefore critical for the residents of Ibadan. However for such programmes to yield positive results it must be based on sound understanding of the social and cultural characteristics of the communities.

3.0 Materials/Methods

3.1 Study Area

Ibadan South-West Local Government Secretariat is located in sub-locality, Ibadan locality, District, Oyo State of Nigeria Country. Ibadan South West Local Government Area was carved out of the defunct Ibadan Municipal Government (IMG) in 1991. The Administrative Headquarter is located at Ring road. The Local Government area is dominated by the Yoruba's and other tribes who engaged in different type of economic activities. Ibadan South West local government area is subdivided into 12 wards. It lies between Longitude 3.8596° E and Latitude 7.3694°N It covers a landmass of 133,500 square kilometres with a population density of 2,401 persons per square kilometre. It has an area of 40.751 km² and a total population of 283,098 of which male population

was 139,622 (49%) and female population was 143,476 (51%) at the 2006 census (National Population Commission). The 2010 estimated population for the area was projected 320,536 people, using a growth rate of 3.2% from 2006 census. The Local Government Area is bounded by Ibadan North West and Ido Local Government Areas to the north, Oluyole Local Government in the south, Ido Local Government Area in west and Ibadan North and South East in the east

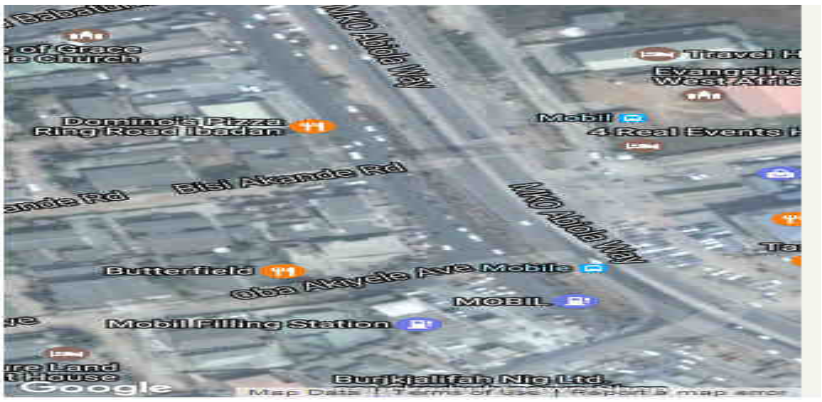

Figure 1: Google earth imagery of the study area

3.2 Research Design

Primary sources of data for this study are from oral interviews from selected residents in major parts of Ibadan where these solid wastes are commonly seen. A Simple random sampling technique was used in selecting 350 samples from the twelve (12) wards in Local Government Area which makes a total of 350. The instrument used in this study was questionnaire, which contains variables to draw out response on the effects of indiscriminate dump of refuse on Health, Environment, Economic and the relationship between people's attitude and practices and indiscriminate dump of refuse in the local government. The questionnaire was developed by the researcher using the likert scale of Strongly Agreed (SD), Agreed (A), Strongly Disagreed (SD), and Disagreed (D). Data collected in the field were analyzed using frequency distribution tables and simple percentage technique. chi-square (X^2) statistical tool were used in testing the hypotheses in order to achieve the objectives of the study. Below are the

$$X^2 = \frac{\Sigma (O-E)^2}{E}$$

Where;
X^2 = chi-square
Σ = Summation
O = observed frequency
E = expected frequency

Also, the secondary data were source from desk review method. Documented information on municipal solid waste in the city was obtained from the relevant literatures and records from Oyo State Waste Management Authority (OYOWMA).

4.0 Results

The noticeable visible features that are always seen along the some major streets, Open space, abandoned building and waterways of the study area are the municipal solid waste. These large amounts of waste which in some areas have formed mountains are shown in figure 2a&b and 3a&b. Data analysis was also done by non-parametric method of chi-square ($\varkappa^2$) to test for effects of indiscriminate solid waste disposal on environment, health and peoples' attitude.

The degree of freedom (df) or critical value were calculated as follows

Df = (R-1) (C-1). Where R = number of rows = 5
C = number of column = 2
= (5-1) (4-1)
= 4 x 3 = 12
Df = 12

For this study, 95% level of confidence and 5% level of significance were used, the degree of freedom (df) at 12 = 21.026 which is approximately equal to 21.03.

4.1 Results and Discussion

The results presented in this section were the results of the field work for the study

Environment

Indiscriminate Solid Waste Disposal has significant effect on the Environment

Table 1a: Chi-square analysis showing the effect of indiscriminate dumping of solid waste on environment

Responses options (O) and their percentages					
Variables	A %	SA %	D %	S D %	Row Total
Indiscriminate Solid Waste prevention leads to better environment for the present and future, thereby leading to sustainable development	112 32%	196 56%	28 8%	14 4%	350
Indiscriminate dump of Solid waste disposal is a huge mess to the environment	98 28%	196 56%	21 6%	35 10%	350
Indiscriminate dump of Solid waste disposal reduces environmental values	84 24%	126 36%	87.5 25%	52.5 15%	350
Indiscriminate dump of Solid waste causes damage to soil through deposits of harmful chemicals and material	168 48%	133 38%	21 6%	28 8%	350
Indiscriminate dump of Solid waste blocks drainages which can lead to flood in the environment	105 30%	210 60%	21 6%	14 4%	350
Column Total	**567**	**861**	**178.5**	**143.5**	**1750**

Table 1b: Result of the Hypotheses on Environment

Hypotheses	Options (O)	Exp. Freq. (E)	O-E	$(O-E)^2$	$\frac{(O-E)^2}{E}$	$(x^2)\ \sum\frac{(O-E)^2}{E}$	Df	Critical value	Remarks
H_O 1	112	70	42	1764	25.2	322	12	21.03	HO_1 Rejected
	196	70	126	15876	226.8				
	28	70	-42	1764	25.2				
	14	70	-56	3136	44.8				
Total					**322**				
H_O 2	98	70	28	784	11.2	390.6	12	21.03	HO_1 Rejected
	196	70	126	15876	226.8				
	21	70	-49	2401	34.3				
Total	35	70	-35	1225	17.5				
					390.6				
H_O 3	84	70	14	196	2.8	531.3	12	21.03	HO_1 Rejected
	126	70	56	3136	44.8				
	87.5	70	17.5	306.25	4.38				
Total	52.5	70	-17.5	306.25	4.38				
					531.3				
H_O 4	168	70	98	9604	137.2	253.4	12	21.03	HO_1 Rejected
	133	70	63	3969	56.7				
	21	70	-49	2401	34.3				
Total	28	70	-42	1764	25.2				
					253.4				
H_O 5	105	70	35	1225	17.5	376.6	12	21.03	HO_1 Rejected
	210	70	140	19600	280				
	21	70	-49	2401	34.3				
Total	14	70	-56	3136	44.8				
					376.6				

Sources: Author field work, 2017

From table 1(a&b), the calculated chi-square (x^2) values are; 322, 390.6, 531.3. 253.4, 376.6 for hypotheses 1,2,3,4 and 5 respectively on environment which indicate a degree of freedom of 12, and calculated chi-square (x^2) value of 322, 390.6, 531.3. 253.4 and 376.6 is greater than the critical value of 21.03. Since the calculated X^2 value of 322, 390.6, 531.3. 253.4, 376.6 was greater than the table value of 21.03 thus, the null hypothesis 1 was rejected. This shows that indiscriminate dumping of solid waste had significant effect on the health of people in all the Local Government Area.

Health

Indiscriminate Solid Waste Disposal has no significant effect on the People's Health

Table 2a: Chi-square analysis showing the effect of indiscriminate dumping of solid waste on health

Variables	A %	SA %	D %	S D %	Row Total
Indiscriminate dump of Solid Waste causes infectious diseases among people	49 14%	280 80%	14 4%	7 2%	350
Indiscriminate dump of Solid Waste pollutes the atmosphere which causes air-borne diseases	91 26%	192.5 55%	42 12%	24.5 7%	350
Indiscriminate dump of Solid Waste is a breeding place for diseases vectors which transmit diseases	70 20%	227.5 65%	38.5 11%	14 4%	350
Indiscriminate dump of Solid Waste results to contamination of food and water	115.5 33%	210 60%	17.5 5%	7 2%	350
Indiscriminate dump of Solid Waste causes Cholera and Dysentery	98 28%	227.5 65%	17.5 5%	7 2%	350
Column Total	**423.5**	**1137.5**	**129.5**	**59.5**	**1750**

Table 2b: Result of the Hypotheses on Health

Hypotheses	Options (O)	Exp. Freq. (E)	O-E	$(O-E)^2$	$\frac{(O-E)^2}{E}$	$(x^2)\ \sum\frac{(O-E)^2}{E}$	Df	Critical value	Remarks
H_O 1	49	70	-21	441	6.3	737.8	12	21.03	HO_1 Rejected
	280	70	210	44100	630				
	14	70	-56	3136	44.8				
	7	70	-63	3969	56.7				
Total					**737.8**				
H_O 2	91	70	21	441	6.3	261.46	12	21.03	HO_1 Rejected
	192.5	70	122.5	15006.25	214.38				
	42	70	-28	784	11.2				
	24.5	70	-45.5	2070.25	29.58				
Total					**261.46**				
H_O 3	70	70	0	0	0	413.35	12	21.03	HO_1 Rejected
	227.5	70	157.5	24806.25	354.37				
	38.5	70	-31.5	992.25	14.18				
	14	70	-56	3136	44.8				
Total					**413.35**				
H_O 4	115.5	70	45.5	2070.25	29.58	405.66	12	21.03	HO_1 Rejected
	210	70	140	19600	280				
	17.5	70	-52.5	2756.25	39.38				
	7	70	-63	3969	56.7				
Total					**405.66**				
H_O 5	98	70	28	784	11.2	461.66	12	21.03	HO_1 Rejected
	227.5	70	157.5	24806.25	354.38				
	17.5	70	-52.5	2756.25	39.38				
	7	70	-63	3969	56.7				
Total					**461.66**				

From table 2 (a&b), the calculated chi-square (x^2) values are; 737.8, 261.46, 413.35, 406.66, 461.66 for hypotheses 1,2,3,4 and 5 respectively on peoples heath which indicates a degree of freedom of 12, and calculated chi-square (x^2) value of 737.8, 261.46, 413.35, 406.66, and 461.66 is greater than the critical value of 21.03. Since the calculated X^2 value of 737.8, 261.46, 413.35, 406.66, and 461.66 was greater than the table value of 21.03 thus, the null hypothesis 2 was rejected. The shows that indiscriminate dumping of solid waste had significant effect on the health of people in all the Local Government Area.

People's Attitude and Practice

Indiscriminate dump of Solid Waste has no Significant relationship between people's attitude and practice

Table 3a: Chi-square analysis showing the effect of indiscriminate dumping of solid waste on People's Attitude and Practice

Variables	A %	SA %	D %	S D %	Row Total
Indiscriminate dump of Solid Waste arises because people cannot pay for the waste	84 24%	245 70%	7 2%	14 4%	350
Indiscriminate dump of Solid Waste is because of people's laziness	105 30%	157.5 45%	17.5 5%	70 20%	350
Indiscriminate dump of Solid Waste were dumped in abandoned lands	35 10%	280 80%	10.5 3%	24.5 7%	350
Indiscriminate dump of Solid Waste results as a result of non-implemented sanctions for violators	105 30%	175 50%	42 12%	28 8%	350
Indiscriminate dump of Solid Waste dumped on the waterways	77 22%	192.5 55%	56 16%	24.5 7%	350
Column Total	**406**	**1050**	**133**	**161**	**1750**

Table 3b: Result of the Hypotheses on Peoples' attitude

Hypotheses	Options (O)	Exp. Freq. (E)	O-E	$(O-E)^2$	$\frac{(O-E)^2}{E}$	$(x^2)\ \sum\frac{(O-E)^2}{E}$	Df	Critical value	Remarks
H_O 1	84	70	14	196	2.8	541.8	12	21.03	HO_1 Rejected
	245	70	175	30625	437.5				
	7	70	-63	3969	56.7				
	14	70	-56	3136	44.8				
Total					**541.8**				
H_O 2	105	70	35	1225	17.5	166.26	12	21.03	HO_1 Rejected
	157.5	70	87.5	7656.25	109.38				
	17.5	70	-52.5	2756.25	39.38				
	70	70	0.00	0.00	0.00				
Total					**166.26**				
H_O 3	35	70	-35	1225	17.5	457.66	12	21.03	HO_1 Rejected
	280	70	210	44100	630				
	10.5	70	-59.5	3540.25	50.58				
	24.5	70	-45.5	2070.25	29.58				
Total					**457.66**				
H_O 4	105	70	35	1225	17.5	211	12	21.03	HO_1 Rejected
	175	70	105	11025	157.5				
	42	70	-28	784	11.2				
	28	70	-42	1764	25.2				
Total					**211**				
H_O 5	77	70	7	49	0.7	454.46	12	21.03	HO_1 Rejected
	192.5	70	122.5	15006.25	214.38				
	56	70	-14	196	2.8				
	24.5	70	-45.5	2070.25	29.58				
Total					**454.46**				

From table 3 (a&b), the calculated chi-square (x^2) values are; 541.8, 166.26, 457.66, 211, 454.46 for hypotheses 1,2,3,4 and 5 respectively indicates a degree of freedom of 12 and shows that the calculated Chi-square (x^2) value of 541.8, 166.26, 457.66, 211, and 454.46 is greater than the critical value of 21.03. Since the calculated $(x)^2$ value of 541.8, 166.26, 457.66, 211, 454.46 is greater than the table value of 21.03 thus the null hypothesis 3 was rejected. This shows that there exists significant relationship between people's attitude and practice and indiscriminate dumping of solid waste in the Local Government Area.

4.2 Environmental Issues

The environmental consequences of municipal solid waste in Ibadan are in heaps. If the solid wastes are not managed properly, decomposition and putrefaction may take place, causing land and water pollution when the waste products percolate down into the underground water resources. The organic solid waste during decomposition may generate unpleasant odours. Stray dogs, reptiles, and birds may sometimes invade garbage heaps and may spread it over the neighborhood causing unhygienic and unhealthy environment. Some of the most prominent environmental issues resulting from indiscriminate solid waste disposal are as follows:

i. Climate Change: It is observed that municipal solid waste in Ibadan that are put into enormous piles often decompose to emit methane a "greenhouse gas" that is more potent than carbon dioxide. This methane contributes to global warming which could result into climate change as a result of destruction of ozone layer (Sharma, 2010). The continuous increase of methane gas in Ibadan metropolis will surely contribute to climate change.

ii. Pollution: Many areas have heaps of municipal solid waste unattended to; and many of the objects that are thrown away contain toxic substances which leach into soil and water as well affecting the health of plants, animal and humans. Electronic waste contains mercury, lead, arsenic cadmium, chromium and other metals that have environmental health implications. Construction waste may contain asbestos, fossil fuel derivatives, and other toxic substances. Measures to control these substances are hampered by the fact that they are dispersed within millions of tons less toxic trash, making their removal very problematic. Thus, Yusuf (1983) observes that soils under refuse dumps sampled in Ibadan city contained high levels of metals greater than acceptable limits.

Figure 2a: Solid Waste at Gege Oloorun Ibadan South West L.G

Figure 2b: Solid Waste at Oke Ado in Ibadan South West L.G

Source: (Authors field survey 2016)

Figure 3a: Solid Waste at Aleshinloye Market, Ibadan S/W LG

Figure 3b: Solid Waste at Bere Area, Ibadan S/W

Source: Authors field survey 2016

5.0 Conclusion

Indiscriminate solid waste generation, disposal and management in Ibadan South West is a serious issue because of the environmental issues these waste brings. From the findings of this study, it was observed that indiscriminate dump of solid waste in the society has several effects on individuals and as well as the society at large. These effects range from its negative effects on environment, health, and also people' attitude which will have multiplier effects on the present and future inhabitants of the area. Indiscriminate dump of solid waste causes infectious disease among people, contamination of food and water, air pollution, sharp objects and chemicals illegal disposed thus causing harm to people. It also serves as breeding sights for disease vectors. Indiscriminate dump of refuse causes environmental degradation, soil pollution, creates harmful soil that is bad for crops production, environmental mess and poor environmental hygiene. People's attitude such as refusal to pay waste management bills, laziness, violation of rules on refuse disposal and also some people may not be able to pay for waste management bills. All these could be described as the effects and causes of indiscriminate refuse dumps in Ibadan South West Local Government Area. While the Government has good intention to tackle the problem of environmental pollution within the city, it has a very low political will to back up its desire. This has manifested in the poor funding of the institutions charged with this responsibility.

Recommendations

The paper concluded that the management of environment of Ibadan city is a function of the concerted efforts of the three agencies charged with the environmental sanitation especially the Oyo State Solid Waste Management Authority. It is a capital intensive project that are closely associated with adequate manpower and the government should consider the care of the environment as a social service, otherwise Ibadan South West local government will continue to remain as the city of refuse in West Africa with its attendant health hazard. Also, the creation of Ibadan state which has been thirst for will go a long way to solve some of the environmental problems presently facing the city.

To prevent this ancient city and the commercial nerve Centre of Western Nigeria from environmental deterioration, the following recommendations are to be attentively looking into:

i. There is the need to look into all legislations regarding waste management with a view to stream lining them so that there is a comprehensive and clear role for all the agencies, various tiers of government, as well as the public including Non-Governmental Organizations (NGOs) and community associations.

ii. There should be public enlightenment on the dangers of indiscriminate dump of solid waste to the general public.

iii. Citizens should be made to pay a realistic fee for waste services in return for the guarantee that indeed these services will be provided.

iv. Residents should contribute to the environmental cleanliness by adopting attitudinal change from indiscriminate refuse dumping along the street and as well as the median strip of the highways

v. Severe Sanction: Weekly and Monthly sanitation should be enforced .This will assist in cleaning up the environment.

References

Achi, H. A., Adeofun, C. O. Ufoegbune, G. C. Gbadebo, A. M. and Oyedepo. J. A., (2012). "Disposal Sites and Transport Route Selection Using Geographic Information System and Remote Sensing in Abeokuta, Nigeria." Global Journal of Human Social Science Geography & Environmental Geosciences 12 (12): 14–24.

Achnkang E., 2003. Globalisation, Urbanization and Municipal solid waste management in Africa. University of Adelaide. African studies Association of Australasia and the pacific 2003 conference proceedings-African on a Global Stage, pp: 8-12

Adeniran, A. A., Adewole, A. A. and. Olofa, S. A (2014). "Impact of Solid Waste Management on Ado Ekiti Property Values." Civil and Environmental Research 6 (9): 29–35.

Akindutire, I. O., and Alebiosu. E. O. (2014). "Environmental Risk Factors of Indiscriminate Refuse Disposal in Ekiti State, Nigeria." IOSR Journal of Research and Method in Education 4 (5): 54–59.

Al-Jassir, M. S., Shaker, V and Khaliq. M. A. (2005). "Deposition of Heavy Metals on Green Leafy Vegetables Sold on Roadsides of Riyadh City, Saudi Arabia." Bulletin of Environmental Contamination and Toxicology 5: 1020– 1027

Ali, S. M., Pervaiz, A. Afzal, B. Hamid, N. and Yasmin. A. (2014). "Open Dumping of Municipal SolidWaste and its Hazardous Impacts on Soil and Vegetation Diversity at Waste Dumping Sites of Islamabad City." Journal of King Saud University- Science 26: 59–65.

Ashitey, G. A. (2014). "Editorial Commentary of Cholera and Ebola Virus Disease in Ghana." Ghana Medical Journal 48 (3): 120.

Aziale, L. K., and. Asafo-Adjei. E (2013). "Logistic Challenges in Urban Waste Management in Ghana (A Case of Tema Metropolitan Assembly)." European Journal of Business and Management. 5 (32): 116–128.

Aziegbe, F. (2007). "Seasonality and Environmental Impact Status of Polyethylene (Cellphane) Generation and Disposal in Benin City, Nigeria." Journal of Human Ecology 22 (2): 141–147

Chakrabarti, S. and Sarkhel, P. (2003). Economics of Solid Waste Management: A Survey of Existing Literature. Economic Research Unit, India Statistical Institute, pp. 1-58

Demirbas, A. (2011). "Waste Management, Waste Resource Facilities and Waste Conversion Processes." Energy Conversion and Management 52 (2): 1280–1287.

Gwartkin, D. R. and Guillot, M. (1999). The burden of Diseases Among the Global Poor: current Situation, Future Trends and Implication for strategy. Global Forum on Health Research Working Paper.

Kenneth, C. and Huie J.M. (1983). Solid Waste Management. The Regional Approach. Cambridge, Ballinger Publishing Company: 78.

Loboka, M. K., Shihua, Q. Celestino, J. L. Hassan, S. O. and Wani. S. J. (2013). "Municipal Solid Waste Management Practices and Faecal Coliform Water Contamination in the Cities of the Developing Countries: The Case of Juba, South Sudan." International Journal of Environmental Sciences 3 (5): 1614–1624.

Mangizvo, R. V. (2012). "The Incidence of PlasticWaste and Their Effects in Alice, South Africa." Online Journal of Social Sciences Research 1 (2): 44–53.

Machete, F., and Shale. K. (2015). "Classification of Unregulated Landfills by Waste Stream Analysis Method: A Case of Chief Albert Luthuli Local Municipality, Republic of South Africa." African Journal of Science, Technology, Innovation and Development 7 (6): 446–452.
Mathee, A. (2011). "Environment and Health in South Africa: Gains, Losses and Opportunities." Journal of Public Health Policy 32: 537–543.
Muchangos, L. S., Liu, Y. and Li. B. (2014). "Comparative Study on Municipal Solid Waste Management Systems of Maputo City, Mozambique and Chongqing City, China." African Journal of Science, Technology, Innovation and Development 6 (4): 323- 331.
Musingafi, M. C.. Manyanye, C., S Ngwaru, K. and Muranda. K. E. (2014). "Public Health and Environmental Challenges in Zimbabwe: The Case of Solid Waste Generation and Disposal in the City of Masvingo." Journal of Environments 1 (2): 68–72.
Nabegu, A. B. (2013). An Analysis of Municipal Solid Waste in Kano Metropolis, Nigeria; A Paper Presented in a Workshop at Kano State University of Science and Technology Wudil, on 12th July, 2013.
Ogedengbe, P. S., and Oyedele. J. B. (2006). "Effect of Waste Management on Property Values in Ibadan, Nigeria." Journal of Land Use and Development Studies 6 (9): 29–35.
Ogwueleka, T. C. (2009). "Route Optimization for Solid Waste Collection: Onitsha (Nigeria) Case Study." Journal of Applied Sciences & Environmental Management 13 (2): 37–40.
Okpala Don, C. I., (1984). Nigeria Urban Environmental Management Problem: institutional Preface, 363.70669 Okp. NISER, Ibadan, Nigeria, pp:32-37
Olayinka, O. O., and Adedeji. O. (2014). "Determination of Concentrations of Heavy Metals in Municipal Dump Site Soil and Plants at Oke-Ogi, Iree, Nigeria." International Research Journal of Pure&Applied Chemistry 4 (6): 657–669.
Okechukwu, O. I., Okechukwu, A. A. Noye-Nortey, H. and Owusu. A. (2012). "Health Perception of Indiscriminate Waste Disposal – A Ghanaian Case Study." Journal of Medicine and Medical Sciences 3 (3): 146–154.
Oluranti, O. I., and Omosalewa. A. E. (2012). "Health and Economic Implications of Waste Dumpsites in Cities: The Case of Lagos, Nigeria." International Journal of Economics and Finance 4 (4): 239–251.
Omole, F. K. Alakinde, M. K (2013). "Managing the unwanted materials: The agony of solid waste management in Ibadan Metropolises, Nigeria", International Journal of Education and Research, Vol. 1 No. 4, pp 6-8.
Palfreman, J. (2014). Waste management and recycling in Dares Salaam, Tanzania. Online http://www.researchgate.net/ publication/271441207.
Rahman, A., L. Hossain, A. Rubaiyat, S. A. Mamun, Z. A. Khan, M. Sayem, and M. K. Hossain. 2013. "Solid Waste Generation, Characteristics and Disposal at Chittagong University Campus, Chittagong, Bangladesh." Discovery Science 4 (11): 25–30.
Regassa, N., Sundaraa, R. D. and Seboka. B. B. (2011). Challenges and Opportunities in Municipal Solid Waste Management: The Case of Addis Ababa City, Central Ethopia." Journal of Human Ecology 33 (3): 179–190.
Rim-Rukeh, A. (2012). "Uptake of Heavy Metals by Okro (Hibiscus Esculentus) Grown on Abandoned Dump Sites in Effurun, Nigeria." Journal of Emerging Trends in Engineering and Applied Sciences 3 (4): 640–644.
Sankoh, F. P., Yan, X.and Tran. Q. (2013). "Environmental and Health Impact of Solid Waste Disposal in Developing Cities: A Case Study of Granville Brook Dumpsite, Freetown, Sierra Leone." Journal of Environmental Protection 4: 665–670.
Sharma, B.K. (2010). Environmental Chemistry. GOEL Publishing House, Meerut. Pp w1-w8.