

Examining the Causes of Indiscriminate Waste Disposal in Karu Town, Nasarawa State, North Centrel, Nigeria

Andrew Noah Reigns¹, Oguche Christopher Joseph², Samuel Gwani³

¹Department of Geography, Federal University of Technology, Minna, Niger State, Nigeria

²Department of Geography and Environmental Management, University of Abuja, Abuja, Nigeria

³Department of Geography and Environmental Management, Nasarawa State University, Keffi, Nasarawa State, Nigeria

Abstract:-The aim of this paper is to examine the causes of indiscriminate waste disposal in Karu township using two sources of data. Primary data were obtained through questionnaires and personal field observation while secondary data were obtained from literatures. One thousand and twenty questionnaires were returned successfully and analyzed using quantitative method of analyzing data and statistical method. Descriptive statistics in form of tables, charts, and graphs were used. The result from the administered questionnaires shows that insufficient disposal of facilities are the most dominating reason for indiscriminate disposal of waste in the study area with the total of 27% respondents and people careless attitude is 6% while distance of facilities from residents is 11% but 56% of the respondents choose all the question ask as the reason for indiscriminate dumping of waste. In pursuit of a cleaner and healthier environment, jobs can also be created and generated automatically by embarking on waste recycling which is the waste to wealth idea of managing waste. The use of the Recycle method will aid in the reduction of land, water and air pollution in the area, health risk will be drastically reduced, the environment will be saved from unhygienic embarrassment, money (revenue will be generated and natural resources will be preserved for the future generation. This is the concept of Reduce, Recycle and Reuse method, which is the integrated solid waste management technique.

Key words: Waste disposal, Waste management, Recycling, Karu township

I. INTRODUCTION

Waste, according to Kumar Jain (2007) is almost anything that has served its original intended purpose and is being discarded. In effect, there is no human endeavour that does not result in waste creation. All survival and life improvement (development) activities go with the creation of one type of waste or the other. This fact is aptly captured by Cunningham, W.P. (2002), that waste management is everyone's business. By definition, Solid waste contain however not restricted to junk, garden waste, utilized engine oil, family unit chemicals, building remains, development materials. Solid waste doesn't comprise of rock, soil or dirt Anyanwu, N. C. (2014). We all produce unwanted by-products

and residues in nearly everything we do. As man processes and prepares food, waste is generated from the non-edible parts (i.e. peels husk, fibres, entrails); upon eating food, waste in the form of excreta is the final outcome; in clothing the body, waste is generated from worn out fabrics; in meeting our desires to comfort ourselves by acquiring varied material belongings, waste is generated when these are worn out or become old; and in our technological advancement, waste, most of which is dangerous to life, is generated.

Numerous huge amounts of hard waste are been created each day in Africa. A large portion of it are tossed into open dumps, wet terrains containing surface and ground water aquifers, effectively affecting foundations and poses as threat to wellbeing of people. The amount of solid waste for some urban areas and districts, are about 0.5 kilograms for every individual every day and sometimes increasing as high as 0.8 kilograms daily. This appear to be in reasonable structure contrasted with the 1-2 kg for every individual every day that is been produced in some poor countries, most waste in numerous African nations are not generally gathered by the metropolitan waste management system, due to poor waste management system, malfeasance, breakdown of equipments and insufficient waste management budget (KAPDA, 2014).

To say that waste management has been a serious problem in Nigeria particularly in the towns and cities is an understatement of the reality. Sporadic outbreaks of cholera, typhoid and the endemic nature of malaria including the annual rituals of flooding in Nigeria and other cities all point to poor or inadequate waste disposal especially on the limited infrastructures. Karu, a fast growing urban community a suburb of Abuja, has its fair share of poor waste management by residents. The indiscriminate dumping of solid waste along the roads, on drainages, residential buildings, streets, federal highways and pathways of Karu local government area is very disgusting. The dirt constitute eye sores, littering almost everywhere in the town. Karu which is a town very close to Abuja city and a fast growing settlement which receives thousands of visitors each day. It is home to thousands of

residents; because of its closeness to the federal capital territory, many migrants', workers and business individuals have found their residents in this fast urbanizing settlement.

Nonetheless, accumulation of dumpsites on urban features and facilities such as roads, drainages and recreation centres in many towns like Karu has amount to levels like those that triggers epidemics in the European cities about 500 years back. And the dilapidation of our limited infrastructural facilities has become worse and thus slow down the rate of development. The larger dumpsites were found on the edges of roads, neighbourhoods and close to or on some infrastructural facilities, indeed, even in ecologically delicate environments, and territories where ground water supplies are under genuine treat. They serve as hideouts for rodents, flies fowls and different living beings that serve as illness vectors. Likewise, smoke from burning of waste material may affect wellbeing of adjacent inhabitants as the odour additionally corrupts the air quality and contribute to global warming which leads to climate change. This is so important that on the 22nd – 27th of August, 2015 the residents of Lebanon had to take a proactive step to stage a massive protest against the location of mountains of waste dumpsite on their streets. They appeal to the government to evacuate the waste because such location is not ideal. (Aljazeera network news, 4AM 27th/08/2015.)

Individuals who come into the town with lots of properties alongside other residents generating a lot of solid waste ranging from plastics, nylons to cans, bottles and other materials without proper disposal mechanisms. The side effect of this negligence and indiscriminate dumping attitude especially as it affects the urban setting is worrisome. The mere volumes and quantities of waste generated is not so much the problem, but the consequences thereafter. Contamination of surface and groundwater sources, blocking of drainage infrastructures, decrease in air quality, flooding in the raining season, serious traffic jam, fire outbreaks especially in the dry seasons, street disturbance, and the breeding of vectors and pests which spread diseases are some of the many consequences of improperly managed/disposed waste and unusual location of dumpsites. Such haphazard attitude which will not guarantee a sustainable development for the area and the country at large is what warrants this study.

Adequate solid waste management (SWM) policies is actively carried out in advanced nations, this may not be the same with other developing countries, where insufficient funds, poor institutional planning, and use of poor technological method, little staff motivation, introduction of less environmental friendly products and steady increase in consumption trend continue to hinder effort to attain sustainable efficiency in the solid waste management sector Booth, B. (2001). "Municipal waste is gathered and managed by, or for districts. It covers waste from family units,

including substantial waste, related waste from business activities, workplaces, organizations and little businesses, garden waste, road sweepings, stuffing of litter holders, and business sector remains. Waste from metropolitan sewage systems and treatment, and additionally civil development and obliteration is rejected". Davidson G. (2011) describes the term 'municipal waste' as different types of waste whether created amid the extraction of crude materials, the handling of crude materials into other use, the utilization of conclusive items, stays from other human activities, including (residential, institutional, commercial, agricultural, healthcare, household, sludge and hazardous waste).

II. THE STUDY AREA

Karu town is located in Karu Local Government area in Nasarawa state in the heart of Nigeria. It lay between latitudes 8° 45"N and 9° 25"E and longitudes 7° 54"E and 10° 42"N east of the Greenwich Meridian. Karu Area covers a spatial extent of about 800sqkm Kendie, S.B. (1990). It extends from the eastern boundary of the Federal capital territory Abuja, (old Nyanya) to Gora about 15 kilometers to keffi. The planning area shares common boundaries with the federal capital territory (FCT) Abuja to the west, Keffi local government area to the south, Nasarawa local government area to the east in Nasarawa state and Jaba local government area of Kaduna satte to the north. Karu urban area has both urban and rural settlements. A suburb of Abuja city in central Nigeria. Karu is an urban area with conurbation of towns stretching to Nigeria's capital city, Abuja. Its districts include: Mararaba, Ado, New Nyanya, Masaka, New karu, Kurunduma, Aso, Gwandara and Auta- balefi

These are settlement that developed as an aftereffect of the quick development and extension of regulatory and town planning policies by the federal capital territory (FCT). Before the establishment of the FCT in 1975, the entire Karu zone was customary agrarian settlement known for developing yams and seed grains to bigger towns in Plateau and Niger states. It was a great amount of little, sparsely populated settlements, with around 85% of the settlements having populaces between 50-500 inhabitants Oteng- Ababio, M. (2011). High rate of urban development was discernible just in the 1990s this was after the movement of the new federal capital region from Lagos to Abuja in December 1991, Davidson G. (2011). This empowered the expansive movement of individuals to the FCT and the neighboring settlements which were themselves impromptu and with negligible assets however now suit around 60% of the Federal government and private workers. This has further brought about noteworthy changes in social, financial and political exercises and in area use, designs and different difficulties of urban sprawl and strong waste administration as well.

At present, the precise populace of the area is not known, but rather the National population Commission,

Hanley J. (2009) assessed the number of inhabitants of Karu town which was in line with claims by Karu local government; Nasarawa State Urban Development Board (NUDB); that the population of Great Karu Urban area is

about 117,560 (One hundred and seventeen thousand five hundred and sixty out of the total local government's population of 216, 230 inhabitants, (two hundred and sixteen thousand, two hundred and thirty).

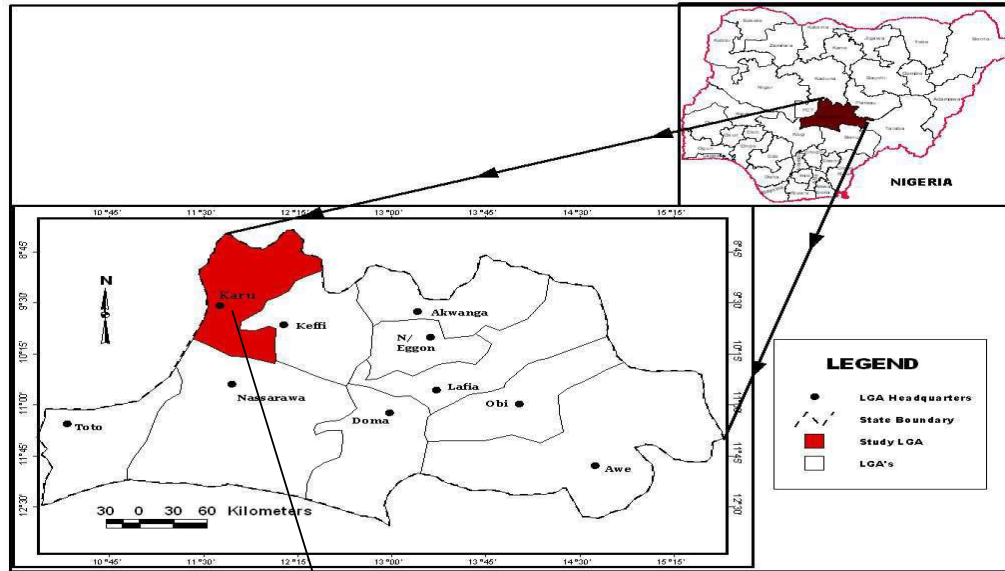


Figure 1.1 Map of Nasarawa state showing Karu Local Government Area (LGA).

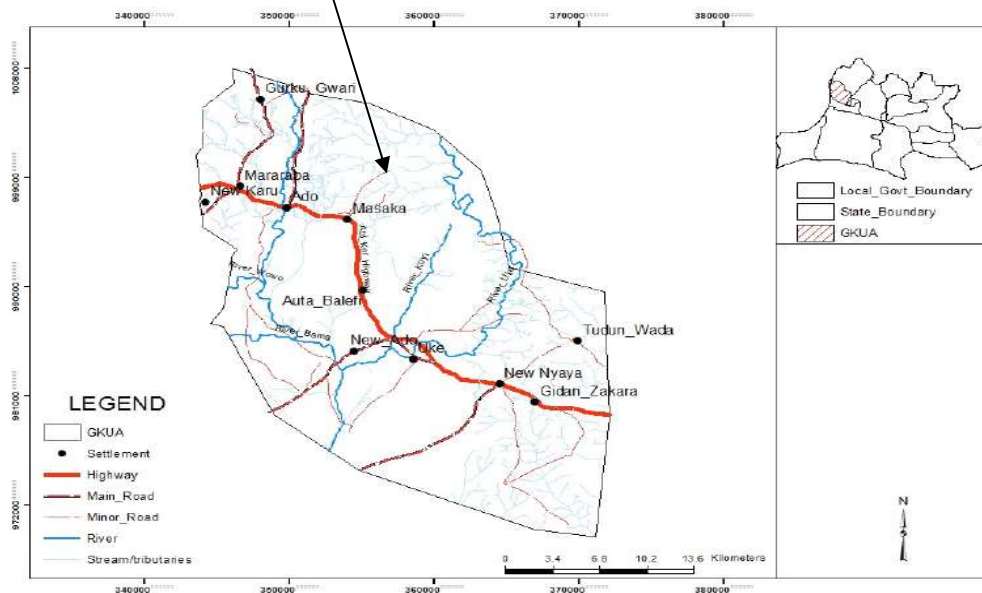


Figure 1.2 Map of Karutown showing the study area

Source: Ministry of Lands and survey Nasarawa state Housing and urban development, Lafia,

III. MATERIAL AND METHOD OF STUDY

3.1 The study population and Demarcation of the study area.

The target population for this study involved residents within Karu town and its spatial environment. It therefore include the people, the various dumpsites and the major urban features in

the area e.g. roads, drainage channels and water courses and the built-up areas.

3.2 Sample and Sampling procedure

The sample and sampling procedure used to acquire data for objective one and three involves the sampling population of

1200 (one thousand two hundred) residents that were randomly selected as the subset of the population for questionnaire administration. This 1200 questionnaire represent about 1.02 (%) of the population of 117,560 (One hundred and seventeen thousand five hundred and sixty) of Karu town according to the 2006 population census Kendie, S.B. (1990) The Sampling technique that was adopted in this study is the Simple random sampling technique. This technique is appropriate because of the diverse nature of the population and non-homogenous nature of the study area.

3.3 Instrumentation and Data required for the study:

The research was conducted in Karu town in Nasarawa State, Nigeria. The sources of data used for this work were both primary and secondary. The primary data which include; questionnaire administration to the resident of the area, personal field observation and the use of Global Positioning System (GPS) during the field survey of the study area by the researcher. The secondary data were obtained from literatures.

Table 3.1 Identification of the location of dumpsite coordinates in the area

S/No	District/dump	Northings (x)	Eastthing (Y)	Elevation (M)
1	Mararaba 01	9.03666667	7.593861111	418
2	Mararaba 02	9.028972222	7.595722222	431
3	Mararaba 03	9.0305556	7.597361111	428
4	Mararaba 04	9.029388889	7.598666667	419
5	Mararaba 05	9.027194444	7.603194444	430
6	Aso 01	9.029277778	7.600805556	418
7	Aso 02	9.029	7.601222222	419
8	Aso 03	9.03	7.602666667	413
9	Guruku 01	9.024638889	7.613055556	413
10	Guruku 02	9.019305556	7.610722222	427
11	Masaka 01	8.994611111	7.672416667	392
12	Masaka 02	8.99425	7.680055556	387
13	Masaka 03	8.993194444	7.680277778	381
14	Masaka 04	9.002388889	7.674083333	379
15	Gwandara 01	9.006472222	7.663055554	386
16	Tudun wada	8.90869444	7.719444444	317

Table 3.2 : Summary of data and data list for the research work

S/NO.	Data List	Data Type	Data collected	Data Source
1	GPS Points	Primary data	Dumpsites coordinate	Field survey
2	Administered questionnaire	Primary data	Respondents data for analysis	Field survey
3	Meter rule	Primary data	Distance of Dumps to features	Field survey

Source: Author's work, 2015

3.4 Method of data Analysis on the reasons for indiscriminate refuse dumps.

Frequency counts for each of the research questions on solid wastes dumps and residents perception on solid waste disposal and management were made and analyzed using quantitative method of analyzing data and statistical method. These include the 1200 structured questionnaires administered to the residents of Karu town. Furthermore descriptive statistics in form of tables, charts and graphs were used to analyze these data collected from the field and presents the results.

IV. RESULT AND DISCUSSION

4.1 Statistical Analysis

The data collected from the one thousand and two hundred (1200) administered questionnaires out of which one thousand and twenty (1020) were retrieved and analyzed are presented on table 4.1

4.2 Respondent background information

This section analyzes residents' background information in the area. Data gathered from the field survey were thus analyzed to buttress and enhanced the result of the research work.

Table 4.1: Background information of the respondents

SEX	RESPONSE	PERCENTAGE
Male	530	52
female	490	48
TOTAL	1020	100
AGE GROUP		
18 – 25	300	29
26 – 33	370	36
34 – 40	250	25
41 above	100	10
TOTAL	1020	100
EDUCATIONAL LEVEL		
Primary	50	5
Secondary	200	20
Tertiary	770	75
TOTAL	1020	100
Household size		
0 – 5	580	57
6 – 10	310	30
11 above	130	13
TOTAL	1020	100

Source: Author's work 2015

From table 4.1, the sex of respondent in the study area shows that male respondents are 530, representing 52% of the total respondents while female are 490, representing 48% of the total respondents.

Also from the same table, the age distribution of the residents in the study area between 26 -33 and 34 -40 rank highest when compared to the age group of 18-25 and 41 above. This is an indication that most of the residents of the area are within the active age population group.

The analysis on table 4.1 shows people of tertiary education ranking the highest this is an education that residents of the area are well educated.

The information on household size in the area on Table 4.1 indicates that the residents' population is active and still increasing.

4.3 Residents' perception on Solid waste problems and management

4.3.1 Various reasons for indiscriminate disposal of waste in the study area

The objective of this study is to find out the reason for indiscriminate disposal of waste in Karu town. The data collected from the 1200 structured questionnaire out of which one thousand and twenty (1020) were retrieved are presented below:

Table 4.2: Reasons for indiscriminate dumping of waste in karu

S/NO.	Reasons for indiscriminate waste dump	Frequency	percentage
1	Insufficient disposal facilities	280	27
2	Distance of facilities from house	60	6
3	Peoples attitude	110	11
4	All of the above	570	56
Total		1020	100

Source: Author's work 2015

The analysis and result from the administered questionnaires which was conducted in the SPSS software revealed that; Insufficient disposal facilities are the most dominating reasons for the indiscriminate disposal of solid waste in the area and this totaled about 27%, then the distance of facilities from residents where they are available amount to about 11%, while peoples careless attitude was about 6% among the reasons for indiscriminate dumping. Furthermore, the research discovered that the most common of all the disposal methods of municipal solid waste in the area is the open dumping method which was observed to be 56% among other means of waste disposal methods and the least used was incinerator method which is the act of burning public refuse.

The Corresponding pie chat in Fig 4.1 below shows that insufficient disposal facilities, people's careless attitude about waste and in some cases the facilities are located far from residents amount as the various reasons for indiscriminate dumping of refuse at various locations in Karu. The non-availability of disposal facilities such as wheeled waste bin, dump trucks, incinerators and garbage trucks, seems to be the major problem contributing to the reasons for indiscriminate dumping of waste in the area.

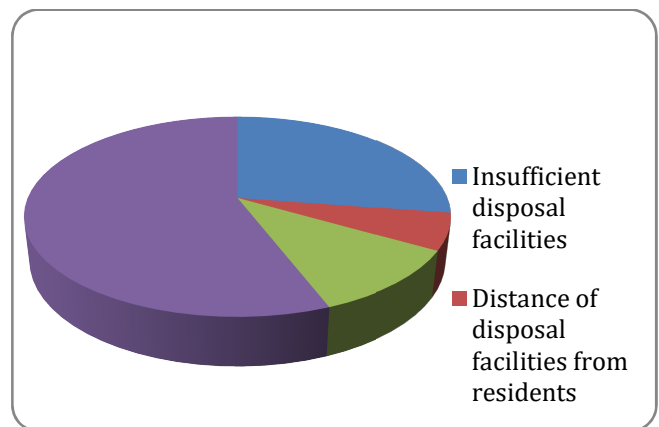


Figure 4.1 Various reasons for indiscriminate disposal of waste in the study area.

Source; Author's work 2015

Due to the above reasons, residents in the area adopted their own method of dumping waste, which this research has discovered during the field survey. The result on the prevailing method of waste disposal is presented on Table 4.2 and Fig 4.1 respectively.

Table 4.3: Prevailing method of waste disposal in Karu town

S/No	Method of waste disposal	Frequency count	Percent ages
1	NASEPA	340	33
2	Dumping in drainage	60	6
3	Neighbourhood/roadside dumping	560	55
4	Burning	60	6
Total		1020	100

Source: Author's work 2015

Table 4.2 shows that the organized disposal method by Nasarawa State Environmental Protection Agency is far below the disposal methods of burning and open dumping, which are highly dangerous to the environment. Such uncontrolled burning of solid waste produces a dangerous gas known as dioxin and other detestable substances while open dumps could serve as habitation for rodents and other dangerous animals in addition to the emission of offensive odour released to the environment.

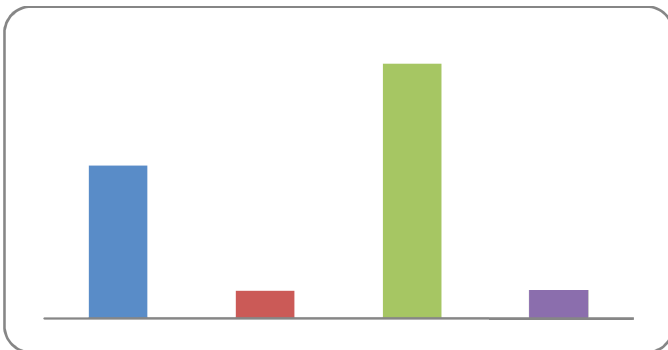


Figure 4.2: Prevailing methods of waste disposal practiced in the study area.

Source: Author's work 2015

Considering the various methods of waste disposal practiced by the residents of Karu, the study also tries to find out if the residents are comfortable with the prominent method of waste disposal in the area. The result is displayed on Table 4.8 and fig 4.3 respectively.

Table 4.4 People's perception on open dumping in the area

S/NO.	Perception on open dumping	Frequency	percentage
1	Not ideal	850	83
2	Ideal	170	17
Total		1020	100

Source: Author's work 2015

The result revealed that the residents considered open dumping as a wrong practice because of the ills associated with it.

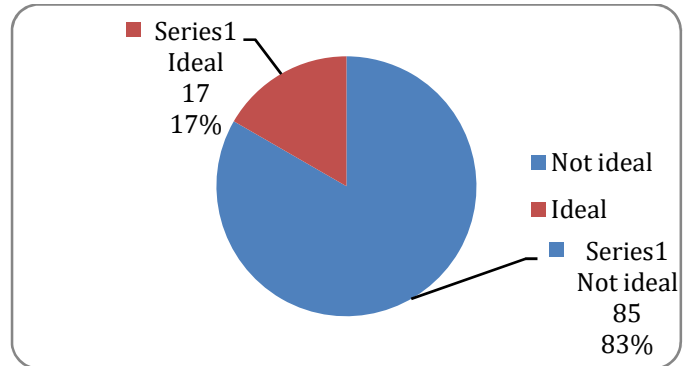


Figure 4.3 Residents perception on open dumping as methods of waste disposal

Source: Author's work 2015

The results in Fig 4.3 shows that open dumping is not ideal, the residents are not actually comfortable with the idea, but due to the problem of insufficient disposal facilities as noted earlier has made them to practice such method.

Table 4.5 Residents perception on the solution and alternative option to waste disposal instead of open dumping.

S/NO.	Suggested solution	Frequency	percentage
1	Provide incinerator/disposal facilities	310	30
2	Waste recycle	440	43
3	Provision of adequate landfill facilities	230	23
4	Others (all of the above)	40	4
Total		1020	100

Source: Author's work 2015

The research discovered that the Residents of Karu also have their suggestion to the problems of waste disposal. Considering the consequences of careless waste dumping in the area, about 30% of the sampled population has suggested the provision of waste disposal facilities to checkmate the problems of indiscriminate dumping in the area. While 43% of the sampled respondents have suggested that recycling of waste is the best option for managing waste generated within the area. This method of recycling is considered valuable because of the benefits attached to recycling programmes. Waste recycling project can help maintain a clean environment, curtail the huge amount of waste generation, generate employment for youth in the area and produce new products for home use. This is also known as the waste to wealth programme.

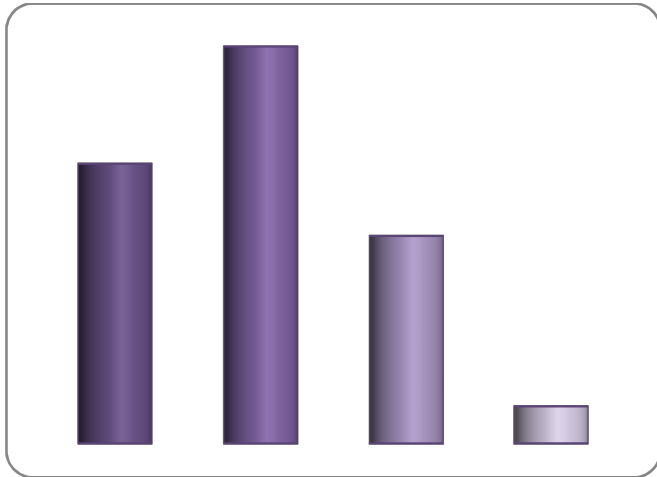


Figure 4.4 Residents perception on solution and alternative option to open dumping

Source; Author's work 2015

The waste to wealth initiative explains the use of modern technology in waste management. Figure 4.5 explains the initiative in a flowchart; the Scavenger collects valuable wastes from dumpsites and landfills and sells them to Agents and dealer usually referred to as Material recovery agents or firms. The dealer take these purchased solid wastes to their junk yard for sorting. These Sorted solid wastes are gathered to large heap that is more than truck full and then sold to relevant recycling industries. Recycling industries will in turn manufacture new products from these recovered materials and sell to the consumers. The consumer or general public utilizes the new products and generates new waste and they are disposed off into dustbins and dump sites again.

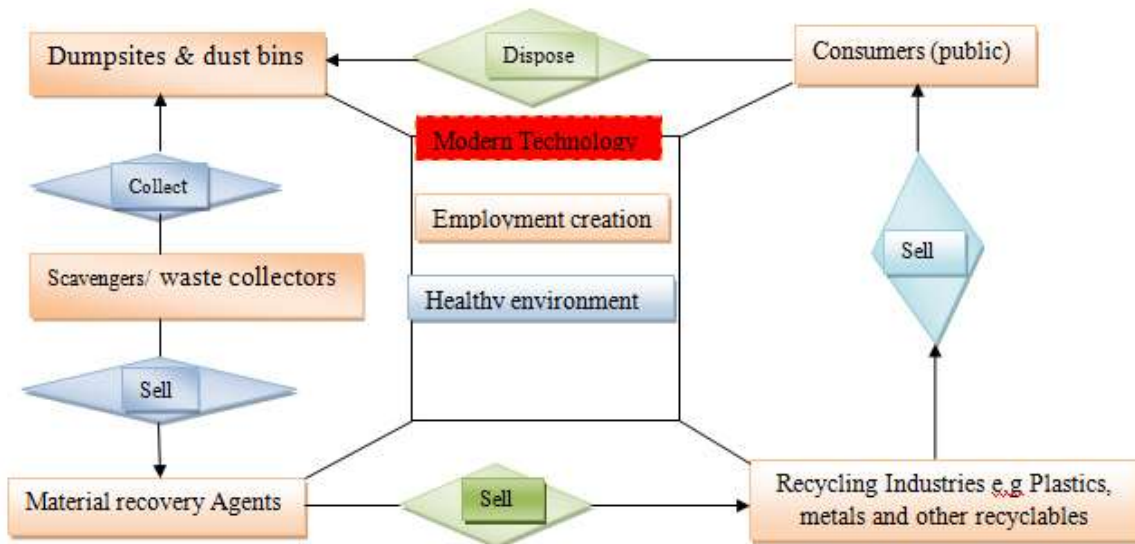


Figure 4.5 The Recycling or waste to wealth Initiative

Source: Davidson (2011)

V. CONCLUSION

The study had showed that improper disposal of solid waste poses potential risk to the environment and human health. The solid waste dump disposal practice in Karu is not in accordance with the best principles of public health and environmental protection. It was deduced from the analysis of the questionnaires that the majority of the residents in Karu practice the open dump disposal method and that waste constituents are usually solid in their forms. In pursuit of a cleaner and healthier environment, jobs can also be created and generated automatically by embarking on waste recycling which is the waste to wealth idea of managing waste. The use of the Recycle method will aid in the reduction of land, water

and air pollution in the area, health risk will be drastically reduced, the environment will be saved from unhygienic embarrassment, money (revenue will be generated and natural resources will be preserved for the future generation. This is the concept of Reduce, Recycle and Reuse method, which is the integrated solid waste management technique.

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