



Solid Waste Disposal in Abossey Okai and its Impact on the Environment

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Abstract Owing to man's quest to survive and earn a living, the environment has been exploited and its resources used to satisfy his insatiable want. This study focuses on the impact of improper solid waste disposal in Abossey Okai; a widely known suburb of Accra, Ghana. Data was collected through the administration of questionnaires and focus group discussion. Simple descriptive analytical tables and percentages were used to analyse data. The study revealed that the major cause of improper solid waste disposal in the Abossey Okai area is the inability of the waste management company to collect waste frequently: this result in environmental and health impacts. The study recommended that for solid waste to be managed and disposed of properly, waste management institutions should be empowered financially to meet the increasing waste being generated by an ever increasing population in the area and Ghana at large.

Keywords Solid waste, Environment, Pollution and Health

Introduction

At the dawn of creation, there was a perfect balance between man and his environment. Due to human activities on earth, the stable equilibrium between man and his environment was distorted, resulting in many environmental problems. As humans, we are collectively an inseparable part of the environment, and the manner and character of our interaction with it influences and determines the quality of our lives. In mankind's attempt to obtain their basic needs including the satisfaction of their nutritional requirements, they interact with the environment on a daily basis, which results in the generation of unwanted materials [1]. Waste is one of the factors that affect the quality of the environment.

Solid waste being the resultant product of man from his numerous activities has a myriad of definitions [2]. Primarily, Solid waste can be defined as any discarded, useless, or unwanted material that is not in a gaseous or liquid form. In addition, it includes all those solid and semisolid materials that are discarded by a community [3]. Waste according to Gourlay, (1992) [4] is more easily recognised than defined, it is any object or material that is no longer useful to the owner or it is used but fails to fulfil its original purpose. Furthermore, Solid waste is any useless, unwanted, or discarded material that is not liquid or gas [5].

The quality of urban environment both in the developing and developed world has been of keen interest with regards to high concentration of people in towns and Cities [6]. Technological advancement has not aided the situation either, as developed and developing countries all over the world still face waste management problems [7-9]. Kwawe (1995) established the fact that technology has not been able to effectively control waste generated in communities because it seems that new technologies have brought new types of waste into the environment to add to the already existing ones .

In Africa, it is estimated that nine (9) out of every ten (10) countries are facing serious waste disposal problems [9]. Waste disposal has been a major problem for many households in Ghana because the necessary infrastructure needed for waste management are inadequate resulting in over 50% of the populace in Ghana seeking alternative ways of disposing their wastes and often dispose of them indiscriminately [10]. The most common methods of solid waste disposal in Ghana are combustion and dumping at land fill sites [11].



From the aforementioned, the issue of collection, management and disposal of solid waste continues to feature prominently in major towns and cities across Ghana. The contamination of water bodies by leachate from landfill and dump sites leads to the spread of water-borne diseases [12]. The stench emanating from uncollected and decaying garbage, choked drains and gutters pollutes the air and the irresponsible disposal of refuse in communities has all contributed to the degradation of the environment [12]. It is against this back drop that this study examines solid wastes disposal in Abossey Okai, Ghana.

Objectives

The general objective of this study is to identify the environmental impacts of solid waste disposal in Abossey Okai. The specific objectives are;

1. Identify the types of solid waste generated in Abossey Okai.
2. Identify the means of solid waste disposal in Abossey Okai (where and how).
3. Examine the cause of poor solid waste disposal in the study area.
4. Determine the impacts of poor solid waste disposal in Abossey Okai.

The Study Area

Abossey Okai is a landmass located between latitude $5^{\circ}33'35.5''N$ of Greenwich Meridian and longitude $0^{\circ}14'13.7''W$ of the Equator. It falls under the Ablekuma Central Sub-metropolitan Assembly in the Greater Accra Region. Furthermore, it is known as a “spare part Mecca” because it is where the populace purchase virtually all types of spare parts. This is attributed to the inhabitants been predominantly spare part traders. It is adjacent to the popular Kaneshie market which makes it one of the dirtiest places in Accra because of myriads of economic activities carried out there such as Car repairs, engine repairs, sale of perishable good e.t.c Features around this location includes Central University College, Accra Waste management Agency, Banking institutions and residential areas where the traders live with their families. This sub locality enjoys a tropical climate with two distinct seasons. These are the rainy season and dry season. The rainy season starts from April to July, with a break in August and September which are characterised with scattered showers. The dry season starts from October to March. Temperature ranges between $23^{\circ}C$ and $28^{\circ}C$ with high humidity.

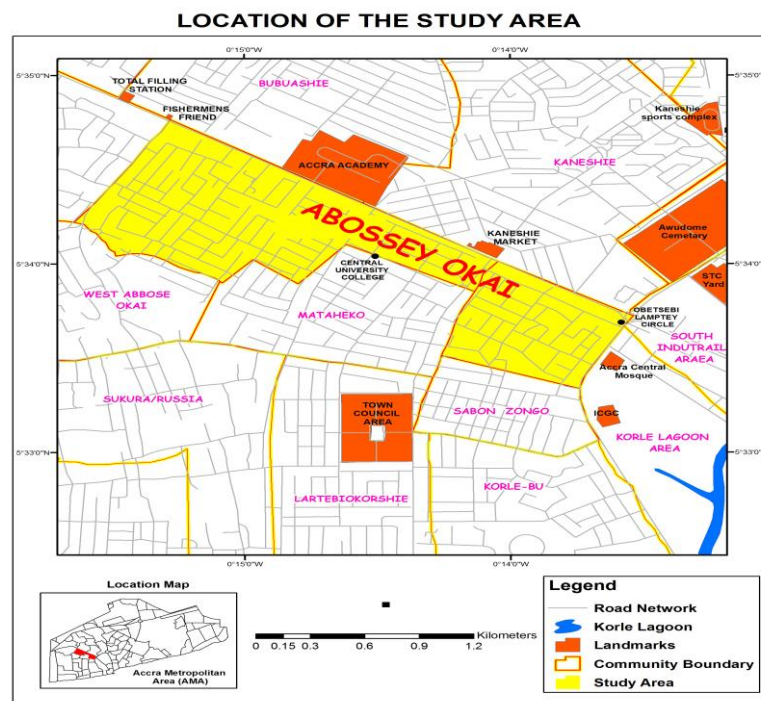


Figure 1: The location of the study area (Abossey Okai)
(Source: composed in the EDS GIS Lab, March 13, 2013)



Methodology

The data for this study were collected from both primary and secondary sources. The Primary methods of data collection were through preliminary field investigation, questionnaire survey and oral interviews. A review of existing literature was done in order to gain an understanding of concepts, frameworks, components, emerging trends important considerations and strategies that are current in the field of solid waste management. A questionnaire was designed for the research. The questionnaire highlights the type of solid waste generated, Methods of solid waste disposal, Causes of indiscriminate disposal of waste, and the negative impacts of indiscriminate waste disposal on the environment. The questionnaire comprised of both open-ended and close-ended questions. The target population of the study were people who live and operate in Abossey Okai. These include dwellers, traders, mechanics and organizations at Abossey Okai. For the sampling technique, stratified-simple random sampling method was used. The target respondents were stratified into workers of public/private firms, traders, mechanics and students. Random sampling was used in administering the questionnaires. One hundred and twenty (120) of the questionnaires were administered, correctly filled and used for the purpose of the research. Furthermore, the authorities of Waste Management Department and Zoomlion Ghana Limited were interviewed. Simple descriptive, analytical and statistical tools like tables, percentages and frequencies were adopted in the analysis of data.

Results and Discussion

Analysis of data collected showed that the major constituents of solid waste products in Abossey Okai are food remnants (30%), plastics (25.8%), papers (17.5%), as well as empty cans and bottles (12.5%). Others are metals (7.5%) and wood (6.7%), (see table 1).

These results agree with the Accra Metropolitan Assembly (AMA) assertion that, organic waste constitute 60% of the solid waste generated in Accra and the rest is made of inert materials, glass, metals and other miscellaneous wastes (AMA, 2013).

Table 1: Types of waste generated by respondents

Types of waste generated	Respondents	Percentage
Paper	21	17.5
Empty cans/bottles	15	12.5
Food remnants	36	30.0
Plastics	31	25.8
Wood	8	6.7
Metals	9	7.5
Total	120	100.0

(Source: field work, 2013)

The adoption of a sustainable approach in solid waste disposal is a function of availability as well as the accessibility of such technique [13]. However, the frequently used methods in the study area are Dumping in public disposal Unit for collection by waste management company (51.7%), Door to Door collection by Waste management Company (33.3%), Burning (11.6%), Recycling (1.7%) and Composting (1.7%). (See table 2).

This further illustrates that dumping solid wastes at public waste collection points for waste management companies to collect, is the most adopted solid waste disposal method. The waste management companies include those that are involved in door to door collection.

Table 2: Solid waste disposal methods at Abossey Okai

Solid waste disposal method	Respondents	Percent
Composting	2	1.7
Dumping in public disposal unit	62	51.7
Burning	14	11.6
Collection by waste management companies	40	33.3
Recycling	2	1.7
Total	120	100.0

(Source: Field work, 2013)



Majority of the populace which constitutes (82%) in Abossey Okai dump their waste in public disposal site to be collected by the waste management companies while (11.6%) dispose their waste in nearby gutters (especially) during rainfall because they believe that the rain would wash them way to a nearby dumpsite, and (5.8%) along the street. (See table 3).

Table 3: Respondents waste dump sites

Place of disposal	Respondents	Percent (%)
Nearby gutter	14	11.6
Along the street	7	5.8
Public disposal site	99	82.5
Total	120	100

(Source: Field work, 2013)

Results from the study indicates that majority of the Solid waste disposed either in Public disposal unit or door to door Collections is mostly done by the Waste management companies (67.5%), Followed by Local waste collectors who are subsidiaries of the Waste Management Companies (26.7%) and only a small portion of the populace dispose their waste themselves (5.8%) (See table 4).

Table 4: Agents/ companies involved in solid waste disposal

Agents/Companies	Frequency	Percent (%)
Self	7	5.8
Local waste collectors	32	26.7
Waste management companies	81	67.5
Total	120	100

(Source: Field work, 2013)

In line with the third objective of this study, which sought to investigate the causes of indiscriminate solid waste disposal, The results of the number of times the populace dispose their waste indicates that majority constituting (35.8%) dispose waste on weekly basis, (32.5%) dispose waste twice a week, (25.8%) dispose waste on a daily basis, a small portion of the populace constituting (5.8%) dispose waste on monthly basis (see Table 5)

Table 5: Frequency of waste disposal by respondents

Frequency of disposal	Respondents	Percent (%)
Daily	31	25.8
Twice a week	39	32.5
Weekly	43	35.8
Monthly	7	5.8
Twice a month	0.0	0.0
Total	120	100.0

(Source: Field work, 2013)

The frequency at which waste is collected either at the public disposal unit or at the door step of residents is crucial in determining the impacts the wastes are bound to cause. From the study, Zoomlion Ghana Limited was identified as the sole collector of waste in the study area and collects (54.2%) wastes at various points (door-to-door) once a week, (24.3%) communal wastes (public disposal Unit) are collected four or more times in a week

This was confirmed during an interview with the Deputy Head of Department and the Chief Environmental and Health Technologist, who stated that with door-to-door waste collection, Zoomlion collects waste once a week, while communal collection is done on daily basis. (see Table 6).

An analysis of Table 5 and 6 reveal that, wastes are deposited at collection points on a regular basis by the populace but they are collected only once a week by the waste management companies. Delay in the collection of waste has resulted in bins and public dumpsite always being full, this compels the populace to resort to dumping their waste anywhere close to the dumpsite and when there is a heavy down pour (rains), these wastes are carried and scattered all over the area. (see Table 5 and 6).



Table 6: Frequency of waste collection by the waste management companies

Frequency of waste collection by the waste management companies	Respondents	Percent (%)
Not at all	0	0
Once	65	54.2
Twice	8	6.7
Thrice	13	10.8
Four times or more	34	24.3
Total	120	100.0

(Source: Field work, 2013)

The result of the study highlight the major causes of poor solid waste disposal as waste bins always full and dumpsites being too far away which are (30%) and (27.5%) respectively. Unavailability of dumpsite, High Cost of disposal, Delay in collection and lack of public awareness scored less (9.2%, 8.3% and 5.8% responses respectively). According to an official of the Zoomlion Company during the interview session stated that, the distance from Abossey Okai to the landfill site, where these wastes are dumped, is about fifteen to thirty-five kilometres on average. The problem of distance is the waste haulage time per trip, which implies that more fuel will be burnt by the trucks. Sometimes, the vehicles could breakdown on the way resulting in delay in the collection of wastes from both communal waste dumps and individual homes (see Table 7).

Table 7: Respondents view on the cause of poor solid waste disposal method

Respondents perception on the cause of poor solid waste disposal Method	Respondents	Percent (%)
No dumpsite in the area	23	19.2
Dumpsite is too far	33	27.5
Waste bin always filled	36	30
Cost of dumping	11	9.2
Delay in Collection	10	8.3
Lack of public awareness on Waste management	7	5.8
Total	120	100.0

(Source: Field work, 2013)

Figure 2 illustrates an overflowing container at a waste collection point in the study area.



Figure 2: Over flowing waste container at abossey Okai (Accra)
(Source: field work, 2013)

The study identified the outbreak of Malaria as a major impact of indiscriminate waste disposal on health which constituted (58.3%) followed by Cholera (30%), skin disease (11.7%) however, none of the respondents identified dysentery as a current disease in the area.

Table 8: The impacts of poor solid waste disposal on health

Diseases	Frequency	Percentage (%)
Dysentery	0	0
Skin disease	14	11.7
Malaria	70	58.3
Cholera	36	30
Total	120	100

(Source: Field work, 2013)

Air pollution was identified as the predominant impact associated with solid waste disposal in the area (28.3%), the populace attested that the cause of the air being polluted is as result of delay in the collection of waste especially from public disposal units. Other impacts identified are land pollution, reduction in aesthetic value of the environment, water pollution and destruction of the natural habitat scored less (19.2%, 18.3%, 17.5%, 16.7% respectively).

Table 9: The impacts of Solid waste disposal on the Environment

Effects on the Environment	Respondents	Percent (%)
Reduction in aesthetic value	22	18.3
Air pollution	34	28.3
Land pollution	23	19.2
Water pollution	21	17.5
Destruction of the natural habitat	20	16.7
Total	120	100.0

(Source: Field work, 2013)

Conclusion

The study has shown that the key factors affecting effective waste management in Abossey Okai are inadequate public disposal points compared to the high population, lack of routine collection of waste, poor methods of waste management by the people and inadequate resources for waste management institutions to effectively collect the waste generated. To effectively tackle the problems enumerated, the following measures were recommended.

Recommendations / Implication for Development

Based on the findings of the study, a number of recommendations can be made. These relate to incentives, financial support, enforcement of waste bylaws and capacity building.

Incentives

Provision of Incentives could go a long way in promoting awareness about the proper way of disposing of waste. Incentives such as award to the cleanest compound or street (it could either be in cash or kind) can motivate people to keep the environment clean. Furthermore, the cost of dumping waste in skips and public disposal units should be affordable to encourage the populace to dump their wastes at appropriate disposal points.

Financial Support

By providing adequate resources to ensure proper solid waste management, problems like delay in collection, waste bins being always full, etc., will be ameliorated and a healthy environment would be consequently attained.

Enforcement of waste bylaws

Bylaws should be set up by government to back the polluter-pays-principle by setting up a task-force to ensure that these waste laws are complied with by the people at the local level. Adequate penalty or punishment should



be meted out to anyone culpable of poor waste disposal such as littering the street or throwing wastes into gutters.

Capacity Building

Government should, through waste management companies, collaborate with similar companies in other countries to find out the best way to handle waste management problems in the country. This can be done through international conferences, workshops and seminars. If the above stated recommendations are well taken and implemented, it will bring about effective solid waste management and ensure a clean environment and curb any possible disease outbreak in Abossey Okai.

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