Assessment of Waste Management in the Market Environment in Auchi, Nigeria

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Abstract The market is a physical point of convergence and a fundamental phenomenon that immediately makes goods and services available to customers in accordance with societal demand. Marketing operations are subsequently impacted by population expansion and rising demand, whereas waste composition is influenced by the size and complexity of the market. Concentration and waste management have a greater potential to harm the environment and the general populace. The outcomes of sustainable management alternatives and market waste disposal in Auchi are presented in this study. On waste management, information was gathered from vendors, nearby homes, garbage managers, market unions, and government organizations. On waste management, information was gathered from vendors, nearby homes, garbage managers, market unions, and government organizations. Based on the products sold, the neighborhood was divided into four groups. The random sampling approach was used to choose 400 samples in a methodical manner for the distribution of questionnaires. The key informant approach was then utilized to choose and interview professionals and stakeholders in waste management, such as unofficial waste managers and regional government organizations. Descriptive and inferential statistics were used to present and interpret the data that had been gathered. According to the research, 78% of the locals were aware that poorly managed garbage exists and that it pollutes the environment and transmits disease. The amount and complexity of garbage produced, as well as the tactics utilized for successful urban solid waste management, were examined using the components analysis approach. The burden of environment-health-risks are persistent as result of poverty and poor access to clean environmental services. The study suggested that standard 50-liter garbage bins be used at each stall and put outside for simple pickup. To establish a solution for urban solid waste management, public involvement and collaboration with all social groups are required. Market waste management costs need to be offset by better services. Vegetable wastes should be used to produce bioenergy through anaerobic digestion and organic fertilizer using composting technologies to safeguard the ecological balance of the planet.

1. Introduction

The presence of a market as an intermediary instrument or system that provides a physical environment and arena for people to facilitate: the purchase and sale of goods and other commodities; exchange; and the distribution of goods or services between towns, villages, and regions. Regularly gathering people of different socio-cultural and economic characteristics together to conduct periodic activities such as commercial dealing, shopping, and purchasing decisions. The structure that guides and contributes tremendously to the actor's socio-

economic development is a basic phenomenon appreciated by every society. One major functional urban area is the market place, which incorporates all the internal or external factors to drive and influence organized activities that have value and fulfil customers' demands, clients' needs, partners' needs, and the needs of culture and society at large. The market offers a reason for people to gather information about customer behaviour and references, make it available resulting in spatial concentration of resources, and enhance the technological way of marketing the products to consumers. Their satisfaction determined many economies' economic and political fates, and sales earnings account for a significant portion of national income, growth, and development through infrastructure and opportunities that eliminate poverty in our society (Ayo-Odifiri, 2017).

The type, accessibility, use, and management of markets tell a great deal about a planned society and contribute to the growth of urban infrastructure, the populace's productive life, and overall economic development. Market planning, design and architecture, economics, accessibility, centrality, publicly aware product or service management, landscape, and building architecture are all parts of a good market project. It also involves physical access to products, personal service, and quick feedback, less tough competition, safer and sounder payment, the atmosphere of a physical store, face-to-face communication, and quicker and easier measurement of responses. In spite of its importance in providing employment opportunities for a large member of the citizenry, the arts enjoy access and patronage and contribute greatly to the national economy when made efficient. Correspondingly, "man's existence is inextricably linked to the consumption of products made available and the transfer of goods or services that generate waste, which, if not properly managed, causes a dastardly effect of environmental degradation on the same man and his cities". It management directly impacts the health of the people and environment surrounding it. Zwarteveen, (2015), argue that because of their urgency, solving waste problems requires new waste wizards and heroes: new courageous visionaries who speak and act on behalf of both nature and society.

According to Medina and Gamse (2010), Agwu (2012), markets are the second largest generator of municipal solid waste after households and contribute about 20% of waste generation. Market densities have an impact on per capita waste generation; as open space is converted to other land uses, the available land for waste disposal shrinks. The inability of enhanced services and facilities of government-owned agencies and the structure of informal participation to adequately cope with the upsurge in the volume of waste generated led to the creation of a "vacuum" in the collection, transportation, recovery, recycling, and disposal of solid waste in the Uchi market. Exposure to pollution and other environmental risk factors makes the urban poor vulnerable, while poor sanitation facilities threaten their lives and increase the spread of diseases. This malady of waste management in most of the Nigerian cities has been causing a lot of concern. It is posing formidable challenges to both state governments and local government councils, researchers, and particularly city residents. However, its requirements require adequate management to sustain and tackle environmental challenges. To address the greater task posed by waste management and planning issues, the paper therefore investigates the nature of market waste, rate of generation, and management situation of the urban market of Auchi.

2. Research Methodology

2.1 Study area

Auchi, the administrative center of Etsako, is situated around 330 kilometers from Abuja, the Federal Capital Territory, and 136 kilometers north-east of Benin City, the capital of the Edo state. It is situated on the edge of Nigeria's southern rainforest and northern savanna grassland. It is located between the equator's latitude of 70°04'44" and longitudes of 50°36'32" and 60°24'57" east of the Greenwich meridian. Its area is roughly 346,316 km², and the majority of its altitudes are between 320 and 420 m above sea level. Figure 1 depicts a map of the study region. Its area is roughly 346,316 km², and the majority of its altitudes are between 320 and 420 m above sea level. The town has tropical weather, which is distinguished by a lot of rain, hot temperatures, and high relative humidity. The scenery of Auchi is characterized by a highly undulating topography that creates an extremely complex drainage system.

The area is well known for its abundant and reliable natural resources. Major cement plants, many stone-processing facilities, and a variety of enterprises are all located in Edo North. Interurban and Intra-urban roadways, which effectively turned the town into a significant commercial and nodal center, and Auchi's political status as the local and regional capital are the main contributing causes. All of these elements have facilitated rapid rural-urban migration and quick growth, which over time have exacerbated sprawling in Auchi (Bada, 2021).

According to the report, the Uchi market is a typical marketplace that was created and is owned by the neighborhood but is run by the government to provide the general public with a wide range of goods and

services. A regularly occurring market with historical and cultural value to the Auchi people that is frequented every week (every five days). Key informant interviews and discussions with waste handlers were used in the study. Field research, observation, and measurement conducted by the author The respondents were chosen using a stratified random sampling technique, which involved collecting qualitative and quantitative information on socioeconomic characteristics, such as market patronage, and the physical characteristics of solid waste generated, as well as information on waste disposal facilities and daily waste generation estimates. In addition to the actions of public entities, the routine and method of collecting, transportation, and disposal were documented.
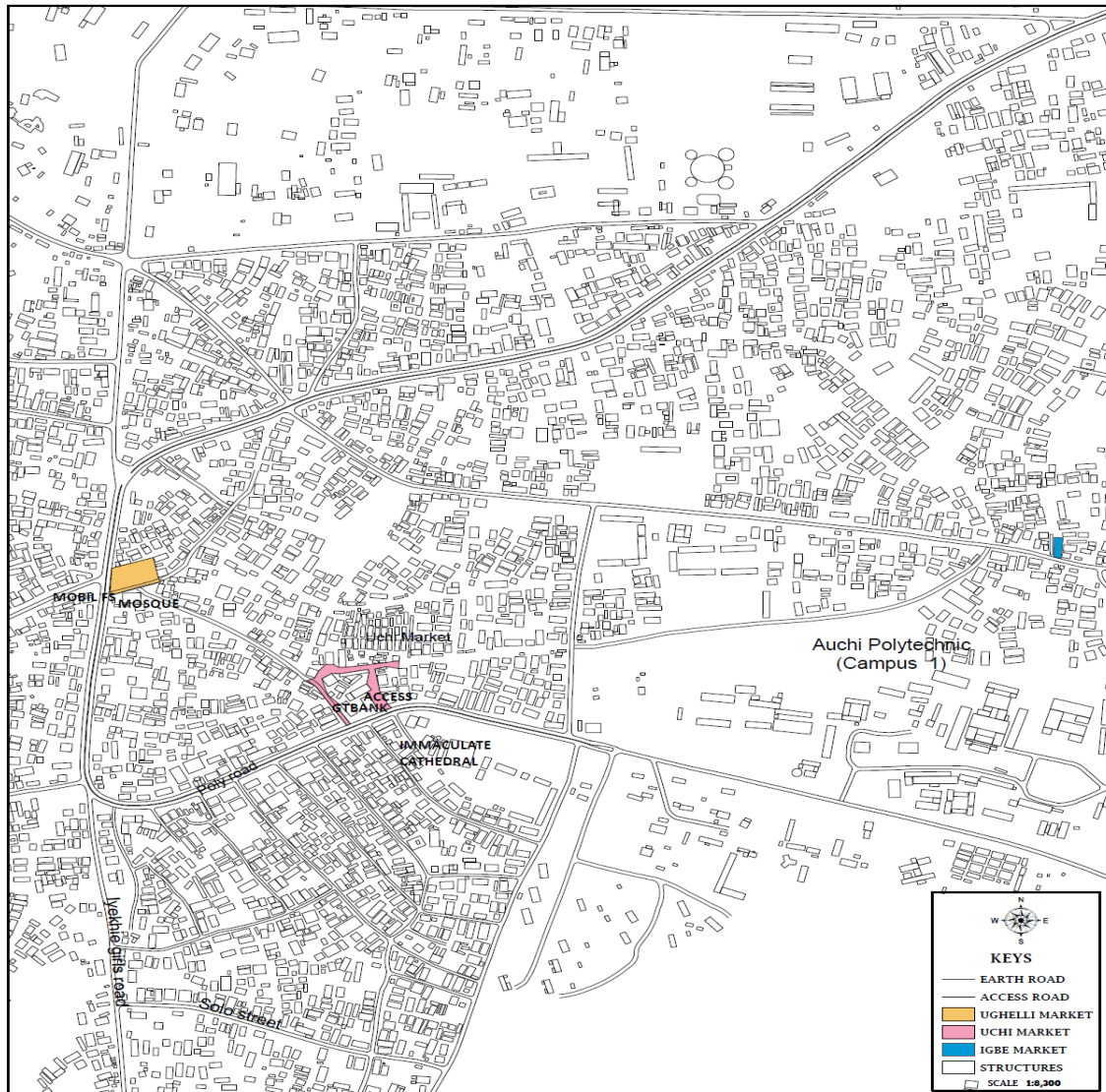

Figure 1: Map Auchi indicating Uchi market
Source: Google Earth-ARC-GIS, 2023

3. Results and Discussion

An ANOVA with one way was used to evaluate the data. According to the survey, organic trash made up 29.0% of the market's waste flow, followed by paper (29.0%), plastic (18.0%), metal (13.0%), leather (5.0%), glass (4.0%), and residual garbage (2.0%). With varying levels of recyclable garbage, the market's daily waste generation levels varied [$F_{(2, 60)} = 105.860$, $p = .000$]. Table 1 displays how individuals feel about the most frequently produced garbage. According to 75% of respondents, the rainy season is when most solid waste is produced because it is when fresh, green farm products like vegetables, cotton and leaves for rapping motions,

yam peals, maize shafts, etc. are in great supply. 25% of the respondents said waste is generated during a long, dry, harsh season. This period is better because solid waste can easily be burned, unlike in the long season of mid-March–July, when solid waste is stored with an unfavorable smell that can cause fever and typhoid because it cannot be incinerated easily.

Table 1: Seasonal waste generation

Season	No of Respondents	Percentage
Raining Season	300	75
Dry Season	100	25
Total	400	100

3.1 Waste management

The methods now used in the market for managing solid waste vary greatly depending on the waste types and products offered. The following is an evaluation of how widely various strategies are used and how well they work: gathering and moving. Market garbage is collected in a range of containers, including used shopping bags, plastic drums or bins that improve collection efficiency, old cans, used cartons, and rattan baskets. Unofficial disposal sites have been formed along roadsides, where bagged and loose trash is gathered. The most expensive components of solid waste management for traders are often garbage collection and, if appropriate, transfer. There are many different collecting methods employed, such as shop-to-shop collection and indirect collection, which involves setting up containers and garbage bins close to markets and other suitable sites. It results agrees with the finding of Acey *et al.* (2006).

In the Uchi market, solid waste is a major source of environmental annoyance. The majority of waste collection and disposal services are provided by the public sector through the Etsako West Local Government Authority, a structure that is not operating effectively and may be directly related to a lack of trained and skilled personnel, inadequate equipment, and inadequate funding from the relevant state and local governments. In contrast, an informal waste collector uses local push carts to move waste around the market and charge between 500 and 1,000 Naira per wheelbarrow. The collection service has a 25% efficiency rate and is largely market-exclusive. Unfavourable economic, institutional, legal, technical, and operational restrictions have an impact on the Uchi Market's current solid waste management system. Lack of policy direction and enforcement, hazy roles, and insufficient level planning to build integrated waste management policies and plans all hinder its development. Operating costs are still a major problem for trash management in Auchi. Trash collection vehicles and other logistics needed to handle the market's rising waste creation were neither available nor functional, and no sustainable funding plans for trustworthy waste collection services had been created. The observation is similar to the study of Akinbamijo. (2019).
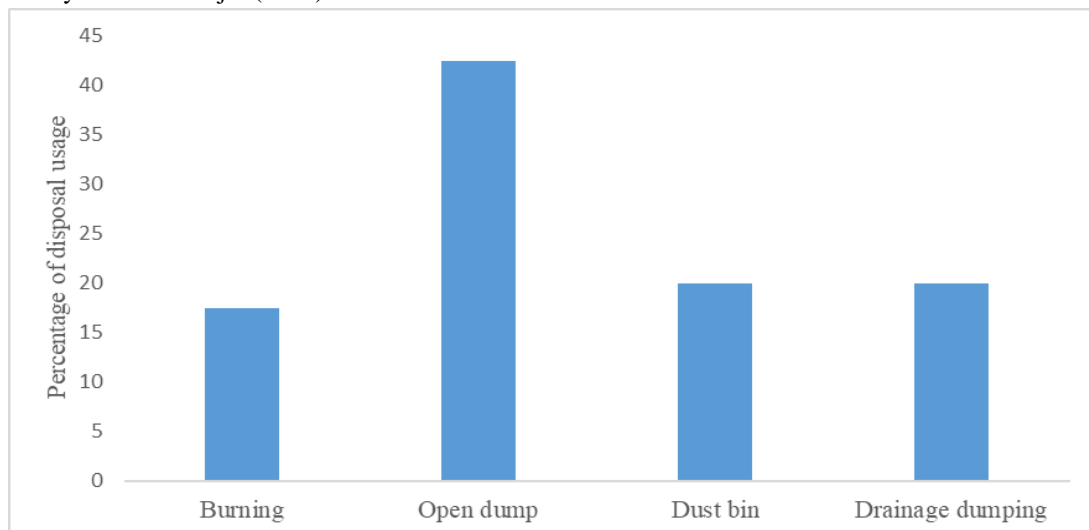

Figure 2: Waste disposal methods at Uchi market

The lack of a strong and integrated strategy for the collection and disposal of all generated garbage in the market region rendered waste management methods ineffective. Waste management is currently accorded a low priority despite growing loads that strain the already constrained resources of waste collection and disposal organizations. The collaboration and coordination of waste management among unions, communities, the informal sector, and official authorities is atrociously poor. The current dumpsite, which has been poorly managed and sited, has not been improved in any way. Wastes are thrown in culverts, drainage channels, beneath bridges, and along roadways. Within the market zone, this is a typical occurrence. Figure 2 presents the available waste disposal methods at Uchi market

The processes of waste collection and disposal services, transfer station and disposal system are not adequately catered for, the management was ineffective or inefficient. A bad attitude of the marketers toward the removal of solid waste, a lack of political will and cost recovery, poor functional level of infrastructure and accessibility within the marker, a lack of waste data for planning, a bad attitude of the waste generators, and the operation of unlicensed dumping sites within the market are a few examples. Maximum weekly rubbish collection by local governments is extremely insufficient from the standpoint of public health and does not call for social acceptance. The planning framework for waste management necessary and the enforcement of waste management and sanitation laws are ineffective, and applicable development rules do not regulate unlawful use of land. Periodic checks to monitor and enforce the established "Market Clean" sanitation program for shop owners to clean up their environments per week (7 a.m.–10 a.m. every Monday) are adequate from a public health perspective but have little or no social acceptance, and failure to do so attracts no fine. While monthly environmental sanitation is not well monitored in Auchi, the waste management authority does not work with private agencies despite a shortage of workers (only civil servants) who collect and manage waste in Uchi Market. There are huge infrastructure deficit and ineffective stockholder participation in development and management of waste schemes. The implicating factors include nonchalance of residents, marketers, agencies negligence and poor maintenance routine.

4. Conclusion

Studies conducted at Uchi Market have demonstrated the present methods used for waste management from the perspective of solid waste management operators. Additionally, every market segment's level of waste production was assessed. At Uchi Market, the traders generated between 0.4 and 0.6 kg of waste per person per day, and the customers also produced an average of 0.1 kilogram per person per day while they were there. The observation matches that of Zwarteveen (2015), whose investigation found a range of 0.44 to 0.66 kg/capita/day. Numerous suggestions were made in light of the data in order to develop an effective, self-sufficient, successful, and long-lasting waste management system in the Uchi market. According to the study, the respondents utilize dustbins and polythene bags to gather their solid trash, and some even make garbage heaps outside where they dump their rubbish. An enhanced garbage storage and collecting system is needed to reduce the issue, efforts are needed to sensitize and aid in waste disposal, sorting, collection and recycling obligations. Standard 50-liter waste bins should be used by each stall and placed outdoors for simple collection. Food scraps, animal waste, and vegetal waste should be used to produce bioenergy through anaerobic digestion and organic fertilizer through composting technology in order to preserve the ecological balance of the planet.

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