# Assessment of environmental sanitation behaviour of market traders in selected markets in Ibadan, Nigeria

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**Abstract.** This paper assessed environmental sanitation behaviour of market operators in selected markets in Ibadan, Nigeria. The two largest markets in the study area (Aleshinloye and Bodija markets) were selected for sampling. The selected markets represented the two types of markets; modern and traditional markets. The modern market comprises 3803 shops while the traditional market comprises 5943 shops. Multistage sampling technique was adopted in questionnaire administration. The selected markets were stratified into zones based on the goods sold. Systematic sampling was used in the selection of traders across the markets. 2% of traders were selected for sampling in each category of goods sold making a total of 189 respondents. This comprises 77 of traders from modern market and 112 traders from traditional markets. Descriptive and Inferential statistics were used in analysing the data. Findings revealed poor access to environmental sanitation facilities especially at the traditional market. The study also established poor environmental sanitation behaviour in terms of utilisation of available amenities across both markets. It recommended a synergy of efforts by all environmentally concerned institutions in managing the market environment. It also advocated for the provision of environmental sanitation facilities in markets by, government, market management authorities, traders, Community Based Organizations (CBOs) and Non-governmental Organizations (NGOs). In addition environmental education is imperative while enforcement of environmental regulations in the market and others with similar setting is strongly encouraged.

**Keywords**: environmental sanitation; sanitation amenities; sanitation behaviour; environmental amenities; traders; market

## 1. Introduction

Market occupies a significant position in the lives of inhabitants of any community in all nations of the world. The term 'market' is very complex to define in contemporary time due to advancement in knowledge and its application across various fields of study. Contextual to this paper, a market is described as an authorised space with or without buildings used for trading and commerce, whereby the buyers and sellers meet at specified places and time or at a time set within a certain interval (Hodder and Ukwu 1969, Federal Republic of Nigeria (FRN) 2005, Muli 2007, Fakere and Fadamiro 2012). It could therefore be referred to as an authorised and physically

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defined location where people meet to engage in business transactions at a defined time.

In Nigeria, there are two types of markets; traditional and modern. They hold daily or periodically on specific days. In a typical Nigerian society, the organisation of traditional market differs from modern market (Oluwabamide 2007, 2015). The former usually exhibit old and cultural aesthetics in term of building materials and design. It is usually a place where indigenous goods and services are traded and had evolved by conscious indigenous city planning approach. The latter, on the other hand, shows elements of contemporary planning in terms of building material, design etc. and thus has a spatial structure guided by modern town planning concepts. Nigerian markets are no exception as they are likewise classified into indigenous and modern markets based on location, physical appearance, building materials, goods sold etc. (Olatunji 2013, Oyelayo 2014).

The social and economic benefits derived from markets are numerous. However, several environmental challenges are attributed to buying and selling in market places. To begin with, activities in market places in Nigeria are known to generate large quantities of solid waste (FRN 2005, Lade *et al.* 2012, Abajegah *et al.* 2013, Ebna *et al.* 2013). It is quite common to observe mountains of refuse at market places. The heaps of refuse provide excellent breeding grounds for vectors of communicable diseases including rodents and insects. They may also pose fire hazards apart from being eyesores and sources of unpleasant odour (WHO 2002, UNEP 2005, UNICEF 2007, Adejumo 2014, Olowoporoku 2016, 2017). Also, refuse from markets can flow into nearby public drains, canals, streams and rivers among others during rainfall.

Another common environmental problem experienced in market places in Nigeria is unsanitary condition of the surroundings (Adejumo 2014, Butu and Mshelia 2014). Open urination and defecation are widespread and the resultant contamination of the environment contributes to environmental degradation (Daramola and Olowoporoku 2016, Olowoporoku 2017). These could be due to gross inadequacy of environmental sanitation amenities such water supply, toilets, bathrooms and refuse disposal facilities (Adejumo 2014, Olowoporoku 2014, Daramola *et al.* Olowoporoku and Popoola 2017). Fakere and Fadamiro (2012) observed that these environmental challenges could result to the spread of communicable diseases with considerable potential that would reach epidemic dimensions.

The notion to mitigate the environmental and human health consequences arising from poor sanitation practices have been put in place by past and present government administrations (Mmom and Mmon 2011, Daramola 2015, Ekong 2015). One of such is environmental sanitation exercise. The exercise is carried out in towns and cities environment including market places. Environmental sanitation in markets is important because it is where buying and selling activities hold and often times the immediate consumption of goods and services. Market environment especially in the developing world is well polluted owing to social misdemeanor of indiscriminate littering, improper domestic wastewater discharge, poor sewage disposal, open defecation and unhygienic sanitary practices. Also, the location of markets within residential neighbourhoods puts surrounding residents at greater risk. The aspects of the mitigation techniques have often been left out in the condition of environmental sanitation amenities and environmental sanitation behaviour of market traders. The condition could be in terms of availability, functionality and accessibility of environmental amenities in markets.

Environmental sanitation behaviour refers to citizens' involvement in provision, utilization, and maintenance of environmental sanitation facilities and services and adherence to environmental legislation (Daramola 2015). It refers to is the disposition of the traders to and the utilization of the amenities when they are available and their response when they are unavailable. The provision of

adequate environmental sanitation facilities and services could at best be referred to as means to achieve proper environmental sanitation condition.  The attitude and behavioural practices of the traders determines the sanitation condition of the markets. Thus, in order to achieve proper environmental sanitation condition in markets, good sanitation behaviour and availability of facilities and services must work in unison (Oyelayo 2014).

At different points in time, considerable information has been provided in literature regarding the relationship between environmental amenities and sanitation behaviour (Trevino and Fernandez 1992, Afon *et al.* 2010, Afon 2011, Olatunji 2013, Abajegah *et al.* 2013, Ebna *et al.* 2013, Adejumo 2014, Olowoporoku 2014, Oyelayo 2014, Daramola 2015, Daramola and Olowoporoku 2016, Olowoporoku 2017). However, most of these studies laid little emphasis on environmental sanitation in   market locations which form a significant portion of commercial land use in the city. The focus for this study is therefore to assess environmental sanitation behaviour of market traders in terms of their utilization of available environmental amenities and response when environmental amenities are not available. Using a case study approach, the study will focus on traditional and modern markets in Ibadan, Nigeria.

## 2. Materials and methods

The study area is Ibadan, the Capital of Oyo State Nigeria. It is located in the south- western part of Nigeria and it is country's second-largest urban agglomeration, with a population of about 3.3 million people (Brinkhoff 2010). Ibadan has been a government headquarter since the colonial era when it was the seat of the government of the old Western Region. Ibadan consists of 11 local government areas, five in urban while the other six are classified as peri-urban. There are many markets in Ibadan ranging from small to large. These markets are peculiar in terms of location, physical appearance, goods sold, construction materials and they can be classified as traditional and modern.

Among the largest of these markets in the city are Gbagi, Bashorun, Oranyan, Oje, Beere, Bodija, Dugbe, Aleshinloye, Oja-oba, Sango, Ojoo etc. However Bodija and Aleshinloye market are the focus of this study. The markets were selected because they are large, serve the purpose of city-wide and regional markets and they exhibit the features of traditional and modern market settings in Nigeria. Bodija Market is a traditional market located in Ibadan North Local Government Area. It covers an area of approximately 7,207 m² (Oyo State of Nigeria 2009). The market is predominantly a food market. Goods sold in the market include tubers, grains, cassava flakes, yam flour, frozen foods, electronics, shoes, bags, plastics among others. It is about one kilometre from the University of Ibadan, along the road to the Oyo State Government Secretariat. It is overcrowded with more than half of the traders displaying their food items along the road sides away from designated stalls. The roads in the market are unpaved and littered with refuse.

On the other hand, Aleshinloye market is a modern market located in Ibadan South West Local Government Area. It covers an area of approximately 5,100 m² (Oyo State of Nigeria 2009). Goods sold in this market include imported clothing, shoes and bags, kitchen utensils, food stuffs, provisions among others. Reconnaissance survey revealed that Aleshinloye market had a total of 3,803 shops, comprising of 2,806 lockable shops and 997 open stalls while Bodija market had a total of 5,493 comprising of 3,139 lockable shops and 2,374 open stalls. For questionnaire administration, multistage sampling technique was adopted.  The markets were stratified into zones based on materials sold. Furthermore, the number of traders in lockable shops and open stalls, in the zones in each market was identified (see Table 3).

Table 1 Categories of shops in Aleshinloye and Bodija markets

| Material sold | Aleshinloye | | | Bodija | | Total |
|---|---|---|---|---|---|---|
| Categories of shops | LS | OS | Total | LS | OS | |
| Food stuffs | 98 | 66 | 164 | 694 | 491 | 1,185 |
| Kitchen utensils | 1,299 | | 1,299 | 322 | 158 | 480 |
| Fruits/vegetables | - | - | - | 358 | 141 | 499 |
| Frozen foods | 84 | 106 | 190 | 306 | 343 | 649 |
| Electrical/ electronics | 15 | 29 | 44 | 209 | 101 | 310 |
| Textile | 200 | 55 | 255 | 187 | 13 | 200 |
| Shoes/bags | 502 | 152 | 654 | 182 | 26 | 208 |
| Accessories/jewelries | 149 | 36 | 185 | 91 | 20 | 111 |
| Cosmetics | 119 | 19 | 138 | 94 | 55 | 149 |
| Plastics/plates | 82 | 69 | 151 | 345 | 231 | 576 |
| Beverages | 96 | 35 | 131 | 45 | - | 45 |
| Provisions | 144 | 46 | 190 | 256 | 93 | 349 |
| Condiments | 18 | 64 | 82 | 295 | 159 | 454 |
| Fresh Meat | - | 320 | 320 | -- | 291 | 291 |
| Goats/livestock | - | - | - | 2 | 5 | 7 |
| Total | 2,806 | 997 | 3,803 | 3,139 | 2,374 | 5,513 |

Note: LS/ =Lockable shops, OS/= Open stalls

Systematic sampling method was used in selecting the sampled traders across the two markets. For questionnaire administration, two percent (2%) of traders in each section of these categories was selected for survey. Thus, a total of 189 respondents were selected. This comprise 77 (40.7%) of traders from Aleshinloye market and 112 (59.3%) from Bodija market. Data collected through the questionnaire survey were on the profile of the traders and their environmental sanitation behaviour in response to availability and non-availability of environmental sanitation facilities. Analysis of the data was done using cross tabulation and Analysis of Variance (ANOVA).

## 3. Findings and discussions

This section discusses the profile of the respondents, the availability and non-availability of environmental sanitation facilities and services in markets, and traders' response to the condition of environmental sanitation facilities and services in the study area.

### 3.1 Profile of respondents

The profile of respondents discussed comprises age, gender educational attainment, ethnicity, average monthly income and number of years spent in the market. The gender distribution of respondents showed that females accounted for the highest proportion of market operators (65.6%), compared to the proportion of male respondents (34.4%). This implies that females are

more involved in sale of goods in the markets in the study area. This could be attributed to the fact that trading in markets is viewed as activities for female in Africa thus less male participate in this activity. Closely related to this is the marital status of the respondents across the two markets. In the modern market, 19.5% of the market operators were single while 80.5% of the respondents were married. Information from the traditional market revealed that 18.8% of the respondents were unmarried while 81.2% of the traders in this market were married. This implies that the married traders might be with their children in the markets. The likely presence of their wards in the

Table 2 Socioeconomic attributes of market operators

| Facilities | Modern | Traditional | Total |
|---|---|---|---|
| | Frequency (%) | Frequency (%) | Frequency (%) |
| Gender | | | |
| Male | 28 (36.4%) | 37 (33.0%0 | 65 (34.4%) |
| Female | 49 (63.6%) | 75 (67.0%) | 124 (65.6%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |
| Marital status | | | |
| Single | 15 (19.5%) | 21 (18.8%) | 36 (19.6%) |
| Married | 62 (80.5%) | 91 (81.2%) | 152 (80.4%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |
| Educational attainment | | | |
| No formal education | 8 (10.4%) | 19 (16.9%) | 27 (14.2%) |
| Primary | 6 (7.8%) | 29 (25.9%) | 35 (18.5%) |
| Secondary | 48 (62.4%) | 47 (41.9%) | 95 (50.3%) |
| Tertiary | 15 (19.4%) | 17 (15.2%) | 32 (17.0%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |
| Ethnicity | | | |
| Yoruba | 60 (77.9%) | 79 (70.6%) | 139 (73.6%) |
| Igbo | 15 (19.5%) | 23 (20.5%) | 38 (20.1%) |
| Hausa | 2 (2.6%) | 10 (8.9%) | 12 (6.3%) |
| Total | 77 (100.0) | 112 (100.0%) | 189 (100.0%) |
| Average monthly income | | | |
| ≤ ₦20,000 | 18 (23.4%) | 32 (28.6%) | 50 (26.5%) |
| ₦21,000- ₦60,000 | 39 (50.7%) | 71 (63.4%) | 110 (58.2%) |
| ≥ ₦61,000 | 20 (25.9%) | 9 (8.0%) | 29 (15.3%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |
| Number of years spent in market | | | |
| ≤5 years | 1 (1.3%) | 10 (9.0%) | 11 (5.8%) |
| 6-10 years | 22 (28.6%) | 33 (29.5%) | 55 (29.1%) |
| ≥10 years | 54 (70.1%) | 69 (61.6%) | 123 (65.1%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |

market invariably puts pressure on the available environmental sanitation facilities in the markets.

Educational attainment is expected to play a significant role in environmental consciousness. Studies such as Olofsson and Öhman (2006) and Theodori and Luloff (2002) opined that improved educational level is directly proportional to growth in environmental awareness. Findings revealed that majority (81.8%) of the traders in the modern market had a minimum of secondary education while in the traditional market a little above half (57.1%) of the operators had a minimum of secondary education. However, the proportion of traders with no formal education and primary education was higher in the traditional market compared to the modern market. The low level of education at the traditional market could be attributed to the indigenous type of goods being sold at the market. The variation in educational attainment could assist in revealing and explaining environmental sanitation activities embarked upon by traders in the two markets.

Closely related to respondents' educational attainment is their income level. For easy analysis, the initial quantitative data on respondents' average monthly income were grouped into three: low, medium and high. Incomes below ₦20,000 were categorized as low income. This is based on the prevailing salary scale approved by both the Nigerian Labour Congress and Trade Union Congress in the country. 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 incomes were categorised as from ₦20,000 to ₦60,000 while residents earning above ₦60,000 were categorised as high income earners.

Findings revealed variation in income classes existed in the two categories of markets. The income from the modern market showed that 23.4% of respondents were low income earners' 50.7% were middle income earners, and 25.9% of the respondents in this market fell within the high income earners' group. In the traditional market findings revealed that 28.6% of the respondents were low income earners, 63.4% were middle income earners while the remaining 8.0% were high income earners. Going by the results, majority (58.2%) of the respondents in the two markets were middle income earners. Further findings revealed that the average monthly income for the modern and traditional markets were at ₦ 46,116.88 and ₦31, 366.07 respectively. The ANOVA results (F=13.317; p < 0.05) indicates that income varied significantly with market. The variation in the income could be attributed to the type of good sold in each of the markets and this might influence their willingness and affordability for sanitation facilities and services.

Markets are places where goods from different ethnic groups within the country are exhibited. The basis for considering ethnicity to assess traders' environmental awareness was premised on the assertions of Leiserowitz (2010) and Renn (2000) that cultural norms and folkways influence environmental awareness. As regards findings on the ethnicity of respondents, it was observed that in the modern market majority (77.9%) were Yorubas, 19.5% were Igbos and 2.6% of the traders were Hausas. In the traditional markets 70.6% of the respondents were Yorubas, 20.5% Igbos and 8.9% Hausas. Further findings revealed increasing presence of heterogeneity of traders in the traditional market compared to the modern market. The increased presence of heterogeneity of traders in traditional market can be attributed to the display of indigenous goods by different ethnic groups in the market.

Another identifiable factor in environmental sanitation practices is length of stay of respondents. Reininger *et al.* (2013) and Eisenman *et al.* (2006) postulated that length of stay of respondent in a particular area influence environmental consciousness. The length of stay of traders in the market was categorized into three (≤ 5 years, 6-10 years and ≥10 years). Findings revealed that majority (64.1%) of the market operators in Aleshinloye and Bodija markets had operated for more than ten years, 29.1% had operated in the markets between 6-10years in the

market while 5.8% of the respondents had operated in the market for less than 5 years in the market.

### 3.2 Market operators access to environmental sanitation facilities

This section examines the market operators' access to environmental sanitation facilities in the study area. Information on this is as contained in Table 3. It is imperative to consider the environmental sanitation facilities available to market operators. This is necessary because availability of facilities may influence respondents' environmental sanitation behaviour.

Information in Table 3 showed that in the modern markets, 62.3% of the traders indicated that their source of water was borehole, 29.9% claimed they had access to well water while the remaining 7.8% claimed that had access to tap water in the market. In the traditional market, 69.9% claimed they had access to water from bore hole, 27.7% indicated that their source of water was well water while 2.7% of the respondents patronised water vendors. However, findings revealed that the most predominant source of water supply in the two markets is bore hole (66.7%) followed by well water (28.5%). On accessibility to toilet, findings revealed that all market

Table 3 Respondents access to environmental sanitation facilities

| Facilities | Modern | Traditional | Total |
|---|---|---|---|
| | Frequency (%) | Frequency (%) | Frequency (%) |
| Source of water supply | | | |
| Tap eater | 6 (7.8%) | 0 (0.0%) | 6 (3.2%) |
| Bore hole | 48 (62.3%) | 78 (69.6%) | 126 (66.7%) |
| Well eater | 23 (29.9%) | 31 (27.7%) | 54 (28.5%) |
| Water vendor | 0 (0.0%) | 3 (2.7%) | 3 (1.6%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |
| Accessibility to toilets | | | |
| Yes | 77 (100.0%) | 59 (52.7%) | 136 (72.0%) |
| No | 0 (0.0%) | 53 (47.3%) | 53 (28.0%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |
| Type of toilet | | | |
| Water closet | 65 (84.4%) | 8 (15.1%) | 73 (53.6%) |
| Pit latrine | 12 (15.6%) | 41 (77.4%) | 53 (39.0%) |
| Bucket latrine | 0 (0.0%) | 10 (18.9%) | 10 (7.4%) |
| Total | *77 (100.0) | *59 (100.0%) | *136 (100.0%) |
| Type of drain in markets | | | |
| Piped drain | 3 (3.9%) | 1 (0.9%) | 4 (2.1%) |
| Covered drain | 14 (18.2%) | 5 (4.5%) | 19 (10.1%) |
| Opened drain | 60 (77.9%) | 106 (94.6%) | 166 (87.8%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |

*These were less than number of questionnaires administered because some respondents did not have access to such facilities

operators in the modern market had access to toilets. However, in the traditional market 52.7% had access to toilet while 47.3% do not have access to toilets. This implies that respondents who do not have access to toilet will explore alternative source as toilets which may be environmentally unfriendly.

Result on the type of toilet available to traders in the two markets revealed that 84.4% of the traders in modern market have access to water close while the remaining 15.6% accessed to pit latrine for defecation. In the traditional market 15.1%, 77.4% and 18.9% of the respondents respectively defected in water closet, pit latrine and bucket latrine. Findings on the type drain available showed that 87.8% of the drains in the two markets were opened. Open drains are susceptible to blockage by filths thus lead to breeding of pests and outbreak of epidemics.

### 3.3 Market operators environmental sanitation behaviour

Sequels to the findings on market operators' access to environmental sanitation facilities, this section presents results of the analysis on market traders' environmental sanitation behaviour in the markets (see Table 4). Findings on solid waste storage facility in the modern market indicated container without lid (46.7%) as the most prominent. Other forms of solid waste storage facility in the market were sacks and polythene bags with respective proportion of 26.3% and 19.6% of the respondents that employed this facility. In the traditional market, the most prominent solid waste storage facility were sacks (50.6%) followed by baskets (20.8%) and container without lid (46.7%).

On solid waste disposal methods, it was observed in the modern market that (50.0%) of the respondents which accounted for the majority engaged the services of solid waste collectors. Other solid waste disposal methods employed by traders in this market are barrow operators (20.5%), dump in nearby bush (13.6%) while dump in drainage, designated dumpsites and burning respectively accounted for 8.4%, 4.5% and 3.0%. In the traditional market, majority (50.6%) of the respondent dump their solid waste at designated dumpsites within the market. Other practices in the market were dumping in nearby bush, dump in drainage, burning, barrow operators and waste collection service accounted for 24.7%, 12.1%, 8.6%, 2.3% and 1.7% respectively. The high rate of dumping of waste on dumpsites and dumping in nearby bush in the traditional market can be attributed to lack of evidence of physical planning in the location and arrangement of traditional markets. However, dumping of wastes in pits and open space in the long- run constitute temporary/permanent filth nuisances around markets.

As regards findings on the distance between respondents shops/stalls and source of water, the initial quantitative data were categorised into three: 1-50 metres, 51-100 metres and 100 metres and above. In the modern market, 49.4% of the respondents claimed the distance from their shops/stalls to the nearest source of water is less than 50 metres, 27.3% covered distance of 51-100 metres while 23.3% were at a distance of 100 metres and above to the source of water. In the traditional market, majority (89.3%) of the market operator's claimed the distance between their stalls and source of water was 100metres and above, 7.1% claimed the distance of 51-100 metres while the remaining (8.0%) travelled less than 50 metres. On the average, the distance travelled in the modern market was 82.33 metres while that of the traditional market was 183.03 metres. The overall mean of distance travelled to sources of water was 142.02 metres. This is further established by the ANOVA results (F=69.27; p<0.05) which indicated that distance travel in search of water varies significantly with markets. The long distance travelled by residents in the traditional market may be due to their evolution which is usually devoid of proper planning.

The distance travelled by traders to access to toilet facilities was likewise examined. For easy analysis, the initial quantitative data were categorised into three: 1-50 metres, 51-100 metres and 100 metres and above. In the modern market 45.4% of the traders travel less than 50 metres to use the toilet, 24.7% travel 51-100 metres to access the toilet while 29.9% travel 100 metres and above to use the toilet. In the traditional market, 72.3% of the traders travel 100 metres and above to use

Table 4 Respondents' environmental sanitation behaviour

| Facilities | Modern | Traditional | Total |
|---|---|---|---|
| | Frequency (%) | Frequency (%) | Frequency (%) |
| Type of waste storage facility | | | |
| Container Without Lid | 50 (46.7%) | 29 (18.8%) | 79 (30.3%) |
| Container with Lid | 7 (6.5%) | 4 (2.7%) | 11 (4.2%) |
| Polythene Bag | 21 (19.6%) | 11 (7.1%) | 32 (12.3%) |
| Basket | 1 (0.9%0 | 32 (20.8%) | 33 (12.6%) |
| Sacks | 28 (26.3%) | 78 (50.6%) | 106 (40.6%) |
| Total | 107 (100.0%) | 154 (100.0%) | 261 (100.0%) |
| Waste disposal methods | | | |
| Nearby Bush | 18 (13.6%) | 43 (24.7%) | 61 (19.9%) |
| Designated Dumpsites | 6 (4.5%) | 88 (50.6%) | 94 (30.7%) |
| Drainage | 11 (8.4%) | 21 (12.1%) | 32 (10.5%) |
| Burning | 4 (3.0%) | 15 (8.6%) | 19 (6.3%) |
| Waste Collection Service | 66 (50.0%) | 3 (1.7%) | 69 (22.5%) |
| Barrow | 27 (20.5%) | 4 (2.3%) | 31 (10.1%) |
| Total | *132 (100.0%) | *174 (100.0%) | *306 (100.0%) |
| Distance to nearest source of water supply (m) | | | |
| ≤ 50 | 18 (23.3%) | 4 (3.6%) | 22 (11.6%) |
| 51-100 | 21 (27.3%) | 8 (7.1%) | 29 (15.3%) |
| ≥ 100 | 38 (49.4%) | 100 (89.3%) | 138 (73.1%) |
| Total | 77 (100.0) | 112 (100.0%) | 189 (100.0%) |
| Distance to nearest toilet (m) | | | |
| ≤ 50 | 35 (45.4%) | 9 (8.0%) | 44 (23.3%) |
| 51-100 | 19 (24.7%) | 22 (19.7%) | 41 (21.7%) |
| ≥100 | 23 (29.9%) | 81 (72.3%) | 104 (55.1%) |
| Total | 77 (100.0%) | 112 (100.0%) | 189 (100.0%) |
| Factors discouraging use of toilets | | | |
| Poor sanitary condition | 45 (34.1%) | 84 (31.0%) | 129 (29.0%) |
| Long distance | 37 (28.0%) | 67 (24.7%) | 104 (25.8%) |
| Others | 50 (37.9%) | 120 (44.3%) | 170 (42.2%) |
| Total | *132 (100.0%) | *271 (100.0%) | *403 (100.0%) |

**This exceeded the number of questionnaires administered because respondents identified more than one method/factors

the toilets, 19.7% travel 50-100 metres to use the toilet while 8.0% less than 50 metres to use the toilet. The mean distances travelled by traders to use toilet in the modern and traditional markets were 69.6 metres and 119.4 metres respectively. The variation in distance travelled to use the toilet was further established by the ANOVA results (F=27.27; p<0.05) which indicated that distance travelled in order to use toilet varies significantly with market.

On findings on factors influencing the use of toilets, investigation from modern market revealed that 38.4% of the respondents do not use toilets within the market because of poor sanitary condition, 28.0% claimed long distance discouraged them from using the toilets within the market while 37.9% claimed to be discouraged by other reasons such as fear of contacting diseases, irritating sight among others. In the traditional market respondents that were discouraged from using the toilets due to poor sanitary condition accounted for 31.0% of the respondents, 24.7% long distance, while 44.3% claimed to be discouraged by other reasons such as fear of contacting diseases, irritating sight among others.

## 4. Conclusions

This study assessed environmental sanitation behaviour of traders in a modern and traditional market in Ibadan in relation to traders' socio-economic characteristics. The study established that relationship exists between traders' environmental sanitation behaviour and type of market where they carry out their trading activities. The study revealed that modern market is more equipped with environmental amenities compared traditional market. The study also established that traders especially in the traditional market travel a longer distance to access environmental amenities such as water supply and toilets than their counterparts in the modern market.

On the background that environmental sanitation is a civic responsibility, the study recommends a synergy of efforts by all actors involved in the creation of a healthy environment. The government, traders' association, Community Based Organisations (CBOs), market management authorities and Non-Governmental Organisations (NGOs) should provide environmental sanitation facilities and services in the markets. Also, since the markets are the places of business, traders should be made to pay for the environmental sanitation services in the markets in order to make the services sustainable. In furtherance of this, the government should enforce existing environmental sanitation regulations in order to sanction market operators with environmentally deviant behaviours.

Also, pro-environmental sanitation behaviour is dependent on effective environmental literacy, thus campaign to raise public awareness about environmental sanitation is essential in achieving success in environmental issues. This campaign can be achieved provision of bill boards and posters within the market areas. Other strategies include organisation of seminars and workshop for market men and women as well as recruitment of trained young men and women who would engage traders one on one especially in the traditional market on the need to be environmentally concerned.

## References

Abajegah, C., Abah, S.O., Awunor, N.S., Duru, C.B., Eluromma, E., Algbiremolen, A.O. and Okoh, E.C. (2013), "Market sanitation: A case study of Oregbeni market Benin-city Edo State, Nigeria", *J. Basic*

*Appl. Innov. Res.*, **2**(2), 25-31.

Adejumo, S. (2014), "Assessment of monthly environmental sanitation exercise in Ikorodu Lagos State", B.Sc. Thesis, Obafemi Awolowo University, Ile-Ife, Nigeria.

Afon, A.O. (2011), *Residential Differentials in Behaviour and Environmental Hazards and Risks Perception in Ile-Ife Nigeria*, in *Issues in the Built Environment of Nigeria*, 52-80.

Afon, A.O., Asani, M.A., Adeyinka, S.A., Hasan, A.Z., Jumah, M.S., Ilogho, T.U., Faborode, T.G., Faniran, G.B. and Popoola, K.O. (2010), "Linkages between responses to the available amenities and expressed environment-related health needs in international refugee camp, Oru-Ijebu, Nigeria", *WIT Trans. Ecol. Environ.*, **142**, 69-78.

Akpan, N. (2004), *Structure of Self-Organized Traditional Financial Institutions in Nigeria: The Case of Etibe*, in *Nigerians and Their Cultural Heritage Lagos*, Lisjohnson Resources, 148-154.

Brinkhoff, T. (2010), City population, <http://www.citypopulation.de>.

Butu, A.W. and Mshelia, S.S. (2014), "Municipal solid waste disposal and environmental issues in Kano Metropolis, Nigeria", *Brit. J. Environ. Sci.*, **2**(2), 10-26.

Daramola, O., Olowoporoku, O. and Popoola, A. (2017), *Worse than a Tiger's Grip: The Case of Household Water Supply and Sanitation Practices in Osogbo Nigeria*, in *Advances in Environmental Research*, NOVA Publishers, U.S.A., 153-170.

Daramola, O.P. (2015), "Environmental sanitation practices in residential areas of Ibadan Metropolis", Ph.D. Dissertation, Obafemi Awolowo University, Ile-Ife, Nigeria.

Daramola, O.P. and Olowoporoku, O.A. (2016), "Environmental sanitation practices in Osogbo, Nigeria: An assessment of residents' sprucing-up of their living environment", *J. Econ. Environ. Stud.*, **6**(4), 699-716.

Ebna, F.M., Rokon, H., Sayed, R., Salma, A., Arifur, R. and Tanisa, T.S. (2013), "Solid waste management strategy and improvement of existing scenario based on market waste", *Global J. Res. Eng. Civ. Struct. Eng.*, **1**(4), 1-5.

Eisenman, D.P., Wold, C., Fielding, J., Long, A., Setodji, C., Hickey, S., and Gelberg, L. (2006), "Differences in individual-level terrorism preparedness in Los Angeles County", *Am. J. Prev. Med.*, **30**(1), 1-6.

Ekong, I.E. (2013), "An assessment of environmental sanitation in an urban community of southern Nigeria", *Afr. J. Environ. Sci. Technol.*, **9**(7), 592-599.

Fakere, A.A. and Fadamiro, A.J. (2012), "Decentralization of markets and environmental sanitation scheme: A focus on urban core of Akure, Nigeria", *J. Environ. Earth Sci.*, **2**(8).

Federal Republic of Nigeria (2005), *Environmental Sanitation Policy*, Federal Ministry of Environment, Abuja, Nigeria.

Hodder, B.N and Ukwu, U.I. (1969), *Markets in West Africa*, Ibadan University Press Limited, Ibadan, Nigeria.

Lade, O., Agbede, O. and Ilori, O. (2012), "Management of solid waste in a market: Case study of Bodija Market, Ibadan, Nigeria", *J. Environ. Sci. Eng.*, **1**(7B), 845-850.

Leiserowitz, A. (2010), *Risk Perceptions and Behaviour*, In *Climate Change Science and Policy*, Island Press, Washington, DC., U.S.A.

Mmom, P.C. and Mmom, C.F. (2011), "Environmental sanitation and public health challenges in a rapidly growing city of the Third World: The case of domestic waste and diarrhea incidence in Greater Port Harcourt Metropolis, Nigeria", *Asian J. Med. Sci.*, **3**(3), 115-120.

Muli, S.J. (2007), *Analysis of Market Typology and Function in Development*, University of London Press, London, U.K.

Olofsson, A. and Öhman, S. (2006), "General beliefs and environmental concern: Transatlantic comparisons", *Environ. Behav.*, **38**(6), 768-790.

Olowoporoku, O.A. (2014), "Assessment of environmental sanitation practices in Osogbo", B.Sc. Thesis, Obafemi Awolowo University, Ile-Ife, Nigeria.

Olowoporoku, O.A. (2016), "Assessing environmental sanitation practices in slaughterhouses in Osogbo, Nigeria: Taking the good with the bad", *MAYFEB J. Environ. Sci.*, **1**, 44-54.

Olowoporoku, O.A. (2017), "A recipe for disaster: An assessment of environmental sanitation situation in

Nigeria", *MAYFEB J. Environ. Sci.*, **1**, 1-5.

Oluwabamide, A.J. (2007), *Peoples of Nigeria and their Cultural Heritage*, Lisjohnson Resources Publishers, Lagos, Nigeria.

Oluwabamide, A.J. (2015), "An appraisal of African traditional economy as a heritage", *J. Res. Human. Soc. Stud.*, **2**(12), 107-111.

Oyo State of Nigeria (2009), *Ministry of Information, Youth and Sports*, Government Press, Ibadan, Nigeria.

Reininger, B.M., Rahbar, M.H., Lee, M., Chen, Z., Alam, S.R., Pope, J. and Adams, B. (2013), "Social capital and disaster preparedness among low income Mexican Americans in a disaster prone area", *Soc. Sci. Med.*, **83**, 50-60.

Renn, O. (2000), *Cross-Cultural Risk Perception: A Survey of Empirical Studies*, Kluwer Academic Publishers, London.

Theodori, G.L. and Luloff, A.E. (2002), "Position on environmental issues and engagement in Pro-environmental behaviors", *Soc. Nat. Res.*, **15**(6), 471-482.

Travino, M. and Fernandez, A. (1992), "The maquiladora industry: Adverse environmental impact and proposed solutions", *J. Borderland Stud.*, **7**(2), 53-72.

UNEP (2005), *Environmental Sanitation and Community Participation: Enhancing Local Programmes*, United Nations Environment Programme, <http://www.unep.or.jp/ietc/kms/data/1459.pd>.

UNICEF (2007), *Community Approaches to Total Sanitation Field Notes: Case studies   from India, Nepal, Sierra Leone, Zambia*, UNICEF Policy and Programming in Practice, Division of Policy and Practice Programme Division.

World Bank (2002), Sustainable Sanitation, <http://www.NETSSAF.net>.


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