RESEARCH PAPER

MARKET SANITATION: A CASE STUDY OF OREGBENI MARKET BENIN - CITY EDO STATE, NIGERIA

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ABSTRACT

Poor market sanitation is an intractable problem in Nigeria and has contributed to the spread of infectious diseases and environmental degradation. This study was undertaken to determine the awareness and practice of solid waste management in market places among market users. It involved 180 store owners and customers recruited from Oregbeni market in Benin City, Nigeria. They were administered questionnaires while an in depth interview was conducted with the waste managers in the market. Checklist was used to carry out observation of the market place sanitation status. The data obtained was then analyzed and compared using SPSS. The results showed that a high proportion of respondents were aware of improper waste management (133; 62.8%) and agreed (174; 96.7%) that it is associated with many risks. Despite this high level of awareness, the practice of open dumping of waste was prevalent (108; 60.0%). Interestingly, 96.1% expressed willingness to pay for an improved waste disposal system while 55.6% rated the existing system as poor. Our findings suggest therefore that there is an urgent needs to improve waste collection, and disposal at market places.

Keywords: Market sanitation, Solid Waste Management, Health hazards, Environmental degradation.

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INTRODUCTION

Environmental sanitation has remained an intractable problem in Nigeria with serious public health consequences. To address the enormous problems of environmental sanitation in Nigeria, the Federal Ministry of Environment (FMOE) through the National Environmental Sanitation Policy, identified market and abattoir sanitations as areas of concern. This was sequel to the overwhelming sanitation problems in markets and abattoirs that includes, improper refuse disposal, inadequate water supply, and gross inadequacy of sanitary facilities that result in open defecation and urination, as well as overcrowding and exposure of food and meat to flies, rodents and contaminants (FMOE, 2005). These problems were attributed to improper planning of markets and abattoirs; the springing up of illegal markets and abattoirs (including slaughter slabs); lack of provision of adequate facilities such as potable water; inadequate road networks, institutional regulations, enforcement and monitoring; and above all, corrupt and sharp practices by the supervisors of markets and abattoirs (FMOE, 2005).

Generally, markets occupy an important position in the lives of Nigerians and activities involved in buying and selling generate large quantities of solid waste that contains a large proportion of putrid vegetable and animal matter (Parks, 2007). Markets attract large gathering of buyers, sellers and especially pre-school children who have

accompanied their mothers to markets. The coming together of buyers and sellers in markets provide opportunities for the spread of communicable diseases with considerable potential to reach epidemic dimensions.

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, insects, etc which increases the potential for the spread of infectious diseases (Nigerian Observer, 2012). It is also acknowledged that many of the diseases that affect Nigerians, including malaria, tuberculosis and diarhoea are due to unhealthy environmental conditions (Nigerian National Planning Commission, 2004).

They may also pose fire hazards apart from being eyesores and sources of unpleasant odors. Very frequently, refuse is dumped in drainages or canals and along watercourses with impunity. All these have unpleasant environmental consequences. Another common feature of markets in Nigeria is the gross inadequacy of sanitary facilities such as potable water, toilets and bathrooms refuse disposal bays, etc. Open urination and defecation are widespread and the resultant contamination of the environment contributes to environmental degradation (Enahoro, 1983).

Furthermore, poor supervision of markets by ill-trained, ill-equipped and corrupt officials has led to overcrowding, as well as trading on access roads within and outside the markets. All these add to the dangers that traders face. Blockade of access roads within the market and its surroundings sometimes lead to unnecessary loss of lives and properties in event of emergency evacuation during fire accidents (Nigerian Observer, 2012).

There are two types of markets in Nigeria- Traditional and Modern. Both may hold daily or periodically on specific days. In terms of impact on the environment, markets in Nigeria may be classified as small, medium or large. Small markets usually serve local communities and may consist of just a few stalls. They are usually easy to keep clean at the end of the day's transactions. Medium markets, on the other hand, serve a number of neighboring communities while large markets are usually central, contain many stalls, and promote inter-township trade. Adequate provision of sanitary facilities is required in medium and large markets.

In addition, markets and abattoirs are often built without proper layouts, and where such layouts exist, they have been distorted. Abattoirs share similar sanitary problems with markets. Lack of sanitary facilities such as adequate water supply, toilets, refuse disposal bays, incinerators, and proper drainage, all increase the chances of contamination of meat meant for human consumption (Enahoro, 1983).

A study in Sango Meat Market, Ibadan Oyo State, Nigeria, identified sanitation problems in order of magnitude as insanitary environment resulting from improper disposal of refuse and animal wastes; lack of toilet facilities; water shortage; and lack of immediate health facilities following injuries (Enahoro, 1983).

In 2000, a study was conducted in eight (8), randomly selected markets in Benin City to assess the sanitary provisions and practices of traders using an observational checklist and an interviewer administered questionnaires (Okojie et al 2000). The result showed inadequacy of sanitary provisions in markets. There was neither provision for screening of food handlers nor inspection of markets by Sanitary Officers in any of the markets. Five of the eight markets had designated sites for refuse disposal. Inspection of these however, revealed that these were actually open dumping sites overflowing with refuse; with the attendant problems of rodent and insect infestation, transmission of vector and rodent borne diseases, depreciation of land values, odour, and sharp increase in air, land and water pollution. Interview revealed that these were irregularly cleared by various Local Government Area staff. Also, the toilets were inadequate in quantity and quality. Out of the 8 markets, 6 had toilets; 5 water closets and 1 pit latrine. Pipe borne water was available in only 3 markets, 3 of the markets with toilets had no water.

In another study in Iran to survey the knowledge, attitude, and practice of Yazd University of medical science students about solid waste disposal and recycling, it was observed that on the whole, the knowledge of the students was inadequate. About 66% of students did not have any action in segregation and recycling of solid wastes. It was concluded that all students must take part in formal and informal education classes to promote their knowledge in this regard (Ehrampouch and Baghian, 2005).

A similar study to assess village level knowledge, attitudes and practices on solid waste management in Sta. Rosa City, Laguna, Philippines, observed that majority of the respondents were middle aged, female, college graduates, and earned zero to low-income. Their knowledge was positively related to education, income and age; attitude was positively related to education and income, while knowledge was the only variable correlated to practice. Other factors were found to make people act (Rosario and Jamias, 2010).

It is obvious from the foregoing, that there exists a huge gap and several unanswered questions in market research, especially waste quantification, waste inventory, segregation, and disposal; hence the paucity of materials for referencing. This study therefore is designed to determine the level of awareness of hazards caused by improper waste management and assess the practice of solid waste management by market users.

MATERIAL AND METHODS

Study area: The study was conducted at Oregbeni market, Benin City, Edo State, Nigeria. Benin City is the capital of Edo State, in South-South, Nigeria.

Sample size determination: Using the Kish (1965) formula $n= (Z^2pq/d^2)$ for determining adequate sample size and further correcting for population less than 10,000 using $n=N/(1+(N/n_1)$ (Araoye, 2003), a total of 180 respondents of the total population of available stall owners and customers in a section (Cluster) of the market was used for the study.

Study design: An in depth interview was conducted with 3 waste disposal agency staff. A checklist adapted from the policy guidelines on market and abattoir sanitation by the Federal Ministry of Environment was used to score the environmental hygiene of the market place. Same checklist was used to carry out observation of the market place.

The checklist was scored by allocating a score of 3 points= A- If Item is adequate, B=2 points, if items needs minor corrective action, and C=1 point, C if the items needs major corrective action. 16 questions were asked for the external inspection with a maximum score of 48 points and a minimum of 16 points and 12 questions for the internal inspection with a maximum score of 36 points and a minimum of 12 points.

For external inspection, a total of 38-48 points was considered good, while 27-37 and less than 27 points were considered fair and poor respectively. For internal inspection, a total point of 28-36 points was considered good, while 20-27 and 12-19 points were considered fair and poor respectively (Table 3).

Sample collection: One hundred and eighty questionnaires (interviewer administered) were used for this study (pretested in Irrua Market Esan Central Edo-State) and were administered to the store owners and all customers in the store at the time of the study, using interviewer - administered questionnaires. The market was divided into four sections and a section was selected through balloting. All the store owners and customers seen in these stores at the time of study were administered the questionnaires. An in depth interview was conducted with the assistance of three randomly selected staff of the waste disposal agency in the market.

Ethical consideration: Individuals informed consent was obtained from respondents and permission from the market authorities and the management of the School of Health Technology, Benin City, was obtained for the study to be carried out.

Data analysis: The data obtained was analyzed using the Statistical Package for Social sciences (SPSS), Version 17.

RESULTS

High proportion of the respondents 133(62.8%) were aware of the associated hazards caused by improper waste management such as those caused by mosquitoes, rodents, and flies Majority (> 90%) agreed that fire outbreaks, foul smelling odors, atmospheric and water pollutions, environmental degradation and flooding, do result from improper solid waste management in market places (Figure 1). Despite the high level of awareness of the respondents concerning the associated hazards of poor solid waste management, the practice of solid waste management was poor as majority (108; 60.0%) of the respondents practiced open dumping method of waste disposal. Majority (173; 96.1%) pay for their waste to be disposed and 100 (55.6%) rated the performance of those responsible for collection and disposal of refuse as poor (Table 2).

The results of the in depth interview of the waste handlers, showed that there were major challenges of manpower, money and machines. It buttressed the fact that the volume of waste generated from the market is more than the coping capacity of the few available laborers. The level of job satisfaction was poor and the final method of waste disposal was unsanitary.

Analysis of the sanitation status based on the sanitation checklist, (Table 3), indicated that both the external and internal environmental hygiene was poor, which means that the waste management facilities were either not available or needed major corrective actions.

Table 1: Socio demographic characteristics of respondents

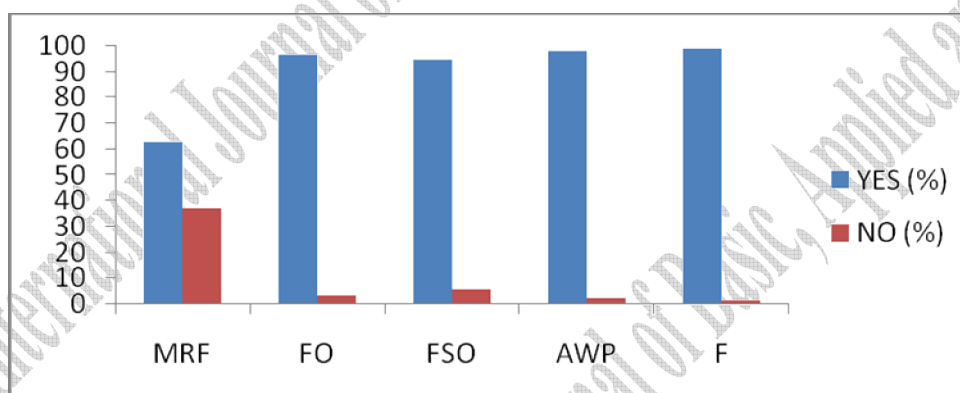| Variable	Frequency (N=180)	Percent (%)
Age		
18-30	63	35.0
31-60	110	61.1
>60	7	3.9
Sex		
Male	76	42.2
Female	104	57.8
Marital status		
Married	114	63.3
Single	57	31.7
Divorced	9	5
Educational level		
None	25	13.9
Primary	31	17.2
Secondary	116	64.5
Tertiary	8	4.4

Figure 1: Awareness of hazards associated with improper waste management
[key: (MRF= mosquitoes, rodents and flies; FO= Fire outbreak; FSO= Foul smelling odours; AWP= Air and Water pollution; F= Flooding]

DISCUSSION

In Nigeria, the major waste disposal method is open dumping which is insanitary as noted by Okojie et al. (2000) and supported by the results of this study. Majority of the respondents were female (57.8%) and most had secondary level of education. (Table1). Despite the large volume of waste generated daily by respondents (43.9%) (Table 2), wastes are disposed once weekly. The existing weekly sanitation exercise in the market held every Monday, though, commendable, should be strengthened.

This study has also shown that the high awareness about the hazards caused by improper waste management in market place did not translate to good practice. It is probably due to a number of reasons: lack of facilities for waste

segregation and timely collection, lack of will power on the part of waste generators to do the right thing and lack of incentives to adequately dispose of the waste generated. Promotion of community based integrated sanitation services as articulated in the Nigerian National Economic and Development Strategy (NEEDS) document (Nigerian National Planning Commission, 2004) is a rational step towards ensuring community participation and ownership of sound sanitation practices.

For this to be sustainable however, there is the need for communities to evolve ways by which those who generate waste are motivated to take responsibility for the disposal of such wastes either directly or through commercial waste collectors and managers and provision of minimum infrastructure for adequate collection, storage, and sanitary disposal of waste which should be regular and timely to improve the sanitation of the market environment.

In addition, consistent and periodic health education on segregation of waste at source, storage, and sanitary disposal of solid waste, would help to sustain improved practice. Improvements in sanitation facilities in the market place such as adequate supply of portable water, good toilet and bathroom accommodation, health post or first aid room, adequate fire fighting and security post etc are other key requirements necessary for achieving the desired sanitary status of the market place in the study area

Table 2: Composite table of results

Variable	Frequency (N=180)	Percent (%)
Products sold by respondents		
Agric	59	32.8
Clothes	23	12.8
Provision	25	13.8
Others	73	40.6
Estimated volume of waste generated/day		
1 Basket (≤5kg)	57	31.7
2 Baskets(6-10kg)	20	11.1
3 Baskets(11-15kg)	79	43.9
4 Baskets and above(≥16kg)	24	13.3
Waste disposal methods		
Open Dumping	108	60.0
Burning	16	8.9
Burying	4	2.2
Local Govt. Dustbins	52	28.9
Payment for waste disposal		
Yes	173	96.1
No	7	3.9
Rate of waste Disposal/week by disposal agencies	148	82.2
Once weekly	13	7.2
Twice weekly	7	3.9
Thrice weekly	12	6.7
Perceived performance rating of waste disposal agencies by the respondents		
Very poor	31	17.2
Poor	100	55.6
Satisfactory	45	25.0
Excellent	4	3.2
Respondents perceived cleanliness of the market		
Not clean	25	13.9
Fairly clean	98	54.4
Clean	15	8.3
Very clean	42	23.4

Table 3.Check list for external and internal environment

S/N	ITEM	SCORE
Section A: External Inspection		
1.	State of access routes	2
2.	Surroundings well kept	1
3.	Presence of tall trees	3
4.	Heaps of refuse observed	1
5.	Stagnant water	2
6	Dangerous excavations including defective septic tanks	2
7	State of drainages	1
8	Fire fighting facilities	1
9.	Security arrangements	2
10.	Water supply	1
11	Toilets	1
12.	Bathrooms	1
13.	Refuse disposal Bays	1
14.	Excreta disposal methods	1
15.	Rat, pest and vector infestation	1
	Total = 21; This is considered poor	
Section B: Internal Inspection:		
1.	Floor	1
2.	Wall	1
3.	Roof and Ceiling	1
4.	Passages and Stairways	1
5.	Stalls	2
6	Premises	2
7	Ventilation	1
8	Health Post	1
9.	Lighting	2
10.	Sanitary Dust bins	1
11	Rat, pest and vector infestation	1
12.	General cleanliness and tidiness	2
	Total = 16; This is considered poor	

(Adapted from the policy guidelines on market and abattoir sanitation by the Federal Ministry of Environment) **Section A: External Inspection** [Description: A-If item is adequate = 3points; B-If the items needs minor corrective action= 2; C-If the items needs major corrective action=1] **Key: External Inspection:** 38-48 points= Good, 27-37 points= Fair, <27 points= Poor, **Internal Inspection:** 28-36 points= Good; 20-27 points= Fair; 12-27 points= Poor**.**

The findings of this study therefore, suggest that there is a need to improve waste collection, storage, and disposal at the market place to reduce the potential of spread of infectious diseases and environmental degradation. We recommend also that researchers should pay more attention to market studies and improved sanitary facilities should be made available in market places and abattoirs. The local Government should take steps to promote community participation in sanitation services, particularly at the market places since it is their responsibility constitutionally.

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AUTHOR(S) CONTRIBUTION

Abejegah C, Eluromma E, and Aigbiremolen AO, designed the study. Abejegah Cand Eluromma E, participated in the data collection and editing. Abejegah C, Abah SO, Awunor NS, and Duru CB worked on the analysis and the initial draft copy. Awunor NS, Duru CB, Okoh EC and Abejegah C, wrote the final copy.