



Attitudes and Practices of Household Waste Disposal Among Residents of New Karu: A Cross Sectional Study

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Abstract

The main purpose of waste management is to isolate waste from humans and the environment, and consequently, safeguard individual, family and community health. This cross-sectional survey was carried out in order to study practices and attitudes of New Karu residents regarding household waste disposal and to examine their opinion regarding government effort towards waste management in New-Karu. Findings of the study revealed that waste in the study area is predominantly disposed of by open dumping and burning. It was also revealed that relevant government agencies have failed to adequately provide waste collection, transportation and processing services to the people. On the part of residents, majority of respondents perceive cleaning the environment as sole responsibility of waste management agencies of government. To help reduce the problem of improper waste disposal, it was recommended that government should embark on public enlightenment campaigns to create awareness about the benefits of environmental sanitation, provide appropriate waste management facilities, integrate the services of private waste collectors into waste management operations and ensure strict enforcement of existing environmental sanitation and protection laws.

Keywords: Waste disposal, Waste management, Household waste, Solid waste and Hazardous waste.

Introduction

Waste management is a global issue and has proven a key challenge facing African countries. Waste management constitutes one of the most crucial health and environmental problems facing African cities. Most cities spend 20-50% of their annual budget on solid waste management and only 20-80% of the waste is collected (Achankeng, 2003). The UNEP (2009) states “ The World Bank estimates that in developing countries, it is common



for municipalities to spend 20-50 % of their available budget on waste management (open dumping with open burning is the norm), even though 30-60% of all the urban wastes remain uncollected and less than 50% of the population is served. In low-income countries, collection alone drains up 80-90% of municipal solid waste management budget. In mid-income countries, collection costs 50-80 % of total budget. In high-income countries, collection only accounts for less than 10% of the budget, which allows large funds to be allocated to waste treatment facilities”.

One of the consequences of population growth and globalization is increased waste generation (Zamorano, Molero, Grindlay, Rodriguez, Hurtado, & Calvo, 2009). Generation varies between cities and city part in Africa, with reliable data being difficult to come by (Achankeng, 2003). This has become a concern for developing countries and is one of the greatest challenges facing environmental protection agencies in developing countries (Olufayo&Omotosh, 2007; Gomez, Meneses, Ballinas, & Castells,2009; Ogwueleka, 2009; Zamorano et al., 2009). The global waste generation was estimated at 318 million tons as of 2002, with an annual increase of approximately 6%. Global solid waste generation is expected to reach about 518 million tons in 2008 and 585 million tons in 2010 (UNEP, 2002; Periathamby& Hamid, 2009).

Hoornweg&Bhada-Tata (2012) in a world bank report estimates that at present almost 1.3 billion tons of MSW are generated globally every year, or 1.2 kg/capita/day and by 2025 this will likely increase to 4.3 billion urban residents generating about 1.42 kg/capita/day of municipal solid waste (2.2 billion tons per year). According to Ogbonna,Ekweozor, &Igwe, (2002) in Nigeria, domestic waste production is increasing and is compounded by a cycle of poverty, population explosion, decreasing standards of living, bad governance, and low level of environmental awareness. Improper solid waste management has contributed greatly to river pollution and also to climate change where decomposing solid waste produces methane gas (Jalil, 2010). Cities in Nigeria are critically affected by huge population fallouts, inadequate supplies of social amenities, and the inability of administrators to meet with the demand of expanding population clusters.

The problem of household waste disposal is one that continues to grow with the growth of human population across the country. Urbanization and rapid population growth in many cities in Nigeria have been accompanied by a myriad of social problems, one of which is poor household waste disposal. Household waste is inevitably produced as a result of domestic activity and the disposal of such waste appears to have become a huge problem which has eluded all attempts at effective control. Though the Federal Government of Nigeria has formulated various policies and laws to tackle this menace, there seems to be a wide gap between policy making and policy implementation. It does appear that attempts by the Nigerian State to effectively inculcate into her citizens, principles of personal hygiene and sanitation through its health sector personnel and urban management authorities have failed (Onyekpere, 1998).

New Karu was chosen for this research because it is a settlement which was created as a result of the relocation of the Federal Capital Territory (FCT) of Nigeria from Lagos to Abuja following the promulgation of Decree No. 6 of 1976 (Imam, Mohammed, Wilson, & Cheeseman, 2008). The Gbagyi people presently living in New Karu were only resettled in the area having left their former settlement, Karu which was part of the area carved out to form the FCT. New Karu can be described as a place where the residents have no option but to dispose of household waste by roadsides, in gutters or any available piece of vacant land.



The activities of regulatory bodies like Nasarawa State Urban Development Board (NUDB) and the Environmental Sanitation Unit seem inefficient as it only encouraged people to clean up their immediate surroundings and dump the waste by roadsides where the rains will flood them back to their doorsteps because of the evacuation delay by these regulatory bodies. Attitudes of these residents toward waste disposal can be readily seen in their daily routine. It is not uncommon to see people urinate in street corners or litter the streets with used nylon bags, “pure water” sachets, corn cobs, biscuit wrappers and the likes. There seems to be a general disregard for the environment (Obijiofor, 2009) with improper waste management norm. The long-recognized hierarchy of management of wastes, in order of preference consists of prevention, minimization, recycling and reuse, biological treatment, incineration, and landfill disposal. It is on this premise that this study is designed to examine the predominant methods of household waste disposal among New-Karu residents.

Objectives

- i. To identify the predominant methods of household waste disposal among New-Karu residents.
- ii. To examine the opinion of respondents regarding government effort towards waste management in New-Karu.
- iii. To examine attitudes of respondents regarding their role in household waste disposal.

Literature Review

Oftentimes when systems are breaking down and problems are intensifying, people look to societal factors to fix the problem. This has been the case when dealing with the mismanagement of solid waste in the developing world. Many researchers have argued that the waste problem is caused by human behavior and therefore the solution lies in changing that behavior (Milea, 2009). Public awareness and attitudes about waste can affect the whole Solid Waste Management System (Zhu et al., 2008). How is waste defined in the developing world? Why has littering become such a prevalent behavior in these communities? What role do social norms and attitudes play in shaping these behaviors? And what measures must be taken to ensure that these behaviors change? These are questions that must be answered in order to come to realistic solutions to the problem of solid-waste management in developing countries. The Attitude and Behavior Gap Waste can mean many things to different people (Moore, 2012). Some people such as the trash pickers or scavengers locally called “baba bola” in Nigeria, see “waste” as a resource or a way to make an income in an otherwise limited job market.

On the other hand, you have a majority of people living in the developing world that see waste as a burden and a problem that needs to be addressed. To say people in developing countries don't recognize trash as an issue is an incorrect statement. The opposite is often true. However, recognizing trash as a problem does not prevent littering or other negative behaviors concerning waste management (Moore, 2012). This attitude-behavior gap often emerges and can be further affected by a variety of reasons including convenience, social norms, lack of public participation, and lack of education and awareness of effective waste management techniques (Milea, 2009; O'Connell, 2011). Within this attitude gap exists an inconsistency between one's values and actions.

This specifically refers to the discrepancy between people's concern over the environmental harm posed by household waste and the limited action by those same people to



reduce their waste or engage in other pro-environmental behaviors (O'Connell, 2011). Many researchers observed this gap first hand when conducting observations in communities of the developing world. I personally observed this behavior in my time in New Karu, where individuals I had just administered the questionnaire to and discussed with, who claimed they were concerned about the trash problem in their community, then proceeded to litter in the street later that day, not connecting their values with this action. A negative behavior often associated with the mismanagement of solid waste in developing countries is the occurrence of littering. There are a multitude of causes that can contribute to an increase in public littering rates, such as a lack of social pressure to prevent littering, absence of realistic penalties or consistent enforcement, and lack of knowledge of the environmental effects of littering (Al-Khatib et al., 2009).

Other causes also include the amount of litter already present at a particular site, presence of signs referring to litter, and the number and/or placement and appearance (if any) of waste collection bins at the site. Convenience of garbage bins has been cited many times in research as a priority when disposing of trash, and when these are not present or lacking in areas this has been reason enough to litter (Henry et al., 2006). Other times people become accustomed to throwing their waste in streets and other inappropriate places, as there had been no formal system for sorting and disposal in their community, so when changes are implemented people are not changing their disposal behavior out of pure habit and custom (Yousif and Scott, 2007). Similarly, a range of socio-economic factors can affect public attitudes toward littering, frequency of littering, and the effective approaches to impede the littering tendency within an individual (Al-Khatib et al., 2009).

These factors are region and culture dependent, and it is very important to study them if an effective littering prevention program is to be designed. For example, in a study conducted in Cuba looking at the relationship between social norms and pro-environmental behaviors, researchers found that a majority of citizens participated in recycling buybacks and non-littering initiatives, not only because the government supports these efforts for economic reasons, but also because of the social pressure created by the community. Citizens also possess internalized social norms and believe that if they do not adapt their behaviors accordingly, they become outsiders and are looked down on (Mosler et al., 2008). To get a clearer understanding of the complexity of street litter problems, integration between socio-economic and environmental studies is essential (Al-Khatib et al., 2009).

The participation of the community in the production and use of scientific knowledge is considered the best approach to environmental management of waste. Many studies have been conducted in the developed world to evaluate and apply strategies to reduce littering by means of behavioral interventions (Al-Khatib et al., 2009), but in developing countries little has been done. Another major constraint seen throughout the developing world is the lack of education and awareness of effective waste-management practices. One study in Gaborone, Botswana, found that even though citizens were aware of recycling and other sustainable waste-management techniques, this does not necessarily translate into participation in pro-environmental activities such as recycling initiatives.

They appear to have not embraced waste management reforms amid their limited knowledge of such activities (Bolaane, 2006). The lack of interest in the environment creates a culture of non-participation of communities in decision-making processes. That stance enhances lack of responsibility for pollution and waste issues. Ultimately this produces communities that have little knowledge of, or concern for, their impact on the environment



(Poswa, 2001). What it may come down to is the difference between information and knowledge. Being presented with the information without prior knowledge may be ineffective in creating change. However, if prior knowledge of waste management was met with new information, these communities may be more willing to accept it and implement these changes.

The need to improve public awareness of, and community participation in, waste management has been widely recognized by researchers as necessary to create sustainable waste systems and to promote environmental citizenship amongst community members (Lumbreras Martín and Fernández García, 2014). Typically, people are more likely to participate in waste management activities, for example recycling, when they observe others in their vicinity recycling. In developing countries recycling programs are rare, so wealthier members of the country rely on informal recyclers as the behavior norm (O'Connell, 2011). The results of a study done in Malaysia by Aini and colleagues (2002) indicated that, in order to overcome the solid waste crisis, the "conscience of the individual needs to be raised through environmental awareness and concern, inculcation of sustainable consumption practices and education on waste management."

Environmental awareness and knowledge about environmental conservation were found to affect recycling attitude positively but positive attitude may not have resulted in recycling if knowledge about it was poor (Aini et al., 2002), so waste managers need to take steps to help align the information presented to the public with the knowledge these individuals already have. Furthermore, many people feel that they have no impact on the decision-making process, and as a result do not bother to register complaints with the authorities. This attitude differs among socio-economic groups. Wealthier socioeconomic groups are more likely to feel like they can make a difference when it comes to these environmental problems or become involved in doing something about them because they feel that they have the ability to make more of an impact in addressing and fixing the problem.

Some researchers argue that people of lower socio-economic groups tend to have less regard for environmental issues on the basis that employment and housing are their main priorities (as cited in Périou, 2012). Turning to more of a response side of this issue, there is often the lack of a sense of responsibility, which is manifested by the accumulation of huge amounts of litter in public places such as parks, highways and recreational facilities and in private areas such as business places (Scarlett and Shaw, 1999). This can be explained as a function of ownership. As cited by Scarlett and Shaw (1999), Aristotle (n.d.) said: "What is common to many is taken least care of, for all men have greater regard for what is their own than for what they possess in common with others." This simply means that people who own property have the incentive to take care of it, unlike the one owned by a large number of people or where there is non-ownership like public places.

Thus, in Nigeria indiscriminate disposal and dumping of solid waste is a common practice in most residential areas. Apart from various diseases and toxic conditions inherent in and derivable from wastes products, the presence of waste degenerates the aesthetic value of the environment (Ogbonna et al., 2002). Health problems associated with poor water quality arising from inadequate waste disposal and waste management practices include; typhoid fever, diarrhea, cholera, hepatitis, hook worm infestation, skin diseases, and malaria. With regards to waste management options there is a large body of literature on the potential adverse health effects of different waste management options, particularly from landfill and incineration (Rushton, 2003). In the same vein Rushton (2003) most research has focused on



the health of the population, particularly those living near a waste disposal site and the occupational health problems of the workforce involved in waste management.

Conceptual Analysis of Household Waste Disposal

Waste is introduced into the environment due to the day-to-day activities of humans. Waste management refers to the many methods and processes of dealing with waste at every stage from generation and collection through to final disposal. The waste we produce can be categorized as liquid waste or solid waste depending on its physical state. It can also be categorized as hazardous or non-hazardous. Hazardous wastes are not classified by their physical state (solid, liquid or gas) but by their properties and potential to cause harm. Hazardous wastes are defined as wastes that have one or more of the following properties. They may be: corrosive (substances that cause damage on contact, e.g. acids), ignitable (materials that can catch fire easily like benzene), toxic (materials that can be poisonous to humans when inhaled or ingested, or come in contact with skin or mucous membranes), reactive (substances that can yield a harmful chemical if they react with other substances) and infectious (substances that are capable of causing or communicating infection).

Non-hazardous wastes include all other types of waste. Liquid waste includes human waste, runoff (storm water or flood water), sullage, industrial wastewater and other forms of wastewater from different sources. The mixture of human waste with wastewater is known as sewage and also sometimes known as blackwater. Human waste is biodegradable and when contained in a waste containment facility (for example, a pit latrine or septic tank) it undergoes a biological digestion process by which microorganisms, particularly bacteria, decompose the organic matter.. The digestion process may take from several days to a few months, depending on the atmospheric temperature and other local conditions, before it is completely decomposed or degraded. The digested waste matter is called sludge. Whereas biodegradable wastes are those that can be broken down (decomposed) into their constituent elements by bacteria and other microorganisms. The term can be applied to both liquid and solid waste. Human and animal wastes, food waste, paper, and agricultural wastes are all biodegradable. (Valkenburg., Walton, Thompson, Gerber, Jones, Stevens, 2008).

Solid waste on the other hand is defined as any waste that is dry in form and is discarded by people as unwanted. You can describe the solid waste from general housekeeping as residential waste, refuse, household waste or domestic waste. Waste produced in other areas is defined as industrial, commercial, institutional or agricultural waste, or street sweepings, depending on its source. In urban settings, municipal waste refers to the solid waste that is collected by local government (the municipality) and may include household, commercial, industrial waste and street sweepings. The solid waste that is produced as a result of food preparation, or any foodstuff leftover after eating, is called kitchen waste or garbage. Food wastes in the European Union are defined as “raw or cooked of any food substances that are discarded, or intended or required to be discarded”. On other hand, the (EPA) U.S. Environmental Protection Agency defines the food wastes as “Un-eaten foods and food preparation wastes from residences and commercial establishments including restaurants, grocery stores, and produce stands, institutional cafeterias and kitchens, as well as industrial sources such as employee lunchrooms (U.S. Environmental Protection Agency.2013).



Theoretical Framework

Symbolic Interactionism Theory

The symbolic interaction perspective additionally referred to as symbolic interactionism, is a main framework of sociological idea. This viewpoint is supported by the symbol that people broaden and depend on the process of social interaction. Symbolic interaction is a statement that insinuates that people act according to how they interpret the meaning of their world (Max Weber, 1930). It presents a key theoretical foundation for a significant number of the studies performed through sociologists. The critical principle of this perception is that the means we derive from and characteristic to the world around us is a social construction shaped by way of daily social interplay. This concept fundamentally centered on our usage and how we infer matters as symbols to talk to one another differently, how we will form and keep an identity that we show to the world and an experience of self within us, including the way we can form and hold the reality that we accept as real with to be true (Meads, 1934).

Blumer came up with the time period “symbolic interaction” in (Meads, 1937). He later quite literally published the book in this theoretical angle, titled “Symbolic Interactionism.”

In this work he outlined three fundamental principles of this theory.

- We act towards things or people with regard to the meaning that we interpret from them.
- These meanings are as a result of social interaction amidst individuals.
- Meaning and conceptualization of a continuous interpretive process that ensures that the original meaning may be the same or change a little bit or evolve radically.

Based on those fundamental views, symbolic interactionist perspectives explain these facts as they are, it is part of a social construct that is produced through continuous social interplay, it exists in a given social context (Blumer, 1969).It should be stated that the symbolic interactionists support a selected technique due to the fact they see it as the fundamental thing of interaction in the human society. Symbolic interaction tends to take two great, but related methodological paths. Processual Symbolic Interaction pursues to ascertain the elaboration and revel in of meanings in natural sets of social interplay via commonly qualitative techniques (e.g. Examining the technique wherein humans come to be and represent selves) whilst Structural Symbolic Interaction pursues to map the contours of the self through predominantly quantitative strategies (e.g. Analyzing the structure of the self by asking who people trust - themselves or others).

Limitations of the Theory

The most important drawback of symbolic interactionism identifies with its essential commitment is that it centers on the continuing contestation and construction of implications within society (e.g. rules, norms, interpersonal experiences or cultures), which can only be seized through scrutiny of individual beings or small groups. Consequently, Symbolic Interactionism characteristically focuses on “how” things are done (e.g. how people achieve things that can be witnessed in the natural world and in real time) instead of “why” things are. Hence, Symbolic Interactions is all the sufficiently appropriate in expounding how the world is but can't exhibit and document expectations about how the world may be in specific situations.



Application of the theory to the Study

The researchers used this theory to determine the cultures that the people of New Karu municipality have formed on matters of solid waste management. The theory states that individuals act from interpretation of meanings. This help the researcher know how concern are members of the community and what meaning do they attach to the solid waste, its handling and disposal. The theory also states that the meanings are products of social interactions between the people and may add the social structures in place. This help the researcher draw conclusion on what might be the driving forces status of the solid waste management in the study area. If the status is bad or worse the conclusion therefore is that the relevant bodies mandated to sensitize the public on solid waste has failed, as well as the relevant bodies to collect and keep the municipal clean and free from irresponsible dumping of solid waste.

The theory also put it across that making meanings and the understanding is a continuous interpretive simple process, in the course of which the first meaning may change slightly, remain the same, or may develop radically. This means that if and when certain meanings and understanding of solid waste management will be altered to suit a sustainable solid waste management then municipality and the whole County will have sound solid waste management systems in place.

Methodology

The setting for the study was New Karu Local Government Area of Nasarawa State. The research design adopted for this study was survey design. Survey allows the researcher to collect data from a fraction of the population. The population of this study cut across all residents of New Karu. New Karu is made up of Eight Areas as such the areas were broken down into clusters namely: AngwanHausawa, Angwan Tiv, Angwan Jabba, Igbo Road Area, AngwanJikwoyi, Kari Kari, Church Road Area and Jogodo Area. For the purpose of this study, four areas were purposively selected and they are as follows: Angwan Jabba, AngwanJikwoyi, Igbo Road Area and Church Road Area. The Population of the New Karu Local Government Area of Nasarawa State is 291,900 inhabitants based on 2016 population projection, (National Population Commission web 2021). In the same vein the sample size was 867, this was arrived at using the Israel 1992 sampling determined table at 3% margin of error.

Also, the study applied the simple random sampling technique in selecting the elements that form part of the study. As such analysis was done based on the number of questionnaires that were retrieved from the field. The major instrument employed for data collection was questionnaire. Analysis of data entails a presentation of frequency distribution tables bearing quantitative information drawn from the respondents with regard to their socio-demographic characteristics such as age, gender and monthly income. Opinion questions were also posed to respondents to elicit information about their waste disposal practices and their attitudinal dispositions.

Data Presentation

Table 1: Respondents' predominant method of waste disposal

Method of Waste Disposal	Frequency	Percentage (%)
Open Dumping	503	75
Burning	139	21
Burying	16	2
Others	16	2



Total	674	100
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Source: Field Survey 2020

one shows that the predominant methods of waste disposal in the study site are open dumping (75%) and burning (21%). These cannot be considered as effective long-term methods of waste disposal. The dangers of open dumping are many; health hazards to scavengers at the dump site, pollution of ground water, spread of infectious diseases, highly toxic smoke from continuously smoldering fires and foul odours from decomposing refuse. Waste burning also causes air pollution.

Table 2: Respondents' Opinion on who is Responsible for waste disposal

Responsibility	Frequency	Percentage (%)
The Government	502	74.5
Individuals	63	9.3
Both	109	16.2
Total	674	100

Source: Field Survey 2020

Table two illustrates that a high percentage (74.5%) of the respondents feel that caring for the environment is a sole responsibility of the government. With the establishment of Nasarawa State Urban Development Board (NUDB) and the Environmental Sanitation Unit of the Local Government Authorities, people tend to view sanitation as the sole responsibility of such agencies. This could be a possible reason for the lackadaisical attitude of the people toward proper waste disposal and management.

Table 3: Government effort in Provision of Waste Dumpsite

Dumpsite Provision	Frequency	Percentage (%)
Dumpsite not provided	634	94
Not Sure	40	6
Dumpsite provided	0	0
Total	674	100

Source: Field Survey 2020

Table three shows that majority of the respondents were not provided with a government designated dumpsite. This is probably why the indiscriminate disposal of household waste along roadsides, drainage channels or open fields is still a common practice in the study area.

Table 4: Government effort in Provision of Waste Collection Vans

Provision of Waste Collection Vans	Frequency	Percentage (%)
Collection Vans provided	0	0
Not Sure	47	7
Collection Vans not provided	627	93
Total	674	100

Source: Field Survey 2020

Table four clearly reveals that a greater portion of the respondents are not provided with waste collection vans to transport garbage from their neighbourhoods to the final disposal site. Thus, when people clean their immediate surroundings and dump the waste along roadsides or in drainages, such waste remain uncleared for long periods of time consequently, providing breeding places for disease-carrying rodents and insects and letting out offensive odours that pollute the environment.



Discussion of Findings

This research has revealed that the predominant methods of waste disposal in the study site are open dumping and burning. Open waste dumping is unsanitary and it destroys the aesthetic appeal of the environment as such waste dumps provide breeding grounds for flies, mosquitoes, rodents and other disease vectors. Waste burning on the other hand causes air pollution as toxic gases are released into the air. The latent health threats of improper waste disposal cannot be overemphasized. Open dumping also leads to the pollution of surface water like rivers and lakes thereby endangering the health of aquatic life forms. Where aquatic organisms are not immediately killed, they accumulate pollutants which eventually gets transferred to man through the food chain. Air borne pollutants produced from refuse dumps contribute to the increase of respiratory or lung diseases as well as a general degradation of the physical environment, the findings of this study are consistent with studies carried out by Ajiwe, Nnbuiké, Onochie and Ajibola, 2000. This calls for concerted effort to avert the looming health danger that improper waste disposal constitutes to residents of study site.

Despite the presence of the Nasarawa State Urban Development Board (NUDB) at the level of the State Government, as well as the Environmental Sanitation Unit at the level of the Local Government, this study has revealed that government effort at household waste disposal and management in the study site is a far cry from the expectations held by the residents. Any effort at effective waste management must adequately plan for the collection, transportation, processing and final disposal of waste however, many of the respondents reported that they are not provided with an effective waste collection system; 634 respondents representing 94% of the total number of respondents reported that no official waste dumpsite was provided for them. Similarly, 627 respondents representing 93% of respondents reported that they were not provided with waste collection vans to evacuate and transport garbage from their neighbourhoods to final disposal sites. This finding supports the argument of Agumwamba (1998) that the poor state of waste management is attributable to an inadequately formulated and poorly implemented environmental policy among other factors.

This study also revealed that people's attitudes play an important role in shaping their waste disposal practices. When asked who they felt should be solely responsible for cleaning the environment, 502 respondents representing 74% of the respondents answered that the government was solely responsible for doing so. With the establishment of the NUDB and the Environmental Sanitation Unit of the Local Government, the residents tend to view sanitation as a sole responsibility of these agencies. The study further reveals that the waste disposal problem in the study site persists because of a prevailing urban culture among the people. Wirth (1938) describes this attitude of urbanism as characterized by individualism and by a marked decline in intimate communication. Social relationships among residents of the study site have been noticed to be highly individualistic thus there is no sense of collective responsibility or collective effort in keeping the environment tidy. People need to understand that effective waste management can only be achieved through collective effort.

Conclusion

As the world becomes more urbanized and developed, consumption rates are on the rise. An inevitable consequence of more consumption is the rapid increase in the amount of solid waste that is produced. Today, solid-waste management (SWM) conditions in the developing world are often quite dire and reminiscent of those found in the developed world



several generations ago. Therefore, the impact of inadequate SWM practices on natural and human environments is now being acknowledged. However, the predominant methods of waste disposal in the study site are open dumping and burning in spite of the hazards that these methods pose to human health and to the environment. The disposal of solid wastes to land is the ultimate end-point for any waste management system. Furthermore, waste landfills should be set up and operated properly in order to minimize the risks posed to health and the environment.

After looking over the cultural, educational, and microeconomics of waste management many things become clear. Public awareness and attitudes towards waste can impact the entire SWM system, from household storage to separation, interest in waste reduction, recycling, the amount of waste in the streets, and ultimately the success or failure of a SWM system. Being aware of problems does not necessarily mean that people find it their responsibility to solve them. It is up to all stakeholders involved to work together towards the common goal of sustainable waste management.

Recommendations

The following initiatives can be helpful in improving sanitary conditions in the study area:

- i. Community mobilization and reorientation for waste management is necessary to enable individuals learn proper waste disposal methods. This kind of awareness will help to remold people's attitudes towards waste generation and disposal overtime.
- ii. Where there is no designated refuse disposal site, officials of the relevant local government council should provide a place for that purpose. Waste bins should be made available at strategic locations to dissuade road users from littering the roads with filth. This can also encourage resident's dispose of their waste using those bins where official dumpsites are too distant for certain neighbourhoods.
- iii. Effective and Sustainable waste management cannot be carried out without incorporating reuse and recycling into waste management operations. Waste sorting should be made an integral part of recycling operations. Each household should begin the sorting of wastes into biodegradable organic containers, metallic products, and plastics and other non-biodegradable materials respectively. The services of private refuse collectors need to be organized and integrated into waste management operations and the residents of each premises should be willing to pay these refuse disposal personnel in their area to evacuate their wastes to the community disposal sites. The mass media should make environmental sanitation and protection special themes which will receive regular media attention and discussions.
- iv. The subject of Basic hygiene should be introduced into the national curriculum of primary and secondary schools in order to teach the Nigerian populace how to keep their environment tidy from the early stages of teaching and learning. Government need to ensure strict enforcement of existing environmental sanitation and protection law as this will lead to the attainment of a healthier and safer environment.
- v. Governments need to take steps to educate the citizenry on waste reduction and separation as a matter of national policy and they should enact waste-minimization



legislation as a first step.

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