

## Waste Management and Enterprise Development in Slum Communities of Ado-Ekiti, Nigeria

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**Abstract:** *This research explores the development of business enterprises through waste management in slum areas of Ado-Ekiti. The problem of waste disposal is a major concern in these areas of the city, being the reference point in this research work. Dirty environment would have been kept clean if only people were made to embrace the business opportunities in Waste Management as it puts money in their pockets. Both primary and secondary sources of data collection were accessed to gather relevant information for the work. The sample frame used is the total number of housing units in the six selected slum areas of the city. The total number of housing units in the area was 7858 out of which 2.5%, amounting to 200 housing units was selected as sample size with the aid of systematic random sampling. Findings in the study revealed the nature of waste generated in the area, ranging from food (domestic), paper, plastic and metal wastes. It was discovered also from the findings that very few, just about 1.0% of the respondents separate their wastes while 99.0% do not. This explains why Waste Management business is not embraced on a larger scale in Ado-Ekiti, except for a very few that are involved in scavenging, collection and those who work directly with the company in charge of street sweeping in collaboration with the State Waste Management Board. However, the encouragement of people becomes necessary in the establishment of business ventures in Waste Management Enterprise, which this research work sought to contribute to economic development in Waste Management in Ado-Ekiti.*

**Keywords:** *Waste management, business enterprise, development, slum communities, Ado-Ekiti.*

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### 1. Introduction

One of the dreadful consequences of urbanization has been the problem of solid waste management, particularly in terms of the environmental nuisance combined with the health hazards implications (Onibokun and Kumuyi, 2000). Raised quality of life and high standards of living has had an unintended and negative impact on the urban environment far beyond the handling capacities of the Urban Governments and Agencies. Cities are grappling with the problem of high volume of wastes, the costs involved, the disposal technologies and methods and the impact of waste on the local and global environment. Change in the natural and human environment are largely due to some factors such as population growth, size and distribution, economic growth and industrial development, the quality, quantity and characteristics of waste generated. The world today is an urban world and it is anticipated that most of our future population increase will be absorbed by cities. The implications of population and settlement patterns in terms of demand on the physical environment and urban services are overwhelming. Sporadic refuse dumps and a breakdown in waste disposal arrangements are a few of the problems associated with arrangements of some Nigerian urban centers.

The disposal of solid waste materials, principally garbage and rubbish, is primarily an urban center problem. However, unlike liquid waste, sewage and industrial effluents disposal, the problem of solid waste has received only limited recognition. It is common practice in many metropolitan areas to overlook or ignore the consequences of waste disposal programmes. Many areas, particularly in developing countries still have inadequate plans for waste management; poorly controlled open dumps and illegal roadside dumping remain a pattern. The dumping spoils scenic resources, pollutes soil and is a high potential health hazard to plants, animals and people. The indiscriminate dumping of wastes and the failure of the collection system in a community as well as the result of improperly managed waste for two to three weeks soon causes many problems. These problems in cycle of environmental, social and public health effects include the followings, among others:

1. Proliferation of health infested animals like rats and rodents which can transmit typhoid fever, rabies and other infectious diseases.
2. Prolific breeding of cockroaches, flies and mosquitoes which can transfer diarrhea, gastroenteritis, malaria, yellow fever etc
3. Production of noxious and offensive odour as a result of ammonia, hydrogen sulphide, amines and indoles produced when organic wastes decompose anaerobically.
4. Pollution of air by smoke and smog especially where wastes are burnt openly as practiced in West African countries.
5. Clogging of waterways when refuse is dumped indiscriminately along the water course and river banks leading to floods with destructive consequences;
6. Obstruction of free-flow of traffic when refuse is disposed onto motor ways.
7. Contamination of ground water with open dumps, unsanitary landfills which have not been properly constructed and their leachates (Onibokun and Kumuyi, 2000).

These problems, if allowed to persist, could lead to epidemics and associated social problems. Therefore, there is an urgent need to address this problem in a sustainable way. All these problems call for immediate attention for cities to find solutions that would involve both communities and the private sectors to embrace innovative technologies and methods of waste disposal by involving behavioural change and awareness. There is a clear need for the approach of waste disposal to move more towards waste processing and waste recycling (turning waste to wealth) instead of the current approach which involves the use of high energy technology. Wastes can be turned into wealth; refuse can become resources while trash is changed for cash. There is definitely an urgent need for the current approach of waste disposal that is focused on landfills and dumpsites to move more towards waste processing and waste recycling which would involve public-private partnership aimed at eventual waste minimization. Some criteria for future waste minimization programmes will include deeper public participation, understanding economic benefits and recovery of wastes, minimizing environmental impacts, reconciling investment costs with long term goals. This therefore become the main focus of this research.

## 2. Statement of Research Problem

By way of definition, waste is seen as any substance or object arising from human or animal activities, that has to be discarded as useless or unwanted (Ajibewa, 1995). This means that waste is heterogeneous in nature and may originate from people, homes, the market place, offices and industrial activities. The population of Ado-Ekiti sporadically increased upon the creation of Ekiti State in 1996 from 156,122 to 176,090 in year 2000 (NPC, 1991 and 1996). Ado-Ekiti being the state capital witnessed a great influx of people thereafter; this in turn increased the volume of wastes generated from durable goods, construction materials, organic matters, wastes from street vendors etc. As traffic congestion increased over the years in the city, it became more difficult for the State Environmental Protection Agency (SEPA) to transport wastes for disposal due to traffic jam and so fewer areas were covered daily. The rate at which solid wastes interfered with other elements of city infrastructure has also increased when garbage blocks drains, canals, rivers, gullies and the roads. It has been estimated that up to 50% of residents in low and middle income countries do not receive waste collection services (Parizeau et al, 2008). Like in most cases, the poor squatters receive no or little collection service mostly because they are usually inaccessible to the transportation vehicles used by the solid waste department. Also, these areas are usually overlooked and so no attention is given to them in the area of waste management. Like in most cities, the poor squatter receive no or little collection service mostly because they are usually inaccessible to the transportation vehicles used by the solid waste departments. These areas are equally overlooked with no attention given to them to evacuate their wastes.

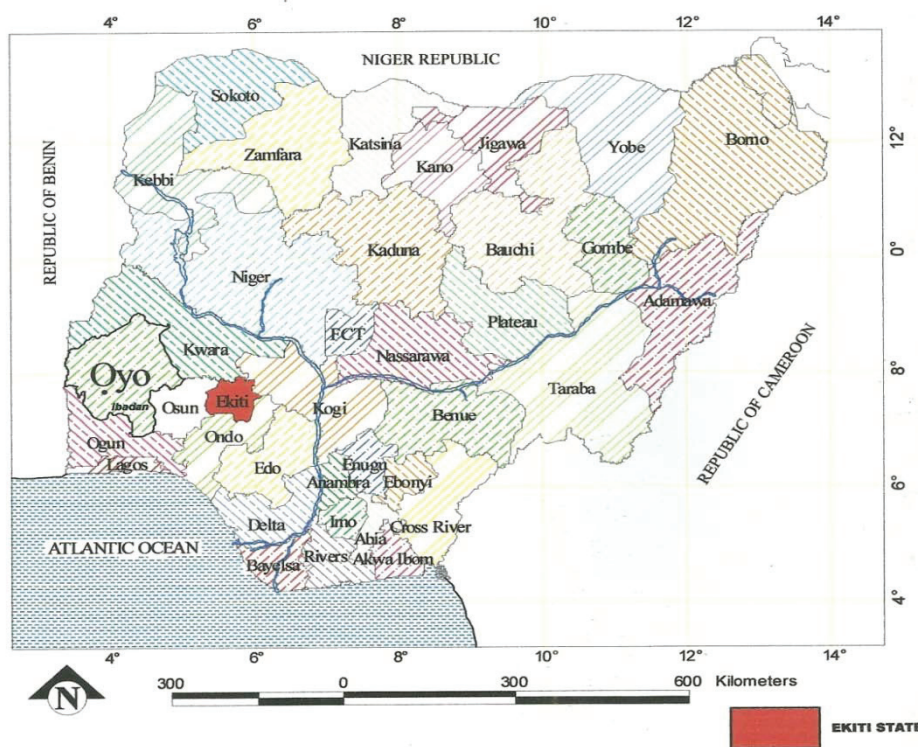
The need for this research is to address how enterprise can be developed from the slum communities of Ado-Ekiti through waste management endeavours. In this town, poorly controlled open dumps and illegal roadside dumping still remains a pattern which spoils scenic resources, pollutes soil and is a high potential health hazard to plants, animals and

even people. The usual practice is for these wastes to be burned or carried from roadsides to be disposed-off at landfills located at the towns' outskirts. There is the need for private individuals to tap into the profit making advantage presented by the waste management process. Until now, the only form of enterprise in waste management process in Ado town is from the scavengers. Governmental bodies, particularly the State Environmental Protection Agency and the Waste Management Board are fully responsible for waste management in the city which their effort is grossly inadequate. This study therefore aims at encouraging the development of firms, private individuals, organizations that would be involved in effective and efficient waste management in such a way that it will generate employment in the study area.

**3. The Study Area**

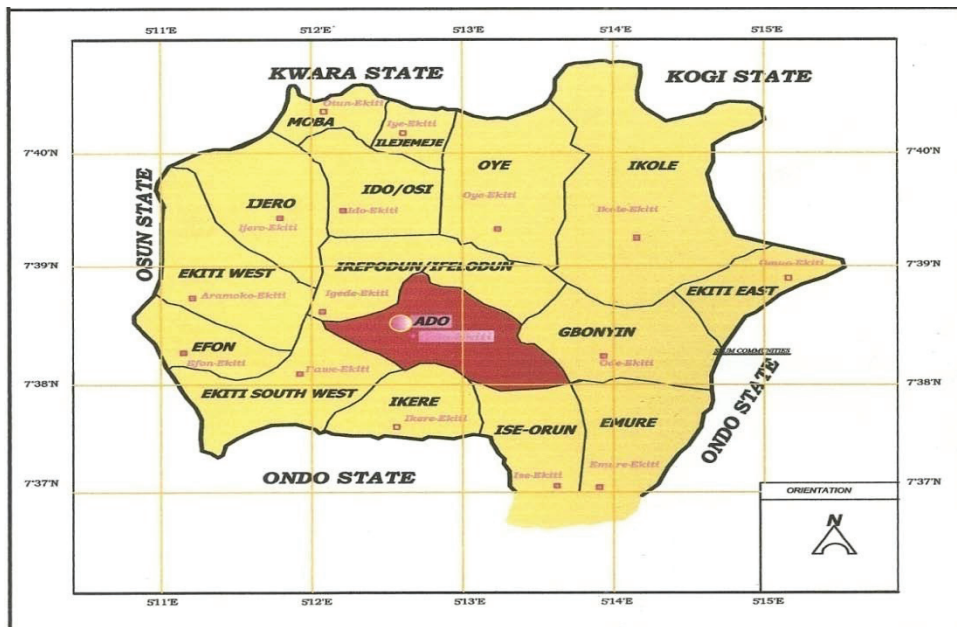
The study area is Ado-Ekiti, the capital of Ekiti State. It is located within the North-Western Part of Benin-Owena River Basin Development Area. The population of Ado-Ekiti region is put at 176,090 by the 1991 census with a density of 310 persons per square kilometer. According to Orubuloye (1993), 48.9 percent of the populations within the urban areas are male while 51.1% are female. The slum communities used in this study include Oke-Ila, Odo-Ado, Ile-Ibiye, Atikankan, Irona, Isato. Figures 1, 2 and 3 show the location of the study area. These areas are inhabited by indigenous people of Ado-Ekiti and are usually inaccessible to transportation because of bad roads; therefore waste carts/vehicles find it difficult to collect their wastes. Their housing structures are poor in nature; they are the low income earners. The area can generally be described as slum communities whose characteristics are similar to the definition above.

**Figure 1:** Ekiti State in the National Setting



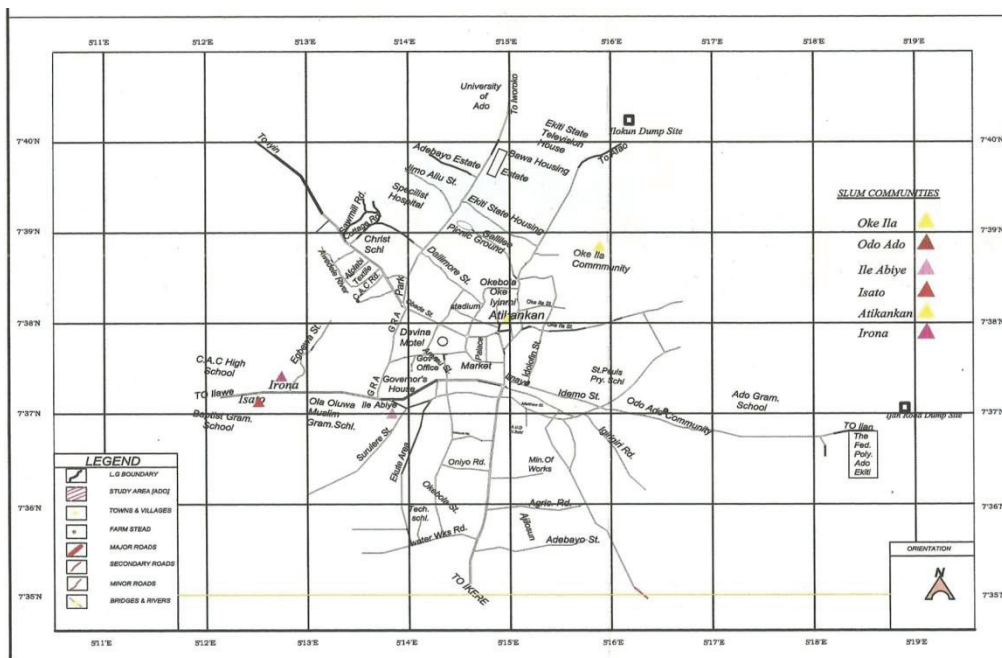
Source: Ekiti State Ministry of Physical Planning, Ado-Ekiti; 2011

Figure 2: Map of Ekiti State showing Ado Local Government Area



Source: Ekiti State Ministry of Physical Planning, Ado-Ekiti; 2011

Figure 3: Map of Ado-Ekiti showing the Location of Slum communities (The Study Area)



Source: Ekiti State Ministry of physical Planning, Ado-Ekiti; 2011



The volume of waste generation in Ado-Ekiti has increased drastically from about 95tons per day to 120tons per day since the creation of the State in 1996 (ESWMB, 2011). This is due to the influx of people into the town which has greatly increased the population of people in the town. The increased population has led to an increase in the generation of wastes. These wastes are not properly disposed-off in the different communities of the town. Most of the wastes are dumped by roadsides; some are dropped in water channels, littering the whole environment. The agencies involved in the collection and disposal of these wastes are not efficiently capable of handling the volume of wastes being generated. This usually makes the environment look littered and dirty. There is therefore the need to sensitize and encourage the involvement of the private sector in managing those wastes in all the processes involved as a means of developing enterprise.

#### **4. Conceptual Underpinning**

##### **The Zero Waste and 3R Concept**

Zero Waste is a philosophy that encourages the redesign of resource life cycle so that all products are reused. According to Wikipedia (2010) any trash sent to landfills is minimal. The process recommended is one similar to the way that resources are reused in nature. In industry, this process involves creating commodities out of traditional waste products; essentially making old input new inputs for similar or different industrial sectors. An example might be the cycle of a glass to milk bottle. The primary impact (or resource) is silica-sand, which is formed into glass and then into a bottle. The bottle is filled with milk and distributed to consumers. At this point, normal waste methods would see the bottle disposed in a landfill or similar waste dump. Zero waste can represent an economic alternative to waste systems where new resources are continually refined to replenish wasted raw material. It can also represent an environmental alternative to waste since waste represents a significant amount of pollution in the world. Zero waste is therefore the ultimate aim of waste valorization. In achieving Zero Waste status, the 3R concept is crucially termed the Waste Disposal Hierarchy, i.e. Reduce, Reuse and Recycle

##### **The Notion of the Zero Waste City Concept**

Cities are over-consuming and per capita waste generation is relatively higher in high consuming cities compared to low-consuming cities. The concept of the 'Zero Waste City' includes a 100 per cent recycling rate and recovery of all resources from waste materials. Cities attract people because of the socio-economic activities and quality of life offered to their inhabitants. However, inadequate urban management, often based on inaccurate perceptions and information, can turn opportunity into disaster (UNFPA, 2007). Cities are not only over-populated and over-consuming in nature but also deplete global finite natural resources at a high rate. There is a positive relationship between urbanization and poverty (UN-HABITAT, 2008) and the relationship indicates that expanding cities in a sustainable manner is an important factor for global sustainability. How to redesign the existing systems, how to design new products for consumption systems and how to design new scenarios for quality of life are now major questions for planners or researchers (Vezzoli and Manzini, 2008).

#### **5. Research Methodology**

To achieve the goal of this study, data were obtained from both primary and secondary sources with the aid of questionnaire administration, direct observation and in-depth interviews as well as housing demographic survey. The study focused on waste management; the perception of slum residents on waste management business development and the effectiveness of waste management service providers in the state in general. The sample frame for this research work is the total number of housing units in the six slum areas involved. The total number of housing units counted in the 6 selected slum areas is 7858 (which become our target population). Atikankan had 1411 houses, Irona 1361 houses, Isato 1201 houses, Ile-Abiye 1024 houses, Oke-Ila 1556 houses while Odo-Ado had 1305 houses,. The sample size taken for this study was 2.5% of the total housing units in the area, totaling 197 houses in all. Systematic Random Sampling was used to select one out of every 40 houses on street-to-street basis. Meanwhile, purposive sampling method was used to elicit information from the principal officers of Ekiti State Environmental Protection Agency with the aid of interview guides.

## 6. Research Findings and Discussion

Findings in this study are discussed under various sub-headings

### 6.1 Nature of Waste Generated

The study examined waste management situations in the slum areas of Ado-Ekiti. Wastes are generated from different households in the communities. The nature of solid wastes generated according to the respondents, as shown in Table 1, ranges from food waste (53.3%), paper (17.3%), plastic (8.6%) and metals (9.1%). It was discovered that very few, just about 1.0% of the total respondents sort their waste while 99.0% do not, because they see no reason doing so, or due to lack of knowledge about waste separation. Some even see it as a waste of time to sort waste. This explains why waste management business is not embraced on a larger scale in the city, except for a very few that are involved in scavenging and those who work directly with the company in charge of street sweeping.

**Table 1:** Nature of Waste Generated

Nature of Waste Generated	Frequency	Percent
Food waste	105	53.3
Paper	34	17.3
Plastic	17	8.6
Metals	18	9.1
Food waste, Paper, Plastic and Metals	23	11.7
Total	197	100.0

Source: Authors' Field Survey, 2011

**Plate 1.** Illegal Dumpsites at Oke Ila and Ile-Abiye Communities respectively



Source: Author's Field Survey, 2011.

### 6.2 Methods of Waste Disposal

Table 2 revealed the methods of waste disposal in the study area, 32.0% of the respondents dispose of their waste through the waste management board, 36.5% through cart pushers, burning accounted for 3.6%, dumping in open space pulled 26.9% and those that use both the cart pushers and dumping in open space is put at 1.0%, it can be deduced here that there is the need for effective waste disposal through the Waste Management Board in order to avoid indiscriminate waste disposal methods like burning and dumping in open spaces so as to ensure a cleaner and healthier environment. See also Plates 1a and 1b.

**Table 2:** Methods of Waste Disposal

Methods of Waste Disposal	Frequency	Percent
Through Waste Management Board	63	32.0
Cart Pushers	72	36.5
Burning	7	3.6
Dumping in Open Space	53	26.9
Cart Pushers and Dumping in Open Space	2	1.0
Total	197	100.0

Source: Authors' Field Survey, 2011

**Plate 2a:** Water Channel Littered with Waste in Ile-Abiye Area



Source: Authors' Field Survey 2011.

**Plate 2b:** Ekiti State Waste Management Truck at work in Atikankan Community



Source: Authors' Field Survey, 2011.

### 6.3 Business Opportunity in Solid Waste Enterprise

The waste management businesses identified by this study are scavenging since collection of waste is the sole responsibility of the State Waste Management Board which it offers to the communities free of charge. Other business identified is the sweeping of the streets contracted by the state government to a company. The research also found out that people still employ unacceptable methods of refuse disposal like burning (3.6%) and dumping in open spaces (26.9%) despite the free service delivery of the Waste Management Board and the outcome of this action is the emergence of a dirty and unhygienic environment which could make the environment prone to sickness and diseases. Besides, 37.1% of the respondents complained that the service of the Waste Management Board was not very effective and suggested the need for private firms to take up the responsibility while the State Waste Management Board coordinates or oversees their operations. About 71.6% of the respondents expressed their willingness to patronize and pay the private firms for service rendered, thereby taking care of the shortfalls from the Waste Management Board and private firms who will have to employ more people into their work force. Over 70.0% of the respondents interviewed claimed to be aware of business opportunities in waste management while less than 25.0% would be willing to engage in waste business. Various businesses identified by respondents are scavenging (21.3%), sale of sacks and bottles from waste items (20.8%), fertilizer making from waste (9.1%) and conversion of excess sachet of water to resourceful products (21.3%). This well illustrated in Table 3 below.

**Table 3:** Various Opportunities in Solid Waste Business

Business Opportunities	Frequency	Percentage
No idea	37	18.8
Scavenging	42	21.3
Buying of sacks and bottles	41	20.8
Fertilizer	18	9.1
None	17	8.6
Conversion excess sachet water to resourceful products	42	21.3
Total	197	100

**Source:** Authors' Field Survey, 2011

### 6.4 Frequency of Waste Disposal

Table 4 shows the frequency of waste disposal by respondents in the study area, the respondents that confirmed once in a week accounted for 10.2%, 6.1% said they dispose their waste twice a week, 17.3 thrice and 66.5% dispose of their waste more than three times a week. Based on the presentation in the table, there is need for Ekiti State Waste Management Board to put in place effective waste management to take care of the frequent waste generation in the study area for effective and efficient waste disposal in the study area.

**Table 4:** Frequency of Waste Disposal

Frequency of Waste Disposal	Frequency	Percent
Once	20	10.2
Twice	12	6.1
Thrice	34	17.3
More than three times	131	66.5
Total	197	100.0

**Source:** Authors' Field Survey, 2011

### 6.5 Agencies Responsible for the Collection of Solid Waste in the Communities

Table 5 displayed the agencies responsible for the collection of solid waste in the community, 26.9% claimed that they are personally responsible for collection of solid waste, 36.0% said the Waste Management Board is responsible for



waste collection, 6.6% for local government and cart pushers accounted for 30.5%. Looking at the involvement of the Waste Management Board at 36% shows that more has to be done by the Waste Management Board in order to withdraw the activities of individuals that dump wastes on illegal sites and road sides.

**Table 5:** Agency Responsible for the Collection of Solid Waste in the Communities

Agency Responsible for the Collection	Frequency	Percent
Self	53	26.9
Waste Management Board	71	36.0
Local Government	13	6.6
Cart Pushers	60	30.5
Total	197	100.0

**Source:** Authors' Field Survey, 2011

#### 6.6 Problems hindering effective Waste Management in Slum Areas of Ado-Ekiti

This research work revealed the problems hindering effective waste management in slum areas as it has been shown in Table 6; 19.8% identified one of the problems to be lack of environmental awareness, 2.5% pointed out the irregular waste collection system, 24.4% attributed it to the lack of monitoring group, 21.3% for lack of public participation and 32% identified the combination of all the problems already mentioned above.

**Table 6: Problems hindering effective Waste Management in Slum Areas of Ado-Ekiti**

Problems	Frequency	Percent
Lack of environmental awareness	39	19.8
Irregular waste collection system	5	2.5
Lack of monitoring group	48	24.4
Lack of public participation	42	21.3
All of the above	63	32.0
Total	197	100.0

**Source:** Authors' Field Survey, 2011

When investigating into the problems hindering waste management and business development in the area; various responses have been associated with lack of environmental awareness, lack of awareness or knowledge about the prospects and values in waste management business, irregular waste collection on the part of the State Waste Management Board, insufficient/lack of information on business to establish in waste management, lack of public participation, and lack of monitoring group among others. Meanwhile, suggestions were made on how to improve solid waste management in Ekiti State, the suggestions range from education and awareness of the people 21.8%, bring more bins nearer to the people 26.4%, 17.3% said government should concentrate on those areas that are capable of making people generate income in waste management and encourage people to participate, 6.1% suggested that government should take waste management serious, 12.7% said there should be monitoring groups, 9.1% suggested that the government bring more vans nearer them for better waste disposal. The opinion of the people on whether or not they want private firms to take up the responsibility of waste management in the state was investigated, it was revealed that 70.6% of the respondents suggested that private firms should come in while 29.4% opposed. It can therefore be concluded based on the responses of the respondents that private participation in waste management is a good compliment to the efforts of the existing State Waste Management Board. In attempt to further know the willingness of the respondents to see private companies taking up the responsibility of waste management in the State, the view of the respondents sampled showed that 71.6% are willing to patronize the private companies while 28.4% did not respond to the commitment of patronage of the private companies who may be involved in waste management. Various advantages in waste management were suggested based on the knowledge of the respondents on waste management business. About 18.8% suggest fertilizer as one of the values in waste management, 5.6% said other products like tissue paper, 21.3% identified recycling of waste as one of the values, 6.6% said metallic waste can be used for nails, 5.1% opined that

manure can be used as candle for further production while 6.1% and 25.9% respectively claim no idea and that there is no value in waste management.

#### 6.7 Benefits of Business Development in Waste Management

The benefits of business development in waste management are discussed based on the opinion of respondents in Table 7; 22.8% identified employment opportunities as a benefit, 40.6% said it is a viable source of income, while 12.2% see the benefits in terms of a cleaner and healthier environment, meanwhile, a section of the population sampled covering 11.7% identified the combination of all benefits already mentioned above.

**Table 7:** Benefits of Business Development in Waste Management

The Benefits	Frequency	Percentage
Employment	45	22.8
Source of income	80	40.6
Cleaner and healthy environment	24	12.2
All the above	23	11.7
Do not know	25	12.7
Total	197	100.0

**Source:** Authors' Field Survey, 2011

**Plate 3:** Solid Waste waiting to be transported from Ado-Ekiti to a Recycling Plant in Lagos for Further Transformation Process



**Source:** Authors' Field Survey, 2011

#### 6.8 Waste Management Business Activities Engaged in by People in the Study Area

In order to know the various business opportunities engaged in by the people in the study area, this research made further enquiries from the respondents. About 34.0% respondents said that people engage in scavenging and cart pushing, 29.4% said people buy metals, cement sacks and bottles while 16.2% respondents identified regular sweeping of roads. This situation therefore suggests the need to explore waste management and develop more businesses that people can engage in. It was further revealed that there were no private waste collectors, recyclers and compost makers in the study area. This makes it the possible areas where business opportunities can be established if people were enlightened about its viability. However, there were 18 scavengers found in active waste management business when this survey was carried out, 72 Cart Pushers while 41 people engage in the selling of recyclables. There were 700

sweepers (550 female and 150 male) engaged by the State Waste Management Board, five sweepers are to sweep a kilometer and to clean at least 4km major streets of the major parts of the town. From personal interview made on three of the drivers involved in the transportation of waste to dump sites, it was discovered that some of the male sweepers are sometimes engaged in transporting the waste dump sites. The summary of this is shown in Table 8 below.

**Table 8:** Number of Persons Engaged in Waste Management Business in the Study Area

Communities	Business Activities						
	Scavenging	Cart Pushing	Selling of Recyclables	Waste Recycling	Making Compost	Street Sweeping	Waste Transportation to Dump Sites
Odo-Ado	2	11	8	-	-	Five sweepers per km	3
Oke-Ila	4	14	7	-	-		
Irona	3	13	4	-	-		
Isato	3	13	9	-	-		
Atikankan	4	11	6	-	-		
Ile-Abiye	2	10	7	-	-		
Total	18	72	41	-	-	700	3

Source: Authors' Field Survey, 2011

## 7. Concluding remark and Policy recommendations

The study has unveiled the situation of waste management in Ado-Ekiti and has without doubt revealed the prospects in waste businesses and aspects of business establishment. The research also reflected on the reasons why people do not embrace businesses in waste management despite their knowledge of the viability of the business. Meanwhile, it was revealed that, waste management business, if embraced by all, is capable of affecting the environment and the economy positively. Therefore, the benefits of business development in waste management are summarized thus:

Employment generation.

Profitable source of income.

Provision raw materials for housing development as waste products, especially metallic solid wastes are converted to iron rods for housing construction.

Aesthetic environment as it will ensure a cleaner and healthier environment.

It is therefore believed that more businesses can be established in waste management enterprise through the establishment of recycling industries such as the ones that convert scrap metals to lanterns and wetting cans, those converting nylons and plastics to plates, PVC, balls and policies that encourage private firms to establish their firms in order to employ more people to engage in waste management businesses. However, to ensure effective waste management and enterprise development in slum communities of Ado-Ekiti, the following recommendation are to be pursued. In the first place, government should see it as important to embark on public enlightenment programmes in order to educate people on the values in waste separation, the viability of waste management businesses and other opportunities that can be engaged in by people in waste management venture. Secondly, the State Waste Management Board should be an advocate for public participation by compensating individual households for separating the waste generated from their homes, thereby encouraging Zero Waste Cities which will foster a clean environment at all times. To further ensure a cleaner environment; thirdly, government should make provision for more bins positioned nearer the people for easy collection by the Waste Management Board and private companies that might be involved. More vans or trucks should be deployed to slum communities that are far from the reach of the metal bins as against two metal bins that are presently located in each of the communities studied while adequate personnel are employed so as to ensure that waste generated in these areas are properly taken care of on time to avoid the outbreak of diseases.

Private firms/individuals who are interested in waste management businesses should be encouraged by the government. The encouragement could be in form of soft loans given out to individuals to start up enterprises in whichever aspect of waste management business anyone may desire. It could also be in the form of training the public on how to develop businesses through waste management. This will help to take care of the inadequacies of the operation of the State Waste Management Board in the city since more hands would be involved in managing wastes generated in various parts of the town. Lastly, government and individuals should take waste management serious in order to ensure a cleaner environment. Lastly, environmental law and edicts should be promulgated to avoid illegal dumping of refuse on

illegal sites. This should be sustained by the establishment of a monitoring group to punish defaulters. Although effective and enforceable environmental policies are difficult to develop and implement in many sub-Saharan countries including Nigeria, but this appear to be a viable solution if a country must be environmentally secured. In this wise, the re-introduction of the old sanitary inspectors is strongly recommended as a sustainable strategy for any environmental law that would be introduced to be efficient implemented in the area.

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