Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2020; 8(1): 511-516
© 2020 JEZS
Received: 13-11-2019
Accepted: 16-12-2019

Uzowuru DI
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Amaechi AA
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Onyeka PIK
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Ukaga CN
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Ikpeama CA
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Ezike MN
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Onuoha BC
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Egejuru NJ
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Oguh EMM
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Osahor KE
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Iwunze JI
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Corresponding Author:
Uzowuru DI
Department of Animal and Environmental Biology, Imo State University, P.M.B. Owerri, Nigeria

Assessment of the knowledge, attitudes and factors militating against solid waste management strategies in Aba, Abia state, Nigeria

Uzowuru DI, Amaechi AA, Onyeka PIK, Ukaga CN, Ikpeama CA, Ezike MN, Onuoha BC, Egejuru NJ, Oguh EMM, Osahor KE and Iwunze JI

Abstract
Solid waste management is now a global issue. Solid waste is generated at all levels of our lives in Nigeria; both locally as household solid waste and in the corporate front as industrial wastes and management practices are very poor. To investigate the management strategies of solid waste in Aba, Abia State, Nigeria, a study was conducted between June and November, 2018. Data was collected using structured questionnaires. A total number of 200 respondents were randomly selected as the study respondents. Results obtained on the awareness and attitudes revealed that greater proportions of the respondents (84.0%) were aware of waste management while (66.5%) exhibited poor attitudes. All the respondents opined that the waste management system in Aba was not effective. On the types and sources of solid wastes generation, non-biodegradables (63.5%) were reported more than (36.5%) biodegradables. It was also revealed that markets were the highest source of waste generation (65.0%). Burning/incineration and open dumping were the major methods of solid waste management methods with (46.0%) and (35.5%) respectively. Bags were reported to be the major waste collection method with (58.5%). These solid wastes generated in Aba metropolis has the potentials to be used for energy generation. There should be an enlightenment program by the government on waste management practices. It was further recommended that Government should create the enabling environment to enable private investors key into the initiative of building thermo-chemical plants that can effectively convert these solid wastes to electricity.

Keywords: Solid waste, management strategy and Aba

Introduction
Solid waste management is the process of collecting, storing, treatment and disposal of solid waste in such a manner that they are harmless to humans, plants, animals, ecology and the environment in general [1]. In developed nations, waste management have evolved into material flow management which involves careful handling of raw materials, reduction of green gas emissions, environmental protection, job creation and revenue generation. In contrast, waste management in developing nations like Nigeria is still at infancy and faces numerous challenges. The indiscriminate dumping of solid wastes along major roads is a source of concern to every well-meaning citizen. The impact of indiscriminate dumping of solid wastes can lead to outbreak of diseases and other related health issues. Solid waste generation can be influenced by several factors such as economic development, income level, industrialization, urbanization, human attitude and local climatic conditions [2]. There is a direct relationship between the economic development and the generation of solid wastes in the country. Solid waste management is now a global issue. On the other hand, due to weak legislation and enforcement in terms of waste generation and management in Africa, most countries in the continent still dispose over 70% of the total solid waste generated in landfill sites, thereby not optimizing the use of these solid wastes in the generation of energy and creation of new products from these wastes. In Nigeria, solid waste (SW) can be classified based on its origin. For instance, domestic waste (i.e. waste from households, food centers, markets, and commercial premises); industrial waste (excluding toxic waste that requires special handling), institutional waste (waste from government establishments, schools, hospitals and recreational facilities). Improper disposal of these untreated wastes can be deleterious. Air pollution, underground water contamination, land degradation, soil contamination and habitat deterioration can be caused by improper waste disposal [2].

Environments close to dumpsites are constantly exposed to risk of infection, reduced agricultural yield, groundwater contamination, decline in benthic communities due to toxicity and exposure to hazardous compounds [3, 4] Additionally, global warming, photochemical oxidant creation, acidification, ecotoxicity of water, eutrophication and abiotic resource depletion can be caused by indiscriminate dumping of waste [5]. According to the World Health Organization (WHO) and the United Nations International Children Education Fund (UNICEF), bad sanitation, decaying or non-existent sewage system and toilets fuels the spread of various diseases (cholera, diarrhea and basic illness) which kill a child in every 21 seconds [6].

Despite numerous efforts by Abia State Environmental Protection Agency (ASEPA) to improve waste management in Aba, there are several impediments which challenge their efforts. Prominent among these challenges are the volume of solid waste generated, logistic difficulty in handling and managing these wastes. The common practice for waste management in Nigeria is landfilling (open dumping) [1]. Substantial quantity of solid waste generated in Aba metropolis are indiscriminately deposited on roads or roadsides, unapproved dumpsites, in water ways (drainage system) or in open sites which negatively impact the environment and de-beautify its landscape [4]. Some of the open dumps are indiscriminately located at streams, valleys, water lands, open fields and abandoned borrow-pits [4]. This system of waste disposal accumulates huge quantity of waste annually and is associated with several problems such as contamination of groundwater and outbreak of various human diseases [7].

Aba is one of the dirtiest cities in Nigeria due to a poor waste management system and poor attitude of the residents (Figure 1). Aba in Abia State, Nigeria has been a center for commercial activities as such, the generation of waste both solid, liquid, municipal and industrial wastes are on the increase, causing environmental health effects on the people and its environs. In Aba, experimental studies have shown that about 47.39% of the total solid waste is organic and compostable whereas recyclable waste accounts for about 4.69–9.90% [8]. However, knowledge, attitudes and factors militating against waste management practices have not been investigated. Hence the current study gave emphasis to assess knowledge, attitude and these factors in order to provide up-to-date data for future management of waste in the area.

Materials and Methods

Study Area

The study was a community based cross-sectional study conducted in Aba, between June and November, 2018. Aba is located in Abia State, South East of Nigeria between latitude 5°06' 60.00"N and longitude 7°21'59.99"E [4]. The city is a commerce center and has Ariria International market which is considered the biggest market in West Africa. Additionally, the city has many manufacturing industries such as brewery, distillery and other famous food and beverage industries which generate huge amount of waste. The municipality in charge of waste management in Aba is the Abia State Environmental Protection Agency (ASEPA).

Ethical Consideration

The study was approved by the Department of Animal and Environmental Biology (Zoology), Imo State University, Owerri and the Abia State Environmental Protection Agency (ASEPA). Before the participants were given the questionnaire, verbal consent was obtained from the participants, following the objectives of the study. In order to maintain confidentiality, names and addresses of the respondents were not utilized.

Study Population

The study population comprised of adult populace from Aba Metropolis who were randomly selected. A total number of 200 people were selected as the study respondents from the area under study.

Data Collection

The study was a cross-sectional based study. Structured questionnaire was the instrument used for data collection and was self-administered to the respondents by the researcher through simple random sampling method. Information obtained was on awareness, attitudes and solid waste management strategies. On-the-spot method of collection was employed to avoid lose of materials and all the distributed questionnaires were collected from the respondents. The researcher after administration and collection counted the collected materials and no one was missing.

Data Analysis

The data obtained was subjected to statistical analysis using descriptive statistics.

Results

The awareness on waste management, types and sources of solid waste (Table 1) revealed that 168(84.0%) of the respondents were aware of waste management while only 32(16.0%) claimed not to be aware of it. Pollution 77(38.5%) was the highest reported impact of waste. Disease vectors/disease outbreak 48(24.0%), road blockage 47(23.5%) and environmental degradation 28(14.0%) were also the reported impacts of waste. On the public health implications of waste management, 147(73.5%) of the respondents were aware of the implications while 53(26.5%) were not aware. Also, 147(73.5%) were aware of the risk associated with waste disposal, which include air pollution 109(74.1%), toxic exposure 21(14.3%), contact with infections 11(7.5%) and 6(4.1%) had no idea of the reported risk. On the types of waste generated, Non-biodegradables 127(63.5%) was reported more than (Plate 1) biodegradables 73(36.5%). The source(s) of wastes revealed that markets 130(65.0%) were the commonest source followed by residential homes 45(22.5%), schools 23(11.5%), hospitals 2(1.05%). Table 2 summarized the knowledge of the respondents on waste management methods employed in the area. Burning/incineration 92(46.0%) was the major method, 71(35.55) of the respondents said open dumping, 37(18.5%) respondents use land filling (Plate 2 & 3). None of the respondents bury their waste as a management practice. On the frequency of wastes disposal, over 50% of the respondents 108 (54.0%) had no specific day of wastes disposal, 44(22.0%) disposed their wastes every month, 31(15.5%) of the respondents disposed 1-3times a week and only 17(8.5%) do it every day. The study investigated the method of waste collection, and it was revealed that 117(58.5%) of the respondents adopted the use of bags. 49(24.5%) used containers without cover, 20(10.0%) used containers with cover and 14(7.0%) used other methods of waste collection. The method of waste transport to final disposal site, revealed

that trucks 105(52.5%) was the major waste transport, 44(22.0%) used hand carrying, 30(15.0%) used wheel barrows and 21(10.5%) used other transport methods. Local government 147(73.5%) was majorly responsible for waste collection, while 41(20.5%) and 12(6.0%) attributed it to state and community. Table 3 revealed that the residents had poor attitudes 189(88.5%) and low effectiveness 177(88.5%) to waste management. Table 4 revealed the factors militating against the efficiency of solid wastes disposal and management. Negligence on the part of the government 56(28.0%) was the main factor militating against waste management efficiency. Other factors were poor enforcement regulation and lack of adequate education 42(21.0%) and 41(20.5%), respectively.

Table 1: Awareness, Types and Sources of Solid Waste

Variables	Frequency	Percentage (%)
Awareness of waste management		
Yes	168	84.0
No	32	16.0
Health implications and risk associated with waste management		
Yes	147	73.5
No	53	26.5
Reported Risks of waste disposal = 147		
Toxic exposure	21	14.3
Air pollution as a result of burning	109	74.1
Contact with infections	11	7.5
No idea	6	4.1
Types of Wastes		
Biodegradable	73	36.5
Non-biodegradable	127	63.5
Sources of Wastes		
Residential homes	45	22.5
Markets	130	65.0
Hospitals	2	1.0
Schools	23	11.5

Table 2: Knowledge on Solid Waste Management Method

Variables	Frequency	Percentage (%)
Open dumping	71	35.5
Burning/incineration	92	46.0
Burying	0	0.00
Land filling	37	18.5
Frequency of Wastes Disposal		
Every day	17	8.5
1-3times a week	31	15.5
Every month	44	22.0
No specific day	108	54.0
Method of waste collection		
Use of bags	117	58.5
Containers with cover	20	10.0
Containers without cover	49	24.5
Others	14	7.0
Method of Waste Transport to Final Disposal Site		
Hand carrying	44	22.0
Trucks	105	52.5
Wheel barrow	30	15.0
Other	21	10.5
Agency Responsible for the Collection of Waste		
Local government	147	73.5
State government	41	20.5
Community organization	12	6.0

Table 3: Attitude of Respondents on Waste Management in Aba

Attitudes	Yes (%)	No (%)
Excellent	0(0.00)	200(100.0)
Average	21(10.5)	179(89.5)
Poor	189(94.5)	11(5.5)
Effectiveness of Waste Management System		
Highly Effective	19(9.5)	181(90.5)
Moderately effective	41(20.5)	159(79.5)
Low effective	177(88.5)	23(11.5)

Table 4: Factors militating against the efficiency of Solid wastes disposal/management

Variables	Frequency	Percentage (%)
Increasing population	17	8.5
Lack of adequate education	41	20.5
Negligence on the part of the government	56	28.0
Lack of awareness on the health implications of waste management	32	16.0
Poor enforcement regulation on waste management	42	21.0
Lack of adequate equipment's	12	6.0

(**Source:** Researcher's Field Work, 2019)

Plate 1: Dumpsite in Aba (Epidemic looms in Abia, as communities reject dumpsite)

(**Source:** Researcher's Field Work, 2019)

Plate 2: Aba Residents Decry Health Implications of Refuse Dump

(**Source:** Field, 2019)

Plate 3: Refuse dump site on Aba

Discussion

The rapid growth in pollution in Aba and its high commercial and industrial activities has not only affected the situation of waste generation rather has increased volume of wastes generation in the area and had also made waste management strategies unable to keep space with the rate of generation. According to Ajero and Ukaga [9], the Nigeria population is estimated to be growing at the explosive rate of over 3 percent and they give a starting rate of urban expansion for the country as 11 percent. The rapid increase in the rate of rural-urban migration has resulted in a situation of overcrowding and consequent waste management problem.

The level of awareness (84.0%) of waste management could be explained by the generally high educational status of respondents. This result is in line with the findings of Adeyemo and Gboyesola [10] on knowledge and attitude on waste management of people living in the university area of Ogbomoso which indicated that the respondents were highly aware of refuse/waste management. Poor attitude on the part of the publics has always been reported over waste management and there no effective waste management system in the area (Plate 1, 2, 3).

The components of waste generated in the study area include biodegradable (such as food materials, paper, etc) with (39.5%) and non-biodegradable (such as metals, cans, and polythene) with (60.5%). This is in agreement with the study conducted on waste management strategies in Owerri Municipal Council of Imo State, Nigeria, which recorded higher non-degradable materials in the study than biodegradable materials [11]. The incrimination of food material as the most common waste is supported by Ayoola [12]. This would be attributed to high standard of living and greater consumption of unprocessed agricultural materials. Farmers constitute a considerable high proportion of the urban population in the developing countries like Nigeria. In the city of Ibadan for instance, with an estimated 1982 population of 2 million people, as high as 30% are probably farmers [12]. Therefore, packed food and other consumable items that are well packed are common occurrence and as such, these components are being generated as solid waste, Cunningham and Cunningham [13] observed that excess packaging of food and consumer products are one of our greatest sources of unnecessary waste. Unfortunately, these wastes occupy more space making up 50% domestic trash by volume. Secondly, many of them do not biodegrade completely and so leave small particles in the environment. In doing so, they release toxins which are harmful to health. Enger and Smith [14] reported similar result (20-25%) in Australia. In advance countries, waste reduction practice is employed as a rule.

The observation of respondents regarding metals and cans as the major waste is not unexpected. Metals and cans are commonly reused in the third world countries. It is a familiar sight, seeing people scavenging through dumpsites for the materials; they however serve as an effective and fertile breeding site for mosquitoes, flies, rodents which are vectors of parasitic diseases. These diseases constitute health, socio and economic burden to the public.

Awareness and attitude towards waste management revealed that most popular methods of waste disposal known to the respondents were burning/incineration (46.0%) and open dumping (35.5%) while the least known method was land filling. This scenario is not very different from findings in other studies. Open dumping remains the simplest and the most commonly used method for disposing municipal solid waste [15]. In most low to medium income developing nations like Nigeria, almost 100 percent of generated waste goes to landfills [16]. While wastes are deposited in open dumps in developing nations; these have become obsolete in the developed countries. The increase in population as a result of industrial revolution in major towns and cities of the world have necessitated rapid growth or high rate of urbanization and development, for instance, Nigeria especially, Aba city in recent time have witnessed rapid population growth resulting from influx of migrants from rural area to the cities. This brings about the concentration of industrial, commercial, infrastructural, administration and government activities in urban cities. Thus, leading to rapid growth of population; the rate of waste generation also increases, leading to increased burning of refuse and high rate of air pollution, which in turn increased concentration of green house gases that cause global warming and subsequent climate change. The volume of waste generated in any city is often a reflection of the intensity of human activities such as population growth, urbanization and social development, resources exploitation and unchecked technological advancement [17]. Sanitary landfills which are well engineered facilities (with liners, leachate collection/ treatment system, and gas collection system) are now used to ensure the protection of human health and the environment. These modern landfills are often under strict federal and state regulations and are therefore specially sited, designed and operationalized to ensure environmental performance [18]. However, it is different in some parts of Nigeria, where the unsanitary landfills are not subject to regulations, and are usually sited for convenience, such as the presence of a pre-existing hole (created from sand mining activities) into which waste could be deposited [16]. In Lagos, Nigeria, some of these open pits are located near residential housing and therefore represent a threat to human health and the environment.

A large number of the respondents had a negative attitude towards waste management as the respondents agreed that proper waste disposal can better their health and the practices of waste management is of great importance. This is in disagreement with the study carried out by Adeyemo and Gboyesola [10], which showed that respondents in university area of Ogbomso had a positive attitude towards waste management as 82.0% agreed that waste disposal into drains and around the surroundings is unhealthy and can be disastrous to health. This study has created a general picture of poor waste management practices among residents of Aba metropolis.

In accessing the agency that is responsible for collection of refuse, local government authority was figured out to be the most reliable agency. This is similar to other study by Ogunsanya [19], in studies on the efficiency of solid waste management in Ibadan North local government. The effort of Bureau for sanitation and transport in the disposing of waste is undermined by lack of adequate personnel, trained manpower and obsolete machines. The efficient functioning of the agency is further compounded by inaccessibility of road. The situation is more dire in the rain. Other factors include finance, haulage, distance and inability to adequately separate the waste.

Waste type and sources showed that the major waste was reported to be generated from market (55.5%) and households residues (22.5%). This is similar to findings of the work done by Modebe and Ezeama [20], on household solid waste management in Awka in which the commonest type of waste

generated was garbage (100%), followed by cellophane bags (99%). It is however different and higher than the household waste generated in the City of Johannesburg, South Africa in which 67% were household wastes, 23% from commercial activities and 10% industrial activities [21]. A good number of our respondents (58.5%) collect their waste in bags and containers without covers (24.5%). This is in line with outcome of study done by Modebe and Ezeama [20], which reported that 85% of households in Awka stored their waste in closed containers outside the house and majority of the respondents (87.8) did not sort their waste prior to disposal.

Conclusion and Recommendations

The main components of generated waste were biodegradable, and the major source was market in Aba. The findings revealed that the solid waste management in the area was inefficient and this can be largely attributed to inadequate knowledge about scientific management of waste and non-provision of appropriate equipment for collection and disposal of solid waste. Other factors include inadequate funding, lack of good sanitation and waste storage facilities. This process requires the preparation of strict procedures to be applied to the site of occurrence. In this way, the problem with the management of waste in Aba could be reduced to the level of no risk or less risky waste. Also, the concept of solid waste management is not properly addressed hence, the adoption of open dumping as the predominant method of waste management. The consequences include pollution, disease outbreak and environmental hazards like flooding, road blockage, accidents, fire out breaks and aesthetic degradation. Therefore, the government of Abia State should currently focus on the methods to approach these challenges posed by Solid Waste Management (SWM). The State Government should add new legislation to the already existing ones that will help improve solid waste management and have a team that will effectively ensue that these laws are implemented. Citizens of the state should engage in good behavioral practices like bagging of solid wastes before disposal in waste collection points. Every household should have solid waste facilities such as garbage bin and dustbin for easy disposal.

References

1. Agwu MO. Issues and challenges of solid waste management practices in Port Harcourt city, Nigeria – a behavioural perspective. Am. J Soc. Manage. Sci. 2012; 3:83-92.
2. Odoemene UD, Ofodu J. Solid wastes management in Aba Metropolis. Int. J Adv. Acad. Res. 2016; 2:1-7.
3. Ayuba KA, Manaf LA, Sabrina AH, Azmin SWN. Current status of municipal solid waste management practice in FCT Abuja. Res. J Environ. Earth Sci. 2013; 5:295-304.
4. Ukpong ECU, Udo EA, Umoh IC. Characterization of materials from Aba waste dumpsites. Int. J Eng. Appl. Sci. 2015; 6:1-10.
5. Nkwachukwu OI, Chidi NI, Charles KO. Issues of roadside disposal habit of municipal solid waste, environmental impacts and implementation of sound management practices in developing country "Nigeria". Int. J Environ. Sci. Dev. 2010; 5:409-418.
6. Momodu NS, Dimuna KO, Dimuna JE. Mitigating the impact of solid wastes in urban centres in Nigeria. J Hum. Ecol. 2011; 34:125-133.
7. Akor AJ, Ayotamuno MJ, Aman LI, Enokela SO. Assessment of domestic solid waste generation in Port Harcourt by separator – Receptacle technology. Int. J Sci. Eng. Res. 2013; 4:1-7.
8. Ajero CMU, Chigbo UN. A Study on the Evaluation of Industrial Solid Waste Management Approaches in Some Industries in Aba, South Eastern Nigeria. W. Afr. J Ind. Acad. Res. 2012; 4:103-112.
9. Ajero CMU, Ukaga CN. Development, Global Change and Public Health 1st Edition. Megasoft Publisher Owerri, 2006.
10. Adeyemo FO, Gboyesola GO. Knowledge, Attitude and Practices on Waste Management of People Living in the University Area of Ogbomso, Nigerian. International Journal of Environment Ecology, Family and Urban Studies. 2013; 3:51-56.
11. Nwoke BEB, Dozie INS, Nwoke EA, Anosike JC, Ajero CMU. Nigeria and Modern Waste Management in New Millennium the Concept of Integrated Waste Management. Journal of Biological and Environmental Sciences. 2006; 1:8-15.
12. Ayoola TO. Solid Waste Management in Kaduna City and Cunningam, M.A. (2008): Principles of Environmental Sciences: Inquiry Problems and Physical Planning Solutions. (Unpublished Document), 2002.
13. Cunningham PW, Cunningham MA. Principles of Environmental Sciences: inquiry and Applications; Solid and Hazardous 4th Edition McGraw-Hill Companies New York, 2008, 10-16
14. Enger M, Smith MB. Solid Waste Disposal for Low-Income Countries. Leicestershire: Water, Engineering and Development Centre, 2006.
15. Aderemi AO, Falade TC. Environmental and Health Concerns Associated with the Open Dumping of Municipal Solid Waste: A Lagos, Nigeria Experience. American Journal of Environmental Engineering. 2012; 2(6):160-165. DOI: 10.5923/j.ajee.20120206.03.
16. Taylor R. Allen A. Waste Disposal and Landfill: Potential Hazards and Information Needs. In: WHO, World Health Organization (Eds.), Protecting Groundwater for Health: Managing the Quality of Drinking Water Resources, 2006, 339-360.
17. Adejobi OS, Olorunnimbe RO. Challenges of Waste Management and Climate Change in Nigeria: Lagos State Metropolis Experience. African J Sci. Res. 2012; 7(1):346-362.
18. National Solid Waste Management Association Solid Waste Technologies, Regulations and Issues: Municipal Solid Waste Landfills, 2011. http://www.environmentalistseveryday.org/issues-solid-waste-technologies-regulations/landfills-garbage-disposal/index.php.
19. Ogunsanya MT. The Efficiency of Solid Waste Management in Ibadan North West Local Government (Unpublished Document.), 2002.
20. Modebe I, Ezeama NN. Public Health Implication of Household Solid Waste Management in Awka South East Nigerian. The Journal of Public Health, 2011, 1.
21. Ogola JS, Chimuka L, Tshivhase S. Management of Municipal Solid Wastes: A Case Study in Limpopo Province, South Africa, Integrated Waste Management, 2011, 1. http://www.intechopen.com/books/integrated-waste-management-volume-i/management-of-municipal-solid-wastes-a-case-study-in-limpopo-province-south-africa