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IMPACT OF INFORMAL SECTOR RECYCLING ACTIVITIES OF WASTE SCAVENGING IN GOMBE METROPOLIS

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Abstract

Informal recycling activities of waste scavenging are associated with health risk and social problems. Despite these problems, a sizeable number of the urban poor population in Nigeria depends on recycling materials from waste for their livelihoods and household poverty reduction. This study utilized data collected from questionnaire survey, in-depth discussion guides and open-ended interviews to examine the demographic characteristics of waste scavengers, income levels from scavenging activities, the working conditions and problems of waste collectors and pickers in Gombe metropolis. For the purpose of data collection, the researcher enumerated 300 waste pickers across the 10 wards that make up the study area and using systematic sampling technique, 150 respondents were selected for the study. The socio-economic and socio-demographic characteristics of scavengers differ from location to location and the findings of this study reveals that 92% male and 8% female respondents of the urban poor engage in waste scavenging activity as an option of securing their livelihood. The 150 informal waste collector participants in the study recovered about 151,200 tons of recyclable materials from the waste stream on an annual basis and this translate to an income of ₦2,186,000.00 on a monthly basis with 34.7% of the respondents earning above the ₦18,000 national minimum wage with their economic impact estimated at ₦26,232,000 annually. It also shows that engagement in waste scavenging activities provides income comparable with national minimum wage in the public sector and thus helps in poverty reduction. The recovered items reduces the volume of the waste stream at the final dump sites and serve as raw material input for some industrial processes particularly in the metal conversion industries. Based on the findings, recommendations on the restructuring and integration of informal recycling with the formal waste management sector in order for it to be lucrative to generate more jobs were made.

Keywords: Informal refuse collectors, informal sector, recycling, scavenging, waste management

Introduction

The informal sector enterprises has been described variously by authors and scholars as been characterized by small-scale, labour-intensive, largely unregulated and unregistered, low-technology manufacturing or provision of services (Wilson, Whiteman and Tormin, 2001). The informal sector recycling activities of waste scavenging is that segment of the private sector that operates outside the official legal and institutional framework for solid waste management (Ukoje, 2012). In the context of municipal solid waste management (MSWM), the informal recycling sector refers to the waste recycling activities of scavengers and waste pickers (Bernstein, 2004). The term is also used to describe those involved in the extraction of recyclable and reusable materials from mixed waste. In most cases, the informal sector enterprises do not pay taxes, have no trading license and are not included in social welfare or government insurance schemes (Haan, Coad, and Lardinois, 1998).

Recycling activities in industrialized countries have become popular and some nations promote recycling through financial incentives and provision of market for these recyclables. In Europe, regulation on waste management anchors around recycling and recovery of waste (DEFRA, 2009). Most recycling activities in developing countries are performed by the informal sector with minimal if any input from institutions of the state (Castells and Portes, 1989; Cointreau-Levine, 1994; Ahmed and Ali, 2004; Wilson et al., 2006).

The Informal recycling sector is very active in solid waste management in Nigerian urban cities since the metropolitan authorities tasked with waste collection and disposal has no formal recycling programme or strategy. Material recovery facility does not exist, consequently materials reuse and recycling activities throughout the metropolis is limited to household reuse and scavenging activities of the urban poor. The participants operate majorly as itinerant waste buyers and scavengers by targeting valuable materials such as plastics, bottles, papers, used electronics and electrical equipments, glasses, tins and cans, scrap metals among others and their activities have great impact in the reduction of the net volume of waste disposed (Sicular, 1992; Agarwal et al., 2005; Masocha, 2006 and Ukoje, 2012). Most recently attention of researches on SWM in Nigeria has shifted to waste recycling as an approach to urban environmental management and livelihoods (Adeyemi et al., 2001; Agunwamba, 2003; Nzeadibe and Eziuzor, 2006; Nzeadibe and Iwuoha, 2008, Ukoje, 2012).

For the urban poor in developing countries, informal waste recycling is a common way to earn income. Generally, in developing countries, the rapid rates of urban growth with the attendant increasing poverty, inadequate public services, and a generally low- skill labour force have made urbanites to increasingly rely on informal means of earning income (Ukoje, 2012). With respect

to SWM in Nigeria, unreliable services in waste collection and disposal make refuse to be readily available for the informal sector waste scavengers. For many people within the urban context it is a means of employment for the unemployed (Wilson et al, 2005; Ahmed and Ali, 2004). The significance of these developments have generated advocacy by scholars and policy makers for adoption of informal recycling activities of waste scavenging as a strategy towards poverty alleviation in urban areas and the integration of informal sector with the formal SWM system (Ukoje, 2012). From the foregoing, it clear that scavenging activities of the urban poor have contributed greatly to the recovery and recycling of waste materials in a way that promotes environmental sustainability. Available literatures and current discourse on the impact of informal sector recycling activities on the economies of mega cities in Nigeria and other developing nations focused on poverty reduction, income generation for the participants, economic growth, waste reduction and resources conservation (Adama, 2012; Nzeadibe and Anyadike, 2012; Ezeah et al, 2013). Waste scavenging and informal sector waste recycling activities in Gombe has not received research attention. This paper examines the impact of informal sector waste recycling activities on wealth creation, their operational structure and associated occupational health risk.

Methodology

Description of the study area

The Gombe Emirate like other territories in Northern Nigeria was founded during the Jihad of the Fulani religious leader Shehu Usman dan Fodio since 1804. Gombe, located on latitude 10.2^0N and longitude 11.1^0E is the capital of Gombe State created from the old Bauchi State in 1996 and it is a fast-growing town situated in the sudan savanna zone of Nigeria. Gombe metropolis is located on latitude $10^0 16^{/} 0^{//}$N -$10^0 18^{/} 0^{//}$N and longitude$11^0 8^{/} 0^{//}$E- $11^0\ 12^{/} 0^{//}$E. It has a landmass of 20,265km^2. The wards that make up Gombe metropolis include Arawa, Tudun Wada, Pantami, Jekadafari, Tumfure, Gabuka, Shongo, Kumbiya, Madaki, Bolari and British Cotton Ginnery Area (BCGA) with 50–60% building density (Fig. 1). The climate over Gombe is described as tropical continental climate. Temperature is high all year round with a mean annual air temperature of 30^0c. The highest temperatures are recorded during the dry heat wave months of between March and May with maximum air temperature of above 37^0c. During the rainy season, the temperature drops considerably due to dense cloud cover between July and August as well as during the harmattan period of November to February. Rainfall is strongly seasonal due to the oscillation of the inter-tropical convergence zone (ITCZ) which controls the Tropical Maritime and the Tropical Continental air masses of contrasting air moisture and relative humidity over the study area.

The mean annual precipitation is 835 mm (Balzerek et al, 2003).

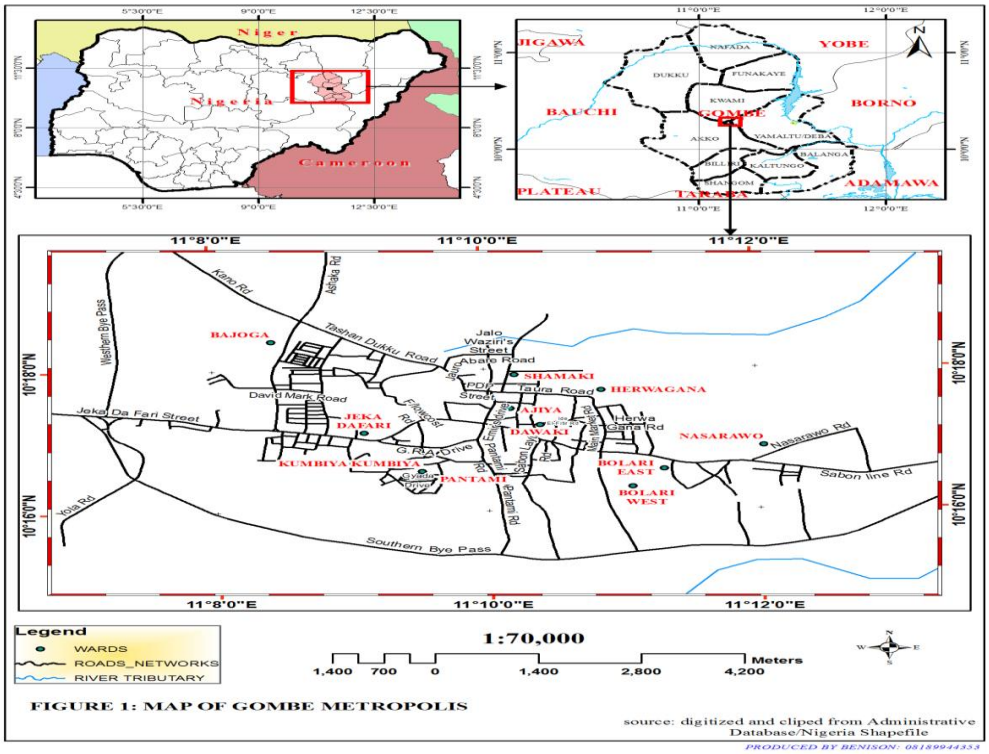

Figure 1: Location of study Area

Procedure of Data collection

The study relied mostly on primary data. The primary data were obtained through the use of questionnaire using the interview schedule and informal observation. This approach was used to collect data on the waste scavenger's socio-economic characteristics such as age, level of education, average monthly income; structure of informal waste scavenging activities in Gombe, health risk associated with waste scavenging and other challenges faced by waste scavengers. During the reconnaissance survey, the researcher enumerated 300 waste pickers across the 10 wards that make up the study area and using systematic sampling technique, 150 respondents were selected for the study. The data collected were analyzed using descriptive statistics such as frequencies and percentages.

Results and Discussion

Demographic and Socio- economic characteristics of informal sector waste scavenger in Gombe Metropolis.

The informal sector waste scavenging activities is attractive to children, teenagers and young adults in Gombe metropolis. There is also a gender mix of the participants though it is mostly dominated by the male counterpart (Table I).

Table I: Demographic and Socio- economic characteristics of Respondents engaged in waste scavenging activities

Variables	Characteristics	No of respondents (n=150)	Percentage (100)
Gender	Male	138	92
	Female	12	8
Age	11-15	45	30
	16-20	38	25.3
	21-25	29	19.3
	>25	38	25.3
Educational level	Primary	32	21.3
	Secondary	24	16
	Post secondary	-	-
	Non literate	94	62.7
Average monthly income	₦7,000	43	28.7
	₦9,000- ₦13,000	29	19.3
	₦14,000- ₦18,000	26	17.3
	>₦18, 000	52	34.7

Table I shows that 92% of the participants are males while not fewer than 8% females are

Table I shows that 92% of the participants are males while not fewer than 8% females are engaged in the rudimentary sorting of collected scrap waste and weighing at the junkshops and retail outlets of scavenging activities. The itinerant waste buyers, pickers and scavengers are mostly unemployed young adult who may not be able to enter formal sector employment because of poor or no basic education. It is evident from the information presented on table I that majority (62.7%) of the informal waste scavengers and are not literate and have no skills. The more educated group is represented by those with primary and secondary education accounting for 21.3% and 16.0% respectively and mostly employed as middlemen and junkshop owners in the reuse and recycling operation. The activities of waste scavenging require no particular skill, consequently lack of adequate and proportionate education and skills exclude them from securing formal employment, hence their decision to pick waste and make a living from alternative employment. The informal sector has often been considered to earn marginal income compared to those of organized private and public sectors, this study shows that waste scavenging activities provide some economic benefits and the 150 informal waste collectors participants in the study recovered about 151,200 tons of recyclable materials from the waste stream on an annual basis and this translate to an income of ₦2,186,000.00 on a monthly basis with 34.7% of the respondents earning above the ₦18,000 national minimum wage with their economic impact estimated at ₦26, 232, 000 annually. It shows that the monthly earning

is comparable to the national minimum wages in the public sector. In comparison with wages of the waste scavengers, the middlemen and the junkshop owners' earner a higher income because they add value to the recyclable materials through sorting, cleaning, processing and storage. Similar studies conducted in Enugu and Zaria by Nzeadibe (2009) and Ukoje (2012) reported that the ₦18,000 minimum wages of the public sector is lower than the monthly income of informal waste scavenging operations in Enugu and Zaria. This suggested that waste picking is a profitable occupation and the income derived is adequate to meet the needs of the participants and their families.

Structure of informal waste collection activities in Gombe Metropolis

Solid waste include food waste, rubbish such as paper, cardboard, plastics, textiles, rubber, leather, wood, furniture, glass, tin cans, aluminium cans, ferrous and other non-ferrous metals, dirt and hazardous waste. The components of solid waste generated within the metropolis include plastics, food waste, metals, paper, bottles, broken wood and glasses. The structure of informal waste collection and recycling in Gombe metropolis is organized under individual waste scavenging, group scavenging and middlemen/junkshop dealers (Table II).

Group waste scavenging constitutes 49.7% of the operators and is mostly embarked upon by children who at the close of the day's operation at the dumpsite and refuse bins pull their recovered material together to meet a minimum threshold that is attractive to buyers in the middlemen and junkshop owners' category. Young adults who operate on individual basis accounted for 38.7% of the operators engaged in waste scavenging activities and they recover recyclable waste materials from the streets, dumps, waste bins and containers and also directly from households that engaged their services in the collection and disposal of waste and refuse at a cost. The third category of 12% comprises middlemen and junkshop owners that operates on small scale and undertake the buying of recyclable materials from scavengers and pickers. They also undertake the sorting and processing of waste materials which are eventually traded as secondary raw materials to industries. The study indicates that the monetary returns attached to the recovered items affect their rate of recovery. Higher premium is placed on waste with metal component and it accounted for 68% of the of the recovered waste items while plastics, bottles and mixed waste of broken ceramic, tiles and china wares accounted for 32% of the waste stream. The high demand for waste with metal component is also connected to their demand by cottage industries, craftsmen and artisans for the production of pots, buckets and other household utensils. It was reported from a study carried out in Zaria that recycle aluminum sheets have recovery rates as high as 90% and the recovered materials are made into kitchen utensils like cooking pots, stoves, spoons and baking pans (Ukoje, 2012) .

Table 2: Structure of informal waste collection activities in Gombe Metropolis

Variables	Characteristics	No of respondents (n=150)	Percentage (100)
Operators	Individual waste Scavenging	74	38.7
	Group waste Scavenging	58	49.7
	Junkshop dealers /middlemen	18	12.0
Types of reuse/recycled waste collected	Household metals, iron rod, pipes, aluminum, copper, tins, cans, zinc	34	22.7
	Motor vehicle scrap metal parts/spare parts	68	45.3
	Plastics and Bottles	21	14.0
	Mixed waste of broken ceramic, tiles and china wares	27	18.0
Quantity of waste Collected daily	10-40 tons	3	2.0
	50-90 tons	40	26.7
	100-140 tons	38	25.3
	>150 tons	69	46.0

Source: Field survey, 2015

Table 3: Health risk and challenges associated with waste scavenging activities in Gombe Metropolis

Variables	Characteristics	No of respondents (n=150)	Percentage (100)
Health consequences of waste scavenging	Cut by bottles and other sharp objects	20	13.3
	Piercing by nails and used syringes	10	6.7
	Cholera/ Diarrhea	15	10.0
	Respiratory ailment	45	30.0
	Fever/malaria	25	16.7
	Body itches due to exposure to waste	15	10.0
	Body pains/aches/ general weakness	20	13.3
Challenges	Low self esteem	70	46.7
	Harassment	55	36.7
	Inadequate capital investment	14	9.3
	Increasing cost of rent and other infrastructures	11	7.3

Source: Field survey, 2015

The environmental benefits of recycling activities of waste scavengers is obvious and the involvement of waste pickers in the removal of waste materials from the street is carried out at zero operational cost to the waste management agencies and their activities divert large volume of waste from the dumpsite. The findings of the study in table II indicated that the 150 informal waste collectors that participated in the study recovered about 151,200 tons of recyclable materials from the waste stream on an annual basis. Medina (2007) reported that recycling by waste pickers saves municipalities in Jakarta much money by reducing the volume of waste that needs to be collected and transported for final disposal. For the same municipalities it was estimated that waste pickers reduce the volume of waste by 30 percent, saving the municipality fuel, equipment, and labour costs and extending the life span of dumps and sanitary landfills. Also in three Mexican cities, Medina (2007) found that nearly 3,000 informal refuse collectors collect 353,000 tons of waste a year.

Health risk and challenges associated with waste scavenging activities in Gombe Metropolis

Occupational health risk is associated with most working environment and employment in the informal sector of waste scavenging and recycling is no exception. According to Castillo (1990) scavenging not only generates benefits to society, it also encourages health risks associated with low life expectancy, prevalence of infectious diseases, high infant mortality rate. In Manila, more than 35 diseases were identified in scavenger communities and slums, including diarrhea, typhoid fever, cholera, dysentery, tuberculosis, anthrax, poliomyelitis, skin disorders, pneumonia and malaria (Adan, Cruz and Palaypay, 1982). Some of the health risk confronting scavenging activities in Gombe metropolis is presented in Table 2.

Table III shows that Informal waste scavengers, picker and those engaged in recycling are exposed to various health risks and hazards resulting from their contact with waste. The occupational health risks they are expose to include cut by bottles and other sharp objects, piercing by nails and used syringes, cholera/ diarrhea, respiratory ailment, fever/malaria, body itches due to exposure to waste, body pains/aches and general weakness of the body. The exposure to these risks results from not adhering to basic principles of occupational health and safety methods. In most cases, scavengers sort waste manually without protective clothing and equipment. Respiratory ailment is highest among scavengers and this result from long term exposure to and inhalation of smoke and fumes produced by open burning of waste. In addition to the hazards informal waste scavengers and waste pickers are exposed to, they are often ascribes low status in the society and face harassment from people in the neighborhood who labeled them as criminals and thieves thereby making them survive in a hostile

physical and social environment. Other challenges confronting the efficiency of the informal sector recycling activities include inadequate capital investment and increasing cost of renting business premises.

Conclusion

Beyond economic benefits as a source of income earner, informal sector recycling activities of waste scavenging also provides environmental benefits through reduced cost of waste collection and disposal by the waste management agencies. The positive effects of informal sector recycling suggest that informal sector activities could be factored favourably into the arrangement of the public waste management institutions because of it flexibility and the ability to respond quickly to demand driven forces. The integration of the informal sector waste managers into the existing public platforms of waste management services will ensure that previously underserved households are covered thereby contributing to better public hygiene and health conditions.

Recommendations

The informal sector activities of waste scavenging contribute significantly to the national economy. Operators in the category of middlemen/junkshop owners are entrepreneur engaged in scrap material trade who by their activities add value to the collected recyclable materials by sorting, cleaning and processing into tradable commodities and also generated employment to a greater majority of the urban poor. Based on the findings of this study, it is recommended that the activities of the informal sector should be integrated into the formal sector by providing supporting services such as financial assistance in the form of interest free loans, skill development and improvements in managerial and marketing skills to enhance competitiveness with other private sector investment driven initiatives.

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