International Journal of Development and Sustainability
Online ISSN: 2168-8662 – www.isdsnet.com/ijds
Volume 3 Number 3 (2014): Pages 530-546
ISDS Article ID: IJDS13082301

Waste management practices in Ghana: challenges and prospect, Jukwa Central Region

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Abstract

Waste management as a social problem has neither spared the developed nor developing nations as statistics have proven that some developed nations are seriously grappling with this bane. The study therefore sought to assess the challenges and prospects associated with waste management practices of the inhabitants of Jukwa. It employed a descriptive survey design and 600 house hold heads were targeted. Questionnaire/interview schedule, focus group discussion and observation checklist were used to collect data. The data obtained from the field was analyzed using SPSS (version 16). The study found that the dominant form of waste that the people generate were solid in nature. It was also revealed that considerable number of the residents disposed off their waste mainly by burning. The study recommends that education and awareness creation by environmental health officers and health professionals through community gatherings, durbars and other social meetings to improve sanitation, ensure healthy living and clean environment must be pursued with all the seriousness it deserves. Further, communal labour must be organized by assembly members and communities frequently in order to deal with the menace.

Keywords: Waste management; Environment; Sanitation; Hazardous wastes; Jukwa; Ghana

Cite this article as: Adu-Boahen, K., Atampugre, G., Antwi, K.B., Osman, A., Osei, K.N., Mensah, E.A. and Adu-Boahen, A.O. (2014), "Waste management practices in Ghana: challenges and prospect, Jukwa Central Region", *International Journal of Development and Sustainability*, Vol. 3 No. 3, pp. 530-546.

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1. Introduction

Waste management is one of the greatest challenges facing humanity in modern times. In spite of the numerous efforts by various governments all over the world to arrest it, technology has not been able to effectively control waste generated in communities worldwide. It appears it has rather worsened the situation (Kwawe, 1995: 53). Waste management as a social problem has neither spared the developed nor developing nations as statistics have shown that some developed nations are seriously grappling with this bane (Chazan, 2002). According to Lyse, 9 out of every 10 African cities are facing serious waste disposal problems (Lyse, 2003: 1). Indeed, a visit to some cities and towns in Ghana revealed aspects of the waste management problem such as heaps of uncontrolled rubbish, polythene bags scattered everywhere and disposal sites overflowing with filth which comes with its associated health hazards such as cholera, malaria and typhoid to residents who live near the dumping sites.

This situation is not so different in many other countries south of the Sahara. In South Africa, Zambia and Zimbabwe rubbish bags are a major eyesore (Chazan, 2002, Wetherell, 2003: 1). in South African black polythene bags are often referred to as the "national flower" because it blights landscapes and can be seen hanging on fences, in gutters and blocking drains (Chazan, 2002). It is not out of place if stakeholders ensure that the rural settings are also given equal attention when it comes to waste management, the reason being that the repercussions associated with improper waste management do not know boundaries and sickness know neither the rich nor the poor. Every task, from preparing a meal to manufacturing of a car, is accompanied with some production of waste material which implies that the problem is as daunting so it is a concern that ought not to be placed at the doorstep of only the governments and the waste management operators to handle but every stakeholder must do his or her best to ensure that our surroundings are kept free from filth by adopting positive attitude towards waste management.

More so, continuous education must be pursued with all the seriousness it deserves by stakeholders like sanitary inspectors to draw home the need for the people to see waste as a monster that threatens their very survival. Waste management generally concerns the purposeful, systematic control of the generation, storage, collection, transportation, separation, processing, recycling, recovery and disposal of waste in a sanitary, aesthetically acceptable and economical manner (Gilpin 1996:201). Factors such as urbanization, lack of funding and economic decline in the 1970s through to the 1980s has been cited as possible reasons for the poor sanitation of most towns and cities of Ghana (Porter et al, 1997: 9; Bartone, 1998:91; Perlman, 1998: 110). Kendie (1999) argues that, the recent upsurge in waste disposal problems stems from the fact that, "attitudes and perceptions towards wastes and the rating of waste disposal issues in people's minds and in the scheme of official development plans have not been adequately considered.

It becomes irritating to say the least when people indiscriminately dump waste as if "it is no one's business to ensure that the environment ought to be clean at all times to guarantee good health. Even on campuses the provision of litter bins at vantage points have not done much to solve this problem. The problem of waste management as has been articulated and is not only a monster to urban Ghana but rural Ghana as well has its share and Jukwa is no exception. At the Jukwa market in particular Figure 1, there is a heap of rubbish in close proximity to the trading activities. The traders go about their business with

polythene bags, waste papers, waste foodstuff displayed around them. The study sought to assess the challenges and prospects associated with waste management practices of the inhabitants of Jukwa.

Figure 1. Facilities located close to a dump site at the market

Table 1. Forms and sources of waste generated in Ghana

Source	Waste generators	Example of solid wastes
Residential	Single and multifamily Dwellings	Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, metals, ashes, special wastes (e.g. bulky items, consumer electronics, white goods, batteries, oil, tires), and household hazardous wastes
Commercial	Stores, hotels, restaurants, markets, office building	Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes
Construction and demolition	New construction sites, road repair, renovation sites, demolition of buildings	Wood waste, steel waste, concrete waste, dirt waste
Industrial	Light and heavy manufacturing, fabrication, construction sites, power and chemical plants	packaging, food wastes, construction and demolition materials, hazardous wastes, ashes, special wastes, scrap metals
Institutional	Schools, government center, hospitals, Prisons	Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes
Agriculture	Crops, orchards, vineyards, dairies, feedlots, farms	Spoilt food wastes, agricultural wastes, hazardous wastes (e.g. pesticides).
Process(manufacturing,etc)	Heavy and light Manufacturing, refineries, chemical plants, power plants, mineral extraction and processing	Industrial process wastes, scrap materials, off specification products, slay, tailings

1.1. Challenges associated with waste management

According to United Nation Conference on Human Settlement report (UNCHS, 1996) one third to one half of solid waste generated within most cities in low and middle income countries, (including Ghana) are not collected. The waste usually ends up on illegal dumps on street, open spaces and waste lands. Malombe (1993) argues that irregular services rendered to producers (thus households) of refuse by Municipal Councils compel them to dispose off refuse indiscriminately. Malombe's argument is very pertinent in Ghana where waste management services are largely inefficient and ineffective. It is estimated that about 83% of the population dump their refuse in either authorized or unauthorized sites in their neighbourhood, and due to poor handling of solid waste, unsanitary conditions are created (Bennah et al., 1993). Onibokum (1999) explained that efficient and effective service delivery depends on managerial and organizational efficiency, accountability, legitimacy, response to the public, transparency in decision making and pluralism of policy making and choice.

In the 1980's, a number of cities in Africa developed their municipal solid waste management strategies and programmes by the government agencies with no considerable public involvement. The common setbacks that confronted most of the cities were managerial and organizational inefficiencies and thus lack distribution of responsibility for different activities of waste management (Onibokum, 1999). The consequences of waste disposal on the environment and health, and inappropriate disposal of waste have had major adverse impact on the natural environment and the lives of the people. The challenges associated with landfill include odour, pests and ground and surface water contamination from leachate. In the long run, landfills reach capacity and constructing a new landfill is costly and time consuming process. According to Karley (1993) the health status of a community is affected by its state of environment. Poor sanitary conditions reduce the protection and preservation of human health. When waste is improperly dumped into the environment, it can lead to the destruction of the ozone layer and may cause disease such as cancer. Air pollution can often lead to the formation of acidic rain which is dangerous to crop life since it hastens the removal of soil fertility from the surface of the ground. It also affects drainage, when solid wastes are dumped in drainage channels and gutters they block the flow of the sewerage.

This may cause flooding which destroys human lives and properties. At the same time, wastes also affect soil drainage which hinders the growing of crops. Littering devalues the land around it and this has impacts on tourism, businesses and residents alike. Most at times, it causes harm to tourist industries of that particular area or country. Improper disposing of waste prevent resources from being recycled example, plastics, metals and paper, health, are dangerous to aquatic life. It can also lead to high mortality of fish stock as well as diseases to man such as dysentery and cholera. When waste like broken bottles are dumped anywhere, they spread diseases because water collect in them and they became breeding ground for mosquitoes and other vectors. Waste like human excreta cause diseases when poorly dumped as the flies will carry the germ from the excreta to food and water.

1.1.1. Management of waste in Ghana

Proper ways of waste management is explained using the waste management hierarchy. It is a nationally and internationally accepted guide for prioritizing waste management practices with the objective of achieving

optimal environmental outcomes (Mariwah, 2012). It sets out the preferred order of waste management practices, from most to least preferred. Energy recovery is a promising form of waste disposal. It works by recycling some forms of waste into a fuel source for heating, cooking and powering turbines. The process of extracting resources or value from waste is generally referred to as recycling, meaning to recover or reuse the material. There are a number of different methods by which waste material is recycled: the raw materials may be extracted and reprocessed, or the calorific content of the waste may be converted to electricity. New methods of recycling are being developed continuously which include physical and biological reprocessing. Reusing requires less energy than recycling, although designs which are both adaptable and durable are essential to its success. Other factors, such as the consumer desire for 'newness', can conspire against reuse. There are many ways that clothes, cars, books, buildings and other materials are currently reused, such as trash and treasure market. Reducing requires less energy again, by designing out waste before it is created. Waste, in all its guises, is an indicator that systems and processes could be designed better.

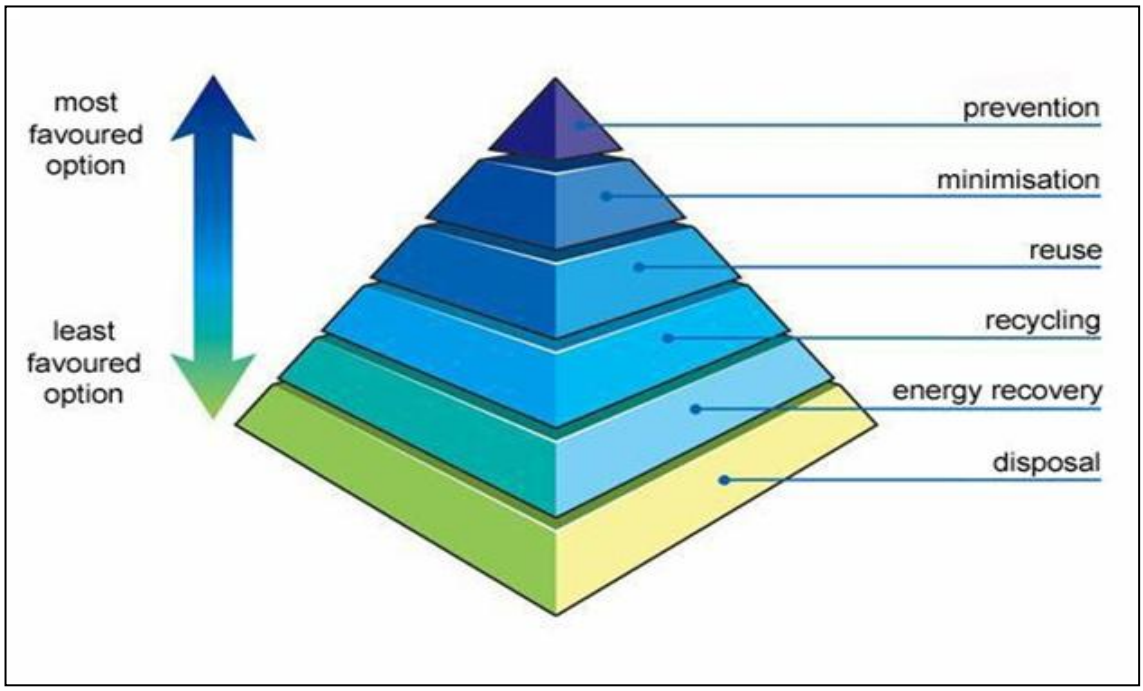

Figure 2. Ideal waste management pyramid

It makes no sense to pay both financial and energy/greenhouse costs for waste twice – first to create it, then to dispose of it, prevention is the ultimate zero waste challenge; the highest point on the hierarchy. The volume and rate at which resources are being channeled through the human economy needs to be slowed, along with a recognition that all our material goods have an energy 'price tag'. To effectively address the zero waste and climate change agenda, there needs to be a move beyond recycling into the largely uncharted territory of the higher end of the hierarchy, to reuse, reduce and prevent, with a particular emphasis on eco-

efficiency: the same or greater utility from less material input. The diagram below is the most appropriate in this part of the world in ensuring environmental quality. in this regard rigorous education and the knowledge base of the inhabitants need to be improve to the extent that they will understand the basic environmental indices and to change their behaviour towards the proper way of managing the environment. This will go a long way to protect lives and the environment as well as the resources in the environment.

2. Materials and methods

The survey approach questionnaire/interview schedule, focus group discussion and observation checklist were used to collect data under the descriptive design since it attempts to collect data from particular members of the population to respond to questions regarding the current status of the research problem. The study used a descriptive survey which aims at collecting data in order to describe the social system, relations and social event of the study area (Sarantakos, 2005:10). The study targeted 600 household heads based on the Ghana population and housing census (2000) figure of 4502 and the reason is that, the researchers wanted individuals who in his or her opinion were in the best of position to offer the kind of information needed for the study.

2.1. The profile of Jukwa

2.1.1. Location

Jukwa sometimes called lower Denkyira is located 19 kilometres north of Cape Coast (Pedu Junction) on the Accra-Takoradi highway and lying south of the Twifo-Heman Lower Denkyira district in the central region. It is one of the major towns within the district and heads one of the area council. It is believed that the people of Denkyiras were led by Nana Kwodwo Tibu around 1922 to come and settle at Jukwa because of the "Feyiase war" (Medium Term Development plan of the district, 2012).

2.1.1.1. Climate

The area falls within the semi-equatorial zone marked by double maximum rainfall regimes which peaks in June and October. Temperature is fairly high ranging between 26°C (in August) and 30°C (in March). Relative humidity is generally high throughout the year, ranging between 70-80% in the dry season and 75-80% the wet season (Medium term development plan of the district, 2012).

2.1.1.2. Vegetation

The interplay of heavy rainfall and soil types influences the vegetation cover that surround the town. The vegetation cover can be describe as semi deciduous forest however human activities like farming has had serious impact on the sustenance of the vegetation (Medium term development plan of the district, 2012).

2.1.1.3. Soils and agricultural land use

The soil found within the area is called Asuansi-Kumasi Associates and it developed over Tarkwaian rocks, which are moderately drained and are good for the cultivation of tree crops such as cocoa and forestry products. They also support food crops such as plantain, cocoyam, maize cassava and banana. They have low soil nutrient and require nitrogen and phosphorus fertilizer usage (Medium term development plan of the district). The town is considered as one of the major food baskets within the district and supply foodstuffs to surrounding towns like Cape Coast, Abura, Moree and Elmina. The people engage in the cultivation of both food and cash crops like cassava, plantain, cocoa, palm fruits and vegetables/fruits of all kinds for example oranges, banana, pepper and tomatoes.

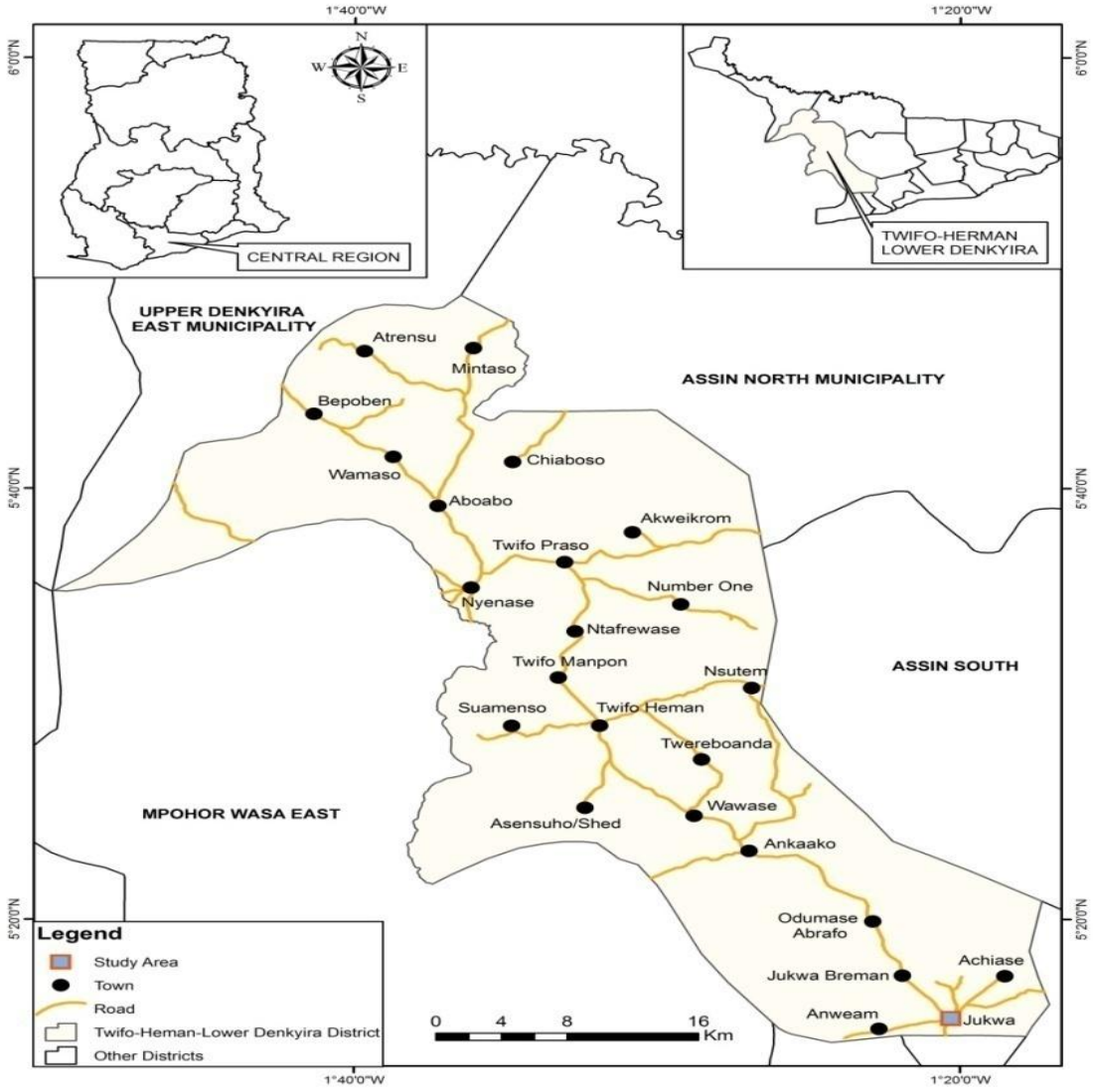

Figure 3. Showing study area in regional and national context

3. Results and discussion

Though the study is not about the socio demographic characteristics of respondents, it is expedient to analyze the background characteristics in order to understand the respondents. According to the 2000 Population and Housing Census Jukwa had a population of 4502 people based on the (Ghana Statistical Service, 2000). The current population as per the research is estimated to be 5047 which in percentage terms represent an increase of 12.1. The current growth rate of the town based on the research is 0.95% which is much lower than the previous one of 2.6% and is far lower as compared to the district growth rate of 4.1% (Ghana Districts.com). This research finding is an indication that birth rate per the area is gradually declining.

3.1. Sex composition of residents

It can be observed that the sex distribution of the town depicts a situation where females outnumber the males. The females are 2770 representing (54.9%) and the males are 2277 representing (45.1%). One major factor that could accounts for the low percentage of males in the town may the high level of male migration in search for jobs. The sex ratio of 1 female to 0.8 males confirms the national data or statistics on the number of females to males. This is shown in Figure 4.

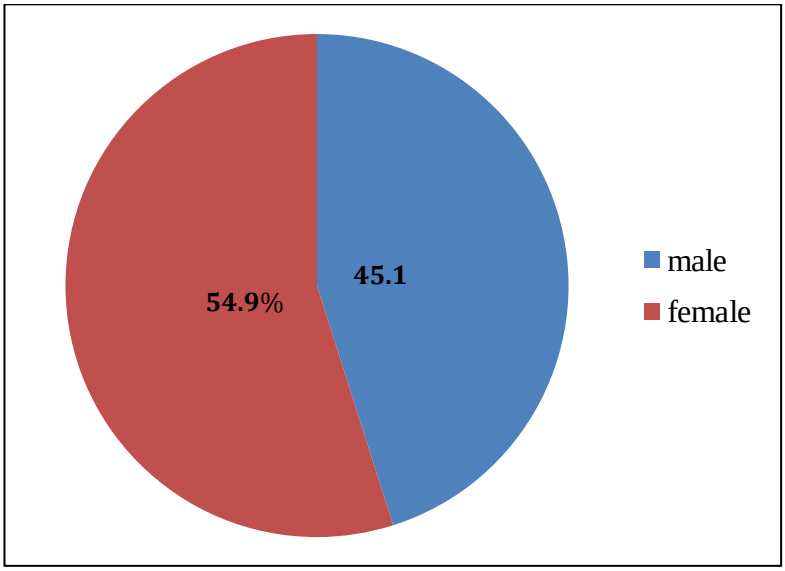

Figure 4. Sex distribution of respondents (Source: Fieldwork, 2012)

3.1.1. Household Size

With regards to the household size most of the inhabitants of Jukwa live in houses with households ranging between 1-5. A total number of 328 respondents representing 57.2% of the population fall in that range. Also, 174 respondents representing 30.4% indicated that they live in houses with households ranging between 6-

10. However, a small percentages of 8.4 and 4.0 respondents claimed that they lived in households of 11-15 and 16-20 respectively. This clearly shows that the traditional practice of the extended family system is dwindling in the settlement.

Table 2. Total household within houses

Frequency		Percentage%
1-5	328	57.2
6-10	174	30.4
11-15	48	8.4
16-20	23	4.0
Total	573	100.0

3.1.2. Waste management practices

In order to understand the waste management practices of the respondents, it is expedient to assess the major form of waste generated by these people. Results from the study indicate that 483 households representing 80.2% of the population asserted that the dominant form of waste was solid and liquid waste. From house to house data collection, it was gathered that the solid and liquid waste ranged from polythene and plastic bags, withered leaves, old and worn out clothing, jute bags, car and utensil parts among others and household water and other liquid. It was also realized that the least of the forms of waste they produced was gaseous waste which accounted for only 0.2% of the waste. This finding is to be understood because Jukwa is not an urban area hence no serious manufacturing activity goes on there to contribute to this kind of waste. The gaseous waste comes from the burning of fire wood and charcoal as fuel for cooking and also used in craftwork such as blacksmithing. Only few people numbering 15 representing 2.5% of the population produced liquid waste. The kind of liquid waste they produced was mainly from washing and bathing water and palm kernel oil sediments. 93 respondents representing 15.4% answered that they produced all the three forms of waste. This result is indicated by Figure 5.

3.1.3. Methods of waste disposal

The results show that the people of Jukwa mainly burn their waste materials as 411 households representing (78.6%) reiterated that fact. The observation from the house to house data collection shows that most of the households had a little refuse dump sited behind their houses where they dumped their waste and burnt it

from time to time. Also 59 households also representing 11.3% of the population engaged in recycling and reusing. The least percentage of responses was burying as only 53 inhabitants representing (10.1%) of the population said they recycle their waste. Although burning accounted for the highest option among the methods it can be inferred that the burning practices also pollute the existing water bodies as well as the air.

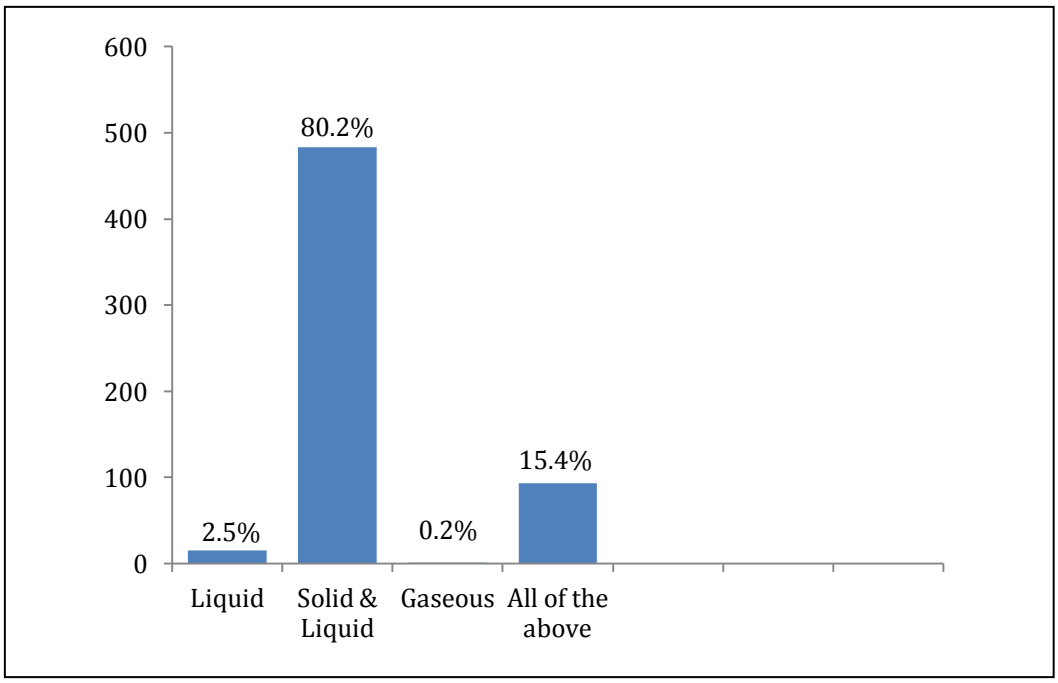

Figure 5. Major Forms of waste

Table 3. Methods of waste disposal

Methods	Frequency	Percentage%
Recycling	59	11.3
Burning	411	78.6
Burying	53	10.1
Total	523	100.0

Figure 6. Traders settling close to a dump site

3.1.4. Appropriate methods of waste disposal

It is useful to identify the appropriate method of disposal from the residents point of view. From the results, 283 households representing (47.2%) of the population responded that disposing refuse at a refuse dump as the most appropriate method whilst 207 inhabitants representing (34.6%) were of the view that the appropriate mode of waste disposal is the house to house collection. Burning of waste which was the dominant waste disposal method of the people is being frowned upon as only 73 households representing (12.2%) of the population see it as the appropriate method of waste disposal. Also, burying which was the least of the waste disposal method used by the people is also seen as the least appropriate mode of waste disposal. It therefore imply that, there should be a demarcated site for the collection of refuse so that residence would not just deposit their refuse indiscriminately and this site should be managed and monitored by the community.

Table 4. Appropriate method of waste disposal

Appropriate	Frequency	Percentage %
House to house collection	207	34.6
Disposal at refuse dump	283	47.2
Burying	36	0.6
Burning	73	12.2
Total	599	100.0

Table 5. Cross-tabulation of education level and appropriate form of waste disposal

Level of education	House to house collection	Dumping at site	Burying	Burning
Tertiary	23	11	6	6
SHS	28	51	5	9
Basic	101	146	15	30
Vocational	5	16	0	5
No education	40	23	6	15

Table 5 presents the relationship between level of education of respondents and method of waste disposal they consider appropriate. Appropriate forms of waste disposal was unrelated with level of education as both educated and uneducated respondents chose house to house collection as the most appropriate method of waste disposal. In spite of slight variations among waste management preferences, majority of respondents preferred either house to house collection or dumping at a site rather than burning and burying which tends to bring enormous effects on the environment. The results presented is in line with Mariwah (2012) who contend that level of education has no correlation with one's choice of appropriate waste disposal mechanism.

Figure 7. Pictorial view of a dump site closed to people's houses

3.1.5. Perception of respondent on waste management

With reference to the perception of respondents in connection with waste management in the locality, it was found that the respondents are not enthused about the situation as a significant number of respondents 344

representing (59.2%) were of the view that the situation is poor. However, 198 inhabitants representing (34.1%) found no problem with the waste management situation and hence said it was good, with only a handful of 39 inhabitants representing (6.7%) responding claiming it as very good. This finding confirms why most of the people who suffer from illness attribute their sickness to improper waste disposal. It again reveals that the waste management operators should be up and doing and that something is not right with their approach towards waste management.

Table 7. Perception of respondents on waste management

	Frequency	Percentage%
Very good	39	6.7
Good	198	34.1
Poor	344	59.2
Total	581	100.0

3.1.6. Challenges associated with waste management

It can be said that the major challenge the people encounter in managing their waste is poor sanitation as 218 respondents representing (53.0%) asserted that indiscriminate disposal of waste in the community has been an albatross around the neck of residents. Another equally important challenge that the people endured when it comes to poor waste management was sickness as 187 inhabitants representing (45.5%) made reference to the frequent outbreak of diseases in the area especially in the raining season. We were made to know that the residence normally suffer from sicknesses like cholera, typhoid fever and dysentery which are all related to unhygienic condition. The least challenge was flooding as only 6 respondents representing 1.5% indicated that as a result of the indiscriminate disposal of the refuse the water table had risen and when it rains the whole town becomes floodable (Figure 8, present results in that regards) The findings are in line with Malombe (1993) who argues that irregular services rendered to producers of refuse by Municipal Councils compel them to find ways of disposing off their refuse including indiscriminately dumping of the waste.

3.1.7. Ways to improve waste management

It was obvious that most of the people prefer the provision of dustbins as best way to improve the waste management situation in the area as 366 respondents representing (52.0%) claimed that waste management could be improved through that means. A total of 144 inhabitants which represent (20.5%) of the population also asserted that the allocation of a collection point will help salvage the situation whilst 98 respondents

represent (13.9%) of the residents advocate for the provision of toilet facilities, with education and improved drainage forming the least percentages of (9.2%) and (4.4%) respectively as the best option. This results is presented on Table 8 below.

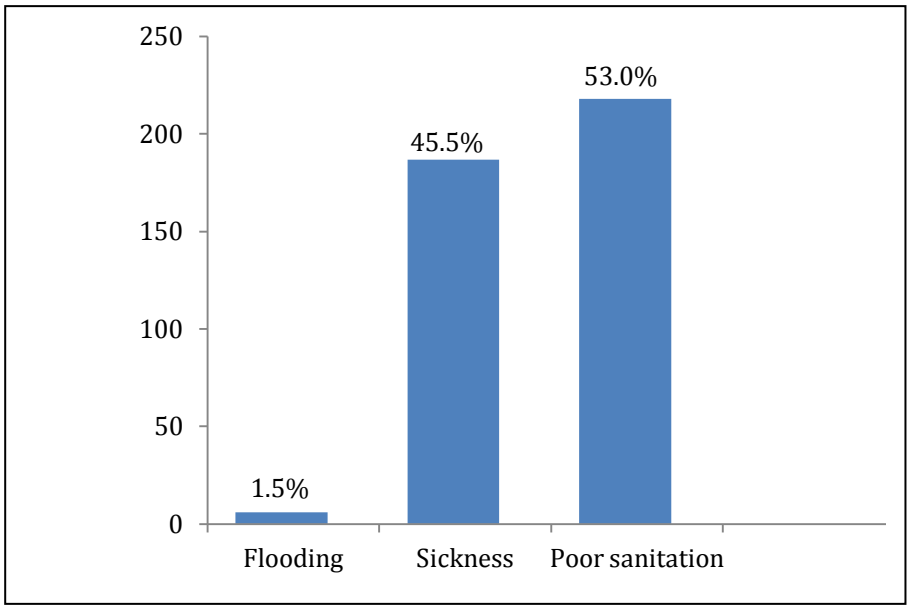

Figure 8. Challenges associated with waste management

Table 8. Ways to improve waste management

	Frequency	Percentage%
Provision of dustbins	366	52.0
Education	65	9.2
Provision of toilet facilities	98	13.9
Allocation of collection points	144	20.5
Improve drainage system	31	4.4
Total	704*	100.0

*Multiple Responses *5*

4. Conclusions

Firstly, the study concluded that the dominate form of waste generated by the inhabitant of Jukwa is solid and liquid in nature and include polythene bags and other solid related waste. and the solid liquid combine recorded the highest because every individual in every house generate both liquid and solid waste combine, hence that findings.

With reference to how waste is disposed off, the study revealed that burning is the most used method of waste disposal but the people are of the view that it is not the best of approach to use as hence advocated for house to house collection and disposal of waste at a dump site. This is due to the fact that burning contribute to the degradation and pollution of the environment and the likely impact on the people.

Again, in connection with the challenges the people face in regard of how they disposed off of their waste, the study revealed that poor sanitation and sickness are the main challenges and this had lead to the outbreak of diseases such as cholera, typhoid and other insanitary related diseases.

Finally, the study revealed that provision of dustbins and allocation of collection points are the most efficient ways of improving the waste management challenge and practices as it will put in place mechanism to check individual behaviour and attitudes

5. Recommendation

The study recommends that education and awareness creation among stakeholders is deemed necessary. This should be done by the environmental health officers health professionals and the community members themselves, this could be done through the organisation of seminars/ symposium, workshop community gathering. It is hoped that if the under listed suggestions are it will bring about improved sanitation leading to clean environment and healthy living among the people.

Again to ensure proper sanitation in the study area it is recommended that there should regular communal labour organized by the Assemblyman or woman and with the support of the environmental health officers and unit committee members as well as opinion leaders. This could be done every two weeks and by so doing it will ensure a clean environment and improved sanitation and may result in reducing the rate of insanitary diseases.

Also there should be effective and regular house to house visitation by sanitary inspectors, environmental health officers, Assemblymen or women and unit committee members and this could be in the form of unannounced visitation to houses of residence and this and the end will put the people on alert to keep a clean environment**.**

There should also be the provision of dustbins at vantage collection points. This should be done by the District Assembly, waste management operators and the community members themselves. This could be achieved through the collection of levies and by lobbying central government for the dustbins it is expected that when all these are done improved sanitation and clean environment is likely to be assured.

Acknowledgement

This paper is one of the outcomes of a community based study undertaken by the Department of Geography and Regional Planning. Special thanks go to the Bsc. Geography and Regional Planning student year group 2012/2013 for their immense contribution towards this paper. We are also grateful to the Cartography section of the Department of Geography and Regional Planning (University of Cape Coast) for providing the map of the study areas. To the Assembly member, Chiefs, and the people of Jukwa for their cooperation and support during the field study.

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