Health Issues Associated with Domestic Waste Management in Local Government Councils in Nigeria.

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Abstract

In this study, the various health problems caused by improper disposal of domestic wastes are identified as cholera, malaria, typhoid and skin infections of which malaria is the most prevalent. Those who live close to dumpsites are more prone to these diseases than those who live far away. Common waste disposal methods in Nigeria are identified as incineration, dump sites, street bins, roadsides, drains, streams, bury and burn in pits, landfills and sewage treatment. All of these put together falls short of the currently globally acceptable appropriate environmentally friendly techniques where bioreactors process organic wastes into biogas and organic fertilizers while industrial materials are recycled. Waste sorting in each household before regular collection at regular weekly intervals by each Local Government in contrast to the regional bodies currently being used by State Governments is recommended. An intergovernmental approach is recommended for the upgrade of the current Private Sector Participation to Public Private Participation at each Local Government level where all the three tiers of government are involved is advocated.

Introduction

Increase in global human population implies an increase in domestic waste generation from homes. The latest United Nations estimates on global human population indicate that the world population rose from 3 billion in 1960 to 7.5 billion in the year 2017. This is a 150% increase in human population in 57 years which implies a 2.6% increase per annum within this period. Latest United Nations projections indicate that the world population will reach 10billion in the year 2056 which implies a 33.3% increase in the next 39 years (Worldometers (www.Worldometers.info)). There is no doubt that rate of increase in the world's global populations is increasing. The implication of this is that food consumption will also increase in line with the rate of population increase. If food consumption increases, domestic waste should be improved upon so as to prevent the health problems associated with poor domestic waste management.

It is common knowledge that poorly managed wastes are a serious health hazard which can lead to the spread of infectious diseases. It is in realization of this that this paper attempts to highlight the health risks posed by poor management of wastes in a situation where waste generation increases as human population increases steadily.

Composition of domestic waste

Domestic wastes include kitchen wastes, inert wastes, paper, wood, glass, textiles and leather. They are largely organic in nature and they pose a serious threat because after fermentation, they create conditions favourable to the survival and growth of microbial pathogens. Prior to fermentation, exposed domestic liquid and solid wastes attract flies, rats, and other organisms that spread disease. Decomposition of wet wastesreleases gases that give bad odour.

Modernisation has added industrial components to domestic wastes in the last century. Earthen pots have more or less completely been replaced with metal (aluminum and stainless steel) containers. Plastics are now prominent in domestic wastes because of their increasing use in domestic activities. Hazardous wastes from mercury containing products such as fluorescent lamps, motor oil, oil-basedand latex paints, paint thinner, propane gas cylinders, used tyres batteries and other electronic gadgets are also more prominent in domestic wastes than before.

Diseases associated with domestic wastes

According to Suleman *et al.* (2015), infectious diseases associated with poor solid waste management in tropical environments include the following: Malaria, skin infections, Typhoid fever and Cholera. In a study carried out in Ghana in 2014, malaria was recorded as the most frequently occurring infectious disease being 71% of recorded cases.

Category	Frequency	Percent
Cholera	8	5%
Malaria	105	71%
Typhoid fever	15	10%
Skin infections	20	14%
Total	148	100%

Table 1: Some of the related	l diseases	contracted in	ı Sawaba,	AsokoreMampong	Municipal
Assembly in Ghana.					

Source: Suleiman (2015).

It is remarkable to note that a disease such as diarrhoea is conspicuously missing from the categories of diseases listed in Table 1. This is because many houses in Sawaba and AsokoreMamkpong Municipal community in the municipalities where these studies were carried out are either connected to the sewer system or have their private modern toilets where human excrement are properly disposed. Non-prevalence of diarrhoea may also be due to more hygienic potable water. In the past two decades, Nigerians have cultivated the habit of drinking treated

water in sachets and plastic bottles, so there is less dependence on contaminated untreated water from the brooks, streams and rivers which encourage the spread of diarrhoea and other water borne diseases.

This is not the case in a case study in Zinyengere area in Zimbabwe by (Makoni *et al.*, 2004) where only 7% of households were connected to the sewer system and 13% had no toilet facilities. Diarrhoeal diseases were the most prevalent diseases in the area.

Many studies have been carried out in various parts of the world to establish a connection between health and hazardous waste (Rushton, 2003). Harmful metals found in plastics include copper, lead, chromium, cobalt, selenium, and cadmium. These metals find their way into the environment when not properly disposed. Other chemicals of industrial source which find their way into the environment from domestic waste are: cyanides, mercury, and polychlorinated biphenyls. All these metalswhich cause chemical poisoning in humans are highly toxic and their exposure to man can lead to diseases such as cancer that inevitably leads to death.

Common waste disposal methods in Nigeria

Incineration

Incineration is the burning of domestic waste in backyards, incinerators or open dumpsites. When plastics and other chemical wastes are burnt along with organic wastes toxic gases such as dioxins which is carcinogenic are released into the atmosphere. Biomedical hazardous wastes are destroyed by incineration to prevent contamination and the spread of disease.

Dumpsites, street bins, drains, streets and streams

Undeveloped plots within cities are target sites of domestic wastes. In places where the Local governments are empowered enough to assist, street bins are deposited at various distances apart on virtually every street (Plate 1).



Plate 1. Typical overflowing street bins inside Obafemi Awolowo University Campus in Ile-Ife, Nigeria. A – Beside the Health Centre: B – In front of a Hall of residence.

In cases where these facilities do not exist, people throw domestic wastes into drains, nearby rivers channels or gullies created by erosion. These wastes block the free flow of water in these rivers which frequently overflow after heavy rainfalls. Such overflows sometimes result into fatally devastative floods which flow into households. This attitude of throwing refuse away from where one lives is synonymous with the '*Not-in-my-backyard*' (NIMBY) syndrome as reported by Olokesusi and Adeagbo (2004) who carried out a field survey in two rural communities in Ibadan and reported that people generally do not want landfills to be located in their vicinity. The failure of waste management in major cities in Nigeria has currently led to the habit of people depositing wastes by the roadside or on the pavement in between dual carriage ways. Ibadan is a typical example of a city where this attitude is a common site (Plates 2a & b). Garbage trucks routinely collect these wastes to tip them at landfills (Plate 3). Logistic problems such as vehicle breakdown, industrial action by workers etc, prevent regular collection of these wastes thereby making them as good as open dumpsites right in front of each household. This exacerbates the health hazard problem associated with improper disposal of waste.

The NIMBY attitude confirms that people know that the closer they are to dumpsites, the higher the probability of contacting diseases. Table 3 reveals clearly that people who live close to dumpsites are at a higher risk of contacting diseases than those who live far away from dumpsites.



Plate 2a. Domesticwastes dumped on the pavement in between dual carriage ways in Ibadan metropolis.



Plate 2b. Waste collectors on routine collection of these wastes by the roadside



Plate 3. A garbage truck on routine collection of these wastes to tip them at landfills

Inanother study carried out by Sankoh *et al.* (2013) on Environmental and Health Impact of Solid Waste Disposal in Developing Cities in Sierra Leone, many of the residents living both nearby and far away from dumpsites were aware that dumpsitesare the breeding places for disease vectors, cause diseases, and present poor aesthetics. In the field survey, all respondents were

aware that dumpsites have considerably made the residents to suffer from various diseases with malaria being the most prevalent.

			Distance of final disposal sites			
			less than 5	5-10	11-15	Total
			minutes	minutes	minutes	
Related diseases contracted	Cholera	Count	4	2	0	6
		Percent	67%	33%	0%	100%
	Malaria	Count	75	26	2	103
		Percent	73%	25%	2%	100%
	Typhoid fever	Count	9	3	0	12
		Percent	75%	25%	0%	100%
	Skin infections	Count	13	5	0	18
		Percent	72%	28%	0%	100%
Total		Count	101	36	2	139
		Percent	73%	25%	2%	100%

Table 3. Related diseases contracted and distance of disposal sites. Source: Suleman *et al.*(2015).

Bury and Burn in Pits

This is a waste disposal method that is hardly practiced in households in Nigeria. It was only after the monthly Environmental Sanitation habit was launched in 1985 by the Federal Government of Nigeria (Stock, 1988) that regular burning of wastes in households and their vicinity increased. Even so, people hardly dig pits. In many cases, people just excavate wastes from drains and deposit them openly on the streets where street bins are not available. These wastes eventually find their ways back into the drains when rainfall is heavy and intensive.

Landfills

This method is fast gaining ground in Nigeria where domestic waste collectors collect them from wherever they are dumped and tip them in open excavations of laterites used for road construction which are scattered on the outskirts of towns and villages as well as abandoned quarries where available where scavengers collect re-useable materials including plastics and bring them back into the cities. A number of private companies are increasingly getting involved in this business of domestic waste collection and deposition in 'landfills' in urban centres. In many cases, itinerant waste collectors play this role most especially in convergent market zones. What this implies is that people are now paying private companies/individuals to dispose their wastes for them when the Local governments have failed in the discharge of their constitutional responsibilities (Agboje *et al.*, 2014; Federal Government of Nigeria, 1998). Most of the so-called landfills are not managed in environmentally friendly way as it is done in more advanced countries where they are covered with plastic protective liners to preventair, soil and water pollution. No attempts are made to sort, separate wastes further and compact and process them

further for biogas and organic fertilizer production. This creates a smelly environment where noxious odours as a result of gaseous emissions prevail.

Sewage treatment

This is a process of treating raw sewage to produce a non-toxicliquid effluent which is discharged to rivers or sea and a semi-solid sludge, which is used as a soil amendment on land, incinerated or disposed of inland fill (Rushton, 2003). This type of waste disposal is not very relevant to household waste but it shares an interface with it being composed of organic wastes. It may be relevant in cottage industries (e.g. tie and dye, fermentation, food processing, etc.) located in backyards where wastes are discharged indiscriminately into the environment without formal treatment.

Appropriate environmentally friendly waste management techniques

Virtually all the elements of proper waste management that will prevent disease and reduce pollution of the environment are missing from current waste management techniques in Nigeria. Waste sorting from households before disposal is virtually non-existent. Paper can be re-cycled if separated from organic and hazardous wastes. Organic wastes can be composted and/or used to produce bio-fuels. Hazardous wastes can be disposed in accordance with internationally accepted (http://www.epa.illinois.gov/topics/wasteensure environmental safety rules that management/waste-disposal/household-hazardous-waste/disposal/index). This scenario will ensure that plastics are not incinerated indiscriminately. There will be organized recycling of used metallic materials. Plastic bottles and metal containers can be made available for re-use under hygienic conditions. The present proliferation of street bins has not worked. It has ended up in creating dumpsites wherever they are located when regular disposal before they are filled to the brim cannot be achieved.

The ideal situation is the *Collection and transfer* system (De Jaeger and Rogge, 2013) where properly sealed sorted wastes in garbage bags and containers of different colours that indicate their contents are collected at appointed dates weekly from each household by garbage trucks. Glass containers which must be emptied regularly should also be placed at a minimum distance of 100 meters apart inside which people can dispose their used glass materials. If this is steadfastly put in place in each local government, health hazards resulting from improper disposal of waste will be reduced to the barest minimum.

Environmentally friendly waste management cannot be achieved at the level of individual households alone. The ideal situation is that each of the 774 Local Governments in Nigeria is involved as a collective that operates independently in each unit based on the peculiarities of their environment. This is because Local governments in Nigeria do not operate at the same level of urbanisation. Rural Local Governments may not have the problem of hazardous wastes as those in sub-urban or urban settings, but they may have more problems of human faecal matter disposal because houses without proper toilet facilities are more prevalent there. Even within urban settings, waste composition may vary depending on how close they are to industrialisation. The issue of Environmental Education for Local Government personnel involved in waste collection and disposal is also very important because their attitude to workwill be influenced by

their level of literacy in environmental and health issues related to poor waste disposal. In addition, the following suggestions of Uju (2014) are also pertinent:

- i) There should bepublic enlightening campaigns on radio, churches, and village meetings to get people educated on the effects of improper waste management on their health.
- ii) Functional waste management education should be organized for women preferably at informal gatheringsetting such as antenatal and postnatal clinics and meetings of their various associations.
- iii) Waste management skill should be included in school curriculum and be taught at all levels of education inNigeria.

Unfortunately, the ideal situation remains elusive because of lack of adequate funding of the Local Government Councils by the Federal Government. As a result, many state governments have now put in place regional bodies whose responsibilities are to collect and manage household wastes. A few examples are the Lagos State Waste Disposal Board (Adefemi, 1980), Oyo State Waste Management Authority (OYOWMA) and the Abia State Environmental Agency (Uchendu, 2016). These regional bodies have also not been able to cope. In order to add value to their mandate, virtually all of them have embraced Private Sector Participation (PSP).

In a paper published by Zhiyong*et al.* (2015) on characteristics and management of domestic waste in the rural area of Southwest China a propositional waste management system was provided in which all the elements of environmentally friendly waste management are incorporated. This system is based on the models used in most advanced countries in the world and it can be adapted to suit the peculiar conditions in each locality anywhere in the world. It is a perfect example of Public-Private-Participation (PPP) which is now being advocated globally for development (Word Bank Report, 2017).

The major determining factor for sustainable environmentally friendly waste management in Nigeria is for the Federal Government to finance Local Governments adequately and ensure that the current PSP strategy is upgraded to PPP. State governments should not allow the private sector alone to finance and cart away all the revenue realized from waste management. For example, bioreactors and re-cycling industries could be provided in each Local Government by the Federal Government and inculcated into the PPP strategy that will increase State and Local Government involvement from mere monitoring to direct participation in the entire process. This is indeed a challenge in inter-government relations that will ensure coordination through policy legislation by the Federal government. Effective implementation of PPP by all tiers of government will provide an enabling environment for environmentally friendly waste management techniques which has profound positive feedback effects on solving global pollution and the attendant climate change problems. Afterall, prevention and treatment of health hazards among the citizenry is more of the responsibility of the Federal and State governments than the Local governments.



Fig. 1. Propositional environmentally friendly waste management system. Source: Zhiyonget al., (2015).

Conclusion

It has been established in this study that malaria is the most prevalent disease associated with poor domestic waste disposal in rural areas where there are adequate toilet facilities, effective sewerage systems and hygienic potable water. The various domestic waste disposal systems in Nigeria are inadequate in preventing diseases and reducing environmental. Sorting of wastes from households before collection and transfer regularly at appointed dates weekly from each household to landfills is recommended. It is suggested that this exercise is carried out at the level of Local Government Councils rather than the current regional bodies established by State Governments through Private Sector Participation (PSP). A case is made for the replacement of PSP with Public-Private-Participation (PPP) which is now being advocated globallyfor sustainable environmentally friendly waste management. This is seen as a challenge in inter-government relations where policy legislation by the Federal government as well as adequate funding of Local Government Councils by the Federal Government is germane.

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