

Assessment of Health Implications of Waste Collectors (Scavengers) to the Individuals, Environment and Its Possible Way Out

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Abstract- There are millions of waste pickers worldwide, predominantly in developing countries, but increasingly in post-industrial countries as well, there is little reliable data about the number and demographics of waste pickers worldwide. Most academic research on waste pickers is qualitative rather than quantitative. Waste collectors are prone or exposed to some kind of diseases and hazards like nosocomial diseases, tuberculosis, dysentery, asthma, pneumonia, parasite, malnutrition and bronchitis. Waste collector is expected to maintain and make use of all personal protective equipment and maintain personal hygiene. Due to improper waste disposal several problems like unpleasant odour and other related health problems may occur. In Kogi State particularly and in Nigeria in general, modern landfill facilities are not found in municipal dumpsites, hence the sorting-out of solid wastes into degradable, non-degradable and recyclable materials cannot be achieved. The study assessed the health effects of exposure to waste on the scavengers; the study identified the health hazards associated with waste collections; the study determined the possible solutions to the hazards associated with waste collections in Lokoja dumpsite Felele, Lokoja LGA, Kogi State. Cross sectional descriptive study designs using multi-stage sampling technique was used to select graduates, skilled and unskilled workers, students, and other residence of the community that were used for the study. A 20- item structured questionnaire was used to generate data from 60 randomly selected respondents. Results were

analysed and were presented in tables and percentages. Majority of the respondents, 48 respondents (80%) stated that they make use of PPE while operating while 12 respondents represent (20%) stated that they did not make use of PPE while operating. However, 3 respondents (5%) stated that they scavenge metal and plastic scraps, 0 respondents (0%) stated that they scavenge wood scraps, 8 respondents (13.3%) stated that they scavenge plastics and woods scraps and 49 respondents (81.7%) stated that they scavenge all class of refuse. It could be concisely concluded that the dumpsite Lokoja imposes a lot of environmental and occupational hazard to man and his environment. These activities cause a lot of skin diseases to their workers especially during their working hours, workers are exposed to acid waste, and they are also exposed to respiratory tract infection through inhalation of gases .and some of the skin diseases like dermatitis and skin cancer contribute a lot to the ill health of the workers and the institutional environment. The study indicated that Government should carryout health education campaign at regular interval as well as proper monitoring and evaluation should be assigned, There should be a designated health officer who can oversee and control the affair of waste collection in every health care setting, they should be implementation of rules, policy, regulations and law of environment and health care waste disposal in every waste generated setting, The sanitary staff should be properly trained of their respective duties and responsibilities and

there should be provision of adequate protective devices for the workers which should be mandatory used by the workers.

Indexed Terms- Health, Waste, Waste collectors, Environment

I. INTRODUCTION

The disposal of domestic, commercial and industrial garbage in the world is a problem that continues to grow with human civilization and no method so far is completely safe. Experience has shown that all forms of waste disposal have negative consequences on the environment, public health, and local economies (Abdulsalam, 2009). Solid wastes are sources of environmental pollution through introduction of chemical substances above their threshold limit into the environment (Obasi et al., 2012). Dumpsite is an old traditional method of waste disposal similar to landfill method of waste management. Dumpsites are often established in disused quarries, mining or excavated pits away from residential areas (Abdul-Salam, 2009). Designated government agency, corporate bodies and some individuals collect wastes routinely into these dumpsites (Abduls-Salam, 2009). In Kogi State in particular and in Nigeria in general, modern landfill facilities are not found in these municipal dumpsites, hence the sorting-out of solid wastes into degradable, non-degradable and recyclable materials cannot be achieved. Poor management of dumpsites could create a number of adverse environmental impacts, including wind-blow litter, attraction of mice and pollutants such as leachate, which can pollute underground soil bed, and / or aquifer (Abdulsalam, 2009). Landfill gas mostly composed of methane and carbon (IV) oxide is produced through biodegradation of such waste (Abduls-Salam, 2009). Leachate from dumpsites is of particular interest when it contains potentially toxic heavy metals. These metals are known to bio accumulated in soil and have long persistence time through interaction with soil component and consequently enter food chain through plants or animals (Dosumu, 2003).

Household and industrial garbage may contain toxic materials such as lead, cadmium, mercury, manganese from batteries, insect sprays, nail, polish, cleaners,

plastics polyethylene or PVC (polyvinyl chloride) made bottles and other assorted products (Abduls-Salam, 2009). Soil microorganisms can degrade organic contaminants, while metals need immobilization or physical removal because metals at higher concentrations are toxic and can cause oxidative stress by formation of free radicals (Henry, 2000) and thus may render the land unsuitable for plant growth and destroy the biodiversity. However, municipal solid wastes are known to contain large amount of persistent organic pollutants (Minh et al., 2006). The municipal waste dump sites in the study area are of environmental interest because of the closeness of these dumpsites to residential houses as a consequence of urbanization and the lack of pre-classification and sorting-out of wastes prior to disposal. Wastes are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law” (Basel convention 2019.) Waste management or waste disposal includes the processes and actions required to manage waste from its inception to its final disposal (United Nations statistics environment statistics 2017). A waste collector, also known as a garbage man, garbage collector, trash man (in the US), bin man or (rarely) dustman (in the UK), is a person employed by a public or private enterprise to collect and dispose of municipal solid waste (refuse) and recyclables from residential, commercial, industrial or other collection sites for further processing and waste disposal. (History of the garbage man 2020). Health, According to the World Health Organization, is "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity” (World health organization 2006). A landfill site, also known as a tip, dump, rubbish dump, garbage dump, or dumping ground, is a site for the disposal of waste materials (U.S. environmental protection agency 2007). Waste collectors are prone or exposed to some kind of diseases and hazards like nosocomial diseases, tuberculosis, dysentery, asthma, pneumonia, parasite, malnutrition and bronchitis. Waste collector is expected to maintain and make use of all personal protective equipment and maintain personal hygiene. Due to improper waste disposal, we may face several problems like unpleasant odour and the health problems. Olorunda (2002) stated that due to the nature of medical wastes, it needs to be handled with care in the process of collection, treatment and

disposal, each unit in any hospital should be provided with equipment e.g. dustbin to convey the wastes properly in a manner that you cannot constitute or lead to injury on the workers at the end of daily activities. The heads of department should recruit Environmental health officers to oversee the collection, treatment and the disposal of the wastes.

The main objective of this research work was to assess the health implications of waste collectors (scavengers) to the individuals, environment and possible recommendations

Specific Objectives

1. To find out the health effects of exposure to waste on the scavengers.
2. To identify the health hazards associated with waste collections.
3. To reveal the possible solutions to the hazards associated with waste collections.

Research Questions

1. What are the health effects of scavengers to individuals?
2. What are the hazards associated with waste collection?
3. What are the possible solutions to the hazards associated with waste collection?

II. MATERIALS AND METHODS

3.1 Study setting.

Lokoja is situated on the West bank of the River Niger at its confluence with River Benue, which divides Nigeria into its natural regions. The River Benue forms its boundary to the east, while the River Niger and Okun land define its frontier to the west. To the south of Lokoja is Ajaokuta while to the south east is an enormous vast land occupied by the Igala people, to the north of Lokoja is the Egbura of Koton-Karfe, whose people also form part of Lokoja. Thus, being strategically located at the confluence of two great rivers and at the Centre of Nigeria, Lokoja has been a melting pot of culture, commerce and conquest which has necessitated assimilation of peoples, particularly, into the Nupe- Kakanda, Oworo and Igala societies within the confluence area. Consequent upon this, the Igala, Jukun and the Fulani at various times had

conquered large part of the region, thereby making it a heterogeneous town.

On the contrary, areas such as Kabawa, with a huge population of uneducated people experience indiscriminate refuse dumping. Similarly other areas such as parts of Adankolo (especially the adjacent Marine Quarters) and Felele also experience random dumping of refuse. Open dumping of waste in Felele, for example, accounts for about 77 percent of total wastes generated in Lokoja. Apart from the fact that waste is generated on a daily basis in these aforementioned areas, their occupants are insensitive to the danger of living or dumping waste in open fields or plots of land, drainages and abandoned buildings. The situation in Kabawa is so pathetic that commuters plying Murtala Muhammed Road are always greeted by the offensive odour that oozes out from the zone. The clustering of residential buildings in Kabawa, with an estimated 150 houses per hectare sq. Aggregation is also another factor responsible for the insanitary condition of the area. The condition along the river bank in Adankolo, NIWA Dock yard and Felele is the same as in Kabawa where indiscriminate dumping of refuse holds.

3.2 Study Population

The population of the workers working in Kogi state waste management board Lokoja is eighty-six (86). The study covers both the Institution and the community so the bulk of information collected alone involves skills people, graduate, undergraduate student, but also to the community which involves skills and unskilled people who live in that community

3.3 Sample Size and Sampling Techniques

For the researcher to have an accurate finding stratified random sampling techniques was used to select 60 people from the Institution and the community where is situated. Out of these 60 people 40 was selected from the Institution (waste management board) workers while 20 is from the community. This figure includes male and female, skilled and unskilled workers. These 60 questionnaires were administered among the selected group and 60 were returned back successfully.

3.4 Instrument Design

Questionnaire was the instrument used for data collection from reliable source within the case study area like the graduates, skilled and unskilled workers, students, and other residence of the community

QUESTIONNAIRE: for accurate findings and coverage of the area the researcher prepared and sent out questionnaire to some resourceful individual for completion among which were male and female. The instrument serves as the major instrument used. The questionnaire administered consists of twenty-six (20) questions and 60 copies were distributed.

3.5 Method of Validating Instrument

All necessary observation and corrections by my supervisor in the research were noted to ensure that the instrument serves the purpose for which it was designed.

3.6 Methods of Data Collection

The researcher administered questionnaire randomly to the respondents, and 50 was returned back. The questionnaire covered on assessment of health implications of waste collector (scavengers) of Lokoja dumping site Felele Lokoja in order to get reliable information.

3.7 Method of Data Analysis

The returned filled questionnaire from respondent was scored in percentage and presented in a tabular form by using the formula:

$$frequency\ method = \frac{number\ of\ respondents \times 100}{number\ of\ questionnaire}$$

3.8 Limitations of Study

1. Lack of previous research studies on the topic
2. Limited access to data
3. Time limit
4. Limited access to information when there is data
5. It is time consuming and expensive
6. Sleepless nights when working on my project

III. RESULTS

A total of 60 copies of questionnaires were distributed for the study

Each hypothesis was tested based on each question chosen from the questionnaire as regards the topic in question

Table 1: Are you aware of the hazard associated with waste collection?

Option	Frequency	Percentage
Yes	56	93.4%
No	4	6.6%
Total	60	100%

The table above indicate 56 respondents (93.4%) stated that they are aware of the hazard associated with waste collection, 4 respondents represent (6.6%) stated that they are not aware of hazard associated with waste collection.

Table 2: Have you been trained on waste collection/scavenging?

Option	Frequency	Percentage
Yes	50	83.4%
No	10	16.6%
Total	60	100%

The table above indicates 50 respondents represent (83.4%) stated that they have been trained on waste collection/scavenging, 10 respondents represent (16.6%) stated that they have not been trained on waste collection /scavenging.

Table 3: How frequent do you collect/scavenger waste?

Option	Frequency	Percentage
Daily	7	11.6%
Twice weekly	34	56.7%
Once weekly	15	25.1%
Once every two weeks	4	6.6%
Total	60	100%

The table above indicate 7 respondents represent (11.6%) stated that the collected waste daily, 34 respondents represent (56.7%) stated that they collected waste twice weekly, 15 respondents represent (25.1%) indicated that they collected waste once weekly, 4 respondents represent (6.6%) stated that they collected waste once every two weeks.

Table 4: Is there any form of orientation or safety tips giving by the supervising individual/agency?

Option	Frequency	Percentage
Yes	47	78.4%
No	13	21.6%
Total	60	100%

The table above indicate 47 respondents represent 78.4% stated that orientation or safety tips was given by individual or agency,13 respondents represent (21.6%) stated that there is no form of orientation or safety tips giving by the supervising individual /agency.

Table 5: Do you use PPE while operating?

Option	Frequency	Percentage
Yes	48	80%
No	12	20%
Total	60	100%

The table above indicates that 48respondants represent (80%) stated that they make use of PPE while operating, 12respondents represent (20%) stated that they did not make use of PPE while operating

Table 6: Have you ever sustained injury as a result of carrying out your duties?

Option	Frequency	Percentage
Yes	31	51.6%
No	29	48.4%
Total	60	100%

The table above indicates that 31 respondents represent (51.6%) Stated that injury was sustain as a result of carrying out their duties, 29respondents represent (48.4%) stated that no injury sustain as a result of carrying out their duties.

Table 7: Where do you sort out waste /refuse?

Option	Frequency	Percentage
At source	6	10 %
Collection point	5	8.3%
Dump site	49	81.7%
Total	60	100%

The table above indicates that 6 respondents represent (10%) stated that they sort out there waste at source, 5respondents represent (8.3%) stated that they sort out there waste at collection point, 49respondents represent (81.6%) stated that they sort out there waste at dumping site.

Table 8:What class of refuse do you scavenger?

Option	Frequency	Percentage
Metal and plastic scraps	3	5%
Metal and woods scraps	0	0%
Plastics and woods scraps	8	13.3%
All of the above	49	81.7%
Total	60	100%

The table above indicate that 3 respondents represent (5%) stated that they scavenger metal and plastic scraps,0 respondents represent (0%) stated that they is no respondents ,8 respondents represent (13.3%) stated that they scavenger plastics and woods scraps,49 respondents represent (81 .7%) stated that they scavenger all class of refuse.

Table 9: Have you ever been to a hospital/health facility for treatment of above?

Option	Frequency	Percentage
Yes	33	55%
No	27	45%
Total	60	100%

The table above indicates that 33 respondent's represent (55%) stated that they have been to hospital/ health facility for treatment, 27respondents represent (45%) stated that they have not been to hospital/ health facility for treatment

Table 10: Is there any form of health talk before treatment on your occupational exposure?

Option	Frequency	Percentage
Yes	35	58.4%
No	25	41.6%
Total	60	100%

The table above indicate that 35 respondents represent (58.4%) stated that health talk was given before treatment on occupational exposure, 25 respondents represent (41.6%) stated that no form of health talk given before treatment on your occupational exposure.

DISCUSSION

The tables expressed that out of the 40-waste management worker served questionnaires 35 said they were aware of the hazard associated with waste collection/scavenging and out of 20 people in the community 15 persons said they were also aware of the hazard associated with waste. This means that they are hazard associated with waste collection/scavenging. To solidify the authentic findings having analyzed the data collected the researcher use one of the literature reviews in chapter two to buttress her findings in which Oduyemi (2014) in his book stated that waste disposal is primarily environmental concern as many medical wastes can classify as infectious of bio hazardous and could potentially lead to the spread of infectious disease.

This project work also helps to identify the waste generated in health care facilities i.e. syringe, identifiable body part etc. This statement was backup by the response to question 16 in the questionnaire and hypothesis

To satisfy these findings one of the literature reviews in chapter two was used to consolidate her findings in which Burton (2010) highlights on the types of waste that is been generated in the hospital, these wastes include used syringes, used needles and other sharps, he further state that these wastes must be properly disposed off after used to avoid hazard that will cause on man's health.

CONCLUSION

Waste management is an important aspect of every establishment and this is the reason for carrying out this research work.

After the thorough research work it could be concisely concluded that the dumping site Lokoja imposes a lot of environmental and occupational hazard to man and his environment. These activities causes a lot of skin

diseases to their workers especially during their working hours, workers are exposed to acid waste, they are also exposed to respiratory tract infection through inhalation of gases .and some of the skin diseases like dermatitis and skin cancer contribute a lot to the ill health of the workers and the institutional environment.

RECOMMENDATION

In the light of the above conclusion, the following are recommended for the government and waste management board.

1. Government should carryout health education campaign at regular interval as well as proper monitoring and evaluation should be assigned.
2. There should be a designated health officer who can oversee and control the affair of waste collection in every health care setting.
3. There should be implementation of rules, policy, regulations and law of environment and health care waste disposal in every waste generated setting.
4. The sanitary staff should be properly trained of their respective duties and responsibilities.
5. Provision of adequate protective devices for the workers which should be mandatory used by the workers.

REFERENCES

- [1] Biomedical waste management and handling (1998)
https://ppcb.punjab.gov.in/sites/default/files/documents/BMW_Rules%201998.pdf
- [2] Davis and Cornwell 2024 Introduction to environmental engineering 31 editions
- [3] E. O. Karibo, "Waste Management and Job Creation in the Niger Delta," A Paper Presentation at the 2nd Annual Dare 2, Dream Youth Summit,
- [4] Effurun, 30 August 2008. [Citation Time(s):1]
- [5] Henry, J. R. (2000). An Overview of Photo remediation of Lead and Mercury. NNEMS Report, Washington.
- [6] Hospital waste management, A holistic approach 2nd edition (2000)

- [7] J. C. Agunwamba, "Solid Waste Management in Nigeria: Problems and Issues," *Environmental Management*, Vol. 22, No. 6, 1998, pp. 849-856. doi:10.1007/s002679900152 [Citation Time(s):2]
- [8] J. O. Babayemi and K. T. Dauda, "Evaluation of Solid Waste Generation, Categories and Disposal Options in Developing Countries: A Case Study of Nigeria," *Journal of Applied Science Environmental Manage*, Vol. 13, No. 3, 2009, pp. 83-88. [Citation Time(s):1].s
- [9] O. A. Ishoka, "Problems of Solid Waste Disposal and Management in Ughelli Delta State, Nigeria," Unpublished B.Sc Dissertation in Geological & Regional Planning, Delta State University, Abraka, 2008, pp. 1-51. [Citation Time(s):4].
- [10] Obasi, N. A., Akubugwo, E. I., Kalu, K. M., Ugbogu, A. E, & Okorie, U.C. (2013). Toxicological assessment of various metals on selected edible leafy plants of Umuka and Ubahu dumpsites in Okigwe of Imo State, Nigeria. *Journal of Experimental Biology and Agricultural Sciences*, 1(6), 441- 453
- [11] Oduwusi (2008) solid waste management and disposal published by koesmag safely and health services LTD Road sabo PM Box 2819 Akure , Ondo state
- [12] Olorunda et al (2007) monitoring and modeling technique of environmental pollution
- [13] R. Makinde, "Making Nigerian Towns and Cities Livable in the 21st century," 2000. [Citation Time(s):1] Rules of hospital waste management 2000)
- [14] Uzoma Anosike (2010) Basic waste management techniques in Nigeria
- [15] U.k Environmental protection Act (2004) it is mercy publisher off stadium
- [16] WHO (2005), understanding and simplifying biomedical waste management