

Waste Scavenging as a Tool for Poverty Reduction among Unemployed Youths in Bauchi Metropolis, Nigeria

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Abstract

Municipal solid waste (MSW) is troublesome to manage because it consists of diverse range of materials such as glass, metals, plastics, papers, food, nylon, vegetable, dead animals. The main objective of this study is to assess the effect of waste scavenging on poverty reduction and unemployment in Nigeria. Poverty is prevalent in most developing countries and these forces the poor to make the most of the resources available to them due to their very low incomes, scavenging provides them with reusable and sellable materials. In doing so, the poor have developed creative ways in order to satisfy their needs, including the recovery of items not necessarily part of the waste stream. Scavenging renders economic and environmental benefits, such as providing income to unemployed individuals, supplying inexpensive raw materials to industries, reducing the demand for collection, transportation and disposal of waste. Despite the non-formalization of waste scavenging as a job in most developing countries of the world. The finding of this study revealed that the 409 respondents engaged in waste scavenging were earning livelihood in the process. A descriptive statistical technique was used in analyzing the collected data and the results summarized. Scavenging encourage family members to sort out materials from wastes in exchange for money, it supplies raw materials for a lot of recycling enterprises and this creates more jobs for people especially the youths.

Keywords: Municipal Solid Waste (MSW), Scavenging, Waste Stream, Poverty, Disposal.

Introduction

Wastes, as defined by Adegoke (1990), is a substances or materials which are being disposed of or are required to be disposed after primary use. While Ajadike (2001) defined waste as man's unwanted materials that need to be discarded.

Also, Magaji (2005) sees municipal solid waste as materials that are no longer valued to the person responsible for it and not intended to be discarded through a pipe. It does not normally include human excrete. It is generated by domestic, commercial, industrial, health care, agriculture and mineral extraction activities and accumulates in streets and public places. It may not be generally accepted that solid waste, and indeed wastes are useless", unwanted or discarded (undesirable) materials" given the degree of scavenging on wastes heaps in less developed countries (LDCs) by both human and animals.

Hand picking or gathering of relevant materials by man may not be considered as a strange event in the history of man anthropologically. People recover the materials to sell for reuse or recycling as well as diverse items for their own consumption. These individuals are generally known as 'scavengers' or waste pickers "*Baban bola*" and the activity they undertake are called 'scavenging'. Scavenging involved in the initial collection, purchase and processing of recoverable materials. Scavengers are not refused workers and they are not concerned with waste management; they are involved into trade for socio-economic reasons and consider waste as a resource which is processed for market purpose. They only collect those waste materials for which there is market value.

The picture of scavenging that emerges from reviewing literature is an occupation that provides a livelihood for the poor. Scavenging is an important survival strategy in which impoverished individuals coped with scarcity. To Martin (2007), scavenging takes place in all stages along the waste management system that is; source separation at household or the place generating waste materials; here material are reused, sold or given away, for example, old newspapers are used for packaging. Baton and Oloverira (1992) observed that during collection, scavengers sort out recyclables for sale. Scavengers also retrieve recyclables at dumps, on the streets or public places, in canals and rivers, at landfills prior to burial and purchase some of the separated recyclables from residents. Scavenging is ubiquitous occurrence throughout the developing world. WSCD (2005) estimated that up to 20% of the population in the third world countries survive by recovering materials from waste. Scavengers salvage materials to sell for recycling as well as repairable and reusable items and sell or use it themselves. The recovery of material for waste by scavengers in developing countries takes place in the wide variety of settings; although the circumstances in which materials are recovered in a particular place may be unique, it is obvious as opined by Blincow (1985) that scavengers source their materials from two major ways that is, either sorting or collecting freely from dumps and landfills, or by buying the already sorted materials from households.

Poverty is prevalent in most developing countries and this force the poor into searching for livelihood in most of the resources available to them. Vogler (1984) stated that given the very low incomes in most developing countries, scavenging provides them with reusable and sellable material. In doing so, the poor have developed ways in order to satisfy their needs, including the recovery of items not necessarily in the waste stream. In Mali, many farmers search and dig artifacts produced by ancient Mali Empire in order to sell them to art collectors (Holmes, 1984; Medina, 2005). In Calcutta, scavengers work along the rail road's tracks in order to recover the places of coal that fall from the train (Furedy, 1984; Medina, 2005). In Vietnam scavenger dig on agricultural fields and jungles searching for scrap metal left over from the war (Blincow, 1986).

Scavenging contribute to the reduction of the amount of solid waste disposed and also helps to save the natural resources which lead to sustainable development. It creates jobs and extra income for people especially the poor. Scavenging encourage family members to sort out materials from wastes in exchange for money, it supplies raw materials for a lot of recycling enterprises and this creates more jobs for people especially the youths who dominate the activity. Scavenging generate economic and environmental benefits such as providing income to unemployed individuals, supplying inexpensive raw materials to industries, reducing the demand for collection, transportation and disposal of waste. Evans and Stoddert (1990) argued that scavenging is a process that is well practiced in developing countries. In fact, scavenging is a source of employment that is why the attempts to abolish the practice in some cities met with a strong resistance. Scavengers roam the streets looking for items that can be reused; other Scavengers conduct their activities at disposal sites.

Nigeria like other developing countries, scavenging among the unemployed begins with the collection of plastic bags, bottles, papers, cardboards, aluminum, iron, rubber materials, cans, and it mostly takes place in the informal sector.

In Bauchi town, the realization of very large waste tends to attract local scavengers. These scavengers play an important role in the process of waste recycling. As the government and its agencies are battling with the management of waste, certain individuals also scout for items that could be recycled for local industries that may need it. In developing countries like Nigeria, the need to survive due to the economic problem has forced some of the citizens to devise scavenging as a means of livelihood. They go from one place to the other; picking waste that can be recycled. They are often found on the streets, in open dumps or landfill areas, some of them even go as far as visiting homes to request for used items.

Clearly, scavenging can be a profitable activity and of significant environmental benefits. Thus, the effects of practicing this activity on waste pickers deserve careful study. A serious investigation on this topic is required. OBJ This research therefore is an appraisal to the socio-economic impact of municipal waste scavenging and its health implications in Bauchi Town.

Statement of the Problem

Poverty and unemployment are the two devils disturbing the Nigerian economy. Many Nigerians are living in abject poverty despite the various Poverty Alleviation Programmes (PAP) put in place by different administration. This situation forces some people to look for alternative way of survival. Scavenging which involve handling waste material to select recyclable one for economic benefit is adopted by many as an alternative source of livelihood despite the possible health challenges involve in the activity.

Objectives of the study

The main objective of this study is an appraisal of the socio-economic impact of municipal waste scavenging and its health implication. Other specific objectives include to: -

- To examine the views of respondents on solid waste scavenging
- To evaluate the views of the respondents on economic benefit of waste scavenging
- To identify the influence of solid waste scavenging on poverty reduction among unemployed youths in Bauchi city.

Literature review

Municipal solid waste management practices are the techniques or methods employed by urban dwellers in the collection, storage, transportation and disposal of solid waste generated from day to day activities. MSW is troublesome to manage because it consists of diverse range of materials such as glass, metals, plastics, papers, food, nylon, vegetable, dead animals etc (Afon, 2003). According to Sheehan and Knapp (2000), waste problems are generally due to resource management, as a result of bad design, and ultimately, the result of bad decision making (Lombardi, 2001). However, zero waste is a new way of looking at or managing our waste stream. Instead of seeing used materials as garbage in need of disposal, they are seen as a valuable resource. Piles of trash represent jobs, financial opportunity and raw material for new products (Matsch, 2000). It involves reuse and recycling instead of our throw away norm/ideas (Oyelola and Ojo, 2004). Recovering of resources from waste is a major player in the reduction of our urban waste stream; it conserves our natural resources and more environmentally benign (Botkin and Keller, 1997; Raven et al., 1998; Moses, 2004). Wikipedia (2012) describes a waste picker (scavenger) as a person who salvages reusable or recyclable materials thrown away by others to sell or for personal consumption. Such practices

eliminate a lot of materials that may be dumped, burnt or buried as waste. This goes to say that if what constitute our waste is segregated and their uses found, they can be good sources of raw materials for our cottage industries, generate employment and income, and equally rid our cities of refuse dumps or reduce our waste stream destined for final disposal.

In municipal solid waste management of developing countries typical problem areas can be identified. These can be described by Zurbrugg (2003) to constitute inadequate service coverage and operational inefficiencies of services, limited utilization inefficiencies activities, inadequate landfill disposal and inadequate management of hazardous and healthcare waste. The need to understand community participation and community-based environmental management initiatives have been addressed by researchers and concerned institutions for the several years now (Richardson, 2003, Omran 2006, Omran & Garrilescu, 2008).

A review of literature reveals that a great number of studies on solid waste management have been undertaken even prior to 1970 (Van Backering, Sehker, Reyer Gerlagh, Kumar, 1999). Earlier studies show that the prime consideration management of the public officials was the quick waste removal and destruction (Melosi, 2005). During the 1970s the debate shifted to issues of waste utilization focusing on the technical and economic issues surrounding the allocation and utilization of available resources. Also, the existing state of the art of resources recovery for management municipal waste was examined (Beve, 1976, Von Heidenstam, 1977). The early studies reveal that recycling in the past was mostly industrial and based on financial considerations to reduce production cost, unlike the current emphasis on recycling as a way of reducing waste in the environment and preserve dwindling resources (Cointrean, Grumereon, Huls, Seldman, 1984; Diwekar, 2005).

During time, systems approaches have also been attempted at by authors dealing with one or few aspects of municipal solid waste management (Imam H, Mohammed B., Wilson, Cheeseman, 2008, Omran and Read, 2008, Zurbrugg, 2003, Van Beukering et al, 1999). Tsiliyannis (1999) discussed the main environmental problems related to municipal solid waste management and in particular those concerning pollutant releases. The analysis was based on the solid waste composition of Athens, Greece, and the facilities were assumed to meet EU Directives as to include the proper disposal of residues. It was found that land drilling with energy recovery produces slightly higher air pollution and greenhouse gas releases mainly owing to the emission of uncollected biogas. Chang and Wang (1997) proposed a fuzzy goal programming approach for optimal planning of solid waste management systems, in which they consider four objectives economic costs, noise control, air pollution and traffic congestion limitations.

During the past fifty years, cities in the developing world have undergone rapid urbanization between 1987 and 2015; the number of urban dwellers is expected to double. Nearly 90 percent of this increase will take place in the developing world, where a growth rate exceeds 3 developed countries (UN-Habitat, 2003).

A positive correlation tends to exist between a community income and the amount of solid waste generated. Wealthier individuals, who consume more than people on lower income, generate a higher rate of waste. The processes of accelerated population growth and urbanization translate into greater volume of waste generated. Globalization can promote economic growth, a desirable outcome; however, this economic growth in addition to population increase and urbanization will seriously strain the municipal resources in order to deal with a booming amount of waste (Beall, 2010).

Higher income and economic growth also tend to have an impact on the composition of waste. Wealthier individuals consume more packaged products, which results in a higher percentage of inorganic materials-metals, plastics, glass textiles and so on is the waste stream (Medina 2010).

Higher volumes of waste and a changing composition have a profound impact on waste management practices. More waste being generated, and with a higher content of inorganic materials, could have a significant impact on human health and environment. If the additional waste resulting from population and economic growth is not collected, treated, and disposed of properly, health and environment in urban areas of the developing world will further determinate (Beall, 2010). Distinct differences have been identified in literature between municipal solid waste management in developed and developing countries. In most developed countries, public health is no more a major drawer of waste management, the current focus is on optimization of waste management practices with a broader goal of resource conservation (McDougall, 2011). Municipal solid waste management in most developing countries is often characterized by inadequate service coverage, operational inefficiencies of service, limited utilization of recycling activities, inadequate management of non-industrial hazardous waste and inadequate landfill disposal (Zurbrugg & Schertenleib, 1998). Most cities in the developing countries do not collect the entire waste generated by their residents, which has a negative impact on human health and the environment. In areas that are not served by the municipality's local entrepreneurs provide waste collection for a fee.

Types of Waste

People associate waste collection with the periodic collection of household waste. However, the problem is more complex. Besides residential customers waste companies also have industrial customers, where requirements differ from typical residential wishes. Industrial customers typically produce larger amounts of waste, which requires a different pick-up system. Also, the collection of recyclables is becoming increasingly important in a society where resources are perishable and environmental concern is growing. Finally, special attention is given to some publications that deal with hazardous materials.

Waste Scavenging

Scavenger concept is not a new phenomenon, but what is new is its perception as a big jolt of society. Various ancient studies have described the socio-economic conditions of scavengers how they are in families shared the work load of their parents and their existing problems. With the many competing demands, on their resources, the developing societies are often unable to do everything that is necessary to give the children their rightful place in the community. The result is that many scavengers in their tender age are exploited at work. There are many studies, scholars, experts of respected subjects, government agencies, NGO's etc. conducted research particularly scavenger socio, livelihood, health conditions they are;

Deviprasad (2007) in their exploratory study reviews the nature and practice of forms of manual scavenging in different areas in Andhra Pradesh, the castes that are engaged in the practice, their social profile, work conditions, and the impact of programmes taken up to eliminate the practice and rehabilitate the scavengers. The study is based on semi structured interviews conducted with leaders involved with issues of the Safai Karmacharis and other Dalit NGO leaders. A number of respondents were purposively selected from the scavenger's communities to obtain first-hand information about their work living conditions and the problems confronted by them. This material was supplemented in official statistics drawn from different sources. A scavenger is one who is wholly or partly engaged in the occupation of manually removing night-soil from dry latrines, or the manual handling of the dead bodies of animals and humans. The practice is reported to be still prevalent in both rural and urban areas, and women form the bulk of the work force. The study begins with a presentation of official statistics on the numbers of persons practicing form of scavenging as an occupation, a description of the different caste groups engaged in this occupation in Andhra Pradesh

(Relli, Madiga, Mala and Yanadi, 2006) their work conditions, and the occupational hazards faced by them. This is followed by an outline of government schemes for the removal of scavenging and the rehabilitation of scavengers, and a description of some notable NGOs working in this area. The researcher stresses the need to create awareness among the scavenging communities about the programmes for their benefit, given top priority to education for the children of scavengers; prepare schemes for the rehabilitation of scavengers in consultation with leaders and NGOs; develop women-specific programmes, in view of the high concentration of women in this occupation; improve the work conditions of scavengers by the introduction of modern technologies; and monitor the health status of scavengers, particularly women.

Socio-Economic Impacts of Waste Scavenging

In most Nigerian communities, retrieval of metal, glass, plastic or cellophane and other recyclable and reusable items from solid waste is the main occupation of waste-pickers. Solid waste reuse and recycling are respectively, second and third in the waste management hierarchy. Reduce, reuse, recycle, compost, incineration and landfill are technologies widely adopted by developed countries. Material recovery facility technology has not been well developed in Nigeria. Even if locally available the quality of recyclables and reusable material in that locality can be negligibly small compared with the magnitude of capital outlay required to install an effective recovery facility technology. Waste pickers suffer many more illnesses and injuries than the general population.

Particularly, prevalent are gas from terminal, respiratory and skin disease, lead poisoning and cuts from needles and broken glass (Cointreau, 2000). Working in hazardous conditions has serious consequences for waste keepers. Life expectancy of Mercian waste keepers is 11 years lower than that of the overall Mercian population (53 versus 64) (World Bank 1994). Infant mortality among the Zabbelin waste collectors in Cairo is much higher than that of other residents of the city with about one in four infants dying before reaching their first birthday (Medina 1997) waste-pickers are part of society and waste picking poses substantial health and safety risks to them. Government holds the responsibility of enhancing the quality of life of the waste – pickers, by helping them improve their working and living conditions, increase their incomes, expand their employment options and improve access to education and social services (Janis 2004).

Availability of recyclable items in solid waste stream in Nigeria influences the activities of waste-pickers. There is a need to examine the solid waste composition in Nigeria, so as to ascertain the quantity of recyclables in the waste stream. This will enable government and non-government organizations (NEOS) to take actions to improve the waste-pickers' productivity and working conditions, and ensure safe and effective disposal of solid waste. Most recyclables in the northern countries are supplied by households on a voluntary basis, whereas the main sources of these materials in the south are the waste-pickers and itinerant waste-buyers that Gerlagh, Van Beukering, Verma, Yadaw and Pandey (1999) collect these materials for livelihood the only available means of recovering recyclable materials from the solid waste stream in Nigeria is through the waste-pickers.

Theoretical and Conceptual Framework

Multiple Modes of Livelihood Approach

This study is based on the concept of sustainable waste management. According to De Montfort University Leicester (2012), sustainable waste management can be defined as using material resources efficiently to cut down on the amount of waste produced, and where waste is generated, dealing with it in a way that actively contributes to the economic, social and environmental goals of

sustainable development, managing waste is not only how we dispose garbage in landfill, or how much we recycle or what we recycle, but it is also how we do not create waste to start with.

Some Theories Related to Poverty Reduction

1. Individualist theory of poverty: This theory suggests that the cause of poverty roots from individual failure and laziness. The advocate of this theory Spenser believe that poor person should not be assisted because doing so will make him/her poorer.
2. Theory of culture of poverty: This theory holds that the individual is not supposed to be blamed for his poverty status, but his individual culture. The advocate of this theory Oscar Lewis relates culture to beliefs, attitude, behaviour and language.
3. Marxist theory of poverty: This theory does not blame the poor and his culture for their poverty status, instead they placed their blame on market-based capitalist economy and fluctuations.
4. Functionalism: This theory believes that poverty is beneficial because it helps society to operate smoothly by making some groups in the society to work for others and to devise means of getting out of the poverty.

This study is linked to individualistic theory and cultural theories of poverty as it encourages individual to rise up and the challenge of life. While changes in culture allows for the engagement into businesses to earn a living.

Methodology

Study Population

The populations of the study are the members of the communities who are above eighteen (18) years of age and scavengers found on sites or at collection points. And according to national bureau of statistics (UN World Population Prospects, 2021), Bauchi local government at which Bauchi metropolis is located and chosen for this study has a population of 621,000.

Sampling Methods and Collection of Study Data

Sampling Technique

The communities were stratified into three (3) based on their income and residential density. However, this study utilized the mapping produce by Local Empowerment and Environmental Management Project (LEEMP, 2008), out of the fourteen (14) wards of the local government, six (6) communities were strategically selected using Ms excel random number generator and the respondents were randomly selected from the selected communities.

Sampling Size

Selection of sample size in studies like this of paramount importance because it assists in the precision of the collected data and the process involved and it also reduces the level of sampling error which also enhances the level of the research accuracy. Levy and Lemeshow (1999) argued that there is correlation between sampling error and achieving low mean square error (MSE) of estimates at a particular cost in a sample. In determining an adequate sample size, there is an existing interactive relationship between population size and sampling error (Sallant and Dillman, 1994). In order to achieve an acceptable level of sampling error, a larger sample from the population is required.

For this study, face-to-face mode of survey elicitation with 440 samples was employed to avoid higher sampling error using Yamane (1976) formulae of determining sample size.

Sampling Units

Another sampling process is to identify and select the respondents who will represent the population in answering the questionnaire. In this study, the units consist of the individuals or households, because it was found that estimates made based on individual sample of respondent yield greater value than household sampling unit (Kaffashi, 2016; Quiggin, 1998).

For the purpose of this study, each community will be allocated questionnaires base on its population size and the direct face-to face interviews with heads of the household as the priority but the female head could also be interviewed in a situation where the head is not present.

The area under study comprises of the following wards: Old GRA, New GRA, Fadaman Mada, Ibrahim Bako, Yelwa, Makama, Nassarawa, Dan Iya, Hardo, Dankade, Dawaki and Dan'amar ward respectively. From each the wards in the area under study, central/dedicated dump site is considered in order to ensure adequate coverage. Being a relatively large area, the Encarta Microsoft Corporation was used for the identification of the dump sites within the areas which made it possible to employ systematic sampling technique. The systematic sampling technique was used for the selection of sampled sites by selecting the samples and households at random to ascertain the possible socioeconomic effects of the sites and activities.

Data Collection

For this study, the data was carefully elicited in the months of April, May and June, 2021. The respondents of the study were of both sexes, and due to the cultural and religious constraint of the metropolis, the enumerators were male and female as well. The female enumerators administer questionnaires to female respondents at their respective houses or working places, while the male enumerators attend to male respondents.

Questionnaire Design and Administration

The structured Questionnaire survey method of information elicitation has been adjudged to be the main instrument or technique used in quantitative studies (Jagsi et al., 2015; Ware et al., 2000). It is a design sets of questions or statements aim at eliciting responds from respondents either by writing their views or by selecting from a given choices of options (Coombe & Davidson, 2015; Kerr & Churchill, 2001). Therefore, the main instrument to be applied in the collection of data in this study is the direct face-to-face questionnaire interview method.

The structured questionnaire survey of both the dichotomous choice and the multi-category format consisting of three (3) main sections of; Section **A** deals with the demographic characteristics of the study participants which included gender, age, occupation, household size and income levels of the respondents. Section **B** is on Solid Waste and comprised of activities involved in solid waste scavenging as well as possible economic benefits derivable from solid waste scavenging as a means of lively hood.

Result and Discussion

Socio-demographic profile of the Respondents

The output result of the socio demographic characteristics of the respondents is presented in table 4.1 as the total retrieved questionnaires from the respondents was four hundred and nine (409) when male respondents constituting 302 (73.8%) while that of women is 107(26.2%) respondents. These can be linked to the socio cultural and religious belief of Muslims of northern Nigeria that mostly prevent their wives and female associate from staying outdoors and taking part on socioeconomic activities.

The age mean score of the respondents is 35 years and respondents age ranging from 18-25 years constitute of 99(24.2%), 115(28.1%) while those fall within the range of 26-35 years covered 103(25.2%), respondents fall within the range of 36-45 years, while 50(12.2%) and 42(10.3%) fall within the range of 46-55 years and 56 and above years respectively.

From the survey result, the marital status of the respondents indicates that married respondents constitute of 273(66.7%) while non-married (singles) are 136(33.3%). The respondent level of education indicates that 100(24.4%) attended a non-formal type of education, those with primary qualification were 73(17.8%), 168(41.1%) respondents that have secondary school qualification constituted majority of the research respondents. Those that attended colleges, polytechnics and university (tertiary education) constituted only 68(16.6%) of the respondents.

The result of the occupational status of the respondents shows that 88(21.5%) are farmers, while 149(36.4%) are being employed by government while those that are self-employed were 112(27.4%). 22(5.4%) of the respondents are unemployed while students, housewife's and pensioners constitute of 10(2.4%), 16(3.9%) and 12(2.9%) of the total survey respondents respectively.

Respondents tribes indicates that 355(86.8%) are hausa fulanis, yoruba and igbos constitute 32(7.8%) and 22(5.4%) respectively. From the survey, family size ranging from 1-4 people per house constitute of 182(44.5%), 56(13.7%) respondents fall within the family size range of 5-6, 68(16.6%) respondents fall within the family size range of 8-10s, while 105(25.2%) fall within the range of 11 and above.

The respondents gross monthly income indicates that 132(32.3%) earn between N10,000-N20,000 monthly, those that earn between N20,001-N30,000 were 112(27.4,6%) while those within the range of N30,001-N40,000 were 99 (24.2%) respondents and N40,001-N50,000 were 54(13.2%) of the respondents. Respondents with the highest monthly income of N50,001 above constituted only 12(2.9%) of the survey respondents. The mean score of gross monthly income of the respondents from the result analysis is N25,597.

Table:1 Socio-demographic profile of the Respondents

Element		Freq.	Percentage (%)
Gender	Male	302	73.8
	Female	107	26.2
Age	18-25	99	24.2
	26-35	115	28.1
	36-45	103	25.2
	46-55	50	12.2
	56 and above	42	10.3
Marital Status	Non married	136	33.3
	Married	273	66.7
Educational level	Non formal	100	24.4
	Primary	73	17.8
	Secondary	168	41.1
	Tertiary	68	16.6
Occupation	Government employed	149	36.4
	Self-employed	112	27.4
	Farmers	88	21.5
	Unemployed	22	5.4
	Pensioners	12	2.9

	Students	10	2.4
	Housewife's	16	3.9
Tribe	Hausa Fulani	355	86.8
	Yoruba	32	7.8
	Igbo	22	5.4
Family size	1-4	182	44.5
	5-7	56	13.7
	8-10	68	16.6
	11 and above	105	25.2
Level of Income	N 10,000- N 20,000	132	32.5
	N 20,001- N 30,000	112	27.4
	N 30,001- N 40,000	99	24.2
	N 40,001- N 50,000	54	12.2
	N 50,001 and above	12	2.9

Source; field survey, 2020

Respondents Views on Solid Waste Scavenging

The descriptive analysis result of the respondent's on questions 6,7,12,13,14,16,18,19,20,21,22,23 and 24 is presented on table 4.2 below.

Majority of the respondents choose to that their response that is a dedicated dump in their communities with 270(66.0%) indicating yes and 139(34.0%) responded as no with a dedicated site. Response to the follow up question on, are solid waste disposed there in the dump site shows that 270(66.0%) say yes while the 139(34.0%) say no to the said question. 237(57.9%) of the respondents shows that they know the meaning of scavenging while 172(42.1%) indicates that they don't know the meaning of scavenging which will adversely affects their response. When ask on their observation of waste scavengers around the dump sites in their communities, 296(72.4%) indicate yes that they do observe them while 113(27.6%) say that they do not. The respondents' response on weather scavengers are easy to identify shows that majority of them say yes with a population of 394(96.3%) and only 15(3.7%) say they are not easy to identify. A question on scavengers going to school for learning indicates that 237(57.9%) of the respondents agree that they attain to one form of formal education in the past or currently while 172(42.1%) disagree that they do not attain to any formal education, on the families awareness of the wards engagement in scavenging, 118(28.9%) and 291(71.1%) chooses yes and no respectively.

The respondents views on scavenging restriction to dump sites shows that 121(29.6%) chooses yes and 288(70.4%) chooses no to the raised question while the follow up question on if scavengers go round house to house to pick solid waste indicates that all the 120(15.9%) say no that they do not. Government interest on scavenging activity was ask to get the awareness of the respondents, and the outcome responses shows that 259(63.3%) indicates that the Bauchi state government have interest on waste scavenging while 149(36.4%) disagree by indicating a no response. But to follow up question tries to justify the government interest based on the respondents awareness and their response shows that 304(74.3%) states that there is justification by choosing yes while 105(25.7%) indicates that there is no any justification from the government whereas, 255(62.3%) of the respondents indicates that yes there is a program indicating Bauchi state government interest on scavenging of solid waste and 154(37.7%) indicates no that they are not aware of any program on it and about 262(64.1%) of the respondents indicates that yes the Bauchi state government have

established an agency in relation to scavenging while 147(35.9%) indicates no, that they are not aware of such agency.

Table 2: Respondents response on dedicated dump site and scavenging

Questions	Yes Freq.	No Freq.	Yes %	No %
Q6- Is there any dedicated dump site in your community?	270	139	66.0	34.0
Q7- Are solid waste disposed there in?	270	139	66.0	34.0
Q12- Do you know the meaning of scavenging?	237	172	57.9	42.1
Q13- Do you observe scavengers around the dump site in your community?	296	113	72.4	27.6
Q14- Are solid waste scavengers easy to identify?	394	15	96.3	3.7
Q16- Do you think majority of the scavengers goes to school?	237	172	57.9	42.1
Q18- Are the families aware of their wards engagement in scavenging?	118	291	28.9	71.1
Q19- Is scavenging activity restricted to dump sites?	121	288	29.6	70.4
Q20- If yes, do they go house to house picking solid waste	-	120	-	15.9
Q21- Is government interested in the activity?	259	149	63.3	36.4
Q22- I yes, is there any justification in Bauchi town?	304	105	74.3	25.7
Q23- If yes, is there any state program to this regard?	255	154	62.3	37.7
Q24- Is there any established agency to this regard?	262	147	64.1	35.9

Source; field survey, 2020

Other questions raised on this section that requires the respondent to indicate their opinions based on the occurring activity of solid waste scavenging are;

How do they collect their solid waste? And the responded as 189(46.2%) using dustbin, 105(25.7%) using polybags and 115(28.1%) using the available refuse heap around their community whereas the method of their disposal indicates that 127(31.1%), 42(10.3%) and 240(58.7%) disposed through dumping at nearby dumpsites, nearby drainages and collection by private waste collectors respectively and the reason for the choosed method of disposal above shows that dumping at nearby dumpsites 127(31.1%), dumping at nearby drainage 42(10.3%) and collection by private waste collectors indicates 240(58.7%). The respondents' reasons for choosing any of the methods above shows that about 241(58.9%) chooses the practice because it is the least expensive while 83(20.3%) and 85(20.8%) choses that it is the practice in their communities and there is no other option respectively.

The times per week for waste collection shows that about 198(48.4%) of the respondents waste is collected once a week, followed by 52(12.7%) to those that don't know how many times their waste is been disposed weekly while 45(11.0%) chooses that their waste is been discarded every now and then, 44(10.8%) voted for there is no collection in their communities, 39(9.5%) tick that their waste is been collected twice a week and those that indicates daily waste collection constitute of 31(7.6%) of the total respondents.

Table 3: Respondents response on waste disposal and collections

Element		Freq.	Percentage (%)
How do they collect their solid waste?			
	Dustbin	189	46.2
	Polybag	105	25.7
	Refuse heap in the compound	115	28.1
How do you dispose your solid waste?			
	Dumping in nearby dumpsites	127	31.1
	Dumping in nearby drainages	42	10.3
	Collect by private waste collectors	240	50.6
Why do you choose the method stated above?			
	This is the practice in the community	83	20.3
	It is the least expensive	241	58.9
	There is no other option	85	20.8
How many times per week is your waste been collected from your house?			
	daily	31	7.6
	Twice a week	39	9.5
	Once a week	198	48.4
	Every now and then	45	11.0
	There is no collection	44	10.8
	Don't know	52	12.7
What is there age range?			
	10-15 years	74	18.1
	16-20 years	75	18.3
	21 years above	260	63.6
What is the family educational status of majority of the scavengers?			
	Literates	237	57.9
	Illiterates	172	42.1

Source; field survey, 2020

Respondents Views on Economic Benefits of Solid Waste Scavenging

Table 4.4 shows the 409 respondents interviewed during the field survey, 317(77.5%) respondents indicates "No" that the scavenged waste products were not kept at home and the remaining 92(22.5%) responded "Yes" that the waste are been kept at home based on their opinion and in the follow up question, all the 317(77.5%) of the respondents that "Yes" the waste products are been sold out. Whereas 237(57.9%) of the respondents indicates "Yes" that they know points were solid waste products are been sold and 172(42.1%) indicates "No" that they don't know any point were solid waste are sold.

Table 4: Respondents response on dedicated dump site and scavenging

Questions	Yes Freq.	No Freq.	Yes %	No %
Q6- Do think these scavengers take waste product collected back home and just keep?	92	317	22.5	77.5
Q7- If no, do they sell them?	317	-	77.5	-
Q12- Do you know any point where solid waste products are sold?	237	172	57.9	42.1

Source; field survey, 2020

Socio-Demographic Profile of the Respondents

The socio demographic characteristics of the scavengers is presented in table 4.6 with only 92 scavengers respondents with male scavengers respondents constituting 92 (100%) and no female scavenger. The age mean score of the respondents is 35 years and respondents age ranging from 18-25 years constitute of 99(24.2%), 115(28.1%) while those fall within the range of 26-35 years covered 103(25.2%), respondents fall within the range of 36-45 years, while 50(12.2%) and 42(10.3%) fall within the range of 46-55 years and 56 and above years respectively.

From the survey result, the marital status of the respondents indicates that married respondents constitute of 273(66.7%) while non-married (singles) are 136(33.3%). The respondent level of education indicates that 100(24.4%) attended a non-formal type of education, those with primary qualification were 73(17.8%), 168(41.1%) respondents that have secondary school qualification constituted majority of the research respondents. Those that attended colleges, polytechnics and university (tertiary education) constituted only 68(16.6%) of the respondents.

The result of the occupational status of the respondents shows that 88(21.5%) are farmers, while 149(36.4%) are being employed by government while those that are self-employed were 112(27.4%). 22(5.4%) of the respondents are unemployed while students, housewife's and pensioners constitute of 10(2.4%), 16(3.9%) and 12(2.9%) of the total survey respondents respectively.

Respondents tribes indicates that 355(86.8%) are hausa fulanis, yoruba and igbos constitute 32(7.8%) and 22(5.4%) respectively. From the survey, family size ranging from 1-4 people per house constitute of 182(44.5%), 56(13.7%) respondents fall within the family size range of 5-6, 68(16.6%) respondents fall within the family size range of 8-10s, while 105(25.2%) fall within the range of 11 and above.

The respondents gross monthly income indicates that 132(32.3%) earn between N10,000-N20,000 monthly, those that earn between N20,001-N30,000 were 112(27.4,6%) while those within the range of N30,001-N40,000 were 99(24.2%) respondents and N40,001-N50,000 were 54(13.2%) of the respondents. Respondents with the highest monthly income of N50,001 above constituted only 12(2.9%) of the survey respondents.

Table 5: Socio-demographic profile of the Scavengers

Element		Freq.	Percentage (%)
Gender	Male	92	100
	Female	0	0.00
Age	18-25	9	9.8
	26-35	35	38.1
	36-45	27	29.4
	46-55	16	17.3
	56 and above	5	5.4

Marital Status	Non married	25	27.2
	Married	67	72.8
Educational level	Non formal	73	79.4
	Primary	15	16.3
	Secondary	4	4.6
	Tertiary	-	-
Occupation	Government employed	-	-
	Self-employed	92	100
	Farmers	-	-
	Unemployed	-	-
	Pensioners	-	-
	Students	-	-
	Housewife's	-	-
Tribe	Hausa Fulani	89	96.7
	Yoruba	3	3.3
	Igbo	-	-
Family size	1-4	32	34.8
	5-7	47	51.2
	8-10	9	9.8
	11 and above	3	3.3
Level of Income	N 10,000- N 20,000	9	9.8
	N 20,001- N 30,000	11	12.0
	N 30,001- N 40,000	7	7.6
	N 40,001- N 50,000	53	57.6
	N 50,001 and above	12	13.0

Source; field survey, 2020

Scavengers Response on Solid Waste Scavenging

The descriptive analysis result of the scavengers on questions 25, 26, 27 and 28 is presented on table 4.6 below shows that the years spent by the scavengers on the scavenging activity is, 38(41.3%) scavengers spent less than 2 years and 54(58.7%) spent above 2 years. Majority of the scavengers indicates that they are not engage in scavenging activity due to lack of parental care by choosing No with 77(83.7%) and indicating some yes that they are into it due lack of parental care with 15(16.3%) responses. Response to the follow up question on, which of the following factors leads them to scavenging shows that 41(44.5%) indicates lack of access to education while 33(35.9%) indicates lack of other jobs and 18(19.6%) chooses lack of education and job. 67(72.8%) of the scavengers indicate no, that even if they been provided with other job or admission, they will not quit scavenging while 25(27.2%) indicates yes, they will quit.

Table 6: Scavengers response on solid waste scavenging

Questions		Freq.	%
Q25- How many years do u spent on scavenging?	Less than two	38	41.3
	years	54	58.7
	Above two years		

Q26- Are you engage in the activity due to lack of parental care?	Yes	15	16.3
	No	77	83.7
Q27- If no, which of these is another factor?	Access to education	41	44.5
	Lack of other job	33	35.9
	All of the above	18	19.6
Q28- If offered another job/admission; will you be willing to quit scavenging?	Yes	25	27.2
	No	67	72.8

Source; field survey, 2020

Respondents Views on Economic Benefit of Solid Waste Scavenging

The descriptive analysis result of the respondent's responses on questions 29, 30 and 31 is presented on table 4.7 below.

317(77.5%) of the respondents choose no, that waste collected products are not taken back home and keep and 92(22.5%) of the respondents indicating yes, they are keep at home and the 317(77.5%) of the respondents answered that yes the collected waste products are sold out after collection. Response to the follow up question on either the respondents know any point where solid waste products are sold shows that 237(57.9%) say yes while the 172(42.1%) say no to the said question.

Table 7: Respondents response on economic benefit of solid waste scavenging

Questions	Yes Freq.	No Freq.	Yes %	No %
Q29- do you think these scavengers take waste product collected back home and just keep it?	92	317	22.5	77.5
Q30- If your answer to the above is no, do they sell them?	317	-	77.5	-
Q30- Do you know any point where solid waste products are sold?	237	172	57.9	42.1

Source; field survey, 2020

Table 8: Scavengers response on economic benefit of solid waste scavenging

Element	Freq.	Percentage (%)
Q32- Where do you pick your solid waste products from?		
Dump site only	-	-
Directly from households only	-	-
Both	92	100
Q39- How do they value your solid waste collected?		
Weighing	92	100
Bargaining	-	-
Q41- How much do you earn averagely per day?		
Less than N500.00	-	.
N 500.00 to N 1000.00	-	-
Above N 1000.00	92	100

Source; field survey, 2020

On the scavenger's responses to questions 33, 34, 35, 36, 37, 38, 40, 42 and 43 is shown on table 4.9 below. The result shows that on question 33, 92(100%) of the scavengers indicates yes that they pick waste products at homes for free, on the follow up question in question on either they pay, 92(100%) of the scavengers indicates no, on the next follow up question on either they exchange other goods to waste, 92(100%) of the scavengers indicates no. on the scavengers views on the question of, do they take collected waste products back home and keep and the answer no with 92(100%) responses, while their responses to the follow up questions on, do they sell the waste products collected indicates that 92(100%) of the scavengers responded yes. When the scavengers are been asked on, if people are willing to buy waste products from them, 74(80.4%) vote yes and 18(19.6%) vote no. while 92(100%) of the scavengers indicates yes, that they are satisfied with the weighing and bargaining valuing method and 92(100%) of the scavengers indicates yes, that they make a living from the income they generated. Finally, 89(96.7%) indicates that they wish for improvement in the scavenging activity while 3(3.3%) indicates no.

Table 9: Scavengers response on economic benefit of solid waste scavenging

Questions	Yes Freq.	No Freq.	Yes %	No %
Q33- Do you pick your waste products from homes for free?	92	-	100	-
Q34- If no, do you pay?	-	92	-	100
Q35- If no, do exchange for other goods?	-	92	-	100
Q36- Do you take waste collected back home and keep?	-	92	-	100
Q37- If no, do you sell?	92	-	100	-
Q38- If yes, are people willing to buy from you?	74	18	80.4	19.6
Q40- Are you satisfied with weighing or bargaining?	92	-	100	-
Q42- Do you make a living from income generated?	92	-	100	-
Q43- Do you wish for improvement in the activity?	89	3	96.7	3.3

Source; field survey, 2020

Conclusion

The study concludes that elderly respondent that attained tertiary level of education with a higher income level and higher awareness level constitutes the target market that would contribute to revenue generation for biodiversity conservation in Yankari game reserve. Also, the engagement of youths in scavenging has improve their earning thereby providing livelihood for those involved.

Recommendations based on the finding of this study include;

- Government should encourage waste recycling that provide market to the scavengers and helps to reduce waste in the environment.
- Safety awareness lectures be organised by both government and Non-Governmental organisation on the health risk involve in waste scavenging.
- The follow up responses of the respondents give an insight about the respondent willingness and non-willingness to pay on natural resources conservation, and it also provide useful guides for policy makers for the development of sound environmental policies and management strategies.

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