Journal of Natural Sciences Research www.iiste.org
ISSN 2224-3186 (Paper) ISSN 2225-0921 (Online)
Vol.8, No.14, 2018

# Assessing the Socio-Economic Benefits and Challenges of Municipal Solid Wastes Resource Recovery Practices in Mubi Metropolis, Nigeria

Ezekiel John Gangaya
Vimtim Central Primary School, Mubi North local Government Area, Adamawa State, Nigeria

Alfred D. Mshelia
Department of Geogrphy, Adamawa State University, Mubi, NIGERIA

**Abstract**
The study examines the socio-economic benefits and challenges of solid waste resource recovery practices, bearing in mind the accruable income and challenges. A total of one hundred and seventy six (176) sets of questionnaire were retrieved out of two hundred sets administered to scavengers, and duly analysed. The purposive and Snowball Sampling Techniques were employed to identify the respondents. Tables, plates, were used to summarise data collected which was analysed using descriptive statistics. Among the benefits derived by the scavengers from resource recovery are; 85.5% of respondents had an increase in their income measurably, a total of 13.9% of the respondent argued that it had increased employment, among the community leading to an increase in income. Majority of the scavengers (98.9%) have been injured in the course of scavenging. This implies that scavenging is not isolated from different form of risk, injury and sickness that are likely to consume part of the scavengers' savings. The common hazard faced by scavengers is open cut (59.9%) sun burns (22.4%) infliction by obnoxious and poisonous gases (8%) while 1.7% and 1.1% suffered typhoid and skin diseases respectively. A major challenges acknowledged by 42% of scavengers is theft of scavenged materials, 23.9% confirm other forms of challenges but could not mention them, while 23.3% noted lack of capital as a challenges, 10.8% of respondents noted their source of challenge as that of leadership. In conclusion respondents (61.4%) affirm the need of fund (grant or loan) to boost their trade
**Keywords:** Solid Waste; Resources- Recovery; Socio-Economic; Benefits; Challenges.

## Introduction

A common challenge of all globalising cities is the rapid generation of waste through households, industrial and commercial activities. Expired materials that have no useful value or materials that have outlived their life spans, unwanted substances, scraps that await disposal or recycling, remain a source of environmental degradation and threat to public health in cities world- wide (Faccio, Personal & Zanin, 2011).

Waste materials either solid or semi-solid, that possess characters no longer considered of sufficient value to retain are disposed. In general, waste is unwanted materials for the person who discards it; a material that does not have a value or has lost its value for the first user and is therefore thrown away or discarded. (Gilpin, 1976).

The European Commission's thematic strategy on the prevention and recovery of waste called for life-cycle thinking in waste policies, moving towards a recycling society (European Union, 2005). This has inturn highlighted the opportunities for improved coherence between policies on waste and those on climate change and resource efficiency (European Environmental Agency, 2011). Recent studies in Africa have shown that the problem of waste management has become intractable and threatens to undermine the efforts of most city authorities gutters, Kirondi (1999). It is observed that the city environment in most developing countries was characterized by heaps of Garbages, overflowing waste containers, chocked drains, clogged streams and stinking gutters Kirondi (1999). Hardoy, Mitlin and Satterthwaite (2001) have, therefore, aptly described the third world urban environment as among the most health and life threatening of all human environments.

Waste reuse and recovery are often undertaken as a survival strategy by scavengers in Mubi and recycling businesses, thereby reducing the total amount of solid waste headed for the landfill. Waste recovery plays a valuable resource-conserving role: by recycling materials, further exploitation of scarce natural resources is minimized, thus containing the spreading ecological footprints of the city. (Cointreau and De kadt, 1991).

It is wasteful to throw away anything that could be made use of, particularly when there is a desperate need for it elsewhere (Mathew, 1999). The study of Adebayo and Oje- Tayo (2001) revealed that most of the secondary raw materials scavenged from wastes are not recycled by industries in lagos state. This is due partly to the fact that most of the industries, also, do not actively promote take-back recycling as practiced in Japan (Kazuhiro and Koizumi, 2001). If secondary raw materials scavenged from wastes are recycled, it is expected that there will be a reduction in the energy associated costs by industries during production because recycling provides easily obtainable manufacturing feedstock (Mumma, 1995; Gheewala and Nielsen, 2003).

The role of waste pickers in cities of developing country is essential for both environmental and economic

reasons. Several authors (Medina, 1997; Assaad, 1996; Medina, 2001; Tuason, 2002; JICA-MMDA, 1998, and Mshelia 2015), revealed that scavenging provides various social, economic and environmental benefits: recycling of solid wastes reduces air and water pollution, saves energy, reduces waste from industrial processes compared with the use of virgin materials, and in many cases reduces imports of raw materials; greatly reduce the cost of a city's solid waste management (SWM) programme; it also reduces the amount of waste that needs to be collected, transported, and disposed of; which in turn becomes an income-generating activity for the poorest in the developing world.

In the economics of waste picking, De Coverly, Macdonagh, O' Malley and Patterson (2008), note that waste is an inevitable consequences of consumption, thus as consumption has escalated, so too has the production of waste. Medina (2000) asserted that waste picking makes up a significant portion of the world's growing informal economic sector. For waste pickers, discarded wastes were neither simple utilities nor necessarily polluting, but complex and potentially enriching materials (Reno, 2009).

About 6000 people from the rural areas are working in the scavenging field; the largest groups within the labour force are those under 20 years old (25%), adult male (31%), and adult female (44%), the system created jobs and extra income as it mobilizes all family members to work (Muktar, 2011). In an effort to study the recycling efforts of industries in Kano, Adisa (2000) studied 60 respondents and find out that; the scavengers in Kano state are not organized in any formal way, yet their contribution to economic growth is significant.

The scavengers are of two type namely; the primary and secondary scavengers. The secondary scavengers give the primary scavengers a token amount of money to buy recyclables from the neighbouring areas and in return, the materials are weighed and priced accordingly. A kilogramme of rubber shoes or plastic on the average costs N22 – N30, and the companies that recycle these materials includes Bailey plastic, and Standard plastic. On the average a secondary scavenger employ 6 primary scavengers or more, by doing this, a lot of youth are employed by the profession. Waste scavenging practices in Mubi Metropolis is not far fetched from such ascertain.

**Methodology**

The study area, Mubi Metropolis is located in the northern part of Adamawa State, Nigeria, and is found between the latitude $10^0$14' and $10^0$ 18' north of the equator and the longitude $13^0$ 14' and $13^0$ 19' east of the Green-Which meridian (Adebayo, 2004).

Primary data were used in the study. However, due to the difficulty in obtaining data regarding the sample size for the study from the Mubi Metropolis Scrap Metal Association, the non-probability sampling techniques involving the purposive and snowball sampling technique were used in locating recyclable materials collection depots, and in identifying scavengers for questionnaire administration.

The identified localities where recyclable materials collection depots are found in the study area include: Tudun-Wada, Sabon-Layi, Lokuwa, Kolare, Yelwa, Kabang, Mundang, Gaya, Wuropa-Tuje,Wuro-Gude, Kwatsifa, Arahan-Kunu, Gashaka, Saibore, Girpata, Lamurde, Gima, Dazala, Anguwan-Baburawa, Sabongari, Wuro-Kwandon. Out of these localities identified, eight largest recyclable materials collection deports of Kabang-Maiha raod, Arahan-kunu, Yelwa, Saibore, Kolere, Wurogude, Wuro-Kwandon,and Wuro-Patuje depots picked were used for data collections. Consequently, 200 scavengers were selected purposively for questionnaire administration, where a hundred and seventy six (176) sets of and questionnaire administered were retrieved, summarized into tables of frequency and percentages and descriptive analysed.

**Socio-Economic Benefits of Solid Waste Scavenging**

Table 1 analyses the socio-economic benefits that is derived by waste scavengers in the study area where it reveals that 98.3% of the respondents affirms they benefit a lot from the scavenging business contrary to 1.7% of respondents who opined that they benefits less from waste scavenging practices. The major benefits derived by the waste scavengers according to data collected shows most respondents (85.5%) alluding to rise in income, employment, which consequently increased the income status of respondents (13.9%), while 0.6% of respondents sees scavenging as a practice that keeps the urban environment clean.

Probing further, 94.9% respondents affirm to have acquired personal effects/facilities from scavenging income. Only 5.1% said they did not acquire any form of personal/facilities with the income generated from scavenging, as such, the financial gains are insignificant. The classes or types of materials acquired from the income generated from scavenging according to respondents are; 63.6% have bought items ranging from food, clothes, phones and shoes 25% noted that they have bought books, food, bags, clothing and bicycles while 10.2% purchased fixed assets like land, houses, food items and clothes among others, and 1.1% used their income for other household items not specified.

Furthermore, the lucrativeness of resource recovery by scavengers is exhibited in the estimated monthly income of the respondents. Most scavengers (26.7%) fall within the income range of N11, 000 – N20, 000 per month, followed by (26.1%) who fall within the monthly income range of N21, 000 – N30, 000. In the same vein

13.1% acknowledged their monthly income falls between N31, 000 – N40, 000 while 10.2% are within the ranges of N11, 000 – N10, 000 monthly earning, and 15.3% have monthly income between N51, 000 and above.

Overwhelmingly, all respondents affirm to the fact that scavenging or resource recovery from solid waste on individual basis have provided or partially provided them with a gainful employment where they derived their livelihood, in the face of unemployment that characterises the community, and hence, the larger Nigerian society. From table 1 25% of scavengers (mainly merchants) have employed between one to five (1-5) employees, 10.2% have employed six to ten (6-10) employees, 0.6% have eleven scavengers and above while 65.3%, may not have employed waste pickers as employees The likely reason for not employing waste pickers could be that most of the scavengers recover resource from solid waste on their own as the income derived from scavenging is not sufficient enough to set up a scavenging enterprise where staff can be recruited as extra hands.

The data analysed on the mode of payment of recruited scavengers showed that 11.4% of the respondent are paid weekly. A total of 46.0% affirms that they are paid on monthly bases while 34.1% of the respondents confirms that they are neither paid daily, weekly nor on monthly basis, out receives payment when they requested for it.

Data analysed on the rate of payment per an individual in naira (#) Nigeria currency reveal that 47.7% of scavengers pays between the sum of #500 - #1000 per individual on daily basis 7.4% confirm to pay #1001-#2000 while 4.0% pay the sum of #2001 - #4000 and 10.8% of scavengers entrepreneurs pays #4001 and above whereas 30.1% of scavenging entrepreneurs that recruit waste pickers did not disclose that they pay their staff.

This result indicate a varying degree of level payment of remuneration by waste collecting entrepreneurs to scavengers they recruit to collect various waste types irrespective of the volume or quantity collected.

**Table 1 Socio-Economic Benefits of Resource Recovery from Solid Waste to Practitioners**

| Items | Frequency | Percentage (%) |
|---|---|---|
| **Availability of Benefits** | | |
| Yes | 173 | 98.3 |
| No | 3 | 1.7 |
| **Total** | **176** | **100.0** |
| **Types of Benefits from Scavenging** | | |
| Employment | 27 | 15.3 |
| Income generation | 148 | 84.1 |
| Clearing Environment | 1 | 0.6 |
| Others | 0 | 0 |
| **Total** | **176** | **100.0** |
| **Acquisition of Materials** | | |
| Yes | 167 | 94.9 |
| No | 9 | 5.1 |
| **Total** | **176** | **100.0** |
| **Materials Acquired** | | |
| Category I | 18 | 10.2 |
| Category II | **44** | 25.0 |
| Category III | **112** | 63.6 |
| Category IV | **2** | 1.1 |
| **Total** | **167** | **100.0** |
| **Estimated Monthly Income of Scavengers** | | |
| N1000 - N10000 | 18 | 10.2 |
| N11000 - N20000 | 47 | 26.7 |
| N21000 - N30000 | 46 | 26.1 |
| N31000 - N40000 | 23 | 13.1 |
| N41000 - N50000 | 15 | 8.5 |
| N51000 and Above | 27 | 15.3 |
| **Total** | **134** | **100.0** |
| **Number of Employees** | | |
| 1 - 5 Employees | 44 | 25 |
| 6 - 10 Employees | 18 | 10.2 |
| 11 and Above Employees | 1 | 0.6 |
| No Response | 115 | 65.3 |
| **Total** | **176** | **100.0** |
| **Mode of Payment** | | |
| Daily | 81 | 46.0 |
| Weekly | 20 | 11.4 |
| Monthly | 15 | 8.5 |
| No Response | 60 | 34.1 |
| **Total** | **176** | **100.0** |
| **Rate of Payment per Individual** | | |
| N500 - N1000 | 84 | 47.7 |
| N1001 - N2000 | 13 | 7.4 |
| N2001 - N4000 | 7 | 4.0 |
| N4001 and Above | 19 | 10.8 |
| No Response | 53 | 30.1 |
| **Total** | **176** | **100.0** |

**Challenges of Municipal Solid Waste Resource Recovery**

The analysis of data summarised in table 2 establishes the challenges that affect the practice of scavenging. The data revealed that majority of the respondents numbering (98.9%) have had a challenges resulting to injury in the course of resource recovery from solid waste. This implies that scavenging is not isolated from different form of risks such body injury leading to sickness that is likely to consume part of the income derived from scavenging. 1.1% of respondents could not establish any form of cuts or injury during the cause of scavenging.

Table 2 further showed 59.2% of respondents affirms the common type of hazard associated to scavenging to include injuries from open cut, 22.4% from sun burns, 8% from infliction by obnoxious and poisonous gas such as methane and 1.7%% and 1.1% suffered from typhoid and skin diseases respectively. This finding is in consonance Owusu-Sekyere, ( 2014),where the study reported the in sufficiency in data on the long-term effect of exposure to airborne bacteria as well as infectious or toxic materials present in solid waste, where respiratory and dermatological problems, eye infections and low life expectancy are common. Oteng-Ababio, (2013) and Pinto, (2013) also have found similar health impacts of waste toxicants, wafting into the immediate atmosphere or leaching into soils, vegetation and nearby water bodies.

In the end, uncontrolled land fill gas migration particularly methane from dumpsite can not only damage the global environment but can also negatively impact human health and pollute the local environment Oteng-Ababio, (2013) and Pinto, (2013). Without doubt, untreated solid wastes frequently contain components that have the potential to cause infectious diseases. The level of this potential remains largely not assessed, but more current treatment process can either totally or consistently eliminates such risks (Hamer, 2003).Apart from the health challenges, 42% of respondents view theft of scavenged materials collected as a major challenges while the lack of fund or capital (23.3%) for the purchase of materials like wheel barrow, push-push, hammer and other tools needed to facilitate scavenging are lacking, hence a challenge. 23.9% feel there are other challenges but were unable to exactly place their hand on any.18.8% views the lack of better leadership regarding the executive officials of the Scavenger Association of Mubi as a challenge. The lack of better price for scavenged materials is pointer to the leadership problem, where leaders of the Scavengers Association of Mubi have not been able to control and determine better price for their members.

Furthermore, data was collected and analysed on the form of government assistance the scavengers need to cushion the challenges affecting their activities. Accordingly, respondents affirm the need for capital to expand their business through soft loan or grants and the setting up of recycling industries where they can directly sell their collections and better points.

**Table 2. Challenges of Scavenging Solid Waste Materials.**

| Items | **Frequency** | **Percentage (%)** |
|---|---|---|
| Existence of Hazard | | |
| Yes | 174 | 98.9 |
| No | 2 | 1.1 |
| Total | **176** | **100.0** |
| Types of Hazard in Scavenging | | |
| Skin Disease | 2 | 1.1 |
| Dysentery | 0 | 0 |
| Open cut/Tetanus | 104 | 59.2 |
| Typhoid | 3 | 1.7 |
| Obnoxious/Poisonous gas (methane) | 15 | 8.0 |
| Sun Burns | 39 | 22.4 |
| Others | 0 | 0 |
| Total | **173** | **100.0** |
| Other Challenges | | |
| Stolen Materials | 74 | 42.0 |
| Lack of Capital/ | 41 | 23.3 |
| Leadership | 19 | 10.8 |
| Others | 42 | 23.9 |
| Total | **176** | **100.0** |

**Conclusion**

The study examined the benefits and challenges of Municipal Solid Waste Resources Recovery in Mubi Metropolis. Inspite of the numerous benefits of scavenging such as increased income, employment, and the clearing of the environment, scavengers are faced with challenges such as injury from open cut, exposure to

obnoxious and poisonous gas, tetanus, typhoid and skin infection, fatalities, theft of scavenged materials, lack of funds for expansion among others. Scavenging as a form of resource recovery in the study area is ill-organised, unsupported by government and other waste management agencies despite the fact that it has taken away many residents from unemployment and hence abject poverty.

**Recommendations**

On the basis of finding which emanated from this study, the following recommendations are made:

1. Training programme by both government agencies and non-governmental organizations to educate the scavengers on the health hazard associated scavenging.
2. Train waste pickers on sound method of waste picking so as to avert the common health hazards resulting to fatalities.
3. Government agencies and banks should intervene promptly by giving soft loans to waste both the waste merchants and scavengers to boost their financial status which enhances the scavengers effective participation in waste picking and recycling of waste which will consequently reduce the waste stream.
4. Registration of waste pickers to facilitate the democratization of the leadership of the union where good leadership and accountability is a keen to development.
5. The establishment of waste recycling cottage industries where scavengers could directly sell their collections and make better income.

**REFERENCES**

Adebayo, O.O., Ojetayo, T.A, (2001). Beneficial uses of lagos Municipal solid waste, Mechanical Engineering Department, University of lagos, Nigeria. Pp 22-27. (Unpublished BSc thesis).

Adebayo, A.A. (2004), Mubi Region, Geography Synthesis. Paraclete publishers, Yola-Nigeria first edition, p22-48.

Adisa, (2000) In: Muktar, M. (2011). The Economics of Waste Scavenging in Kano State. Department of Economics, Bayero University, Kano- Nigeria. Pp. 4-5.

Assaad, R. (1996). Formalizing the Informal? The Transformation of Cairo's Refuse Collection System, Journal of Planning Education and Research 1(16):115- 126.

Cointreau, S. and De kadt, M. (1991). Living with Garbage: Cities Learn to Recycle. Development Forum, January-February, 1991.

De coverly, E. Mc Donagh, E. O. Malley, L. and Patherson, M. (2008). Hidden mountain: The Social Avoidance of Waste. Journal of Macro Marketing, 28(3): 289-303.

Europians Environmental Agency (EEA), (2011). Waste Opportunities, Pass and Future Climate Benefit from Better Municipal Waste Managing in Aurope. Annual European Union. Green House Inventory 1990-2009.and Inventory Report 2011.Accesses from: (http://www.eca.europa. Eu/publicational European Union Green House-gas-Inventory-2011).

European Union (EU), (2005) Communication from the Commision to the Council, the European Parliment, the European Economic and Social Committee and the Committee of the Regions-Taking Sustainable use of Resource forward a Thematic Strategies on the Prevention and Recycling of Waste com, (2005) 666 final.Accessed from : chttp:// eur-lex Europe eu /lex uriservido? Uri= com:2005.0666:FIN:EN:Pdf.

Faccio, M, Personal, A. and Zanin, G. (2011). Waste Collection Multi Objective Model with real time Treaserbility Data. Waste management, 31, 2391-2405.

Gheewala, S.H., Nielsen, P.H.,( 2003). Beyond Energy Efficiency – Application of LCA and Integrated environmental assessment.

(Gilpin. (1976). The New York State Department of Environmental Conservation (2007) also Define solid Waste in a Simple Ward as any Discarded Cabandoned or Considered Waste- like Materials.

Hamer G., (2003). Solid Waste Treatment and Disposal: Effects on Public Health and Environmental Eafety, Biotechnology Advance; 22, 71-79.

Hardoy, J.E. Mitlin, D. and Sattethwaite, D. (2001) Enviromental Problem in an Urbanizing World, Local Solution for City Problem in Africa. Asia and Latin America, London and SAtirling: Va Earthscan publication.

Japan International Cooperation Agency (JICA)-Metropolitan Manila Development Authority (MMDA) (1998). The Study on Solid Waste Management for Metro Manila. Unpublished Paper. Pp. 2-25.

Kazuhiro, U., Koizumi, H., (2001). Reducing Household Waste: Japan learns from Germany, environmental.

Kironde, J.M.L. (1996 Dares Salaam, Tanzania Onibokum, A.G. (eg). Managing the Monster. Urban Waste and Governance in Africa. Otawa. IDRCs pg 101-132.

Mathew, D., (1999). Recycling Putrescible/Household Waste. In: Bar- rage, A., Edelmann, X. (Eds.), Recovery, Recycling, Re-integra- tion (R '99) Congress Proceedings, vol. 1. EMPA, Switzerland, pp.363-366.

Medina, M. (2001). Scavenging in America: Back to Future? Resources, Conservation and Recycling (31): 51-

69.
Medina, M. (2000) Scavengers cooperative in Asia and Latin America. Resources, Conservation and Recycling (31). 51-59.
Medina M. (1997) Informal Recycling and Collection of Solid Waste in Developing Countries: Issue and Opportunities UNU/IAS Working Paper No 24.
Mshelia D.A.(2015).sky Journal of Soil Science and Environmental Management Vol.4(4),pp,045,july,2015. Available on line http://WWW.sky Journal.org/ sjssEM.issN 2315-8794.
Muktar, M. (2011). The Economics of Waste Scavenging in Kano State. Department of Economics, Bayero University, Kano- Nigeria. Pp 4-5.
Mumma, T, (1995). Construction, Reducing the Embodied Energy of Building Home Energy Magazine Online
Owusu-Sekyere E., Arkum T. A., Samuel Z. B. (2014). Household Water Supply Vulnerability in Low Income Communities in Ghana: Experiences from Aboabo in the Kumasi Metropolitan Area. *International Journal of Environmental Protection and Policy.* Vol. 2, No. 1, 2014, pp. 9-18. doi: 10.11648/j.ijepp.20140201.12.
Oteng-Ababio, M., Melara, J.E. and Gabbay, O. (2013). Solid Waste Management in African Cities: Sorting the Facts from the Fads in Accra, Ghana. *Habitat International*, vol. 39, pp. 96–104.
Pinto, V.N. (2008). E-waste Hazard: Impending Challenge. *Indian Journal of Occupational & Environmental Medicine,* 12, 65-70.
Tuason, C. (2002). in Gonzales, E.M. (2003) Waste Asset: The Scavenger of Payatas International Conference on Natural Assets. Tagayfaycity, Philippines Pp 1-25.
Reno, J. (2009). Your Fresh is some one's Treasure" Journal of Materials Culture, 14(1):29-46.