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The Concept of Waste to Wealth Market Operation in Mubi North Local Government Area of Adamawa State.

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ABSTRACT

The concept of waste to wealth which is the transformation of waste from an exhausted utility to a valuable commodity as a mechanism for effective solid waste management is yet to be properly utilized in Mubi north local government area of Adamawa state. The objectives included to identify the challenges facing waste market operation in Mubi North Local Government area. Questionnaires were distributed to 200 people. The numbers of respondents were evenly distributed on gender basis within the age group of 20-80 years. The result of the research revealed that 96% of the respondents are concerned about the volume of waste presently generated in the local government. 86% responded positively as they are supportive of waste recycled products especially for plastic/polythene products. 10% gave negative responds as they were of the opinion that recycle products may not be durable and efficient. 10% of the respondents are uncertain. 10% shows poor responds. 5% gave high negative responds. 95% indicate lack of sensitization and enlightenment on need for proper sorting before disposal. Participation in the waste market operation: 77% gave positive response, 10% gave negative responds and 13% of the respondents were uncertain. Those who responded saw the job as demanding, which can be attributed to the present perception of the job. Those who responded positively have been involved in the waste market operation indirectly as they have in so many occasions sold household recoverable waste in exchange for other useful items or money. This people would be encouraged more if government provides certain incentives necessary to make the market lucrative.

1.0 INTRODUCTION

Waste is a substance which is discarded after primary use, or it is worthless, defective, and of no use. The term is often subjective, because what is waste to one need not necessarily be a waste to another. Sometimes, the matter is objectively inaccurate, for instance, to send scrap metals to a landfill is to inaccurately classify them as waste because they are recyclable *(Konstantinos et al, 2022*). There are variety of waste, liquid or solid, emanating from human activities (domestic), agricultural or industrial activities (neither domestic nor hazardous), and hazardous or special. Faeces, indeed is also included in solid waste. Among the liquid waste, sullage, sewage, livestock and industrial wastes are known among communities (*Sridhar and Hammed, 2014*). Solid waste management has emerged as one of the greatest challenges facing state and local government environmental protection agencies in Nigeria. The volume of solid waste being generated continues to increase at a faster rate than the ability of the agencies to improve on the financial and technical resources needed to parallel this growth. Solid waste management in Nigeria is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal of solid waste (*Thisday News paper; 2010; Egun, 2012*). The quantity of solid waste generated in urban areas in industrialized countries is higher than in developing countries; still municipal solid waste management remains inadequate in the latter. Solid waste in developing countries differs from developed countries. Most developing countries, including Nigeria have solid waste management problems different from those found in industrialized countries in areas of composition, density, political, and economic framework, waste amount, access to waste for collection, awareness and attitude. The wastes are heavier, wetter and more corrosive in developing cities than developed cities (*Ogwueleka, 2009*).

The concept of Waste-to-Wealth literally means moving waste from a platform of exhausted utility to valuable and desirable level. Its transformation: in engineering, requires some form of energy, and in economics requires factor of production. The latent issue here is that "waste" in itself can never be wealth otherwise generator will never discard it. Likewise, wealth is created and process of creating wealth has some cost implications that the market forces construe as the price. This means that not all wastes are potentially of secondary benefit. In all, the slogan "waste-to-wealth connotes that waste management operations must transcend delivery of service to provision of goods or value like energy. The aim of this work is to examine the operation of waste markets in the Mubi, identify the challenges facing its operation, and create awareness on the need to explore opportunities inherent in waste market for environmental and economic benefits.

2.0: LITERATURE REVIEW

A survey was conducted on waste market operation and found to be different from the one I obtained.

(*Adinife and Salami, 2016*) from the result obtained in their study, it could be inferred that the level of knowledge of the effects of solid waste ecotoxicity, abiotic resource depletion, and health in Abeokuta households is high but for eutrophication. Practices such as non-sorting, separation and characterization of waste composition, indiscriminate dumping of refuse and the dumping on the immediate environment, canals, undeveloped lands, drainages, which connotes low safe and appropriate practices hamper exploitation and proper record of waste generated the high level of knowledge of the impact of poor waste management practices notwithstanding. It therefore demands that adequate and appropriate machinery should be put in place for proper and effective waste management in the metropolis.

(*Butu and Mshelia, 2014*) in their study showed that increase in population, uncontrolled and unplanned nature of most parts of Kano especially the old Kano city, Kano municipal council, Gwale, Daurayi and other areas compounded the problems of waste management. The municipal solid waste generation in Kano metropolis is very high, non-biodegradable waste such as polythene bags, the so-called pure water sachet and e-waste are scattered all over indiscriminately. These materials are known to contain high level of metals which are toxic when exposed to above certain limits. The biodegradable fractions of municipal solid waste disposed at major open spaces and highways in Kano are mostly food remnants, yard wastes, kitchen consumables and discarded papers for packaging. These biodegradable wastes have no direct chemical implication, but constitute environmental nuisance and good hideouts for diseases carrying vectors such as rodents, reptiles and insects.

(*Ebikapade and Jim, 2016*) in their survey, found out that Waste management across Nigeria have deteriorated significantly over time, without a doubt the management approaches employed in tackling waste management challenges have recorded very little success. Hence, only a handful of cities such as Lagos seem to be making significant progress in addressing the wastes management challenges inherent in their localities. The reason for this failure is that the approaches do not distinguish the different needs and diversities of cities across the country. In addition, the lack of coordination and expertise on waste management issues by the environmental agencies and other organs of Government promote inefficiency. It is clear from the paper that the bulk of the problems relating to waste management in the country is as a result of the unavailability of proper waste management policy.

(*David et al., 2015*) based on their findings of this study, it is imperative to stress that resources for running the waste management are harnessed and attention should be paid to storage, separation/sorting, collection

and transfer to respective processing unit before final disposal. Waste generation is inevitable due to human activities. As long as the populations demand for goods increase, so also would the waste. It is very important to understand the waste, their nature, problems associated with them, and how to dispose them off hygienically. In Nigeria today, there are no sewers or underground drainage system and as a result all liquid wastes find their way into water courses. There are no urinals or toilet facilities in many public areas. Schools are devoid of functional toilets. Solid wastes are found everywhere and anywhere. In Nigeria, waste is generated at the rate of 0.43 kg/head per day and 60 to 80 per cent of it is organic in nature (*Sridhar 2006; Ogwueleka 2009*).

A cow brought for slaughtering produces about 328.4 kg of wastes in the form of dung, bone, blood, horn and hoof. Sheep and rams produce about 0.9 kg waste per head per day (based on observation). The markets generate a variety of wastes, for example, corn cobs, vegetable wastes, packaging materials, etc. The household wastes also contain other materials such as paper, glass, metal, plastic, and other non-biodegradable materials and some of them are excellent raw materials for various industries in the country. People litter the roads with no civic concern. All these wastes contain a lot of valuable resources in the form of nitrogen, phosphorus, potassium and other chemicals which are useful (*Hammed et al. 2011*). Microorganisms play an important role in biogeochemical cycles and convert these valuable resources into harmless and useful products. However, there are certain wastes arising from industries or healthcare facilities which may be hazardous, infectious and need to be treated as special wastes.

2.1: Description of the Study Area

Mubi North is among the 21 Local Government Areas of Adamawa State. Mubi Area of Adamawa state is located on latitude 11^{o}5^{1}Nand longitude 13^{o}5^{1}E. It has altitude of 696m above sea level with an annual mean rainfall of 1,220mm and a mean temperature of 15.2^{o}c during Hamattan periods from November to February and 39.7^{o}c in April (ADADP, 1986). The town is essentially a mountainous landscape transverse by river Yedzaram and many tributaries, Mandara and Adamawa Mountains formed part of this undulating landscape (*Mansir, 2006*).

Fig. 2.1 Map of Mubi North Local Government Area

2.2: Waste Generated from Mubi North

Income and economic growth have impact on the composition of wastes. *Rotich et al. (2006*) established a positive relationship between income levels and waste generation at the household level as High-income earners consume more packaged products, which result in a higher percentage of inorganic materials, metals, plastics, glass, and textile. Waste characteristics vary according to season, income level, population, social behaviour, climate, and industrial production, the size of markets for waste materials and the extent of urbanization, effectiveness of recycling, and work reduction (*Hoornweg et al., 1999*).

Municipal solid waste composition in Mubi North Local Government Area, Adamawa State varies from one settlement to another and is dependent on the level of human and industrial activates taking place in these settlements, i.e. there are variations between urban/suburban and rural residential wastes. A closer observation shows that there exists a relative homogeneity of residential/ household waste generated across the local government area. A new dimension to municipal solid waste which is a general feature of developing/underdeveloped economies is the electronic waste (e-waste) ranging from bad/faulty television display screen (tube), faulty/damaged computer and electronic hard wares such as refrigerators and air conditioners (*Egun, 2012*).

In all of these, a common/general component of solid waste generated in Mubi North Adamawa State is plastics/polythene products. This can be attributed to their diversity in usage ranging from household to industrial and the absence of a recovery system for them when compared to metal scraps and bottles. The high level of reuse of recyclable waste reflects the extent of poverty in the developing countries. In developing countries, waste stream is over 50% organic material (*Hoornweg et al., 1999*).

Table 2.1: Percentage Composition/ Kg of Municipal Solid Waste in Mubi North Local Government Area of Adamawa Sate

S/No	Composition	Dump site 1 Kg	Dump site 2 Kg	Dump site 3 Kg	Average Kg of Solid waste	% Kg of Solid waste
1	Plastic/Polythene Products	0.38	0.36	0.37	0.37	37
2	Paper Product	0.17	0.18	0.19	0.18	18
3	Metals/aluminium Products	0.10	0.11	0.09	0.10	10
4	Vegetative materials Organic compost	0.22	0.23	0.10	0.21	21
5	Ceramics	0.07	0.05	0.06	0.06	6
6	Textile Materials	0.04	0.06	0.05	0.05	5
7	Others eg. Batteries Forms etc	0.02	0.03	0.03	0.03	3

2.2.1: Wood and wood products

Waste generated from wood products which range from wood shavings in the sawmill, wood used at building/ construction sites to condemned finished wood products such as household/ office furniture, have little or no economic cash return value as they are mainly used as firewood for cooking, especially among the low income earners as it is presently the cheapest source of cooking energy. The increase in poultry farming at subsistence level and as a Small/ Medium Scale Enterprise (SME) in the State concurrently lead to the increase and popularization of the litter system of poultry farming, were wood shavings from sawmills have found application as floor overlay for the collection of bird droppings and easy sanitation, thereby creating a waste market for it (*Egun, 2012*)

2.2.2: Waste Materials

Waste in this category includes all waste generated from plants and animal materials either in their processed form such as food wastes from households and restaurants, or unprocessed form such as those generated from poor handling of food materials from the farm to the market. These wastes are sold to interested persons who use them as adjuncts for animal feed in farms. It is estimated that nearly a quarter of all household waste is organic and can be composted. Vegetative waste generated at household level constitute a very large percentage of organic waste found at dumpsites as they arrive the dumpsites already decomposing and mixed with other forms of waste, thereby making their recovery unsuccessful. Compositing is undertaken in the open and the end product is used on farms as compost manure (*Egun, 2012*).

2.2.3: Metal Waste

This kind of waste popularly referred to as metal scraps are gotten from condemned gadgets, equipment and properties with metal components. Presently, this is the most lucrative waste material in the local government area and the state as they are collected as scraps and sold back to the steel industries as adjunct raw materials for new product formulation (*Egun, 2012*).

2.2.4: Glass Materials

Waste from glass materials are of two types. Those generated from electrical appliances (e-waste) such as electric bulbs and computer display screens have no economic value presently in the State; thereby ending up in the various dumpsite. While those generated from packaging such as wine bottles, drugs and drinks have economic return value as they are collected and sold back to their producers who reuse them for the same purpose or sold in the retail market to small scale enterprises who use them for packaging their produce such as cowpea nuts *(Egun, 2012*).

2.2.5: Plastics/ Polythene Materials

Waste from this material is presently a challenge to effective solid waste management in the Local Government as the rate of their reuse when compared to the rate of generation is very poor. At present there is no economic value attached to plastic waste in the Local Government Area; this could be attributed to the challenge of sorting and grading of polythene products leading to their voluminous presence at dumpsites (*Egun, 2012*).

2.2.6: Waste Market Operation

A waste picker is a person who salvages reusable or recyclable materials thrown away by others to sell or for personal consumption (*Srinivas, 2011; Egun, 2012*). Many terms are used to refer to people who salvage recyclables from the waste stream for sale or personal consumption. These terms include reclaimer, informal resource recovered, recycler, salvager, scavenger, and waste picker. In 2008, participants of the First World Conference of Waste Pickers chose to use the term “waste picker” for English usage to facilitate global communication. Although the term “scavenger” is also commonly used, but many waste pickers find it demeaning due to the implied comparison with animals (*Samson, 2008*). “Waste picking” is an activity motivated purely by economic need.

Forms of waste picking have been practiced since antiquity, but modern traditions of waste picking started during industrialization in the nineteenth century and over the past half century have expanded vastly in the developing world due to urbanization (*Wilson, et al., 2005; Martin, 2007*). This has led to millions of waste pickers worldwide, predominantly in developing countries, but increasingly in post-industrial countries as well (*Gowan, 1997*). Waste pickers are key actors in the informal economy, as they make vital social, ecological, and economic contributions to their cities and help mitigate global warming. In many cities, they provide the only solid waste collection service. Yet they face many hardships, including stigma, exploitation by middlemen, and hazardous working and living conditions (*Scheinberg and Anschütz, 2007*). In Nigeria, recycling activities are not popular. However, the recovery of materials from wastes (scavenging) is practiced on a large scale. This type of recovery takes place at both legal and illegal dump sites where scavengers search continually for valuable metals, plastics, and bottles to be reused or for sale to buyers of different type of scraps. Waste market in Mubi North Local Government Area of Adamawa State is presently an informal private sector market with unregulated activities, which is operated mainly by small enterprises and waste pickers who are driven by poverty and desire to earn a living. The practice of scavenging is a widespread occurrence at existing waste dump sites in the State as opposed in most developed countries, and is to be expected at new disposal sites unless policies and/or programs are implemented to prevent the practice. The waste pickers operate by scavenging waste directly from the various dumpsites, the streets of neighborhood in search of abandoned metal scraps and other useful recoverable waste. In the course of their activities, they are open to negotiations for the purchase of valuable waste from households and establishments (*Egun, 2012*).

These collected wastes are then taken to the scrap market locations which are owned and operated by individuals who play the role of middlemen in the waste market business, especially for glass and metal waste. At the scrap shops the waste are further sorted, weighed and bought from the waste pickers. These middle men known as “Waste Traders” then take upon themselves the responsibility of transporting and supplying these wastes to the various industries which utilize them as raw materials. The financial gain made by the waste picker is dependent on the purchasing price of the waste trader and also on the bargaining power with waste generators in situations when the waste has to be purchased. The increase in financial gain for the waste when the waste is gotten for free has resulted to their conspicuous presence at dumpsites, and some of them exhibiting criminal behaviours of stealing valuable materials from private and public premises. In some cities, waste pickers have been known to steal, meltdown, and resell public property such as telephone electrical copper wires, steel fence, or manhole coverings *(Martin, 2007).*

3.0: METHODOLOGY

Data were collected through the use of a questionnaire by using stratified random sampling to administer to two (200) hundred people with the age range of 20-30, 31-

50, 51-60, and above 60 as can be seen in figure 3.1. Among the people that were contacted based on educational profile are 16 with no education, 50 with primary education, 72 with secondary education and 62 with tertiary education and above as can be seen in figure 3.2. Considering occupation, the people that were contacted are 12 farmers, 60 traders, 30 salary earners, 38 food vendors and 60 skilled workers as can be seen in figure 3.3. Issues affecting waste market operations were asked. A total of 200 people were interviewed, with the number of respondents evenly distributed on gender basis.

Table 3.1: Demography Profile of Respondents

Characteristics	Number of Respondents	Percentage Respondents
Sex		
Male	100	50
Female	100	50
Age		
20 to 30	20	10
31 to 50	90	45
51 to 60	50	25
Above 60	40	20
Educational Level		
No Education	16	8
Primary Education	50	25
Secondary Education	72	36
Tertiary and above	62	31
Main Occupation		
Farming	12	06
Trading	60	30
Food Vendor	38	19
Salary Earner	30	15
Skilled Workers	60	30

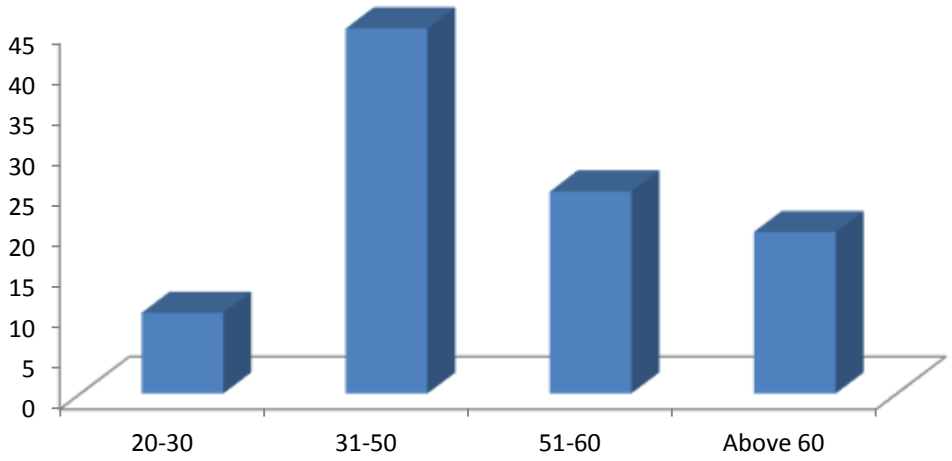

Fig 3.1: Demography profile of Respondent Ages

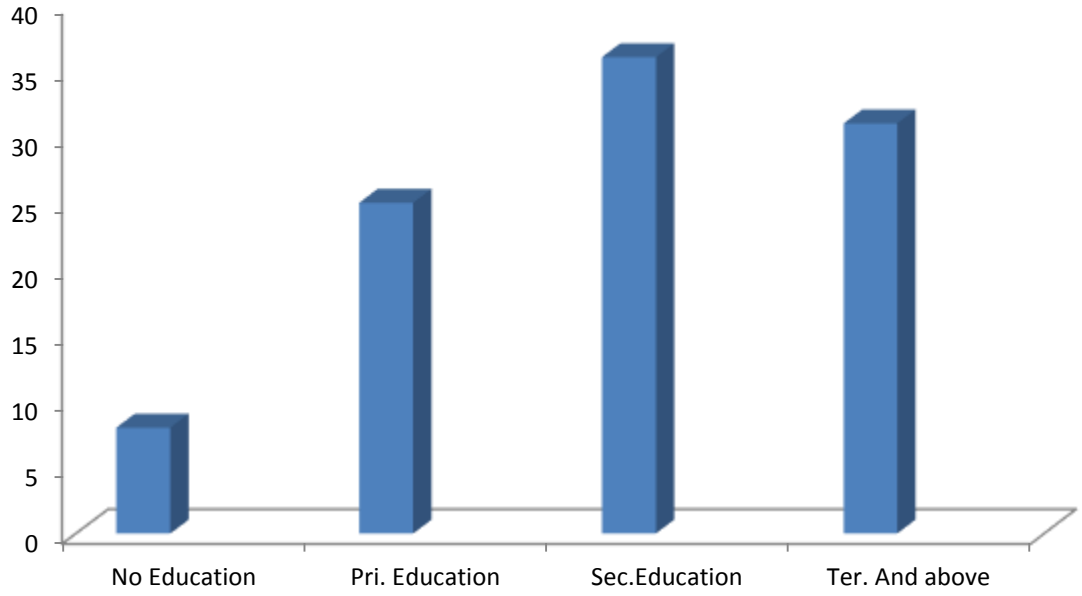

Fig. 3.2: Demography profile of Respondent Education Level

Fig. 3.3: Demography profile of Respondent Main Occupation

4.0: RESULTS AND DISCUSSION

Figure 4.1 shows that, majority of the respondents of about (96 %) are concerned about the volume of waste presently generated in the local government area; an indication of an increase in environmental awareness among the citizenry but lack environmental consciousness as reflected in their attitude to waste generation and disposal. However, 4% are not concern about the volume of waste generated and the effect on human life and non of the respondents are unconcern about the waste generated. Pertaining to the purchase of and use of recycled waste, majority of the respondents about (80%) responded positively as they were supportive of waste recycled products especially for plastic/polythene products which is a major concern in

the local government area; 10% of the respondents gave a negative response as they were of the notion that recycled products will not be durable and efficient as their un-recycled counterparts; and 10% of responses were uncertain, which could be attributed to their lack of knowledge about the concept of recycling. The use of compost fertilizer had 90% positive response and uncertain response of 10%. The high positive response is attributed to their background knowledge of cultural agricultural practices. Awareness on the concept of waste separation before disposal showed a poor positive response (5%) and a high negative response (95%), an indication of lack of sensitization and enlightenment on the need for proper waste segregation before disposal, as present enlightenment done on waste management has been centered on proper disposal of waste using waste bins/tanks with the aim of preventing water erosion and flooding as a result of waste blockage of water drainages; and having a cleaner environment. Those who responded positively to waste separation/sorting before disposal where mostly those who have had the opportunity of living in cities where it is been practiced; and are not presently doing so because of the absence of adequate facilities. Also, on the issue of participation in the waste market operation; 77% of the respondents gave a positive response, 10% responded negatively and 13% of the respondents were uncertain. 05% show awareness on the concept of waste separation before disposal and 95% show no awareness on the concept of waste separation before disposal. Those who responded negatively saw the job as a dirty job, which can be attributed to the present perception of the job. Those who responded positively have been involved in the waste market operation indirectly as they have on several occasions sold household recoverable waste such as bottles, metal scraps, newspapers and abandoned electronics to waste pickers/scavengers for a token amount of money or in exchange for other useful household items.

Table 4.1: Respondents replies to issues affecting waste market operation

Questions and Responds	Percentage Respondents
Are you Concerned about the Volume of waste generated	
Yes No Uncertain	96 04 00
Do you Purchase products made from recycled waste	
Yes No Uncertain	80 10 10
Do you normally use Compost Manue	
Yes No Uncertain	90 00 10
Do you Participate in Waste Market Operation	
Yes No Uncertain	77 10 13
Do you have the Knowledge of waste separation before disposal	
Yes No Uncertain	05 95 00

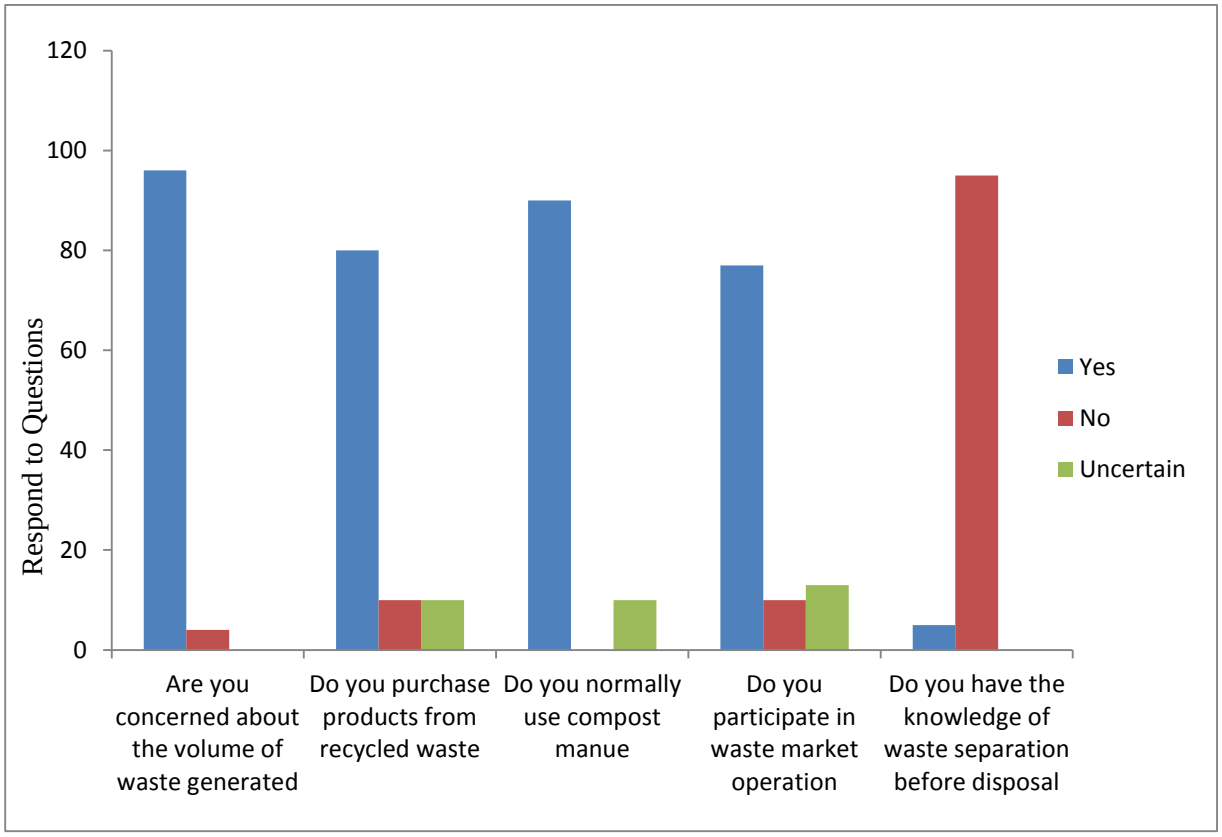

Fig. 4.1 Respondents replies to issues affecting waste market operation

5.0 CONCLUSION

Many people in Mubi Local Government are of Adamawa State are concerned about the Volume of waste generated especially on the dumpsites. It was observed that a large number people dwelling in Mubi buy these waste and resell them to the whole sellers or industries to get money. It has become a livelihood to many people in the community. It was also gathered that because of high cost of fertilizer some people resulted to using vegetable wastes generated from homes as compost manue on their farms. Many people are self employed because of the money involved in waste market operation to earn a living. However many people also lack the knowledge of waste separation before disposal. Today it can be seen that, when waste management service is delivered and money paid for by the generator, it means that waste has provided wealth and can be construed as waste-to-wealth. Consequently with this extension, effective waste management practice has become not only service but an instrument for eradicating poverty. Government and the people should realize that proper waste management system provides clean environment and employment for the people.

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