

THE NIGERIAN JOURNAL OF SOCIOLOGY AND ANTHROPOLOGY

ISSN: 0331-4111

E-ISSN: 2736-075X

Volume 21, No. 2 (November, 2023)

DOI: 10.36108/NJSA/3202.12.0220

Household Waste Reduction Practices in Ibadan, Nigeria

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Abstract

With an average of 42 million tons of waste produced annually and no effective structure for managing solid waste in Nigeria, indiscriminate disposal of waste poses a serious danger to the constituents of the environment. Waste reduction at source is one of the potent strategies for reducing disposable waste, thereby, making non-reused waste at the household level manageable by municipal authority. Therefore, this study examines household waste reduction practices in Ibadan. A random selection of 281 respondents was conducted using a sampling ratio of 3% among three places within the Ibadan North East Local Government Area. Buying packaging-less products, targeting reusable and not items that are disposable in nature, using reusable bags made of recyclable materials for shopping, reducing food remnants and waste, and maintaining and repairing household items are the five household waste reduction practices that have been identified. Results showed that plastic accounted for more than half (54.4%) of the garbage produced, 14.6% was kitchen waste, 19.2% was glass and bottle, and 11.7% was paper waste. The study suggests an aggressive sensitisation programme by Oyo State Waste Management Authority to raise awareness of the benefits of reducing waste before disposal in Ibadan, to curb indiscriminate disposal of waste.

Keywords: Household waste, reduction practices, Ibadan

Introduction

The massive increase in garbage output that has taken place in recent decades shows no signs of slowing down. By 2050, there will be 3.4 billion metric tons of municipal solid waste produced worldwide, an increase of around 70%. Numerous factors, such as changing consumer purchasing habits, population growth, urbanization, and economic expansion, are to blame for this (Abumere and Filani, 1986; Bamgboye & Ojolo, 2004; Imoh & Emmanuel, 2011; Ian

Tiseo, 2021). Globally, both rural and urban dwellers generate millions of tons of waste yearly, this portends a grave challenge to everyone (Chinedulke *et al.*, 2018). Because of the massive volumes of waste created, authorities are now required to provide appropriate trash treatment and disposal services. Furthermore, waste is regularly disposed of in hazardous open dump locations, especially in poor nations. The majority of the countries in the North generate more trash than their counterparts in the South, but the former often have superior waste management systems to address the issues of soaring waste generation (Ishaq, 2004; Ogundele *et al.*, 2011; Miezah *et al.*, 2015; NEMA, 2015).

Waste is a global environmental problem that has negative socio-economic, health, and environmental implications due to poor management. Waste comes in many different forms and sizes. Wastes are continuously produced in rising records and tons globally due to the increase in global populations and urban density sprawls (Abul, 2010; Afon, 2012; Kaza *et al.*, 2018; Akimanizanye *et al.*, 2020). Waste management poses significant challenges for managers and policymakers in both urban and rural areas, therefore solutions should be sustainable and integrated (Adewole, 2009; Oguntoyinbo, 2012; Yousefloo and Babazadeh, 2020). Sustainability advises that the waste management challenges be approached by optimising the advantages for society in areas of environmental, social, and economic value, while integration means that the waste management process must take into account the full approach to the generation and disposal of waste (Babayemi & Daudu, 2009; Abel, 2009; Behzad *et al.*, 2020). The disposal of solid wastes in underdeveloped nations has always posed a threat to the population's health and quality of life because of the absence of integrated waste disposal infrastructure, culture, and technology, all of which are greatly influenced by financial restrictions. About 62 million tons of solid waste are produced in Sub-Saharan Africa each year, which is a significant problem that is largely attributable to a lack of political will (Barr *et al.*, 2001; Bassey *et al.*, 2006; Abd El-Wahab *et al.*, 2014. Chinedu *et al.*, 2018; Ogundele *et al.*, 2018).

Africa's population is expected to more than quadruple over the next four decades, and the rising human population has been linked to the development of solid waste on a number of occasions, according to United Nations Habitat Watch (Olufayo & Omotosho, 2007; Armstrong, 2009; Ogwueleke, 2009; Blessing, 2013; Bakare, 2021). According to Chinadu *et al.* (2018), Nigeria generates 42 million metric tons of solid trash annually, or 0.65 kg to 0.95 kg per person each day. Every year, millions of tons of waste are generated by occupiers of both residential and commercial buildings, who dispose of it in landfills and very little of it gets recycled. Thus, waste minimization is essential since it will benefit society and the environment in addition to providing a number of important economic and social benefits. rubbish reduction is the process of producing less rubbish, which lessens the production of hazardous and persistent wastes and supports programs that maintain a sustainable environment.

Redesigning products to reduce waste creation and altering society norms about production and consumption are both components of waste minimization. Waste reduction clearly encourages moral business and financial behaviour in addition to environmental conservation, but there are other benefits as well, such as improved environmental conditions, lower pollution, the capacity to save and make money, support environmental sustainability for future generations, and lower greenhouse gas emissions that lessen the effects of climate change. Reduction of waste through the reuse of household trash will reduce the quantity of waste dumped indiscriminately in the environment and eventually deposited in landfills. Therefore, this study investigated household waste reduction practices in Ibadan that could contribute to environmentally friendly waste management approaches. This will not only reduce the amount of waste dumped in landfills but also decrease the overhead cost of waste management.

Method and materials

Study area

This study was conducted in Ibadan, Oyo State, Nigeria. Ibadan is situated within latitude 7.3775° N and longitude 3.9470° E in Oyo State, South-West geopolitical region. The State has a total land area of 27, 249 square kilometres, and the 2006 national census estimated that the total population of the State was 5,591, 589. Ibadan's economic activities include manufacturing, services, handicrafts, agriculture, and business. Even if there are fewer farmers in the city, it is still a sizable quantity for a city. Many cultivators are part-time farmers who work two jobs to boost their income. Ibadan is a major commercial hub. Almost every street and corner in the inner suburbs and historic center of the city has a market square or stall. Markets can be found all across the city. The business sector of Ibadan is situated along a strip that runs from the city center to the west of the railroad station.

The administrative centre for the Ibadan North East Local Government Area is in Idi-Ape, on the Iwo Road axis in Ibadan, Oyo State, Nigeria. It was established as a replacement for the former Ibadan Municipal Government. These local government areas share borders with Ona-Ara, Ibadan South East, and Egbeda (Figure 1). The 12 operational wards of the Ibadan North-East Local Government Area are led by the 12 elected councillors. Oje, Argugun, Agodi Gra, Orita Bashorun, and the Iwo Road Axis are included in the Ibadan North East regions. The land area of Ibadan North-East LGA is approximately 15.5 km^2 . It is located between the latitudes of $7^{\circ}15'$ and $7^{\circ}30'$ North and the longitudes of $3^{\circ}45'$ and $4^{\circ}00'$ East, with an elevation between 150 and 210 feet above mean sea level (MSL). With a land area of $16\,679 \text{ km}^2$, the study area is one of Oyo State's LGAs with the highest population density. The study area is primarily a residential neighbourhood and Ibadan's business centre. Homes are small and primarily defined by business and economic activity, both formal and informal, primarily along the sides of the road (street hawking). The study region comprised the commercial markets in Oje, Orita-Aperin, Agodi, and Oranmiyan. The Lagos-

Ibadan Expressway, an interstate highway system that crosses the administrative boundary and offers the sole significant access for interstate traffic through multiple hierarchies of roads, connects Ibadan North-East.

Sampling procedures

Within the study region, 281 copies of a questionnaire were distributed. 3.1% of the buildings were used in the sampling of the areas. The Oje axis, Idi-ape/Bashorun, and Iwo Road were the three main study areas. The axes of Iwo Road (69), Bashorun (91) and Oje (121). A semi-structured questionnaire about waste management techniques, environmental characteristics, and symptoms and conditions of illnesses linked to the environment was used to collect data from our respondents. The questionnaire's sections asked participants about their comprehension of household waste management in Section D, household garbage disposal habits in Section C, environmental factors in Section B, and sociodemographic data in Section A. Every questionnaire was carefully reviewed to ensure that the answers were accurate and pertinent.

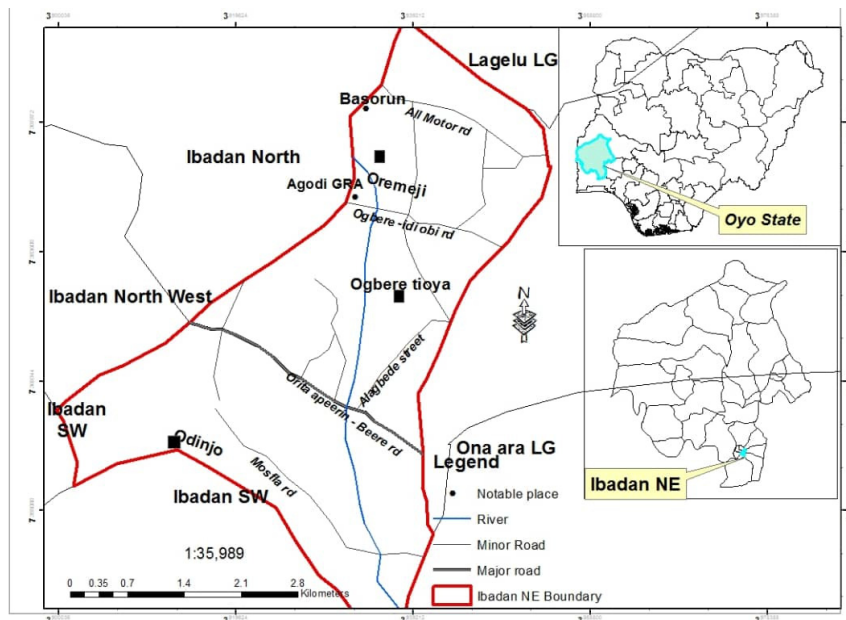


Figure 1: Ibadan North-east Local Government Area

Source: Author's Fieldwork 2021

Sampling and sample size

Ibadan North East was chosen as a case study in this investigation. Residents of the study area were given a total of 281 questionnaires. Using a Google map to illustrate, the Ibadan Northeast local government encompasses thousands of houses. The Oje axis is home to 4,060 buildings, Bashorun has 3,050 buildings, and the Iwo road axis which has 2,300 buildings extends to Abayomi from

Agbaakin. The eleven Local Government Areas that make up the city of Ibadan are Ibadan South East, Oluyole, Ona-Ara, Egbeda, Ibadan North East, Ido, Ibadan North West, Ibadan North, Ibadan South West, Akinyele, and Lagelu. The population of this local government is distributed between high and medium densities which generate a lot of waste. The amount of waste generated per household was determined and measured in kilograms (KG).

Data collection and analysis

A combination of questionnaires, personal observation, and Google Earth were used to collect the primary data. Questionnaires and observation were used to collect data on the socio-economic characteristics of residents, household waste generation and disposal methods, and garbage collection services. The buildings in the study area were counted in Google Earth, while the coordinates of the sampled buildings were collected using Global Positioning Systems (GPS). Journal articles and other published documents served as sources of secondary data and were helpful in augmenting the primary data.

For the questions using string variables, descriptive statistics were employed, and frequency and percentage tables were used to illustrate the data. The returned questionnaire was coded in SPSS and analysed using the statistical package for the social science (SPSS) program. The output viewer revealed the outcome, which was then used to discuss the findings from various sets of questions. To support the material gathered, a qualitative approach was used, specifically from focus group discussions and oral interviews.

Results and discussions

The income level of the respondents

It was revealed that 56.6% of the respondents earn less than ₦30,000, 19.7% earn ₦30,001- ₦60,000, 13.2% earn ₦60,001- ₦90,000, 5.3% earn ₦90,001- ₦120,000 while 5.2% earns above ₦120,000 monthly. The majority of the respondents interviewed earn less than ₦30,000. Since plastic utensils are less expensive than glass or ceramic ones, more people fall into the lowest income group's purchasing power than the other two income categories. As a result, lower-income groups produce more plastic than middle-income groups, whereas higher-income groups produce the least plastic as a percentage of garbage. According to this analysis, individuals with higher incomes tend to produce more waste because they don't reuse their waste because they believe they can easily buy another one. In contrast, people with lower incomes buy beverages and then buy sachets to refill the can after the contents are used up, reusing their waste to save money. Individuals with higher incomes tend to purchase more items, hence their households will produce less garbage than those with lower incomes.

Percentage composition of waste generation in households

The survey found that kitchen garbage accounted for 14.6% of waste, while plastic waste accounted for the largest percentage at 54.4%. This can be attributed to the residents' increased consumption of products wrapped in plastic, including bottled water, pet beverages, vegetable and palm oils, custard, spices for cooking, and other items. We have 11.7% paper waste and 19.3% solid garbage. Glass, leather, textiles, wood, metal, sanitary waste in septic tanks, and other waste materials are all considered solid trash (Nduka *et al.*, 2023). Food waste is a category that includes kitchen waste. This conclusion that food waste makes up a large portion is also evident in other major cities across the nation, including Nigeria and many other developing nations (Yuanyuan, *et al.*, 2021). Although industrialized nations typically use processed packaged meals, a higher percentage of food waste indicates that Ibadan's garbage has a high potential for composting or bio-gasification (Dong J.; Ding L., 2017). However, this tendency is not always followed in developed nations. According to this study, recycling and composting are attractive options to reduce the environmental effects of open dumping and to offset the cost of solid waste management by lowering the amount of waste to be handled, as well as by selling compost and recycled products. This is because the municipal waste stream of the study area contains a significant amount of organic waste and recyclables (paper and plastic).

Waste disposal methods

This survey identified the many ways that respondents disposed of their garbage: 10.0% burned it, 9.3% dumped it in the gutter, 22.8% dumped it beside the road for waste collectors, 54.1% used containers and waited for the collectors, and 3.9% buried it. This suggests that the area has excellent garbage disposal practices at a high level. In developing countries, managing urban MSW (municipal solid waste) presents significant challenges, including waste collection and disposal. Two main methods of trash collection are used in developing nations: house-to-house collection and collection from neighbourhood dumps (Singh, 2019). The first garbage collecting technique involves setting up neighbourhood dumpsites where each family is compelled to transport and deposit its trash. The garbage is then loaded into municipal vans, which transport them to locations for final processing and disposal. In Iwo Road, Ibadan, this is extremely typical. The local dumpsite method was the most common in Lagos State up until the turn of the new century (Agunwanba 2003). According to Afon and Okewole (2007), the second type of waste collection involves the frequent collection of trash from house to house using vehicles (pack lift, compactor, wheel-barrow). The majority of Nigerian cities currently use this technique. According to the data, 10% of the responders who burn their trash will undoubtedly pollute the neighbourhood and put people's health at risk if they breathe the fumes. While 9.3% of the respondents dispose of their garbage in water channels like gutters, this might result in floods in the area, which can result in the loss of lives and property.

Waste separation practice

According to the survey, 32.70% of the respondents separated their waste, whilst 67.30% did not; this indicates that most people do not separate their waste for recycling. They do not practice waste minimization since they dispose of everything at once. According to Ghorbani *et al.* (2017), monetary incentives combined with education about the benefits of household trash separation for the environment will encourage people to actively participate in waste separation at home. Recycling trash has been shown to increase consumption rates, according to more studies (Chung & Poon, 1996; Corvellec *et al.*, 2018). Households that closely monitor their trash will also benefit from reduced waste and increased awareness of the garbage they make, which will reduce collection costs and preserve resources.

Table 1: Income and waste management methods

Variable	Category	Frequency	Percentage
Monthly Income	>₦30,000	159	56.6
	₦30,001 - ₦60,000	55	19.7
	₦61,001 - ₦90,000	37	13.2
	₦90,001 - ₦120,000	15	5.3
	>₦120,000	15	5.2
	Sub-Total	281	100.0
Composition of waste generation	Kitchen waste	41	14.6
	Plastic waste	153	54.4
	Paper waste	33	11.7
	Solid waste	54	19.3
	Sub-Total	281	100.0
Waste Disposal Methods	Burn		10.0
	Dump in gutter	26	9.3
	Dump on the road for the waste collector	64	22.8
	Dump in household containers for waste collectors	180	64.0
	Bury waste	11	3.9
	Sub-Total	281	100.0
Waste separation practice	Separate waste	92	32.7
	Do not separate waste	189	67.3
	Sub-Total	281	100.0

Types of household waste reduced, reused and recycled

The study identified the types of garbage that were reduced and reused in the homes; reuse is the key to waste reduction. Reducing and reusing waste will help you save money, as the inhabitants told us during our interview. The more rubbish you produce, the more money you will spend. Additionally, it will lessen the amount of rubbish dumped at the sites. According to the results, 50% of plastic was recycled; bottles made up 19.9%; paper made up 10.6%; and 18.8% went into miscellaneous categories, which included things like

mattresses, electronics, clothing, shoes, rugs, and other items. People received some of these items that are still in good condition (Needhidasan *et al.*, 2014).

Therefore, it was concluded that the plastics were cleaned and utilized to sell liquids such as soap, zobo, and isal, among others. In addition, it was found that groundnuts were sold in bottles, some of which were also utilized as decorations. The paper was distributed to vendors of finger snacks, such as fried yam and potatoes, roasted corn, scotch egg, fish-roll among others. The kitchen garbage, which is included in the 18.8% of waste that was recycled, was recycled by being disposed of in the courtyard, where it will be used as compost (recycle). To support this, Ziraba *et al.* (2016) gathered data demonstrating that garbage sorting is uncommon in the majority of developing nations, making recycling and composting challenging (Achankeng, 2003). Hidalgo (2015) also discovered that homes can benefit from employing organic compost on a residential level. Waste must be regularly cleansed in its original form for the same or different purpose (for example, bottles, clothes, and books) if it is to be reused. Low-income households frequently reuse trash as a source of energy or heat, including manure, crop leftovers, wood, sawdust, paper, and cardboard. Animals are fed on food scraps like meat and bones.

Conclusions and recommendations

Findings revealed that trash generation is an unavoidable factor in a household. Waste is usually a product of consumption. A greater proportion of households do not recycle their waste because they think it is worthless after it has been used and that sorting rubbish for recycling is a waste of time. Also, there is an irregular collection of refuse in the Ibadan metropolis, where the study was conducted. The recommendations that result from this study are:

- Waste management needs to be given priority as a social service with sufficient funding.
- The government should make sure that rubbish collection occurs regularly everywhere.
- Education initiatives about how every individual may contribute to appropriate waste management are crucial to waste reduction measures. Cleanliness can be greatly increased by taking small steps, like not leaving rubbish on the road. Slowly implementing more sensible strategies, such as sorting trash at the source of generation, can significantly improve solid waste management.

Waste is not ineffective! Recycling practices should be promoted. Recycling can assist in lowering trash volume and the need to exploit alternative materials in natural forms. For instance, if the demand for plastics rises, more petroleum is required, which has a cost and an effect on the environment.

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