

## Indiscriminate Refuse Disposal and Its Implication on Public Health in Maiduguri metropolis

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### Abstract

The study was conducted to examine the respondent's view on the implication of indiscriminate refuse disposal and its impact on human health in Maiduguri Metropolis. The study makes use of data from both primary and secondary sources. Random sampling technique is used for the study the sample size for the study comprises the population of Maiduguri Metropolis. The data generated from the questionnaires and other primary sources for this study was analysed through frequency count and percentage score. The result showed that domestic waste, agricultural farm waste, bio-medical waste, constructional waste were the types of waste generation in the metropolis as confessed by the respondents. The result shows that landfill/open clumping, incineration, dust-bins, river dumping are the common methods of waste disposal practiced in the study area. The findings show that majority of the respondents are aware of the impact of indiscriminate waste disposal on the Public health and the environment. Base on the findings of the study it is recommended that; there is need for wider range of services of waste management agencies in proper and hygienic disposal of waste generated in the metropolis.

**Keywords:** Refuse Disposal, Public Health, Maiduguri metropolis

### Introduction

The problems of indiscriminate refuse disposal in most cities especially in development countries have become one of the intractable environmental problems. Modernization and progress has had its share of disadvantages in refuse generation and the way that is being disposed, and one of the main aspects of concern is its implications on the public health and the

surrounding environment-be it land, air, and water. With increase in the global population and the rising demand for food and other essentials, there has been a rise in the amount of waste being generated daily by each household. This waste is ultimately thrown into municipal waste collection centres from where it is collected by the area municipalities to be further thrown into the landfills and dumps. However, either due to

resource crunch or inefficient infrastructure, not all of this waste gets collected and transported to the final dumpsites. If at this stage the management and disposal is improperly done, it can have serious impact on health and to the surrounding environment. The human society today are face with so many environmental problem, prominent among which is pollution of air, water and land release of unclean or impure element into the environment (Richard, 1995)

### **Methodology**

The study employed is the descriptive research of the survey type. According to (Isangedigi, 2004) survey research involves the collection of data to accurately and objectively describing existing phenomena. Kerlinger, (1986) in a view similar to the above describe the survey research as that which is directed towards determining the nature of a situation as it exists of population by selecting and relative incidence, distribution, inter-relation of sociological and psychological variables. To (Awokeni, 2004) this design is used in describing the population, designing sample, choosing respondents all of these are characteristics of a survey design.

#### **Data Required**

The researcher employed the use of survey research to obtained data concerning Indiscriminate Refuse Disposal and Its Implication on Public Health in Maiduguri metropolis

### **Sources of Data**

For the purpose of this research work, primary as well as secondary sources of data were employed. The primary source includes personal interviews, discussions and the administering of questionnaires. The secondary source on the other hand includes, textbooks, magazines, journals and seminars

presented papers as well as Microsoft information's. In this research work however, the most important instrument used for data collection is the questionnaire, which is a primary sources of data.

### **Results and discussion**

This chapter deals with the results and discussion of the research work carried out in this chapter. Out of the 110 questionnaires distributed 100 were returned filled while 10 were missing in the questionnaire.

#### **Socio- Economic characteristics of the Respondents**

This section gives information about the personal and socio-economic characteristics of the respondents. The variables considered in this section include age and sex of the respondents were determined.

Table 1 is a summary of the demographic information of the respondents. Result shows that 58(58%) of the respondent were male, while 42(42%) of the respondents are female. The result also shows that 30(30%) of the respondent are within the age range of 15 — 25 years, 24(24%) of the respondent are within the age range of 26 — 30 years. While 23(23%) of the respondents are within age range of 31 — 35 and 36 — 40 years respectively. The result also indicated that 2(2%) of the have informal education, 7(7%) have attended primary while 35(35%) have secondary certificate, while 56(56%) of the respondent attended tertiary institution. However, the result also reveal that the majority of the respondents are married with 55(55%) ratio, while 40(40%) are single and 5(5%) are divorced. From the findings of this study in table 4.1 above it was deducted that the majority of the respondent were married, and the male also are the majority.

Table 1: Demographic information of the respondents

S/N	ITEM	RESPONSES	FREQUENCY	PERCENTAGE
1.	Gender	Male	58	58%
		Female	42	42%
		Total	100	100%
2.	Age	15-25	30	30%
		26-30	24	24%
		31-35	23	23%
		36-40	23	23%
		Total	100	100%
3.	Educational Qualification	Informal	2	2%
		Primary	7	7%
		Secondary	35	35%
		Tertiary	56	56%
		Total	100	100%
4.	Marital Status	Married	55	55%
		Single	40	40%
		Divorce	5	5%
		Total	100	100%

Research Question 1: What are the types of waste generation in Maiduguri metropolis?

Table 2: Respondent view on the type of waste generation in Maidugurimetropolis.

S/N	ITEM	RESPONSES	FREQUENCY	PERCENTAGE
5.	Is bio-medical waste like; syringe, injections vial, expired drugs swaps, bandages, a type a type of waste generated in Maiduguri metropolis	Yes	67	67%
		No	33	33%
		Total	100	100%
6.	Is domestic waste such as garbage excreta, paper, smoke, cans, glasses, old shoes, old cloth, and polythene bag a type of waste generated in the metropolis.	Yes	94	94%
		No	6	6%
		Total	100	100%
7.	Is industrial waste like pies of sacks, raw material, pack containers, damage goods, squeezed fruit a type of waste generated in the metropolis.	Yes	4	4%
		No	96	96%
		Total	100	100%
8.	In agricultural farm waste such	Yes	52	52%

	as animal dungs, groundnut shell, deaths animal like poultry and cow a type of waste generated in the metropolis.	No	48	48%
		Total	100	100%
9.	Is construction site a source of waste generation in the metropolis like; wooden pieces, nails etc.	Yes	59	59%
		No	41	41%
		Total	100	100%

Table 2 above shows the result on the type of waste generated in Maidugurimetropolis. The result of the table 4.2 shows the respondent view on the type of waste generated in Maiduguri metropolis, the result shows that 67 (67%) of the respondent agreed that bio — medical like syringe, injection vials, expired drugs, blood, bandages swap, is a type of waste generated in Maiduguri, while 33 (33%)of the respondent disagree to it. The result also shows that 94 (94%) of the respondent agreed that domestic waste such as garbage, excreta, papers, smoke,cans, glasses, old shoes, old cloth, and polythene bags is a type of generated in Maiduguri, while 6 (6%) of the respondent disagree to it. This also indicated that 4(4%) of the respondent s agreed that industrial waste such as piece of sacks, row materials, packs container, damage goods, squeezed fruit is a types of waste generated In Maiduguri metropolis, while 96 (96%) of the respondent disagreed to it. The result also indicated that 52 (5 2%) of the respondents agreed that agricultural waste such as; animal dungs, groundnut shells, death animals like poultry and cow is a type of waste generated in Maiduguri, while 48 (48%) of the respondents disagree to it. The findings of this study also shows that 59 (59%) ofthe respondent agreed that construction waste like; paint rubber

containers, wooden pieces, nails etc are generated in the metropolis, while 41(41%) of the respondent disagree to it.

Table 3 above show the result on the methods of waste disposal in Maiduguri metropolitan council.

The result of table 4.3 shows the respondents view on the methods of waste disposal in the metropolis, the result shows that 98 (98%) of the respondents agreed that dumping (landfill) is a way of refuse disposal, while 2 (2%) of the respondent disagree with it. However, the finding of the result also indicated that83 (83%) of the respondent agreed that incineration is a methods of waste disposal in the city, while 17 (17%) of the respondents disagree to it. The result also indicated that 33 (33%) of the respondent agreed that recycling is a way of refuse disposal, while 67 (67%) of the respondents disagree to it. The result also shows that 63 (63%) of the respondents agreed that dust — bin is a way of refuse disposal in the metropolis, while 37 (37%) of the respondents disagree with it. The finding of this study also reveal that 98 (98%) of the respondents agreed that ocean or river dumping is their way of waste disposal, while 2 (2%) of the respondents disagree to this.

Research Question 2: what are the methods of refuse disposal in Maiduguri metropolis?

S/N	ITEM	RESPONSES	FREQUENCY	PERCENTAGE
10.	Is dumping or landfill a way of refuse disposal in Maiduguri metropolis?	Yes	98	98%
		No	2	2%
		Total	100	100%
11.	In incineration a way of waste disposal in the metropolis?	Yes	83	83%
		No	17	17%
		Total	100	100%
12.	Is recycling a method of refuse disposal in Maiduguri metropolis?	Yes	33	33%
		No	67	67%
		Total	100	100%
13.	Is dust-bins a way of waste disposal in the metropolis?	Yes	63	63%
		No	37	37%
		Total	100	100%
14.	Is ocean or river dumping a way of waste disposal in the metropolis?	Yes	98	98%
		No	2	2%
		Total	100	100%

Research Question 3: what are the implications of waste disposal on humanhealth?

Table 4: Respondents view on the implication of waste disposal on human health.

S/N	ITEM	RESPONSES	FREQUENCY	PERCENTAGE
15.	Is there any disease occurring in the metropolis due to indiscriminate refuse disposal?	Yes	78	75%
		No	25	25%
		Total	100	100%
16.	Don you know that source of water can be constructed with water slowly flowing from refuse dump?	Yes	83	83%
		No	17	17%
		Total	100	100%
17.	Do you know that solid waste is a breeding ground for vectors?	Yes	91	91%
		No	9	9%
		Total	100	100%
18.	Do you know that polluted air from dumping site bringing out odour and lead to	Yes	98	98%
		No	2	2%

	respiratory disease?			
		Total	100	100%
19.	Do you know that solid waste causes aesthetic- nuisance?	Yes	48	48%
		No	52	52%
		Total	100	100%

Table 4 above show the result on the implication of waste disposal on human health.

The result of the table 4.4 show the respondent view on the implication of waste disposal on human health. The result shows that 75 (75%) of the respondents agreed that diseases can occur as a result of indiscriminate waste disposal, while 25(25%) of the respondents disagreed to it. The result of the findings also shows that 83 (83%) of the respondents agreed that water can get contaminated as a result of refuse dumping, while 17 (17%) of the respondents disagreed to it. The result

also indicated that 91 (91%) of the respondents agreed that solid waste is a breeding ground for disease vector. The finding also revealed that 98 (98%) of the respondents agreed that respiratory diseases occur as a result of polluted air from refuse dumping site, while 2 (2%) of the respondents disagreed to it. The finding also shows that 48 (48%) of the respondents agreed that solid waste causes aesthetic — nuisance, while 52 (52%) of the respondents disagreed to it.

Research Question 4: what are the control and management of waste generation in Maiduguri metropolis?

Table 5: The respondent view on the control and management of waste in Maiduguri metropolis.

S/N	ITEM	RESPONSES	FREQUENCY	PERCENTAGE
20.	Did you know that many diseases can be prevented if waste are properly administered and managed?	Yes	99	99%
		No	1	1%
		Total	100	100%
21.	Do you know how waste should be managed?	Yes	99	99%
		No	1	1%
		Total	100	100%
22.	Dose refuse need to be disposed?	Yes	100	100%
		No		
		Total	100	100%
23.	Do you know how treat waste before disposal?	Yes	93	93%
		No	7	7%
		Total	100	100%

Table 5 above shows the result on the control and management of waste generation in Maiduguri metropolis.

The result of the findings indicated that 99 (99%) of the respondents agreed that many diseases can be prevented with a prompt waste management, while 1 (1%) of the respondent disagree to it. The result also indicated that 99 (99%) of the respondents agreed that they have a prompt knowledge on waste management, while 1 (1%) of the respondent disagreed to it. However, findings on the knowledge of refuse disposal have 100 (100%), while the findings on the study on how to treat waste before disposal have 93 (93%) of the respondent agreed to that, while 7 (7%) of the respondents disagreed to it.

### Discussion

Base on the responses obtained in Maiduguri metropolitan council, in the above bio-medical waste, industrial waste, constructional waste and Agricultural waste are the common type of waste generated in Maiduguri metropolis.

However, the responses on the methods of indiscriminate waste disposal revealed that dumping or landfill, incineration, dust-bin, and ocean or river dumping are the common methods of indiscriminate waste disposal, while recycling is the less method according to the findings in the study area.

The findings on the implication of indiscriminate waste disposal on human health in Maiduguri metropolis. Result of the findings reveals that contaminated water, disease outbreaks, vector breeding ground, and polluted air are common in the study area.

The findings on the control and management of indiscriminate waste disposal, the result revealed that proper disposal of waste prevent diseases outbreak, waste management and treatment of waste before disposal are practice in the study area.

Base on the findings of the study, the majority of the respondents are married and they are between the age range of 26-30 years of age. The responses base on

educational background revealed that the majority of the sample population with 56 (56%) of the respondents attended tertiary institution, while 35 (35%) of them attended secondary school, and 7 (7%) attended primary school and only 2 (2%) of them with informal education. Result on the types of waste generation indicated that the majority of the sample population agreed that bio-medical waste, domestic waste, industrial, agricultural\farm waste and constructional waste are among the type of waste generation in Maiduguri metropolis. The findings of this study were also in agreement with the study of Akpan (1995) cited by Lawal provide the diagrammatic summary of classification of refuse. On the methods of refuse disposal in the metropolis, findings of the study also indicated that majority of the respondents agree that during\landfill, incineration method, recycling, dust — bin, and ocean or river dumping are among the methods of refuse disposal in Maiduguri metropolis. However, the finding was in line with the report of United Nations Development Programme (TJNDP, 2016). On the implication of indiscriminate waste disposal on human health the finding of this study indicated that majority of the respondent agree that contaminated water, disease outbreak, vector breeding ground, polluted air due to indiscriminate disposal there by releasing odour resulting in respiratory diseases are among the health impact of waste disposal in the Maiduguri metropolis. The findings was also in agreement with the statement of (Richard, 1995), whose stated that human society are face with so many environmental problems, prominent among which is pollution of air, water, and land, release of unclear or impure element in to the environment. On the control and management of waste in Maiduguri metropolitan council, the findings of this study indicated that majority of the population agreed\are aware that disease can

be prevented if waste should be managed, disposed, and handle properly.

### Conclusion

Base on the findings and within the limitation of the study, the following conclusion were drawn.

The study concluded that, the major sources of waste generation in the metropolis is the house hold waste that contributes almost 60-70 percent of waste generated in the metropolis, agricultural and constructional waste also form a significant functions of waste generation in the metropolis. The methods of waste disposal found in the metropolis base on the result of the findings include; open dump landfill, incineration, recycling, dust-bins, river dumping are found in the study area.

However, due to indiscriminate disposal of waste base on the result of the findings there are diseases outbreak of cholera, typhoid, malaria in the study area due to contaminated water, vectors breeding ground as a result of dumpsites and aesthetic- nuisance. It is also found that majority of the population are aware or they do have the knowledge of how refuse should be disposed properly

### Recommendation

Base on the results of the findings the following recommendation were drawn

1. It is recommended that the types waste generated in Maiduguri metropolis are; house hold/domestic waste, agricultural farm waste, constructional waste and bio-medical waste.
2. Base on the results of the findings, landfill dumping, incineration, recycling, dust-bin, river dumping are the methods of waste disposal in the study area.
3. It is recommended that refuse should be disposed and managed properly.
4. It is also recommended that there is need for wider range of services of waste management agencies in proper and

hygienic disposal of waste generated in the metropolis.

### References

1. Adebayo, W. O. (1995). "Environmental Consequences of Waste Generation and Disposal Techniques along Roadsides, Drains and Stream Channels in a Tropical Urban Centre" Environmental issues vol. 1. No. 1, pp 1-4 focus on energy consumption, Ibadan STAN.
2. Akpan E. A (1995) Environmental health education in N.S Olaniran, E. Akpan, EE, Ikperne, G. A. Udofia, (eds) Environment and health. Lagos: Macmillan Nigeria Publishers.
3. Akpan E. A (1995) primary health care in environment protection. In N.S Olaniran, E.A Akpan. E.E, Ikpeme, G.A Udofia, (ed) Environmental and health. Lagos. Macmillan Nigeria publishers.
4. Aribisala. J.O. (1997) "Waste Transport in Unsaturated soils". International Journal of Environment and Development. Vol. 1 pp. 49-54.
5. Aribisala, J.O. Omotoso, T and Folorunso, p. (2004) "Waste Management System". Proceeding for National civil Engineering Conference, Port Harcourt. Pp. 17-20
6. Bartone, C. R. (2000) "strategies for improving Municipal Solid Waste Management: Lesson from a Decade of World Bank Lending". Regional Conference "partnership in Municipal Solid Waste Management Cairo 10-2 April World Bank, Washington D.C
7. Buckle and Smith (2000) "Solid Waste Handling in Metropolitan". United States of America Public Health Services (USPHS) Publication. Washington D.C. February.
8. Chadwick E. (1842). Report on the Enquiry into the Sanitary Condition of

- the Labouring Population of Great Britain. Cited on <http://facstaff.siu.edu/~mwhickey/chadwick%201842.htm>. retrieved, 2<sup>nd</sup> February, 2009.
9. Corburn J. (2004) Confronting the Challenges in reconnecting Urban planning and public health, *American Journal of Public Health*. Vol.94, No.4. April. Pp54 1-546.
  10. Kagu A. Refuse generation and disposal in Maiduguri, Borno state in *issues in Environmental Monitoring in Nigeria*, Edited by M.M Daura, Nigerian Geographical Association (1997). Page 247-251
  11. Feilman HJ. Getis J (1995). *Human geography: Landscape of human activities*. Chicago: WIVIC Brown publishers.
  12. Kagu A (1996). Refuse generation and disposal in Maiduguri, a paper presentation of at the 39<sup>th</sup> conference of the Nigerian Geographical Association at Kashim Ibrahim collage of education (KICOE) Maiduguri.
  13. Kagu A, Badawi I-IL, Abba JM (2013) Assessment of domestic waste water disposal in some selected wards of Maiduguri metropolis, Borno State, Nigeria. *Journal of Geography and Geology*; vol. 5 No.4; 2013 ISSN 1916-9779 E-ISSN 19 16-9787 published by Canadian Center of Science and Education. Pp 85-86.
  14. Nigerian Environmental Study Action Team (NEST) (1991). *Nigerians threatened Environment: A National profile*. Ibadan: NEST.
  15. News Diary (2014). The needs for public support to keep Borno clean, September 28, 2014. Habiba Ahmed.
  16. Oyediran AB (1997). Waste generation and disposal in Nigeria. In: D, Okali, K.O. Ologe and U.M Igbozurike (eds) *perspective in environmental management*.
  17. Kagu, A. Refuse generation and disposal in Maiduguri, Borno State in *Issues in Environmental Monitoring in Nigeria*, Edited by M.M Daura, Nigerian Geographical Association (1997). Page 247—25 1.
  18. Madu I A (2001). Urban Solid Waste Problem in Nigeria. In: E.O Ezeani and N. N. Elekwa (eds). *Issues in Urbanization and Urban Administration in Nigeria*. Enugu: Jorhoe Enterprises.
  19. Richard D.B (1995) *Understanding your health* (4<sup>th</sup> ed) Missionary.