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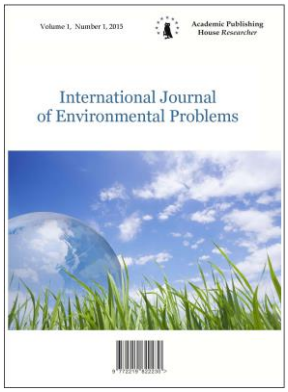

Articles and Statements

Influence of Local Governance on Residents' Environmental Sanitation Behavior in Nigeria: the Ile-Ife Experience

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Abstract

This paper examined the influence of local governance on residents' environmental sanitation behavior in Ile-Ife, Nigeria. This was with a view to suggesting policy response in furtherance of a sustainable environmental behavior among residents in the city and others with similar background. Four residential zones were identified in the study area. A total of 2,881 buildings were identified comprising 739, 154, 357 and 431 respectively in the low income, middle income, high income and post crisis residential area. One out of every 10th residential building was sampled in each residential area. A total of 288 residents were selected for survey using systematically sampling technique. The study revealed that residents' socio-economic characteristics varied significantly across residential areas. The study also found that there is low level of access to environmental sanitation facilities/services in the low income, middle income and post crisis residential areas.

The study established that a relationship exist between residents' environmental sanitation behavior and their place of residence. The study also established a variation in the level of agreement of the functions of the mandated monthly environmental sanitation exercise. In general, the maintenance of dumpsites within the city by government was not satisfactory to the residents across the four identified residential areas. The study recommended a synergy of strategies among environmentally-concerned institutions in the study area in provision of facilities/services, environmental awareness and enforcement of sanitation legislations in the study area.

Keywords: environmental sanitation, governance, legislation, facilities, services, Ile-Ife.

1. Introduction

Many countries especially in the developing world are characterized by poor sanitation conditions, indiscriminate dumping of wastes, open urination and defecation. This situation manifested as a result of poor sanitation behavior of citizens, inadequate environmental amenities, ineffective legislation and governance among others (Daramola, Olowoporoku, 2018; Olukanni et al., 2014; Akpabio, 2012). In Nigeria, issues of environmental sanitation have constituted a major problem to both individuals and government as living environment in urban centres of the country pose serious health risk and affront to human dignity. In order to alleviate these challenges, proper

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environmental sanitation behavior in close involvement with the regulators and facilitators of environmental sanitation especially at the local level must be ensured.

The delivery of environmental sanitation services and facilities which is meant to aid environmental sanitation behaviour in Nigeria is poor. This poor delivery is a reflection of the disjointed nature of local governance of Nigerian cities (Daramola, Olowoporoku, 2017a). Local governance is the formulation and execution of collective action at the local level. It encompasses the direct and indirect roles of formal institutions of local government and other government hierarchies (World Bank, 2005; Wilson, 2000). Local governance is not limited to the relationship between the government and its citizens at the local level rather, it emphasis citizens' interaction and the delivery of local public services (Daramola, Olowoporoku, 2017).

Local governance refers to how government at the local level among other stakeholders decides how to plan, finance and manage urban areas (Avis, 2016). It plays a critical role in shaping the physical, political and social character of cities and influences the quantity and quality of local services and efficiency of delivery (Slack, Côté, 2014). Nigeria as a country operates federalism and has witnessed concerted efforts of federal, state and local governments and other allied institutions on various issues such as environmental sanitation. Various government agencies and non-governmental institutions have been established to manage environmental sanitation in terms of providing interventions, facilities, promulgation and enforcement of legislation. However, the efforts of these agencies and institutions have been a clap with one hand.

Environmental sanitation behavior encompasses the involvement of citizens in the provision, utilisation and maintenance of environmental sanitation facilities and services and adherence to environmental sanitation legislation both in their homes and neighbourhoods (Daramola, 2015). The concern for urban environmental sanitation has been part of Nigerian development. Efforts in these regard include regular inspection of households by sanitary inspectors and the promulgation of environmental sanitation regulations (Olowoporoku, 2016). The legislations were made so as to arrest the sanitation problems and inculcate correct healthy habits, attitude and practices among citizens. Despite these laws, the physical environment in most states are still plagued with worrisome environmental sanitation conditions, gross environmental indiscipline, heaps of refuses on roadsides, rivers, road medians, therefore making issue of sanitation seems incurable (Daramola, Olowoporoku, 2017b). As opined by Daramola, Olowoporoku (2017a) and Olowoporoku (2014) enhancing citizens' environmental sanitation behaviour, involves improved governance of the local administrative system of the city.

Issues related to environmental sanitation have aroused the interest of researchers in Nigeria (Daramola, Olowoporoku, 2017a; Daramola, Olowoporoku, 2016; Olukanni et al., 2014; Oke et al., 2013; Olawuni, Daramola, 2012; Odekunle, 2015; Ojedokun, Balogun 2010). However, they have only focused on environmental sanitation behavior in relation to availability of environmental amenities. Other studies in this regard include Ekong (2015), Afon, Okanlawon, Adigun, Odunola (2008). These studies examined the influence of socioeconomic background on environmental sanitation behavior while Olowoporoku, (2017) and Daramola and Olowoporoku (2017a) examined environmental legislation and service delivery. In all these discussions, little emphasis was placed on the link between institutional policies and people's sanitation behavior. In order to bridge the identified gaps in literature from the previous studies the intent of this study is therefore to examine the influence of local governance on residents' environmental sanitation behavior in Ile-Ife, Nigeria.

2. Materials and Methods

2.1. Object of the Study

The study area is Ile-Ife, Osun State Nigeria. Ile-Ife is known to have been in existence before the advent of colonialism. The city is located in the South-western geopolitical zone of the country. It lies between Latitude 7^{o} 15^{o}N, 7^{o} 31^{o}N and Longitude 4^{o} 43^{o}E, 4^{o} 45^{o}E (see Figure 1). Ile-Ife covers 1,846km^{2} with a population of 214,258 (Federal Government of Nigeria, 2007). Ile-Ife comprises two Local Government Areas (LGAs); Ife Central and Ife East LGAs of Osun state.

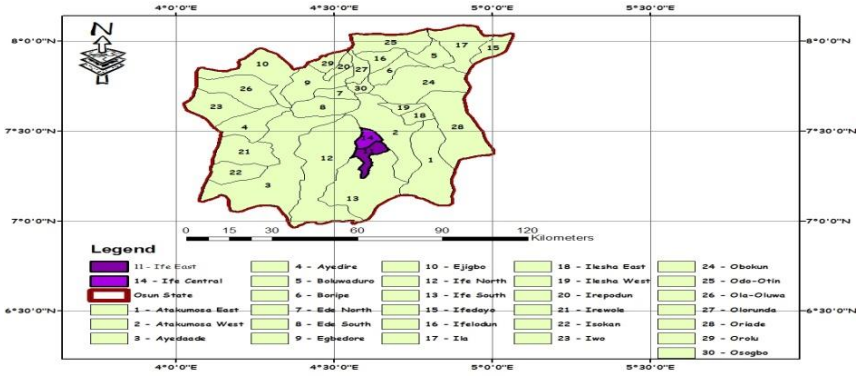

Fig. 1. Ile-Ife Local Government Areas in the context of Osun State

As identified by Afon & Badiora (2013), Ile-Ife is divided into the traditional town centre, middle income, high income and post crisis residential areas. The traditional town centre is mainly occupied by indigenes and the first migrant settlement (Mabogunje, 1962). The area is characterized by low income earners, high levels of poverty, high population density, lack of physical planning, dilapidated buildings, high level of illiteracy and inadequate environmental services both at household and community levels. The houses in the zone are closely built together, mainly of the traditional system, connected together with footpaths in a serpentine manner. Presence of human and animal waste, waste products from food and other consumables litter is obvious in this area (Adedimeji et al., 2005). The most predominant housing types are face-face bungalow buildings.

According to Afon (2011), the middle income residential area evolved to accommodate growing middle-income class in the city. In these areas, ethnic composition of the population is more varied compared with the traditional areas (Mabogunje, 1962). In this area there are evidences of development with layout plans and planning regulations.The area is characterised with higher income status compared to the traditional area, lower population density and higher accessibility to environmental facilities and services than the traditional residential area. It features house types such as flats and face-face storey-buildings.

The high income residential areas are characterised by well-planned layouts and high income earners than all other residential areas (Adedimeji et al., Durotolu, 2005). The ethnic composition and housing types are heterogeneous. Also there improved provision of urban environmental services compared to the middle income areas. Majority of residents in this area engaged in white collar jobs. These areas have high quality of landscape architecture, streets layout with planned distributed structure. It features house types such as flats and duplexes.

The post crisis residential areas were originally parts of the traditional residential areas and middle income residential area. This is because some part of this area developed as transition zone through a layout plan while others organically developed. They are mainly occupied by the indigenes of Ile-Ife. However, its present social and physical conditions emerged as a result of the last Ife-Modakeke crisis. This area consists of freestanding row houses and dilapidated buildings, vacant spaces, unoccupied buildings serving as dump sites, low trees and bushes between the buildings. The local streets inside the area are frequently disserted particularly in the night. The social compositions of the dwellers consist of mostly immigrants, unemployed and low-income families and the areas' spatial layout tend to be spatially segregated with few possibilities for social control and natural surveillance.

2.2. Methodology

In determining the sample size for the study, the two local governments in the city of Ile Ife were stratified into the four identified residential areas. These are the low income, middle income, high income and post crisis residential areas. A total of 287 streets were identified from the identified residential areas comprising 77, 118, 35 and 57 respectively. One out of every five street (20%) in each residential stratum was randomly selected without replacement. From the selected

streets, a total of 2,881 buildings were identified comprising 739, 154, 357 and 431 respectively in the four areas.

Every 10th residential building was sampled sequel to enumeration of buildings based on street numbering system and counting of buildings where houses were not numbered, especially in the low income and post crisis residential areas. Of the 288 questionnaire administered, 270 were retrieved for analyses. In each selected building, the focus was on any adult from age 18 years and above. The benchmark of 18 years is premised on the legal age appointed as legal transition into adulthood in the country. Data collected through the questionnaire survey are socio-economic attributes of the residents, those pertaining to availability of sanitation services/facilities, sanitation and their perception on the mandated monthly environmental sanitation exercise**.** Analysis of the data was done using cross tabulation and Analysis of Variance (ANOVA).

Mean indexes was used to determine residents agreement with the roles of the mandated monthly environmental sanitation exercise in the study area. The views of the residents on agreement with the exercise were expressed using a five-point Likert scale. Residents were provided with a list of functions of environmental sanitation exercise in the literature. The analysis of the responses evolved Residents' Agreement Indexes (RAIs) and mean Residents' Agreement Indexes ($\overline{RAI}$). To obtain a RSI, a weighted value of 5,4,3,2 and 1 were respectively attached to rate each response (Strong Agreement (SA) =5, Just Agreed (JA) =4, Agreed (A) =3, Disagreed (D) =2 and Strongly Disagreed (SD) =1) on any functions of the exercise. The SWV for each item was obtained through the sum of the product of number of responses of each item and the respective weighted value attached to each rating. This is expressed mathematically as:

$$SWV = \sum_{I=1}^{5} X_i Y_i$$

Where:

SWV = summation of weight value, X_i = number of respondents to rating i; Y_i = the weight assigned a value (i = 1, 2, 3, 4, 5).

The RAI for each item on the scale was arrived at by dividing the Summation of Weighted Value (SWV) by the total number of respondents in each residential area, mathematically expressed as:

$$RAI = \frac{SWV = \sum_{I=1}^{5} X_i Y_i}{N}$$

The $\overline{RAI}$ later was computed by summing residents' agreement and dividing by the number of the functions (n = 10), mathematically expressed as:

$$\overline{RAI} = \frac{RAI}{n}$$

Residents' agreement with function of the exercise with the actual values of the $\overline{RAI}$ indicated a moderate level of agreement by residents. Values with positive deviations indicated high level of agreement, while those with negative deviations indicated low level of agreement with functions of the exercise. The ranks of the index values were likewise provided. The views of the residents on satisfaction with the roles of government in the exercise were expressed using a five-point Likert scale of Very Satisfied (VS) =5, Satisfied (S) =4, Fairly Satisfied (FS) =3, Dissatisfied (DS) =2 and Very Satisfied (VD) =1. The views were measured through an index called Residents Satisfaction Index (RSI). The procedure for arriving at this index is similar to the one used to measure resident agreement. The mean indexes were denoted by $\overline{RSI}$.

3. Result and Discussion

This section discusses the profile of the respondents, availability of environmental sanitation facilities/services in residents' homes based on residential characteristics, household sanitation practices and perception of the conduct of the monthly environmental sanitation exercise in the study area.

3.1. Profiles of the Respondents

The profiles of the respondents discussed are gender, age educational attainment, length of stay, income status, household size and type of building all these in relation to their places of residence. As established by Afon and Faniran (2013) and Daramola and Olowoporoku (2016) socio-economic attributes are main features that affect environmental behaviour.

Findings were made on gender distribution of respondents across the four residential areas of Ile-Ife. The proportion of males in the low income, middle income, high income and post crisis residential areas constituted 61.1 %, 48.4 %, 33.3 % and 40.0 % respectively. Also, female respondents in the low income zone were 38.9 %, middle income 51.6 %, high income 66.7 % and post crisis residential zone 60.0 %. In general, 51.1 % of the total respondents across the four residential areas were females. Impliedly, females participated more in the study than their male counterpart. The high level of participation of females could be attributed to their availability at home for family obligations, neighbourhood trading and their key role in environmental sanitation issues (Daramola et al., 2017; Daramola et al., 2017; Afon, Faniran, 2013).

Another important attribute of residents discussed is age**.** As established by Schultz et al, (2005) and Olowoporoku et al. (2017), age plays a significant role in environmental awareness. For a better understanding, the initial qualitative data on age of residents was categorized into four. These are teenagers (≤ 20 years); young adults (21 – 40 years); elderly adults (41 – 60 years) and older people (> 60). In the low income areas, 16.7 % of the respondents were teenagers 44.4 % were young adults, 36.1 % were elderly adults and 2.8 % of the respondents were older people. In the middle income areas, 14.1 % of the respondents were teenagers, 64.1 % young adults, 20.3 % were elderly adults while the remaining 1.6 % older people. Information from the high income areas revealed that the proportion of teenagers, young adults and elderly adults constituted 6.7 %, 66.7 % and 26.7 % respectively. Investigation from the post crisis zone revealed that 40.0 %, 45.0 % and 15.0 % of the respondents were teenagers, young adults and elderly adults respectively. Across the four residential areas majority (80.7 %) were adults. The ANOVA Test result ($F= 13.916$, $p < 0.05$) revealed that the age distribution of respondents varied significantly across the residential areas.

Findings were made on the average monthly income of respondents in the study area. The mean monthly income was grouped into three: low, medium and high. Income below ₦20, 000 categorized as low. This was premised on the fact that the minimum wage at the federal level in Nigeria is ₦18, 000 while it ranges from ₦15, 000 to ₦20, 000 in the states of the federation. The medium monthly income was categorized from ₦20, 000 to ₦70000 while residents earning above ₦70000 were categorized as high income earners. Based on the categorization, variation in average monthly income class existed among the respondents in the study area. Findings revealed that in the low income areas, 50.0 % earned less than ₦20000, 41.2 % earned between ₦20000 and ₦70000 while 8.8 % earned above ₦70000. In the middle income areas, 26.9 % of the respondents earned below ₦20000, 55.8 % earned between ₦20000 and ₦70000, and 17.3 % earned above ₦70000. In the high income areas, 7.7% of the respondents earned below ₦20000, 23.1 % earned between ₦20000 and ₦70000 69.2 % earned above ₦70000. In the post crisis areas, 53.3 %, 33.3 %, and 13.3 % earned below ₦20000, ₦20000 and ₦70000 and above ₦70000 respectively. The ANOVA test result ($F = 9.080$, $p <0.05$) revealed that income distribution varied significantly with residential areas.

Household size was measured by the number of people living together with common eating arrangement. Based on this, the household sizes of the residents were categorized into three. The household sizes of one to five members were categorized as small, those with six to ten members as medium while those with more than ten members was categorized as large (Daramola, Olowoporoku, 2016; Olowoporoku et al., 2017). Thus, in the low income area, 63.6 % respondents had small household, 33.3 % had medium household size and 3.0 % of the respondents had a large household size. In the middle income zone, 75.8 % of the respondents had small household size, 24.2 % had medium household size. In the high income zone, 50.0 % of the respondents had a small household size and the remaining (50.0 %) had medium household size. In the post crisis zone, 75.0 % had a small household size while the remaining (25.0 %) had a medium household size. Further findings revealed that aside from the low income residential areas, other areas have no respondents with large household size.

Table 1. Socio-economic Attributes of the Respondents

Attributes	Low Income	Middle Income	High Income	Post Crisis	Total
	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)
Gender					
Male	44 (61.1)	62 (48.4)	10 (33.3)	16 (40.0)	132 (48.9)
Female	28 (38.9)	66 (51.6)	20 (66.7)	24 (60.0)	138 (51.1)
Total	**72 (100.0)**	**128 (100.0)**	**30 (100.0)**	**40 (100.0)**	**270 (100.0)**
Age (years)					
≤20	12(16.7)	18 (14.1)	2 (6.7)	16 (40.0)	48 (17.8)
21-40	32(44.4)	82 (64.1)	20 (66.7)	18 (45.0)	152 (56.3)
41-60	26 (36.1)	26 (20.3)	8 (26.7)	6 (15.0)	66 (24.4)
> 60	2 (2.8)	2 (1.6)	0 (0.0)	0 (0.0)	4 (1.5)
Total	**72 (100.0)**	**128 (100.0)**	**30 (100.0)**	**40(100.0)**	**270 (100.0)**
Income					
<₦20000	34 (50.0)	28 (26.9)	2 (7.7)	16 (53.3)	80 (35.1)
₦ 20000-₦70000	28 (41.2)	58 (55.8)	6 (23.1)	10(33.3)	102 (44.7)
>₦70000	6 (8.8)	18 (17.3)	18 (69.2)	4 (13.3)	46 (20.2)
Total	**68 (100.0)	**104 (100.0)	**26 (100.0)	**30 (100.0)	**228 (100.0)
Household size					
≤5	42 (63.6)	94 (75.8)	14 (50.0)	30 (75.0)	180 (69.8)
6-10	22 (33.3)	30 (24.2)	14 (50.0)	10 (25.0)	76 (29.4)
>10	2 (3.0)	0 (100)	0 (100)	0 (100)	2(0.8)
Total	**66 (100.0)	**124 (100.0)	**28 (100.0)	**40 (100.0)	**258 (100.0)
Length of stay					
≤5	20 (41.6)	66 (64.7)	8 (50.0)	14 (50.0)	108 (55.7)
6-10	14 (29.2)	20 (19.6)	6 (37.5)	10 (35.7)	50 (25.8)
>10	14 (29.2)	16(15.7)	2(12.5)	4 (14.3)	36 (18.6)
Total	**48 (100.0)	**102(100.0)	**16(100.0)	**28 (100.0)	**194 (100.0)
Educational Status					
No formal education	6 (8.3)	0 (0.0)	0 (0.0)	2 (5.6)	8 (3.1)
Primary	14 (19.4)	4 (3.3)	4 (13.3)	0 (0.0)	22(8.5)
Senior secondary	14 (19.7)	12 (9.8)	4 (13.3)	6 (16. 7)	36 (13.8)
Tertiary	38 (52.8)	106(86.9)	22 (73.3)	56 (77.8)	194 (74.6)
Total	**72 (100.0)	**122(100.0)	**30(100.0)	**64 (100.0)	**260(100.0)
Type of Houses					
Face to Face (Bungalow)	41 (56.9)	59 (46.1)	0 (0.0)	16 (40.0)	116 (43.0)
Face to Face (Storey)	24 (33.4)	38 (29.7)	0 (0.0)	11 (27.5)	73 (27.0)

Flats	7 (9.7)	27 (21.1)	19 (63.3)	10 (25.0)	63 (23.3)
Duplex	0 (0.0)	4 (3.1)	11 (36.7)	3 (7.5)	18 (6.7)
Total	**72 (100.0)**	**128 (100.0)**	**30 (100.0)**	**40 (100.0)**	**270 (100.0)**

** These were less than the total number of respondents as some respondents did not provide the relevant information

The length of stay of respondents are categorized into three (<5, 6-10, >10 years) (Daramola, Odunsi, Olowoporoku, 2017). In the low income area, 41.6 % of the respondents have been living in the area for up to 5 years, 29.2 % have been living in the area for a span between 6 to 10 years while 29.2 % have dwelled in the area for more than 10 years. Information from the middle income residential area revealed that the proportion of respondents that have lived in the area for less than 5 years, 6-10 years and above 10 years constituted 64.7 %, 19.6 % and 15.7 % respectively. In the high income residential areas, 50.0 %, 37.5 % and 12.5 % of the respondents in this area have respectively spent less than 5 years, 6-10 years and above 10 years in the study area. In the post crisis residential zone, 50.0 % of the respondents claimed to have lived in the area for a maximum of 5 years, 35.7 % had resided in the areas for an interval of 6 to 10 years while the remaining 14.3 % had spent more than 10 years in the area. The volatile nature of the post-crisis residential area might be responsible for the short length of residency of the respondents in the area.

Educational level plays a significant role in environmental awareness. Studies such as Olofsson and Öhman (2006), Daramola and Olowoporoku (2016) and Olowoporoku (2017b) opined that educated people are more concerned and place more emphasis on preserving the environment. Findings on residents' educational qualifications across the residential zones of Ile Ife revealed that 19.4 %, 61.2 % and 19.4 % of the respondents had no formal education, primary and secondary education respectively. In the middle income area, it changed to 9.8 % for no formal education, 37.8 % for primary education holders, 43.4 % for secondary school holders and 11.9 % for tertiary education. There was improved level of education in the high income area, 13.3 % of the respondents had primary education, 23.3 % had secondary education while 63.4 % had tertiary education. In the post crisis zone, 40.0 % had no formal education, 15.0 % of the respondents had primary education, 27.5 % had secondary education, while 17.5 % had tertiary education. Further findings revealed that the average number of years spent in school computed for the low income, middle income and high income area were years, 6years, 11 years and 14 years respectively while the mean number of years spent in school in the post crisis area was 10 years. This indicates that the number of years spent in school increases as distance increases from low income to the high income area of the city. This is further established by ANOVA results ($F= 9.279$; $p < 0.05$) which indicated that educational attainment varied significantly with residential zones. This variation would assist in explaining environmental sanitation activities embarked upon by residents across the three different residential areas of Ile Ife.

The type of house occupied by residents was also considered relevant to this study. This is premised on the fact that type of house is a factor in provision and maintenance of sanitation facilities for households (Daramola, 2015). Type of house in the study area was categorized into four: face-face (bungalow), face-face (storey), Flat (bungalow) and duplex. Findings revealed that in the study area, 70.0 % of the residents sampled lived in multi-habitation buildings (face-face) while the remaining (30.0 %) lived in single-family apartments. Findings revealed that majority of the multi-habitation buildings were found in the low income, middle income and post-crisis residential area. One important fact to note is that multi-habitation buildings may have to do with sharing of water supply and sanitation facilities in the houses.

3.2. Respondent's Access to Environmental Sanitation Facilities/Services

Information on availability of environmental sanitation facilities across the residential areas is presented in Table 2, 3 and 4. It is necessary to consider the environmental sanitation facilities available to residents. This is imperative because availability of facilities may influence resident's environmental sanitation behavior.

Findings on the availability of water in respondents' homes revealed that across the residential areas, majority (91.9 %) of the respondents have water available in their house while 8.1 % do not have water in their homes. On the sources of water available to the respondents household, findings revealed that in the low income area, the proportion of respondents that had

access to well water, bore hole, stream, tap water and water vendors constituted 46.3 %, 30.5 %, 12.2 %, 8.5 % and 2.4 % respectively. In the middle income area, 48.8 %, 16.2 %, 4.3 % and 23.6 % constituted respondents that had access to well water, borehole, stream and tap water while 7.5 % engage the services of water vendors in their homes. Furthermore, findings from the high income zone revealed that respondents who had access to well water constituted 13.8 %, boreholes 60.3 % while those who had accessed to tap water and water vendor respectively represented 8.6 % and 17.3 % of the respondents. In the post crisis area, respondents whose household sources of water were well water, borehole, stream and tap water respectively constituted 38.2 %, 19.0 %, 7.9 % and 28.6 % while respondents who patronized water vendors accounted for 6.3 %. In general, the most predominant source of water in the study area is hand dug well and it is predominant in the low income, middle income and post crisis residential areas.

Investigation was made on the distance between the respondents' house and source of water to household. This is considered necessary as the distance travel in obtaining water could influence peoples' environmental sanitation behavior (Daramola et al., 2017). Findings revealed that in the low income zone, 11.7 % of the respondents live within the distance of 0-50metres from their household water source, 36.7 % live within 51-100metres and majority (51.6 %) travel above 100metres in search of water. In the middle income area, 31.0 %, 50.0 % and 19.0 % of the respondents travel 0-50 metres, 51-100metres and above 100 metres to source for water used in their homes. In the high income area the source of water used by a significant majority (89.3 %) of the household was located within 0-50 metres while the remaining 10.7 % claimed their water source is located within 51-100 metres from their homes. Findings from the post crises area revealed that 44.1 % travel 0-50metres to source for their household water, 35.4 % travel 51-100 metres to source for their household water while 23.5 % travel above 100metres to source for their household water. Across the residential area, majority (61.7 %) travel between 0-50 metres in search of their household water.

Table 2. Availability of Environmental Facilities/Services

Facilities	LI	MI	HI	PC	Total
	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)
Availability of Water					
Yes	60 (83.3)	126 (98.4)	28 (93.3)	34 (85.0)	248 (91.9)
No	12 (16.7)	2 (1.6)	2 (6.7)	6 (15.0)	22 (8.1)
Total	**72 (100.0)**	**128 (100.0)**	**30 (100.0)**	**40 (100.0)**	**270 (100.0)**
Source of Water Supply					
Well water	38 (46.3)	90 (48.4)	8 (13.8)	24 (38.2)	160 (41.1)
Borehole	25 (30.6)	30 (16.2)	35 (60.3)	12 (19.0)	102 (26.2)
Stream	10 (12.2)	8 (4.3)	0 (0.0)	5 (7.9)	23 (5.9)
Tap water	7 (8.5)	44 (23.6)	5 (8.6)	18 (28.6)	74 (19.0)
Water vendor	2 (2.4)	14 (7.5)	10 (17.3)	4 (6.3)	30 (7.8)
Total	***82(100.0)**	***186 (100.0)**	**58 (100.0)**	***63 (100.0)**	***389(100.0)**
Distance Between House and Nearest Public Water Point (Meters)					
0-50m	7 (11.7)	39 (31.0)	23 (89.3)	15(44.1)	84 (61.7)
51-100m	22 (36.7)	63 (50.0)	5 (10.7)	11 (35.4)	101 (13.3)
>100m	31 (51.6)	24 (19.0)	0 (0.0)	8 (23.5)	63 (25.0)
Total	****60 (100.0)**	****126 (100.0)**	****28 (100.0)**	****34 (100.0)**	****248 (100.0)**
Availability of Toilet					
Yes	32 (44.4)	103 (80.5)	30 (100.0)	21 (52.5)	186 (71.5)
No	40 (55.6)	25 (19.5)	0 (0.0)	19 (37.5)	84 (28.5)

Total	**72 (100.0)**	**128 (100.0)**	**30 (100.0)**	**40 (100.0)**	**270 (100.0)**

** These were less than the total number of respondents as some respondents did not have such facilities in their homes
* These were more than the total number as respondents had the opportunity of selecting multiple responses

The mean distance between respondents' house to their source of water in the low income area was 93metres, in the middle income 67metres, high income 31metres and the post crisis area, it was 58metres. This is further established by the ANOVA results ($F=18.34$; $p < 0.05$) which indicated that the distance from respondents' homes to source of water varies significantly with the residential area. Closely related to the findings on the distance between respondents homes and source of water are investigations on the availability of toilets in respondents home. In the low income, middle income and post crises residential areas, the proportion of respondents that had toilets in their homes respectively constituted 44.4 %, 72.7 % and 52.5 % while all the respondents in the high income areas indicated the availability of toilets in their homes.

Table 3. Availability of Environmental Facilities/Services

Facilities	**Low Income**	**Middle Income**	**High Income**	**Post Crisis**	**Total**
	Count (%)	**Count (%)**	**Count (%)**	**Count (%)**	**Count (%)**
Type of Toilet used in Respondents' House					
Flush toilet	4 (12.5)	52 (50.5)	30 (100.0)	3 (14.3)	89 (47.8)
VIP latrine	6 (18.8)	22 (21.4)	0 (0.0)	6 (28.5)	34 (18.4)
Pit latrine	21 (65.6)	27 (26.2)	0 (0.0)	12 (57.1)	60 (32.2)
Bucket latrine	1 (3.1)	2 (1.9)	0 (0.0)	0 (0.0)	3 (1.6)
Total	**** 32 (100.0)**	****103 (100.0)**	****30 (100.0)**	****21 (100.0)**	****186 (100.0)**
Alternative Toilet Available					
Public toilet	9 (22.5)	6 (24.0)	0 (0.0)	2 (10.5)	17 (20.2)
Nearby Bush	15 (37.5)	9 (36.0)	0 (0.0)	12 (63.2)	36 (42.9)
Nearby Stream	2 (5.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.4)
Uncompleted buildings/Open spaces	14 (35.0)	10 (40.0)	0 (0.0)	5 (26.3)	29 (34.5)
Total	****40 (100.0)**	****25 (100.0)**	****0 (100.0)**	****19 (100.0)**	****84 (100.0)**
Availability of Drains					
Yes	20 (27.8)	60 (46.9)	24 (80.0)	26 (65.0)	130 (48.1)
No	52 (72.2)	68 (53.1)	6 (20.0)	14 (35.0)	140 (51.9)
Total	**72 (100.0)**	**128 (100.0)**	**30 (100.0)**	**40 (100.0)**	**270(100.0)**
Type of Drains Available					
Covered drain	2 (10.0)	8 (13.3)	13 (51.2)	3 (11.5)	26 (20.0)
Open drain	18 (90.0)	52 (86.7)	11 (45.8)	23 (88.5)	104 (80.0)
Total	****20 (100.0)**	****60 (100.0)**	****24 (100.0)**	****26 (100.0)**	****130 (100.0)**

** These were less than the total number of respondents as some respondents did not have such facilities in their homes

Findings on the type of toilet available in respondents' house are contained in Table 3. Findings revealed that in the low income area, 12.5 % of the respondents had flush toilet, 18.8 %

had VIP latrine, 65.5 %, had pit latrine and 3.1 % constituted respondents that had bucket latrine in their homes. In the middle income zone, the proportion of respondents that had flush toilets, VIP latrine, pit latrine and bucket latrine in their homes constituted 50.5 %, 21.4 %, 26.2 % and 1.9 % respectively. In the high income area, all respondents had flush toilets in their homes. Investigation from post crisis residential area revealed that 14.3 %, 28.5 % and 57.1 % of the respondents had flush toilets, VIP latrine and pit latrine respectively. Further findings revealed that availability of flush toilets increases from the low income area to the high income area while availability of pit latrine decreases from the high income to the low income area.

Outcomes of the analysis on the alternative to unavailability of toilet in respondents' homes are contained in Table 3. In the study area, the most predominant means of defecation by respondents who do not have toilet in their house was defecation in the nearby bush constituting 42.9 % of the total aggregates; this was followed by defecation in uncompleted buildings/open spaces 34.5 %, defecation in public toilets which constituted 20.2 % and defecation in nearby streams which accounted for 2.4 %. Information on availability of drains in respondents' homes revealed that 48.1 % of respondents in Ile-Ife had drains to discharge excreta and wastewater in their homes while 51.9 % do not have such in their homes. Waste water and discharge excreta cannot be properly channeled in homes where there are no drains. Findings made on the types of the available drains in the study area revealed that the most common type of drain in the city was open drain and it accounted for 80.0 % of the available drains while 20.0 % of the drains were covered.

Table 4. Availability of Waste Management Facilities/Services

Attribute	LI	MI	HI	PC	Total
	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)
Availability of Waste Storage Facility					
Yes	13 (18.0)	73(57.0)	22 (73.3)	17 (42.5)	125 (46.3)
No	59 (82.0)	55 (43.0)	8 (26.7)	23 (57.5)	145 (53.7)
Total	**72 (100.0)**	**128 (100.0)**	**30 (100.0)**	**40 (100.0)**	**270(100.0)**
Type of Materials used for Solid Waste Storage					
Plastic container	2 (6.9)	27 (22.6)	18 (54.5)	9 (25.7)	56 (25.8)
Bag/sack	11 (37.9)	31 (25.8)	8 (24.3)	15 (42.9)	65 (30.0)
Metallic container	4 (13.8)	19 (15.8)	4 (12.1)	5 (14.3)	32 (14.7)
Basket	12 (41.4)	43 (35.8)	3 (9.1)	6 (17.1)	64 (29.5)
Total	****29 (100.0)**	****120 (100.0)**	****33 (100.0)**	****35 (100.0)**	****217 (100.0)**
Waste Disposal Method					
Waste Collectors	46 (26.6)	87 (31.2)	24 (40.7)	22 (28.6)	179 (30.4)
Communal Dump Site	56 (32.3)	68 (24.4)	11 (18.6)	19 (24.7)	154 (26.3)
Open Spaces	39 (22.5)	44 (15.8)	6 (10.2)	18 (23.4)	107 (18.2)
Burning	23 (13.3)	59 (21.1)	15 (25.4)	12 (15.5)	109 (18.5)
Composting	9 (5.2)	21 (7.5)	3 (5.1)	6 (7.8)	39 (6.6)
Total	***173 (100.0)**	***279 (100.0)**	***59 (100.0)**	***77 (100.0)**	***588 (100.0)**

** These were less than the total number of respondents as some respondents did not have such facilities in their homes

* These were more than the total number of respondents as some respondents had multiple choices

Findings on waste management practices in the study area are contained in Table 4. Investigation on the availability of waste storage facilities in respondents' homes revealed that

46.3 % of the respondents had waste storage facilities in their houses while 53.7 % constituted respondents that do not have waste storage facilities in their homes. In other words, majority of the residents do not have designated containers for dumping solid wastes in their homes. Further investigation revealed that respondents in the low income, middle income, high income and post crisis residential area who used plastic containers to store waste in their houses accounted for 6.9 %, 22.6 %, 54.5 % and 25.7 % respectively while the proportion of respondents using bag/sack to store waste in the low income, middle income, high income and post crisis residential area stood at 37.9 %, 25.8 %, 24.3 % and 42.9 % respectively. Other prominent waste storage facilities in respondents' homes were baskets and metallic containers. These were used by 29.5 % and 14.7 % of the respondents in the study area.

Information on waste disposal methods as put by the residents is also presented in Table 4. The common waste disposal methods in the study area were engagement of the services of waste collectors, dumping in communal dump sites, dumping outside building premises and others. Findings revealed that 26.6 %, 31.2 %, 40.7 % and 28.6 % of the respondents in the low income, middle income, high income and post crisis residential areas engage the services of waste collectors in collection of waste. This implies that the residents engage the services of waste disposal agencies. From the investigation, the proportion of residents who dump their waste in the communal waste disposal sites in the low income area was 32.3 %; this was 24.4 % in the middle income area, 18.6 % in the high income area and 24.7 % in the post crisis residential area. The high rate of dumping of waste on dumpsites in the low income, middle income and post crisis residential areas can be attributed to the presence of derelict and undeveloped lands which are converted to communal waste dumpsites, within these residential areas in Nigerian traditional cities. However, waste dumpsites in the high income areas are usually designated by the government and are usually distant from residential areas. Also multi-habitation buildings which could lead to increase waste generation are not common in these areas.

The pattern of the rate of dumping of waste in the open spaces outside building premises is explained as 22.5 %, 15.8 %, 10.2 % and 23.4 % of residents in the low income, middle income, high income and post crisis residential areas respectively. Dumping of wastes in pits on open space around building premises in the long run constitute temporary/permanent filth nuisances in the residential areas. Other waste disposal methods were burning and composting as it accounted for 18.5 % and 6.6 % of the methods respectively.

3.3. Residents' Perception of Institutional Polices on Environmental Sanitation

Presented in this section are respondents' perceptions of existing institutional policies and environmental sanitation. It is premised on respondents' agreement and satisfaction with the mandated monthly environmental sanitation exercise

Contained in Table 5 are the residents' views of what the environmental sanitation exercise entails. This is measured in the study by calculating Residents Agreement Indices (RAI). The RAI across the four residential zones were measured by mean and mean deviation.

In the low income area, residents' in these areas predominantly agreed that environmental sanitation exercise restricts peoples movement (4.37), waste time (3.97) and that the exercise has no influence on individual environmental sanitation behavior. In the middle income area, there was change of opinion as respondents agreed that the exercise is capable of achieving a healthy environment (4.69), enhancing citizen involvement in the environmental sanitation (4.13) and that the exercise contributes to hygiene behavior (3.70). Findings from the high income area revealed that respondents agreed that the exercise contributes to respondents' hygiene behavior (3.64), restricts people's movement (3.58) and encourages public participation (3.50). Investigation from the post crisis residential area revealed that respondents agreed that environmental sanitation exercise helps to achieve a healthy environment (4.11), that the exercise enhances citizen involvement in the exercise (4.05) and that it contributes to hygiene behavior (3.45).

Also, in the low income area, respondents disagreed with the view that environmental sanitation exercise has nothing to do with community groups as it ranked the lowest (1.91). In the middle income and high income area residents disagreed with the opinion that environmental sanitation waste time. This received the lowest ratings in the two residential areas with computed means of 1.93 and 3.00 respectively thus forming an accord of opinion in the two residential areas while in the post crisis area, respondents disagreed that the exercise is only observed in the areas of the poor as it rated 2.30. From the foregoing analysis, it can be deduced that the residents in the

four residential areas of Ile- Ife have different views about the ideals of the monthly environmental sanitation exercise.

Table 5. Resident Agreement Index (RAI) with of Environmental Sanitation Exercise

Attribute	Residential Area							
	LI = 72		MI = 128		HI = 30		PC = 40	
	RAI (RAI-$\overline{RAI}$)	Rank	RAI (RAI-$\overline{RAI}$)	Rank	RAI (RAI-$\overline{RAI}$)	Rank	RAI (RAI-$\overline{RAI}$)	Rank
Enhances Citizens Involvement	3.86 (0.77)	3	4.13 (1.11)	2	3.36 (0.06)	5	4.05 (0.90)	2
Achieving a Healthy Environment	2.20 (-0.89)	8	4.69 (1.67)	1	3.43 (0.13)	4	4.11 (0.96)	1
Restriction of People's Movement	4.37 (1.28)	1	3.24 (0.22)	5	3.58 (0.28)	2	3.05 (-0.10)	6
Contribute to Hygiene Behaviour	2.79 (-0.30)	6	3.70 (0.68)	3	3.64 (0.34)	1	3.45 (0.30)	3
A Waste of Time	3.97 (0.88)	2	1.93 (-1.09)	10	3.00 (-0.30)	9	2.63 (-0.52)	8
Encourages Public Participation	3.59 (0.50)	5	3.45 (0.40)	4	3.50 (0.20)	3	3.40 (0.25)	4
No Influence on Individual Sanitation Behaviour	3.96 (0.87)	3	2.48 (-0.54)	6	3.08 (-0.22)	7	3.26 (0.11)	5
Time to Play	2.29 (-0.80)	7	2.29 (-0.73)	8	3.07 (-0.23)	8	2.75 (-0.40)	7
Only observed in the Areas of the Poor	2.00 (-1.09)	9	2.35 (-0.67)	7	3.29 (-0.01)	6	2.30 (-0.85)	10
Influence Community Groups	1.91 (-1.18)	10	2.00 (-1.02)	9	3.07 (-0.23)	8	2.53 (-0.62)	9
$\overline{RAI}$	**3.09**		**3.02**		**3.30**		**3.15**	

Presented in Table 6 are the findings on residents' satisfactions with the various roles of the government in the monthly environmental sanitation exercise. The computed average Resident Satisfaction Index (RSI) in the low income, middle income, high income and post crisis residential areas were respectively 3.20, 3.25, 3.09 and 2.41. Findings revealed that residents in the low income areas were satisfied with enforcement of rules and regulation, attitude of law enforcement agency to residents and cleaning of water drains as they respectively ranked highest 3.60, 3.38 and 3.37 respectively in the zone. In the middle income area, residents were satisfied with prompt collection of waste, cleaning of water drains and enforcement of environmental sanitation rules and regulation as they ranked 3.63, 3.52 and 3.46 respectively. In the high income area, residents indicated their satisfaction with attitude of sanitation officers to their work, politeness of sanitation

officers to residents and the monitoring of environmental sanitation exercise as they ranked 3.43, 3.38 and 3.23 respectively. However, residents' opinion differed in the post crisis residential area as politeness of sanitation officers to residents, prompt collection of wastes and attitude of sanitation officers to works were the most satisfactory role of the government in this area as they ranked 2.76, 2.65 and 2.61 respectively.

Residents of the low income residential area were dissatisfied with the prompt trial of offenders and maintenance of dumpsites as they ranked lowest with mean values of 3.06 and 2.60 respectively. In the middle income area, the residents were unsatisfied with the management of dumpsites and the level of involvement of relevant stakeholders during the conduct of the exercise, as they ranked lowest with mean values of 3.02 and 3.00 respectively. In the high income area, the management of dumpsites and the number of waste collection vehicles provided as they were least ranked with mean values 2.93 in each case. However, residents in the post crisis area were discontented with maintenance of dumpsites and prompt trial of sanitation offenders with mean values of 2.20 and 2.10 respectively. It can be deduced from the foregoing that environmental sanitation exercise and legislation is popular in the city.

Further findings revealed that residents in the post crisis residential area were generally least satisfied with the roles of the government in the conduct of the monthly environmental sanitation exercise. Generally, residents across the city were not satisfied with the management of the dumpsites by the local government agencies within their residential area. Nevertheless, the prompt trial of may scare respondents from participating in the exercise thus defeating its purpose. In the middle income and high income areas were not satisfied with the attitude of law enforcement agency to residents. Also, government waste collection facilities and services does not adequately cover the high income areas. This could prompt environmentally defiant behavior in residents.

Table 6. Residents Satisfaction Indices on Government Roles in Various Aspects of Environmental Sanitation Exercise

Attribute	Residential Area							
	LI = 72		MI = 128		HI = 30		PC = 40	
	RSI (RSI-$\overline{RSI}$)	Rank	RSI (RSI-$\overline{RSI}$)	Rank	RSI (RSI-$\overline{RSI}$)	Rank	RSI (RSI-$\overline{RSI}$)	Rank
Enforcement of rules and regulation	3.60 (0.40)	1	3.46 (0.21)	3	3.00 (-0.09)	7	2.50 (0.09)	4
Prompt trial of offenders	2.60 (-0.06)	11	3.13 (-0.12)	8	3.14 (0.05)	5	2.20 (-0.21)	11
Prompt collection of waste	3.17 (-0.03)	8	3.63 (0.38)	1	3.00 (-0.09)	7	2.65 (0.24)	2
Cleaning of water drains	3.37 (0.17)	3	3.52 (0.27)	2	3.14 (0.05)	5	2.35 (-0.06)	8
Politeness of sanitation officers to residents	3.26 (0.06)	4	3.42 (0.17)	4	3.38 (0.29)	2	2.76 (0.35)	1
Attitude of sanitation officers to their work	3.23 (0.03)	5	3.10 (-0.15)	9	3.43 (0.34)	1	2.61 (0.20)	3
Number of workers provided	3.21 (0.01)	6	3.25 (0.00)	7	3.08 (-0.01)	6	2.30 (-0.11)	10
Monitoring of environmental	3.26 (0.06)	4	3.40 (0.15)	5	3.23 (0.14)	3	2.40 (-0.01)	7

sanitation exercise								
Number of waste collection vehicles provided	3.09 (-0.11)	9	3.27 (0.02)	6	2.93 (-0.16)	8	2.45 (0.04)	5
Involving the relevant stakeholders	3.20 (0.00)	7	3.02 (-0.07)	11	3.15 (0.06)	4	2.33 (-0.08)	9
Maintenance of dump site	3.06 (-0.14)	10	3.00 (-0.25)	12	2.93 (-0.16)	8	2.10 (-0.31)	12
Provision of waste disposal facilities	3.20 (0.00)	7	3.10 (-0.15)	9	3.00 (-0.09)	7	2.30 (-0.11)	10
Attitude of law enforcement agency to residents	3.38 (0.18)	2	3.05 (-0.20)	10	2.80 (-0.29)	9	2.44 (0.03)	6

4. Conclusion and Recommendation

The study examined the influence of local governance on residents' environmental sanitation behavior across the different residential areas of Ile Ife. Findings revealed variation exist in the level of access to adequate environmental facilities/services such as water supply, toilets, drains and solid waste disposal services across the residential areas. The study established that low level of access to these facilities/services is predominant in the low income, middle income and post crisis residential areas. The findings from the study revealed that relationship exist between residents' environmental sanitation behavior and their place of residence. Also, the availability of environmental sanitation facilities/ services is reflections of residents' socio-economic characteristics. These findings are consistent with the results of some earlier studies (Daramola, Olowoporoku, 2016; Daramola, 2015; Hunter et al., 2004) which have indicated that there is a significant statistical association between socio economic characteristics, place of residence, availability of facilities/services and residents' environmental behavior.

On the link between local governance policies and environmental sanitation behavior respondents' perception of the existing legislations were examined. The study established a variation in the level of agreement of the functions of the exercise. This disparity in opinion of residents can be attributed to varying socioeconomic status across the residential areas. On the satisfaction with government roles on the exercise, the study established that in the low income area, residents were dissatisfied with the prompt trial of offenders while across the remaining residential areas, residents were not satisfied with the maintenance of dumpsites. In general, the maintenance of dumpsites by the government agencies was not satisfactory to the residents of the city.

On the background that environmental sanitation is a civic responsibility, the study recommends the following

- The local governing authorities, non-governmental organizations (NGOs), community based organization (CBOs) and landlords should ensure adequate provision of environmental sanitation facilities/services to households for effective observance of sanitation behavior irrespective of socio-economic status and place of residence. Also, an effective cost recovery framework should be devised in order to ensure viability of the facilities/services.
- The government should promulgate laws and enforce existing environmental sanitation regulations in order to sanction house owners without basic environmental sanitation facilities. There should be composition of a team of government official to inspect buildings and ensure house owners adhere to sanitation ethics
- The relevant stakeholders should ensure proper management of dumpsite across the city. This can be achieved by formulating an effective cost recovery framework in order to ensure viability of their maintenance.

• All relevant stakeholders should embark on campaign to raise public awareness on the need for proper environmental sanitation behavior. This can be achieved through recruitment of trained young men and women for constant awareness exercises, use of bill boards, constant media announcements, seminar, workshops etc.

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