SOLID WASTE MANAGEMENT AND SUSTAINED URBAN DEVELOPMENT PROBLEMS IN ABA, NIGERIA.

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Abstract

Background*: There is a high rate of environmental hazards of which poor solid waste management constitutes a significant source in Nigeria. The natural environment as it was endowed man with a healthy ecosystem devoid of diseases and vital support for the sustainable existence of man on earth. However, urbanization and other adverse human activities have massively altered the natural environment. They are consequently exposing humans to a multiplicity of issues leading to underdevelopment in Nigeria. This study thus investigated solid waste management: Implication for sustained urban development in Aba, Nigeria.*

Methods: *The study adopted a quantitative data collection. The sample size was 372 Aba Urban residents aged 18 years and above who were selected using the multi-stage sampling technique made up of cluster, simple random sampling and systematic sampling techniques. Data were collected using the questionnaire schedule. The quantitative data were processed with SPSS, presented with descriptive statistics and charts.*

Finding: *It was found that business activities are constrained by poor waste Management (63.50%). And there were no factories that convert waste to electricity or other useful products in Aba urban. The study revealed that inadequate waste management constraint's sustainable development in Aba Urban.*

Recommendation: *The paper recommended that the government and other private investors make concerted efforts by empowering a competent agency for effective waste management, there is also an opportunity for an investor to build a waste recycling plant within the city as the raw material is in abundance.*

Keywords:Solid waste, Waste Management, and Sustainable Development

Introduction

Sustainable development is seen as a development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Commission, 1987). This view contributes to the understanding that for development to be considered sustainable, it must encompass several areas. Furthermore, the United Nations Development Program (UNDP, 2007) highlights sustainable development as comprising environmental, economic and social progress, as well as equity, all within limits of the world's natural resources. However, sustainable development cannot be achieved with the persistent environmental harmful activities of man. Human consumption - induced environmental challenges are threatening an even bleaker future; while at the same time, inequalities in human societies remain extreme. The United Nations Human Development Report (UN-HDR, 1998) reveals that, globally, 20% of the world's people in the highest-income countries account for 86% of total private consumption expenditures which generates more waste than – the poorest 20% in low-income countries which consumes a minuscule 1.3%. Also, a Delhi – based environmental organization, the Centre for Science and Environment, points out that, if the poor world were to consume resources at the same rate developed nations do, we would need two additional planets to produce resources and absorb wastes.

The magnitude of wastes generated from human activities alone may exceed 18,000 tons per year for a developing country: thus posing a significant challenge of sustainability to such a state (UN-Habitat, 2003a; Onibokun, 2004). Waste, according to the Nigeria Environmental Study Team (NEST, 1997), is categorized as i) industrial, ii) commercial and iii) household wastes. It is pertinent to state that these waste typologies can either be in liquid, gaseous or solid form and in some case, the solid may decompose into a liquid known as leachate. Similarly, Aina (1998) cited in Busari&Olaleye (2007) classifies waste according to their sources into commercial, industrial, domestic and agricultural sources. However, for this study, only issues related to urban waste with a core emphasis on household and commercial waste (e.g. excreta, abattoir remnants and garbage) and their impending consequences on sustainable development will be given focus. It is worthy of note that, rapid population growth combined with increasing urbanization exacerbates increase in waste production and related issues. Experts claim that more than 50% of the global population already resides in towns and cities (U.N. 2012; UNFPA 2007). Olatubara (2001), cited in Busari&Olaleye (2007), stated that urbanization is the agglomeration of people in urban areas. In their view, urbanization is a process whereby an increasing number of people live in urban centres as against rural areas. He attributed the exodus of people from the rural to the urban centres to unguarded population growth and lack of means of subsistence in the rural communities. Increasing urbanization in most developing countries of the world, acts as a spring-board for unprecedented problems such as an increase in waste generation, crime and infrastructural inadequacies (Olatubara, 2001). The above results in garbage heaping up along major urban streets.

Concerning the African region, over one-third of Sub-Saharan Africans (SSA) currently lives in urban areas, according to Henson (2007). In his view, in the next thirty years, that figure may swell to over half the continent's population. Experts claim that some 72 per cent of Sub-Saharan African's urban population currently lives under slum conditions (U.N. 2007). Economists such as Jeroen (2001) says that urban areas can and do spur economic growth. However, without improvements in local governance and infrastructure as well as coordination between local, national and international groups; many experts caution that the region's urban areas will remain impoverished (Hanson, 2007). About waste generation, according to the World Bank (2012), globally, over 3.5 million tons of solid waste is generated daily – a tenfold increase over the past century. They estimate that this will likely double again by 2025. It could balloon to over 11 million tons per day by 2100, a tripling of present rate; with Sub-Saharan Africa said to be fueling much of this growth. In Sub-Sahara Africa alone, almost 1 billion people lack access to adequate waste disposal systems (Hanson, 2007). Jacquot (2013) opines that the global upsurge will require more resources to ensure environmental safety and sustained development.

The mounting problems of poor waste disposal are particularly prevalent amongst the urban poor globally. Although poverty rates are generally lower in most developed countries, urbanization is causing concentrated poverty rates in cities and a rapid increase in the number of urban poor in developing nations (UNFPA, 2007). Today, over one billion people live in overcrowded, polluted and dangerous urban conditions in Africa. These typically lack essential services such as clean water and adequate waste disposal management scheme (UNFPA, 2007). The majority of wastes are dumped on the streets, discharged into

rivers, water drainages and dumpsites. It does not only pollute the urban environment but also has detrimental impacts on socio-economic growth and sustained development. According to Fakere, Fadairo&Oriye (2012) the problem of waste generation, handling and disposal have reached an alarming rate in Nigerian urban centres, as most of the commercial cities are littered with unsightly mounds of garbage and other waste materials.

Economically, most people prefer to visit and live in places that are clean, fresh and healthy. A city with poor waste management mechanism, littered with waste matter, exuding fowl smells and environmentally polluted is anti-development. This is because investors and tourists detest such environments. Such cities tend to have poor living standards (Noi, 2014). Whether it be through associated illness and premature death, or blocked access to education and labour markets; each or a combination of these factors consequently weaken national economies and contribute to an inescapable cycle of poverty according to COHRE, (2008) cited in Davies (2013). It could be argued that sanitation was included in the United Nations (U.N.) conference in New York on Millennium Development Goals (MDGs) as an afterthought. This is because it was included as a sub-category of Goal 7: Environmental Sustainability, as Target 7.C which aims at reducing the proportion of the population without sustainable access to safe drinking water and basic sanitation by 2015 (Davies, 2013). This is despite its being linked to the success of at least three, of the eight main goals. In recent years, there has been an increased political focus on effects of poor waste management and allocation of funds to waste management, especially since the U.N. declared 2008, the International Year of Sanitation (Davies, 2013). However, agencies such as WHO and UNICEF stated that target 7.C of Millennium Development Goal on environmental sustainability might not be met by 2015 (WHO/UNICEF, 2012). As a result, millions of urban dwellers continue to live without the provision of an adequate facility for disposing of their waste. Policies such as privatization of waste management system, regulation of general waste bins have failed to substantially upgrade waste management and sanitation in Sub-Saharan African slums as shown by Abibat (2000).

Most Sub-Saharan African cities such as Kumasi, Accra – Ghana; Nairobi – Kenya; Freetown – Sierra Leone; Lagos, Port Harcourt and Aba – Nigeria are infamous for plastic bags filled with human waste that is dumped on the streets (Onibokun, 2004). Without waste management and sanitation systems, human excrement, dead animal carcasses from abattoirs and other garbage accumulate in fetid ditches along roads, seeping into water supplies. The consequences are dire. It is noted by WHO (2011) that in Africa, more than 1.5 million children die of water-borne diseases each year, in part due to poor waste management. Furthermore, the cities are flooded continuously; thus further spreading pollution and impacting adversely on the free movement of goods and services, and consequently inhibiting sustained development. In Sub-Saharan Africa, more than 200 million people, about 60 per cent of the urban population live in slums that lack adequate access to modern waste management methods and general sanitation (WHO, 2011).

This study's focus is Aba urban – a city in Nigeria, where poor waste management constitutes a severe problem. The 2006 national population and housing surveys put urban population growth in Nigeria at over

39% while Moughalu& Okoye (2010) placed it at over 45%. However, these urban population growths have not been matched with adequate infrastructural development, leading to several problems. Such as widespread poverty as a result of unemployment, under-employment, and indiscriminate disposal of waste (Moughalu& Okoye, 2010). The above characteristic features of Nigerian urban scene have resulted in a host of environmental, political and social problems which has impinged upon sustainable development of the nation (Ademibuyi&Solanke, 2007). The most pervasive of these problems are endemic poverty – the poverty of income, poverty of development-oriented ideas and activities in particular concerning upgrading of the environment. As revealed by Onibokun (2004), if 1$ per day is used as the yardstick for defining poverty line, then 70 per cent of the Nigerian population lives below the poverty line. He further argued that most Nigerians could not afford to pay for the services of private waste collectors.Consequently, they dump their waste in the streets or any available open space.

Furthermore, as a result of the rapid growth of the population and the increasing density of people and houses in major urban centres, the volume of waste generated in the urban centres has grown by geometrical progression (Ademibuyi and Solanke 2007). Unfortunately, in almost all the cities in Nigeria, Aba inclusive, the arrangements for waste disposal are very inefficient; as less than 50% of the waste generated is collected (NEST 1997). Regrettably, not a single city in Nigeria has a modern sanitary landfill. The common practice is the use of borrow pits, open plots of land, street vessels, streams and rivers close to residential areas; all of which results in the pollution of surface and ground-water, as well as soil and air (Ademibuyi&Solanke, 2007). The deplorable situation of municipal services and urban infrastructure for waste management in Nigeria calls for urgent intervention, as 66 per cent of the urban population lack access to improved urban sanitation (U.N. – HABITAT, 2003). This is even though waste can be used to create wealth, a process known as "waste to wealth".

However, unsightly dumps of accumulated solid waste are an apparent feature of most Nigerian urban centres leading to a blighted environment. This has often been cited as contributing to Nigerian urban decay (Egunjobi, 1996). This situation, in turn, increases the need for a reduction in environmentally damaging activities. In Aba urban metropolis, poor waste disposal has gained notoriety because of waste visibility and consequent general degradation of the environment. For instance, along with Aba – Porthacourt Express between Osisioma and Ala Oji axis the heaps of waste variegated in Ariaria market, Ngwa Road, Ahia-Ohuru and other major commercial areas in Aba, mounds of garbage are often sighted, while wastes generally litter in gutters, street corners and roadsides. Anyanwu (2014) cited in Umahi (2014) captured the situation when he stated that the sanitary condition in Aba town is deplorable and that the poor state of the roads is part of the problem. He also noted that the Abia State Environmental Protection Agency, (ASEPA) does not operate effectively and their trucks only evacuate waste placed in vessels on major roads, these and other challenges hinder effective waste management.

Aba urban is known for intense commercial and manufacturing activities in the markets and other commercial and industrial locations (Encyclopedia, 2008). These extreme human activities and high population concentration have increased the tons of solid waste generated in the area (Umahi 2014). Inadequate management of these wastes, in his view, has impinged on socio-economic activities in Aba, as many businesses are forced to relocate out of the town. Also, many traders now prefer other markets outside Aba. This situation, he claimed constrains the sustained development of the city due to loss of revenue. Poor waste management has equally imposed health and other related challenges to Aba urban residents (Umahi, 2014). It is against this background that this study seeks to evaluate solid wastes management and attendant issues of sustainable development using Aba urban as the study focus.

Empirical Appraisal on Nexus between Swelling Haphazard Waste Disposal and Sustained Development

The effects of poor urban sanitary conditions and waste management on the well-being of city residents are often expressed in health and environmental terms. Of equal importance, which requires the attention of all stakeholders are the social consequences of poor sanitation (Owusu, 2010). More so, Owusu (2010) studied the social implications of solid waste in Sabon Longo, Accra, Ghana. He found out that the abundance of uncollected garbage, which youths often throw at adults who reprove their behaviour of dumping refuse recklessly, raises questions about community social cohesion. He noted that poor urban communities are noted for their strong cohesion which is achieved through social networks; a process which tends to assist the poor to weather the storms and challenges associated with urban life. A focused group discussion (FGD) conducted in the area revealed some disquiet between the older and younger generations. Poor sanitation in the community is partly blamed on the lack of discipline among youths concerning their non-participation in the communal cleaning exercise (something the older people frequently undertook when they were young) as well as their indiscriminate dumping of refuse. This view is captured in a quote from an adult women FGD participant.

> *"Some youths in the community dump refuse anywhere they like when nobody is watching them. They collect the rubbish from homes for a fee but dump them in unauthorized places because they do not want to pay at the container site. So when they are caught, we allow the community members to beat them up" (Owusu, 2014).*

Loan (2002) cited in Muktar (2011) studied the social impacts of solid waste recovery and recycling in Hanoi, Vietnam. The recovery system, according to his findings consisted of collections sold to buyers and traders. Collectors gather materials from three groups of sources: dumping grounds; dumpsites, a scavenger in the public places, (itinerant scavengers) and in-house places (itinerant junk buyers' storage places). Groups of depot operators buy the materials from scavengers and junk buyers at dumping grounds within the city. The study further revealed that 6000 people are working in the scavenging field. Most of these people came mainly from the rural areas; the most significant groups within the labour force are those above 20 years old, with (31%) male and (44%) female. The system creates jobs and extra income as it mobilizes all family members to work. Adeyemi Olorunfemi and Adewoye (2007) examined the role of waste scavengers in the waste recycling process in Ilorin, Nigeria. Using plastic waste as an example the study demonstrated that such recycling is economically viable. The preliminary finding reported indicates that scavengers have contributed significantly towards the provision and separation of recyclables for the recycling industries. Muoghalu and Okoye (2010) studied solid waste management and economic growth in Awka, Anambra State, Nigeria. The study found that;

> *of the (10) scavengers involved one person is from Anambra, Imo and Enugu state respectively; while the rest of (70%) are from Ebonyi State. All the scavengers are male. Only (40%) completed primary education, while 10% dropped out of primary school. One person had a senior secondary school certificate, with 30% dropped out of secondary school. Regarding their marital status, (20%) are not married; the remaining (80%) are married. The reasons for staying in business are varied, ranging from poverty (20%), business downturn (10%), hardship (10%), and the prospect of improving their lot or opportunity for a switch over to other business (30%) and desperation (30%).*

Waste pickers provide between 50% and 100% of waste collecting services in most cities of the world, according to a 2010 UN-Habit report. This service effectively servers as a mass

subsidy for city governments; who do not pay for the labour. Moreover, recycling expands the life span of city dumps and landfills. Solid waste has also served as a reliable source of energy, reducing economic cost in the importation of crude and other sources of energy. According to the American Society of Mechanical Engineers (ASME, 2008), the US WTE industry has existed for over thirty years, and its technology has continuously been improved. For example, MSW combustion facilities of all types were once considered a significant source of mercury and dioxin emissions. They reported that currently there are 86 WTE facilities in the U.S. processing 29 million tons of MSW annually and generating 2.3 GW of electricity. Every ton of MSW processed in a WTE facility avoids the mining of one-third ton of coal (9.6 million tons per year) or the importation of one barrel of oil (29 million barrels per year). MSW, depending upon the moisture and energy content of the waste materials, is an excellent fuel source. The thermal treatment of MSW results in the generation of 500-600 kWh of electricity per ton of MSW combusted. European WTE facilities often recover another 600 kWh in the form of steam or hot water that is used for district heating. This new energy recovery is not generally achieved in the U.S. due to the absence of district heating systems. The corresponding savings in fossil fuel use range from one to two barrels of oil per ton of MSW.

Theoretical Framework

The theoretical framework incorporates Risk Society to explain waste disposal management and sustainable development. This theory is adopted because it illustrates the fact that in its quest to develop human activity creates waste which also affects humans adversely, especially in developing nations with low technology for efficient waste management. The Risk Society theory is a critical theory of modernization; it has a firm focus on how modern society organizes in response to risk. It is closely associated with Ulrick Beck and Anthony Giddens (Beck, 1992). The term was coined in the 1980s and popularized in the 1990s as a consequence of its links in thinking about wider modernity, in particular the growing environmental concerns during the period (Beck, 1992). The theory premises on existence and non-existent of risk; the risk is not the same as a catastrophe, but the anticipation of the future disasters in the presence. As a result, risk leads a dubious, insidious, would – be, fictitious, allusive existence: it is existent and non-existent, present and absent, doubtful and real. In the end, it can be assumed to be ubiquitous and thus grounds a political fear and politics of prevention. In the case of environmental risk that poses physical threats, Beck maintains that there is on the one side affluence-induced environmental destruction, as in the case of the hole in the ozone layer and the greenhouse effect which may justifiably be laid primarily at the door of the Western industrial world, with global impact. From this, we must distinguish poverty – induced environmental destruction, such as the clearing of the rainforest, which is mainly confined in particular regions though its scale is no less alarming. Also, Giddens (1999) argues that though non-human forces have produced risk "natural disaster", modern societies, however, are exposed to risks such as pollutant-waste, 'leading to new forms of illness that are as a result of modernization process itself. Giddens defines the human-produced risk as manufactured risks. Manufactured risks, according to him are marked by a high level of human agency involved in both creating, and mitigating such risks. As manufactured, risks in this case, high waste generation, poor disposal and its social cost are products of human activity; Giddens and Beck argue that it is possible for societies to access the level of risk that is being produced, or that is about to be produced. This sort of reflexive introspection can, in turn, alter the planned activities themselves.

One major criticism of this theory stems from Beck pessimistic perception of social risk as disruptive hence societies must disembark from every social action associated with risk existence or anticipated, this is a

pitfall considering that active – risk-taking is a core element of a dynamic economy and innovative society. Another criticism by Ormrod (2013) is centred on whether Beck's understanding of risk is a realist or constructionist one, he argued that Beck's never substantiated on either that the world has become riskier or that risk merely intervenes between 'really existing risks' and our response to them is untenable.

Methodology

The study is located in Aba urban Abia State, Nigeria, in 2015. It adopted a cross-sectional survey design. According to the 2006 National Population figure, the area covering Aba has a total population of 1,310,609. The distribution of the population by gender is as follows male 656,274 and female 654,335, giving a total of 1,310,609. However, the target population of the study is the population of Aba South and Aba North Local Government Area's (LGA). The population for Aba South is 214,926 males and 208,926 females, while that of Aba North is 55,744 males and 51,744 females, giving a total of 531,340. The target population for this study were adults aged 18 years and above. The multi-stage sampling technique made up of cluster, simple random sampling, and systematic sampling techniques were adopted in selecting the sample for the study. First Abia state was clustered into three senatorial districts.

Then using the random sampling technique, Abia central senatorial district was selected. The LGAs in the chosen cluster were numbered, and then with the application of the simple random sampling technique, two LGAs were selected namely Aba North and Aba South. This was done by first numbering all the elements in the sampling frame out of which the above two were selected through the balloting method. Furthermore, the communities in Aba North and Aba South were numbered, and through the aid of the balloting method of simple random sampling technique, two cities were selected from namely Ogbor – Hill and Ngwa Road from Aba North LGA and Ariaria and Eziama from Aba South LGA. Then the streets in the selected four communities were numbered, and through the balloting method of the simple random sampling technique one street was chosen from each of the four communities namely; Ukaegbu, Ndoki, Nwankpa and Kamalu Street respectively. Finally, compounds in the selected streets were numbered and the systematic sampling technique was employed to select every Kth household in the sampling frame from which an adult was selected as a respondent for the study. The sequence continued until a total of three hundred and seventy-two were drawn from the streets. However, only persons of 18 years and above were allowed to participate. A sample size of (372) was selected using the Fishers, Laing, Stockel, and Townsend (1998) statistical formula and was used for the study and the primary instrument for collecting data was questionnaire. A uniform set of questionnaires validated were administered to all the respondents. The In-depth interview guide (IDI) was used to complement data generated from the questionnaire. Four IDI's were conducted with two males and two females purposively selected based on their knowledge of the subject matter; namely a primary health worker from Aba South and North health centres; Ngwa Road Market chairman; Ahiaoru Market chairman. Care was taken to maintain gender balance in the selection of interviewees who participated in the survey. Out of the (372) questionnaires distributed, (353) were correctly filled and returned, giving a response rate of 96 per cent.

Findings

Socio-demographic Attributes of Respondents

This section of the analysis deals with the personal data of the respondents and these include gender, age, marital status, educational attainment, and occupation.

Table 1: Distribution of respondents by socio-demographic

Group	Demographic	Frequency (n=353)	Percentage %
Sex	Male	199	56.4
	Female	154	43.6
Age	18 – 27	185	52.4
	28-37	100	28.3
	38-47	35	9.9
	48-57	22	6.2
	58 and Above	11	3.1
Marital Status	Single	210	59.5
	Married	137	38.8
	Separated	1	.3
	Divorced	2	.6
	Widowed	3	.8
Educational	No schooling	7	2.0
	primary school	52	14.7
	SSCE/ WAEC	103	29.2
	GCE/A Level/OND	111	31.4
	First Degree/HND	68	19.3
	Higher degree	12	3.4
Occupation	Traders	91	25.8
	Civil servants /self-employed professionals	43	12.2
	Bus/Tricycle driver	60	17.0
	Student /unemployed	72	20.4
	Artisan / Farmers	50	14.2
	Health workers	37	10.5

Source: Field Survey, 2014

Analysis of Research Questions

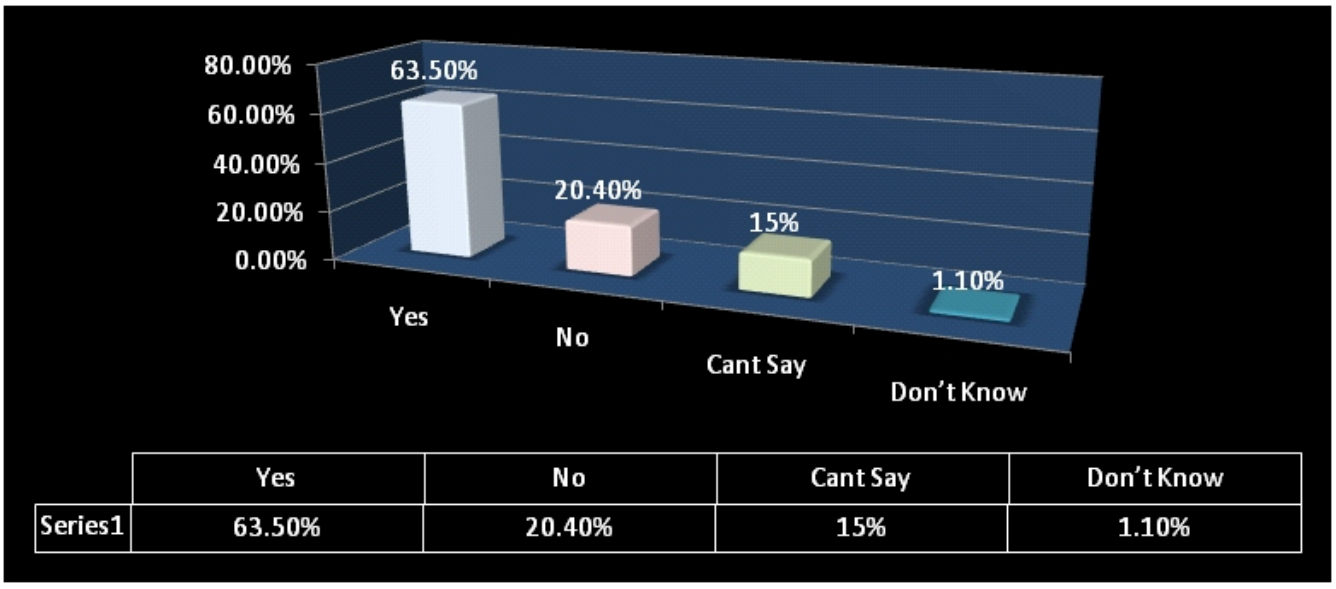

Figure 1: Business Activities and Sustainable Development are constrained by Poor Waste Management

Figure 1 shows the frequency distribution of respondents on whether business activities are constrained by poor waste management. 224 respondents (63.5%) said yes that inadequate waste management affects business and sustainable development adversely, while 72 (20.4%) were of the contrary view. It could be deduced from the data that poor waste management strategy hampers business activities; thereby constraining the sustained development of Aba urban.

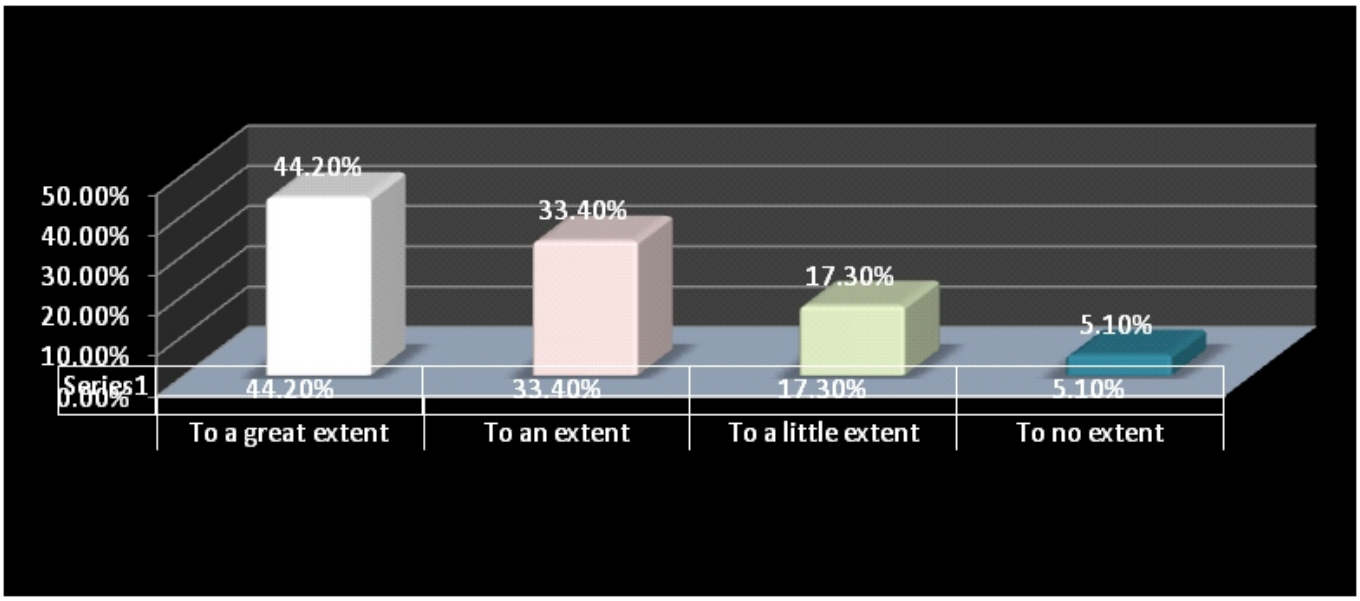

Figure 2: Extent Poor Waste Management Affects urbanization and businesses firms in Aba Urban.

Figure 2 shows the frequency distribution of respondents on the extent poor waste management affected urbanization and business organizations in Aba. Majority of the respondents 156 representing (44.2%) said urbanization and businesses have been affected to a great extent, while only 18 respondents representing (5.1%) said it had not been affected. The data suggest that the drive for urbanization and sustained business activities within the study area has been greatly affected by poor waste management. Summarily, poor waste management strategy has largely affected the commercial enterprise in Aba negatively; most traders do not visit the markets in Aba anymore as a result of environmental decadence. Most of the streets filled with filth.

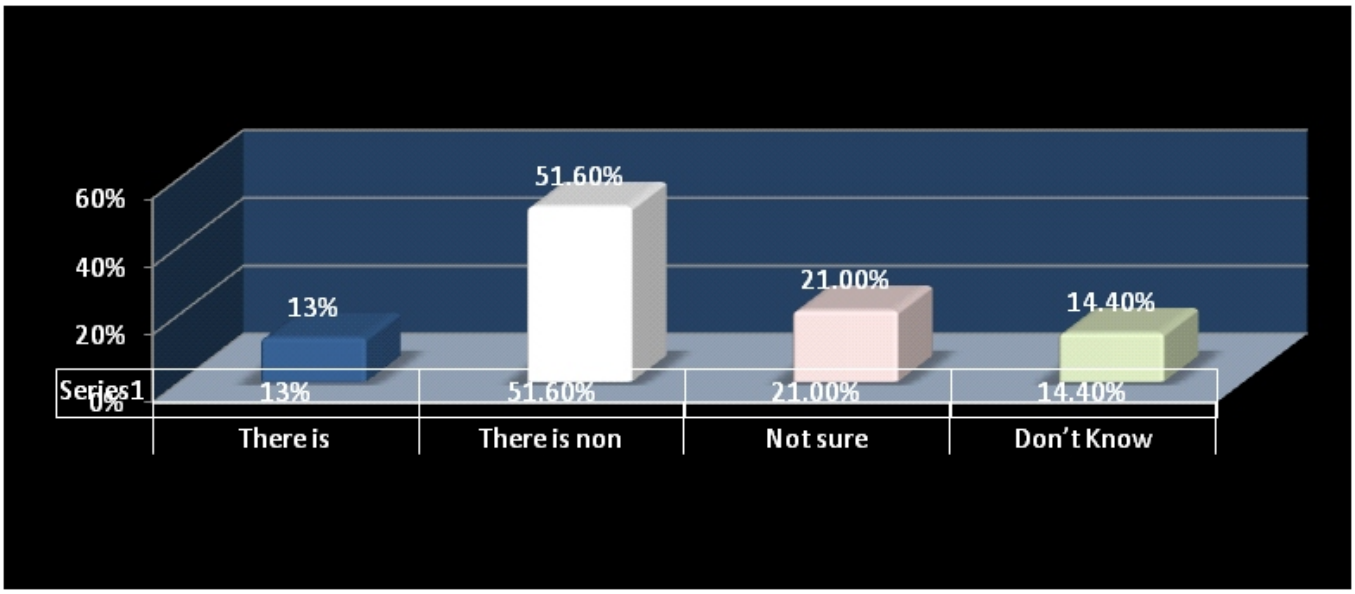

Figure 3: Factories that Converts Waste to Electricity or other useful Products in Aba Urban.

Figure 3 shows the frequency distribution of respondents on whether there is a factory that converts waste to electricity or other useful products. Majority of the respondents 182(51.56%) said there is no factory in Aba that converts waste to power, and 74(20.96%) respondents were not sure if there is any of such factory. It, therefore, follows that despite the high volume of waste generated in Aba, there is no single industry that recycles waste into energy or other useful products within the study area. This is despite the fact that the technology for converting waste to energy is not new in the world, and also the study area is plagued with the challenge of epileptic power supply.

Conclusion

Aba urban has been described as a city with escalating waste management crisis as the high volume of waste generated by the residents are not adequately attended to by the waste management authorities (ASEPA). The inefficient waste management strategy has, therefore made uncollected waste to constitute a severe socio-economic and health problem. This is despite the fact that waste can actually be converted into energy known as biogas. This could ameliorate the acute scarcity of energy supply besetting the city. The decreasing socio-economic growth of Aba urban cannot be unconnected to inadequate waste management in the town. The government and private sector investors should consider investing on waste recycling plant in Aba urban as the primary resource needed to run such an industry is readily accessible in the city and also been that energy shortage is still a constant experience, returns on investment is guaranteed.

Recommendations:

Based on the findings of this study, the following recommendations are made:

- There is an urgent need for the government to review the funding of waste management authorities in line with economic realities of our country and also incentive giving as an encouragement to the workers whose responsibility is essential for the sustainable development of Abia State.
- The government and private sector investors should consider investing on waste recycling plant in Aba urban as the primary resource needed to run such an industry is readily accessible in the city and also been that energy shortage is still a constant experience, returns on investment is inevitable.
- The community should adopt a self-help approach to solve the problem. Much can be achieved when the various communities mobilize themselves and organize periodic cleanup exercises, and by contributing financially to support the training, the residents can also act as watchdogs and make sure that they adhere to proper waste disposal practices.

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