ASSOCIATED HEALTH RISKS FOR URBAN SOLID WASTES IN SOME PARTS OF KANO METROPOLIS

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ABSTRACT

This paper is based study examined the health risks associated with urban solid wastes in some parts of Kano Metropolis identifying and examining the common illnesses related to poor management of wastes. The study area was divided into three clusters of low population density, medium population density and high population density areas. The study observed that the dumpsites are located very close to residences and trade places making both to be dangerous to occupants' health. Statistical Package for Social Science (SPSS) was used to analyze and present the major findings revealing that there is poor waste management in all the areas studied, attributable to poor and informal means of managing waste especially as regards to the sitting of the dumpsites as a result of which certain illnesses like malaria and typhoid are the most common illnesses reported. It was also found that respiratory tract infections in the study area can be associated with the dumping sites across the three clusters. And more than half of all the three areas accepted that there is linkage between waste disposal and illnesses showing a higher level of the health-waste relationship awareness in the study area.

Keywords: Urban Solid Waste, Waste Management, Health Risk, and Kano Metropolis

INTRODUCTION

Nigeria has experienced rapid urbanization, rising standards of living, new technologies and the attendant changes in tastes and lifestyle, have effectively contributed to an increase in both the volume and the nature of wastes generated in urban areas (Okpoechi, 2007). Heaps of solid wastes are common sights in the state capitals and urban areas of the Federation. The Solid waste problem in Nigeria cannot be separated with its consequent effect not only on the environment but on human health and this has become a topic of concern (Ibrahim, 1996). Okpoechi (2007) asserted that widespread of urban poverty coupled with lack of an articulated strategy for the management of solid waste has led to indiscriminate dumping of these wastes on roadways, shop fronts, and other available open spaces; the results of which are contamination of local sources of water, soil degradation, air pollution as a result of offensive odor from the decomposing waste and flooding as a result blocked drainages. This is seen as a way of turning the environment into an automatic breeding ground for diseases, and roads are obstructed leading to traffic congestion while places where the wastes are lying are defaced and eyesore. Faloma (1995) lamented that solid waste disaster could take a form of typhoid epidemic, cholera outbreak or even lead to higher mortality rates among the general

population as a result of various related disease associated with it. Kano metropolis as Kano State capital also accommodates larger parts of the population in the state. This has encouraged commercial, industrial and many other day to day activities which contributed significantly to the huge amount of waste generation in the state (PAI, 1992).

STUDY AREA

Location and Extent

Kano metropolis lies between latitude $12^0 25'$ and $12^0 40'$ North of the equator, and longitude $08^0 35'$ and $08^0 45'$ East of the greenwhich, and it consist of eight local government areas namely Dala, Gwale, Tarauni, Nassarawa, Fagge Kano Municipal, and parts of Kumbotso and Ungogo (Figure 1).

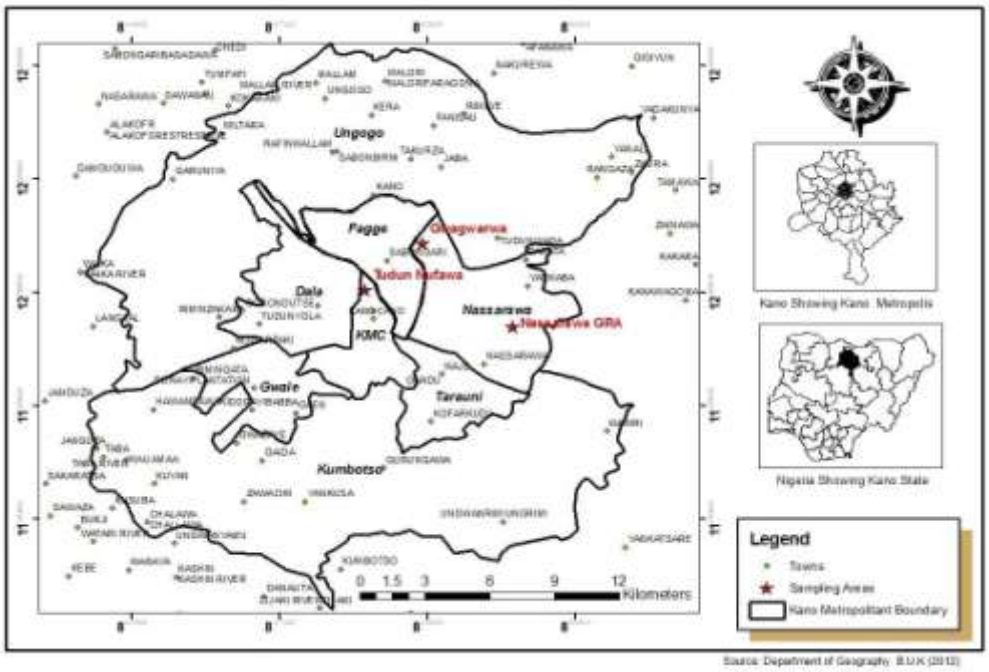

Fig. 1: Kano Metropolis Showing Study Areas

POPULATION AND SETTLEMENT

Kano metropolis is densely populated with a total population of 2,166,179 (NPC, 2011) using the annual exponential growth rate of 3.2% increase growth rate of Kano between 1991 and 2006 census. The land mass of the metropolitan Kano is 683 square kilometer with a population density of 3,171persons/km^2. Kano metropolis has been categorized into three areas based on population density according to Maiwada (2000):

High and Very High Density Areas: Most of the old walled city (Cikin Birni), Fagge, *Sabon-Gari*, *Gwagwarwa* and the newly developed areas of the periphery, such as *Tudun Murtala, Kurna, Dakata, Unguwa Uku, Giginyu* and *Naibawa.*

Medium Density Areas: Hausawa, Tarauni, parts of Hotoro, Kawaji, Gwammaja, *Gadon Kaya, Kabuga*, Zoo Road, NNDC Quarters and Federal Low-cost Houses of *Tukuntawa*.

Low Density Areas: The Government reservation area (GRA) and the Institutional land-uses.

Land-Use and Commerce

Land use is dominated by urban land use and some agricultural land use found around ponds in the area. The urban land use include residential, commercial and institutional. Urban land-uses generate wastes which differ in quantity and composition. There are numbers of industries in Kano Metropolis that generate substantial amount of solid, these industries are categories into small, medium, and large-scaled industries are all found around the urban Kano in places such as industrial layouts at *Bompai, Gunduwawa, Sharada*, and some along Zaria Road.
Ahmad (2007) identified twelve major markets that generate abundant solid wastes in Kano metropolis, these are, *Kurmi* market, *Rimi* Market, *Kofar Wambai* Market, *Yan-Kaba* Vegetable Market, *Kofar Ruwa* plumbing and building materials market, *Sharada* Market, Tarauni Market, and *Sheka ('Yar kasuwa)* market.

MATERIALS AND METHODS

Research tools

Global Positioning System (Garmin 76csx GPS model), Digital Camera, Google Earth Imagery, and GIS software (ArcGIS 9.3 version), Questionnaires, Focus Group Discussion (FGD) and Observation.

Method of data collection and Analysis

Ground Positioning System (GPS) was used to take the co-ordinates of the solid waste collection points in the selected clusters, through which a database was created and used to record the coordinates, legality, locations and addresses of the collection points. A digital camera was also used to take pictures of some selected solid wastes collection points so as to show their proximity to residences.

Geo-Referencing and Digitization

The parts of Kano Metropolis studied were zoomed and extracted from satellite imagery, Google Earth imagery specifically. The extracted image was then imported to Geographic Information System (GIS) software, specifically ArcGIS 9.3, and then geo-referenced and digitized to produce a digital maps.

Distribution of the Dumpsites

The coordinates of the dumpsites taken during the fieldwork were imported into the ArcGIS 9.3 as text file, then converted to shape file to show the spatial distribution on the digital maps. Points (dots) were used to show the solid waste collection points.

Non Spatial Data Analyses

The data obtained using Questionnaires and Focus Group Discussion (FGD) were then compressed, analyzed and presented in tables showing frequency and simple Percentage using Statistical Package for Social Science (SPSS).

Sampling procedure and Sample size

Respondents were identified base on settlement settings. The first stage of data collection consists of wards in the study area (cluster) and three cluster randomly selected are *Tudun Nufawa* in the Kano core-city, *Gwagwarwa* quarters outside the city, and Nassarawa GRA). Finally, Purposive sampling was employed so as to select houses, shops, and road side traders that are closer to the dumpsites.

One hundred questionnaires in each of the three clusters were administered, making a total of 300, and 263 representing 87.67% of the questionnaires were retrieved and used for the analysis. Six (6) Focus Group Discussions (FGD) were carried out, with one male and one female group in each of the clusters consisting of members of each group ranging between six to twelve participants.

RESULTS AND DISCUSSIONS

Spatial Distribution of Dumpsites in Some Selected Areas of Kano Metropolis

With regards to the spatial distribution of the dumpsites in the selected parts of Kano Metropolis, the distribution of the dumpsites in *Tudun Nufawa* quarters is absolutely linear along the major roads of the area (fig. 2), this is because the area is part of the densely populated area of Kano Municipal Local Government Area of Kano Metropolis. Meanwhile, both linear and dispersed distributions are found in *Gwagwarwa* quarters (fig. 3) because of its moderately population and housing densities. In *Nassarawa* GRA (fig. 4), the distribution is never associated with the major roads because of the availability of open spaces everywhere due to the low population and housing densities nature of the area.

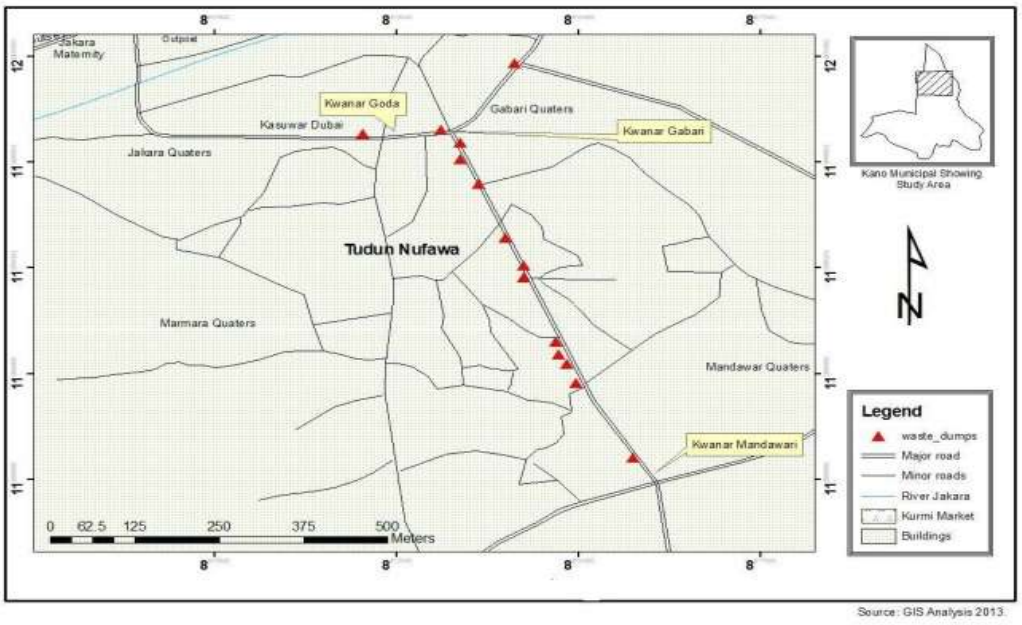

Figure 2: *Tudun Nufawa* Quarters showing the Distribution of Dumpsites

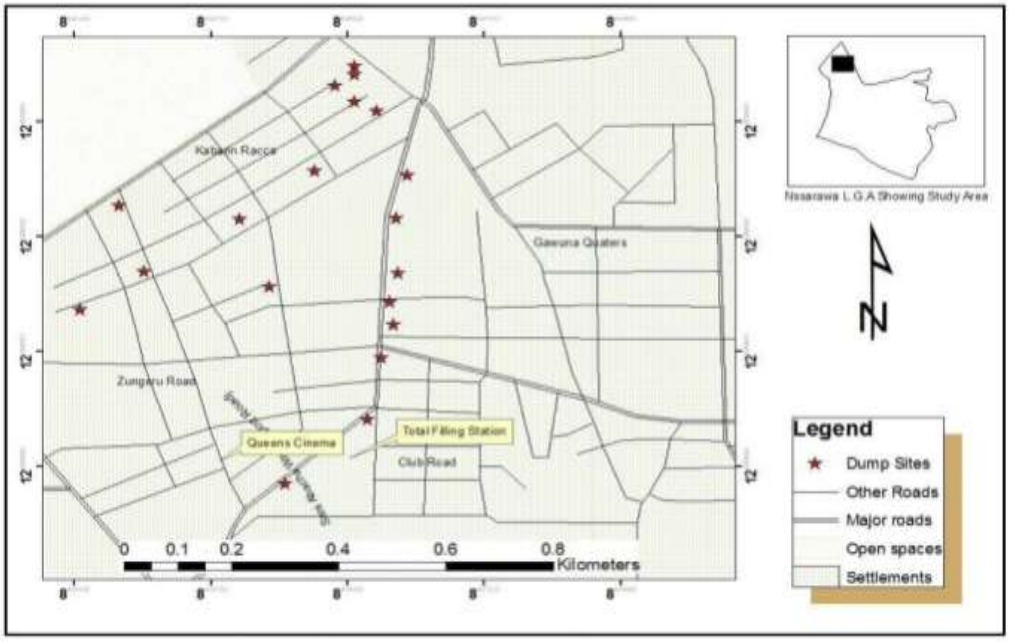

Figure 3: *Gwagwarwa* showing the Distribution of Dumpsites

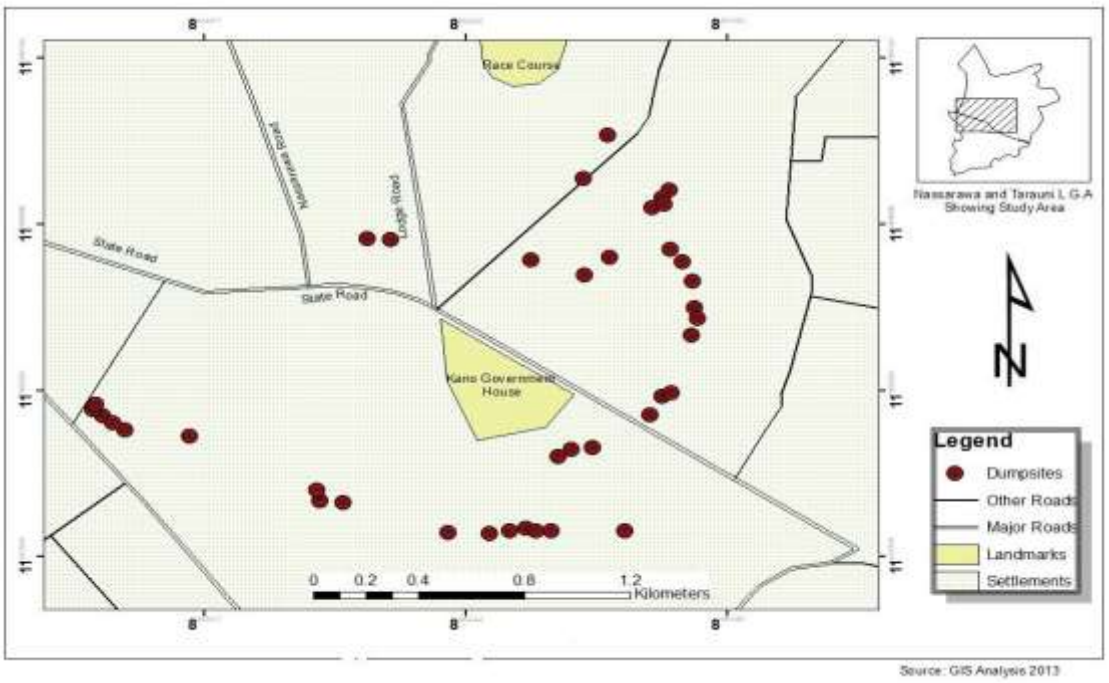

Figure 4: *Nassarawa* G.R.A. showing the Distribution of Dumpsites.

Dumpsites Health Associated Problems

Table 1: Problems associated with wastes accumulation

Problems Caused by the Accumulation	Location of Residence					
	Tudun Nufawa		Gwagwarwa		G.R.A	
	Number	Percent	Number	Percent	Number	Percent
Offensive Odour	25	26.6%	9	9.7%	11	14.5%
Road Obstruction	14	14.9%	8	8.6%	8	10.5%
Drainage Blockage	8	8.5%	8	8.6%	6	7.9%
Mosquito breeding	21	22.3%	41	44.1%	19	25.0%
Flies breeding	9	9.6%	7	7.5%	11	14.5%
Harbor rodent	5	5.3%	8	8.6%	10	13.2%
Produce Leachate	4	4.3%	6	6.5%	5	6.6%
Eye soar	8	8.5%	6	6.5%	6	7.9%
Total	**94**	**100.0%**	**93**	**100.0%**	**76**	**100.0%**

Source: Field survey, 2012

Table 1 above revealed that highest percent of the responses from *Tudun Nufawa* residence (26.6%) stated that offensive odour is the major problem associated with dumpsites, followed by mosquito breeding (22.3%) which is directly associated with malaria and Yellow fever diseases. Meanwhile, mosquito breeding is seen as the highest problem in *Gwagwarwa* and *Nassarawa* GRA, followed by the offensive odour. House flies breeding being very popular in spreading diseases such as typhoid, cholera and dysentery, salmonella, etc, have the same figure with offensive odour in GRA (14.5%), both placed in the second position of the respective areas, and it is forth (9.6%) and sixth (7.5%) in *Tudun Nufawa* And *Gwagwarwa* quarters respectively.

Table 2: Common Illnesses Identified by Residents Living Close to Dumpsite

Common Illness Identified by Residents Living Close to Dump Sites	Location of Residence					
	Tudun Nufawa		Gwagwarwa		G.R.A	
	Number	Percent	Number	Percent	Number	Percent
Typhoid	14	14.9%	10	10.8%	5	6.6%
Malaria	40	42.6%	41	44.1%	13	17.1%
Diarrhea	10	10.6%	13	14.0%	0	.0%
Cholera	16	17.0%	10	10.8%	0	.0%
Skin Disease	1	1.1%	1	1.1%	0	.0%
Abdominal Disorder	5	5.3%	1	1.1%	3	3.9%
Peptic&Gastric Ulcers	1	1.1%	1	1.1%	2	2.6%
RespiratoryTract Infection	0	.0%	10	10.8%	6	7.9%
Cancer	1	1.1%	0	.0%	0	.0%
Others	6	6.4%	6	6.5%	47	61.8%
Total	**94**	**100.0%**	**93**	**100.0%**	**76**	**100.0%**

Source: Field Survey, 2012

This is evident in the assertion that the dumping of solid wastes along road sides which are usually left to decompose naturally by microorganisms habours house flies, mosquitoes, other arthropods, rodents and other diseases vector causing spread of common illnesses that are complicated like malaria, typhoid fever, diarrhea, cholera, etc. (Ike, 2011). In addition to air contamination therefrom, the house flies, the mosquitoes, and the rodents as disease agents to man are from dumpsites. In *Tudun Nufawa*, malaria, cholera and typhoid fever are the common sicknesses faced by the people living near the dumpsites respectively. In *Gwagwarwa*, malaria and diarrhea were placed first and second; and malaria, typhoid fever and respiratory problems occupied the third position with the same percentage figure (10.8%). In *Nassarawa* GRA, unspecified sickness account for more than half of the total responses (61.8%), while malaria, respiratory problems and typhoid fever occupies second, third and fourth positions respectively. In general, cases that might not be dumpsite health-related problems such as gastric and peptic ulcers are also found in the areas. But still ulcers are sometimes caused by bacteria called *Helicobacter pylori* which can be spread through contaminated food and water. And GRA is a better-managed waste area compare to the others.

Plate 1: Dumpsite at Tudun Nufawa showing its Proximity to Residences

Plate 2: Dumpsite at Gwagwarwa showing its Proximity to Residences and Drainage Blockage

Plate 3: Dump site at Nassarawa G R A showing it Proximity from Residents and Drainage Blockage

Table 4: People's Perception on the Association between Dumpsites and Health

	Location of Residence					
	Tudun Nufawa		Gwagwarwa		G.R.A	
Associating Wastes With Illness	Number	Percent	Number	Percent	Number	Percent
Yes	79	84.0%	55	59.1%	66	86.8%
No	15	16.0%	38	40.9%	10	13.2%
Total	**94**	**100.0%**	**93**	**100.0%**	**76**	**100.0%**

Source: Field survey, 2012

More than half of all the three areas accepted that there is linkage between waste disposal and illnesses. This shows that the level of awareness of the linkage between waste and health in Kano Metropolis is above average.

CONCLUSION

This study has focused on the identification of the relationship between urban solid wastes and some common illnesses in parts of Kano metropolis. The study highlighted some factors responsible for challenging frequent illnesses in relation to poor waste management in the study area. The study also revealed that wastes management in the low and the medium populated part of the study area is very poor as there is no formal means of management especially as regards to the siting of the dumpsites location The dumpsites are located very close to residences and shops making residents frequently, directly and indirectly in contact with the wastes getting more exposed to waste associated disease.

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