



Evaluation of Waste Management Practices and its Environmental Implications in Hadejia Metropolis, Jigawa State Nigeria

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Abstract

The study examined waste management practices and its associated environmental implications among residents in Hadejia Metropolis. The study was descriptive and cross sectional in design. Systematic random sampling technique was employed to select the respondents of the study. Data was obtained through the administration of questionnaire, in-depth interview and observation checklist. The results showed that plastics, food, agricultural wastes, papers, metals and construction wastes among others were the major waste generated in the study area. The findings also revealed that the residents dispose waste indiscriminately to a large extent as open dumping in unapproved places and open burning were found to be common waste management strategies employed by residents in the study area. The findings further indicated that environmental implications associated with poor waste management in the area include pollution of water, air and land, spreading of diseases such as malaria, diarrhea and typhoid due to growing of vectors. The study recommends improving awareness campaigns, providing safe disposal grounds and enforcement of environmental laws to avert the consequences of poor waste managements on public health and environment.

Keywords: Waste; Management; Environment; Implications

Introduction

Solid waste management practice is great challenge facing urban areas globally. The rapid growing of urban areas couple with drastic industrial progress and acceleration in economic growth has led to enormous increase in solid waste generation. Management of waste is an issue of great concern for public health authorities because such waste has a great potential to cause hazards to humans and animals, in addition to environmental pollution. Global production of solid waste has practically multiplied over a decade and is expected to reach 2.5 billion tons per year in 2025 as a result of considered effects of urban development and consumption patterns [1]. Many municipalities in developing world are facing tremendous challenges in keeping solid waste

management system working in sustainable manner. Often times, these systems either became ill or ceased to exist because of various social, institutional, financial and technical setbacks. Muktar [2], posited that government in adequate commitments, such as poor funding, in adequate equipments for transport and disposal, poor communities awareness and participation, poor town planning, in adequate involvement of private sectors are among other factors affecting the solid waste management system. In the face of urbanization and population explosion in cities of both developed and developing world, the central environmental concerns has been solid waste management, sanitation and associated adverse health and environmental impacts. Sporadic breaks out of cholera, typhoid and the endemic nature of malaria including the perennial incidences of flooding in Nigeria and

other cities all point to poor or inadequate waste disposal especially on the infrastructures deficits. Viable economic and developmental activities has prompted thousands of people influx in to the city of Hadejia, The rapid population growth as a result of urbanization in Hadejia metropolis has resulted to difficulties for environmental management agency in providing an effective and efficient solid waste management. Poor municipal solid wastes disposal expose human to environmental degradation such as in flooding, drainage obstruction, widespread of infectious diseases, cholera, diarrhea Joshua [5]. It result in breeding ground for insects, rodents and other flies such as rats and mice, which affects humans and other domesticated animals who may come in contact with contaminated wastes. It also spread odour nuisance and create poor environment for growing children. Improper and unorganized solid waste disposal in public and open places result in spread of communicable and non-communicable diseases among humans and other animals in addition, it causes contamination of soil, surface and ground water sources and generation of toxic and greenhouse gases. However adequate information, greater awareness, resources and efficient management practices will help in improving environmental conditions and protect environment and human beings from menace of improper solid waste management.

Study Area and Methodology

Study Area

The study was conducted in Hadejia Metropolis in Jigawa state. It lies approximately between latitude 10°.00' E Longitude and between 12°25' N and 12°30' N longitude. It has total population of 104, 286 according to 2006 National population census. The area is famous with massive cultivation of crops such as rice and wheat and vibrant trade sector hosting several markets.

Methodology

The study was carried out among residents in Hadeja Metropolis. The study was descriptive and cross sectional in design. Systematic random sampling technique was use in selecting 173 house hold heads for the study. Data were collected through in depth interview, questionnaire and observation checklist. The questionnaire solicit relevant Information regarding demographic and socio-economic information of the respondents and waste management practices, in-depth interviewed was carried out with key informants who were selected based on their knowledge on community with regard to waste management. The observation checklist identified the implications of poor waste management practices in the study area. Data for the study were presented using descriptive statistics of

frequency distribution tables, percentages and graphs. The data was cleaned, validated and analyzed using SPSS version 20.

Results and Discussion

| | | N=173 | Percentage |
|--------------------|---------------------|-------|------------|
| Gender | Male | 128 | 74 |
| | Female | 45 | 26 |
| Age | 18-25 | 56 | 32.4 |
| | 26-45 | 85 | 49.1 |
| | 46-65 | 25 | 12.1 |
| | 65 above | 6 | 3.5 |
| Marital Status | Married | 94 | 54.3 |
| | Single | 72 | 41.6 |
| | Divorced | 7 | 4 |
| | Trading | 50 | 28.9 |
| | Arming | 53 | 30.6 |
| Occupation | Government employed | 48 | 27.7 |
| | Unemployed | 12 | 6.9 |
| | Others | 10 | 5.8 |
| Level of Education | Primary | 19 | 11 |
| | Secondary | 49 | 28.3 |
| | Tertiary | 98 | 56.6 |
| | Others | 7 | 4 |

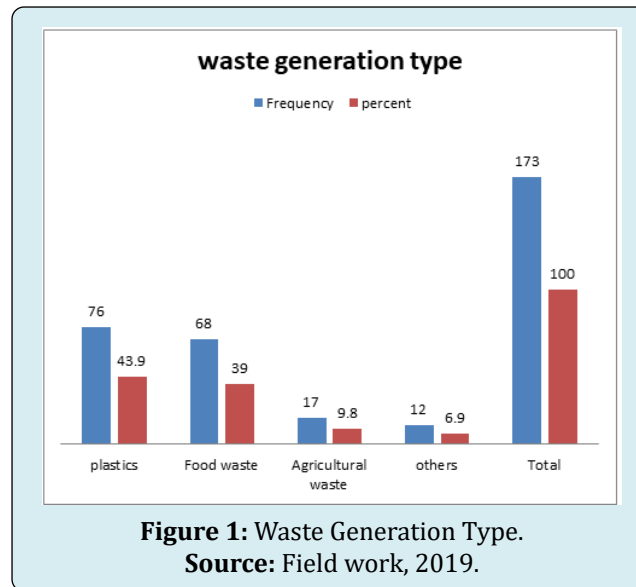
Table 1: Demographic and socio- economic characteristic of the respondents.

Sources: Field Work, 2019.

Data from the demographic section yielded information about respondent's demographic and socio-economic characteristic. From the Table 1 above, majority of the respondents (74%) were male and 26% were female, More than half of the respondents (54.3%) were married 41.6% were single and 4.0% divorced.. The number of males is higher than the females, due to the total population characteristics of the study area and the cultural influence and Willingness of female to respond to the questionnaire. The age category of respondents 25-45 were (49%), 18-25, 45-65 and 65 above constitute 32.4.1%, 12.1 % and 3.5% respectively. The conclusion drawn from the discussion is that majority of the residents of Hadejia LGA are primarily young energetic people i.e. they fall within working age group. Those with no formal education were 4.0%, 56.6% had NCE, diploma , degree or equivalent this is consistent with the findings of Gambo, et al. [3] which shows that 46.7 percent of the respondents in Hadejia attained tertiary level of education 11.6% attended primary school and 28% secondary school

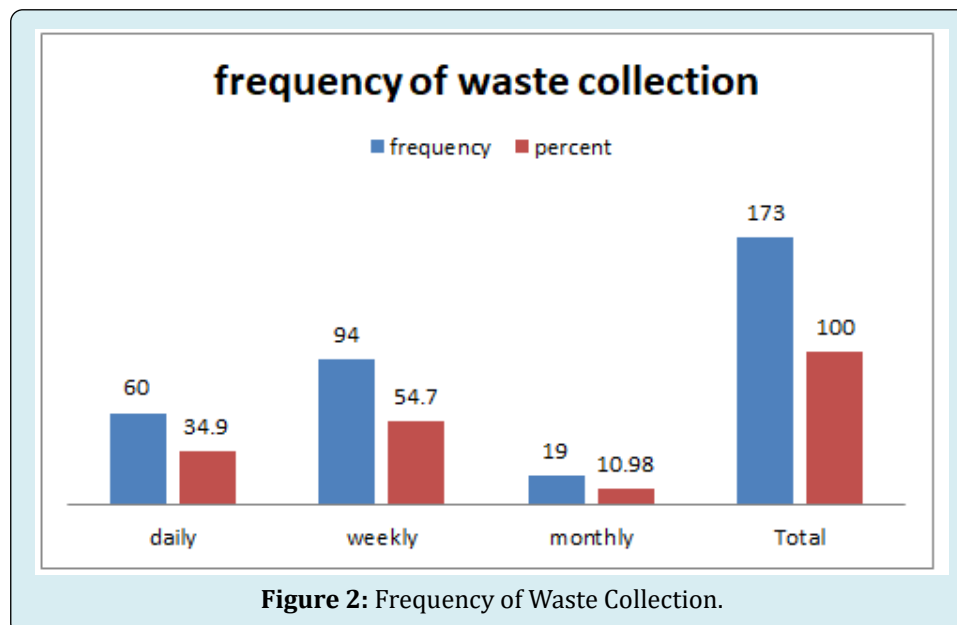
respectively. It could therefore be concluded that the level of literacy amidst the respondents in urban areas is high and this could have high impacts on their level of awareness on environmental impacts of poor waste management. In terms

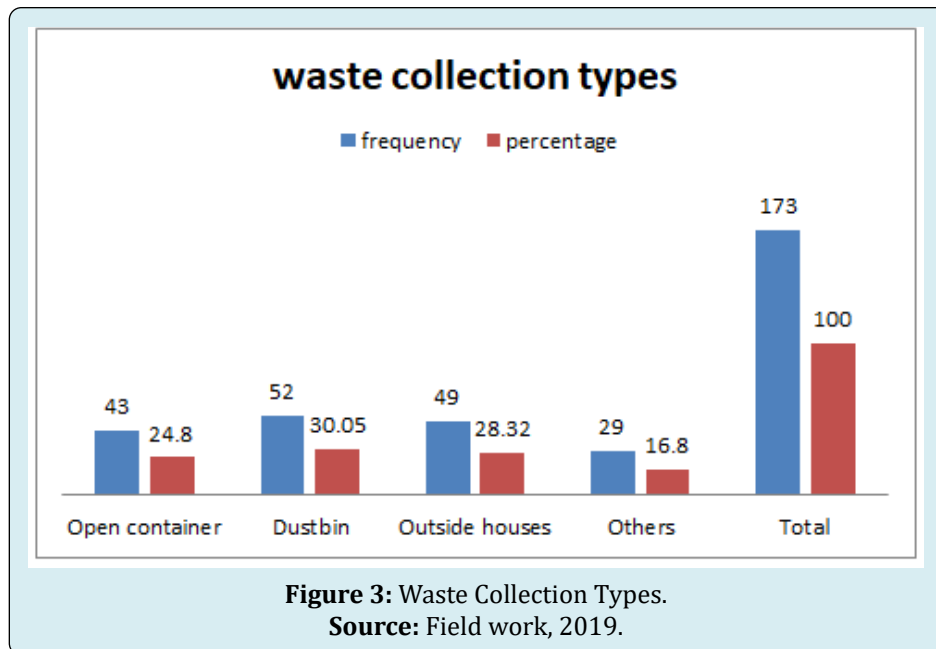
of occupation, about 29% of the respondents were traders, 27.7%, 6.9%, 17.4% and 5.8% were farmers, civil servants, unemployed and others engage in fishing, carpentry and other hand works activities respectively.



Waste generated vary according to season, income level, population, social behaviors, climate, and industrial production, the size of markets for waste materials. When respondents were asked to indicate the type of waste they generate, nearly half (43.9%) of the respondents indicated plastic waste, 39% food waste and 9.8% agricultural waste. The turnout of plastics waste could be attributed to high commercial activities in around the city. Other forms of waste generated (6.9%) include papers, tin metals and furniture

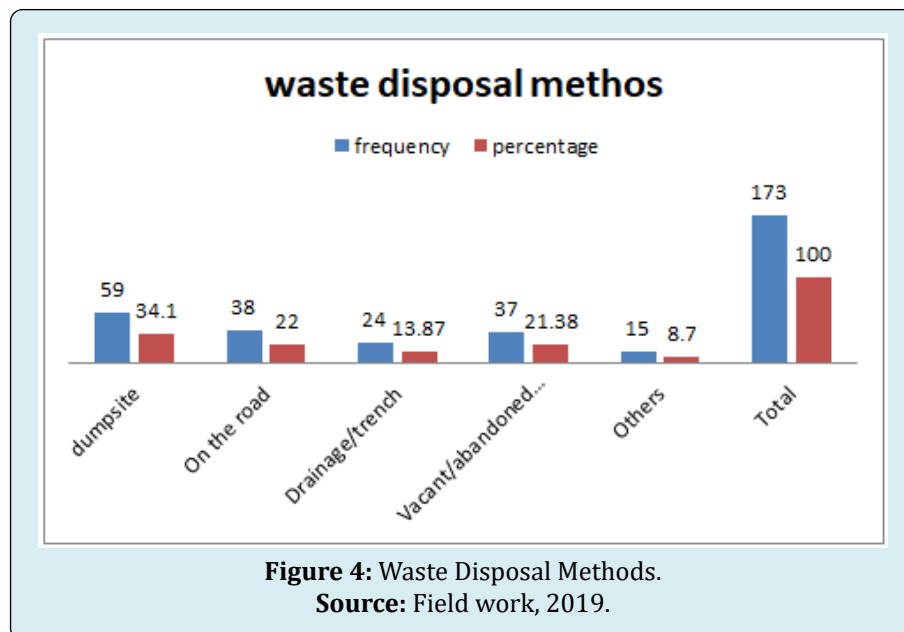
wastes. It could also be concluded that majority of waste generated in Hadejia metropolis comprises of biodegradable non -biodegradable which when poorly managed, could lead to severe implications on human health and environment. This confirm the findings of Nabegu [4] shows that Kano metropolis's solid waste consists to a large extent of organic and other biodegradable matter (43%), the findings also agree with Afangideh, which shows majority of waste generated in Calabar municipality area is biodegradable. .





More than half (52.10) of respondents uses dustbin as a means for waste storage, 24 % uses open container and 22.5% store waste in outside houses. However, some of the collection methods are environmentally unfriendly. However; this can also attract rodents such as rats, mosquitoes to surrounding environment thereby leading to

health problems such as malaria typhoid and cholera, Yakasai [5]. The problem is further compounded by the attitude of communities that do not responsibly participate in waste management, and further aggravated by the inability of local councils to enforce existing waste management laws.

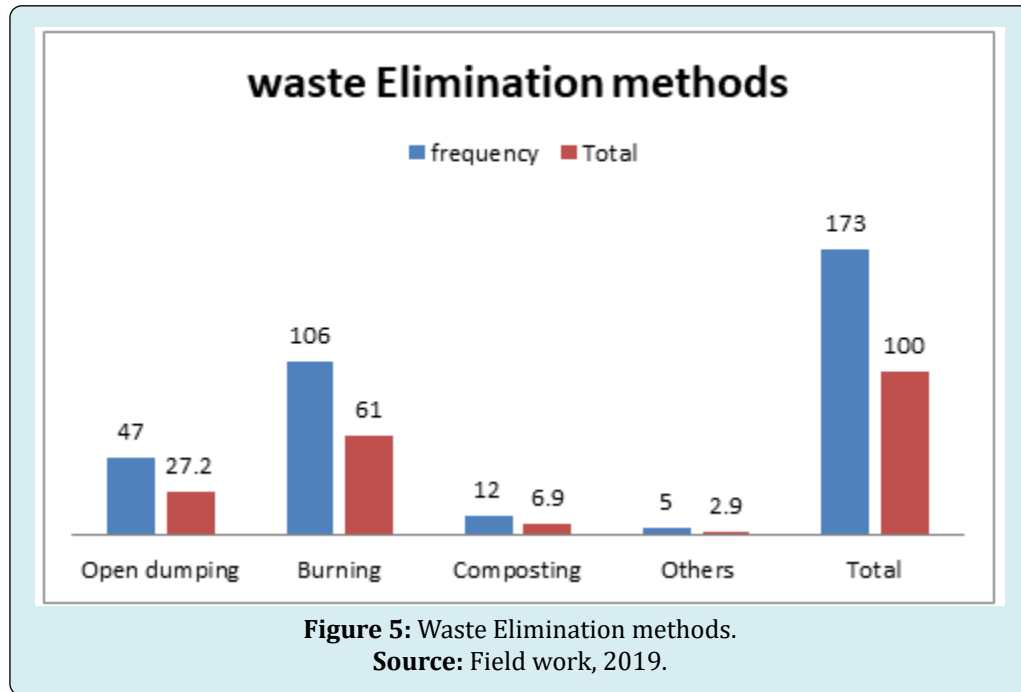


Majority of the respondents in urban areas (34.10%) use dumpsite to finally dispose their waste, while 22%, 24% and 13.8% dispose on the road, drainage/ trench and vacant /abandoned houses respectively. Cumulatively, the residents in hadejia metropolis mainly practiced open

dump. This corroborated with findings of Mansur [6,7]. The results of their findings obviously show that several major streets, open spaces, and even water ways are been used as refuse dump sites within the local government. similarly, the findings of Kazaure [8] uncovered that In Dutse and kastina

Metropolis respectively, like most cities in the developing world, several tons of municipal solid waste is left uncollected on the streets each day. This incurs complications to society such as environmental and health hazards to people via the proliferation of insects and rodents, potential physical injury

and contamination of groundwater and runoff pollution [9]. This indicated that most of the residents dump their waste indiscriminately on the road, in drainages and any available open spaces in the study area a habit which result in environmental and health hazards in the area.



The chart above shows the residents methods of eliminating waste. majority of the respondents (60.9%) burn their waste, this could lead environmental and health hazards .Findings of Jibirin, et al. reveal that (76.7 percent) of the respondents in Hadejia metropolis burn their waste, 7.2% disposes in open dump, 6.9% compost and 2.9% filled potholes . Respondents in the study area are not particularly concerned about proper waste management, open dumping and open burning in unapproved locations has been the norms, this causes emission of ash and gases into the atmosphere which can cause respiratory problems; it is aesthetically unattractive for an area and produces an odious smell that residents would be subjected to. Open burning is often the result of a lack of awareness of alternative disposal options, high levels of poverty, and inadequate environmental regulation or enforcement [10].

Environmental Implications of Indiscriminate Waste Disposal in the Study Area

Wastes disposed indiscriminately are major source of contamination and pollution to both humans and the natural environment. Improper waste disposal may be hazardous and leads to contamination of water supplies or local water sources used by nearby communities or wildlife. Sometimes,

exposed waste may become accessible to scavengers and children if a landfill is insecure. Solid wastes are potentially capable of causing diseases and illness in man, either through direct contact or indirectly by contamination of soil, groundwater, surface water and air During field investigation it was observed that the indiscriminate waste disposal in urban and rural areas of Hadejia are resulting following implications on environment.

Improper waste disposal on streets and drainages lead to flooding .This is consistent with the findings of kazaure [8] on his survey on Sustainable waste management in Duste (SSWM) shows a lot of uncollected waste dispersed on roads and drainages blocking water ways and lead to flooding. Similarly, the findings corroborated with Okechuckwu, et al. [11,12] that indiscriminate solid waste disposal can cause flooding from stagnation water, creating breeding of mosquitoes and other vectors of diseases. Achalu [13] discovered that indiscriminate dumping of waste hinders free flow of erosion and floods when it rains causing blockage of drainages and diversification of water routes in to living housing and destruct life and properties. During the hot season, flies and mosquitoes are increasing in their population so rapidly due to these waste dump and they are very effective vectors that cause diseases such as malaria

.This is consistent with findings of Sarke, et al. [14,15] posted that improper dumping of waste create problem of bad odor, vectors of disease such flies and mosquitoes generation and blockage of drainage.

It was also observed that, the residents in the study area mainly practiced open burning of waste, this causes air pollution issues in Hadejia metropolis. Thus, affecting outdoor air quality and increase the amount of noxious gasses in the atmosphere induces further global warming. During the rainy season, the open dumpsite is causing serious pollution to ground and surface water sources through leaching. Findings from studies conducted by Ali, [16,17] indicated linkages of solid waste and contamination of underground water due to leachate activities. It was also observed during field investigation that indiscriminate waste disposal has changes the, aesthetic view of the environment by making it look dirty and unkept [18-20].

Recommendations

From the findings of this study, it is recommended that:

- The public need to be sensitized and enlightened on proper waste management and disposal practices. This can be achieved through enlightenment campaigns on TV, radio and posters to educate the citizen on it.
- Government should ensure that designated waste disposal points are increased in order to prevent disposing waste in open spaces.
- Adequate funding should be put in place in order to upgrade existing waste management facilities and equipments.
- Government should ensure that environmental laws are effectively and strictly implemented to appropriate the prohibition against illegal dumping of waste.
- Government should setup public-private partnership in waste management .This would help in cleaning up Hadejia and it would also help in creating employment most especially in the areas of waste recycling.

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