

Turning Trash Into Treasure: The Impact of Recycling on Public Health In Southern Taraba, Nigeria.

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ABSTRACT

This study examines the impact of recycling on public health in Southern Taraba, revealing that most respondents acknowledge the health implications of recycling. Using a cross-sectional survey design and the Health Belief Model as the theoretical framework, 1,200 respondents were sampled through Taro Yamane's formula. Data were collected using quantitative questionnaires. Findings indicate that proximity to recycling bins significantly enhances household recycling behaviors. Despite challenges such as inadequate waste management infrastructure and public awareness, recycling serves as a vital livelihood for scavengers and merchants. The research highlights recycling as a cost-effective and environmentally friendly waste disposal method that reduces air and water pollution and minimizes waste toxicity in landfills. It is recommended that establishing a robust recycling system could improve environmental health and resource allocation, promoting community well-being and sustainable waste management practices in the region.

Keywords: Public health, solid waste, recycling, Southern Taraba, Nigeria.

INTRODUCTION

The generation and disposal of solid waste pose significant and ongoing challenges globally, further intensified by a rapid increase in waste production due to urbanization, population growth, and changing consumption patterns. The United Nations Environmental Programme [7] reported that the total volume of solid waste generated worldwide reached a staggering 1.3 billion tons in 2012, a figure that has continued to rise. This substantial waste generation has far-reaching implications for public health, as

inadequate management of solid waste can lead to environmental degradation and increased exposure to harmful pathogens and vectors.

On average, each person contributes approximately 0.74 kilograms of solid waste daily [7] a statistic that highlights the individual responsibility in waste generation. While developed nations, which account for only 16 percent of the global population, generate around 34 percent of the world's waste amounting to approximately 683 million tons [2], developing countries, including those in Southern Taraba, often struggle with inadequate waste management infrastructure. This disparity in waste production and management practices underscores the urgent need to explore sustainable solutions, such as recycling, to mitigate the adverse effects of solid waste on public health.

This study aims to investigate the impact of recycling on public health in Southern Taraba, addressing the critical intersection between waste management practices and community health outcomes. Given the region's unique challenges related to solid waste disposal, including limited access to proper disposal facilities and a lack of public awareness regarding recycling, it is essential to assess how effective recycling initiatives can alleviate health risks associated with unmanaged waste.

By examining the relationship between recycling practices and public health, this research seeks to provide valuable insights that can inform policy decisions and community interventions aimed at improving waste management. Understanding the role of recycling not only contributes to reducing the volume of waste generated but also promotes healthier living environments, ultimately enhancing the well-being of residents in Southern Taraba.

THEORETICAL FRAMEWORK

Health Belief Model

The Health Belief Model (HBM), developed in the 1950s by social psychologists including Hochbaum and Becker, offers a framework for understanding how beliefs influence health-related behaviors. It was initially designed to explain participation in disease prevention programs but has since been adapted to predict general health behaviors. The HBM is particularly relevant in the context of solid waste recycling and public health in Southern Taraba, Nigeria, where the effective management of solid waste is critical for community health.

Core Concepts of the Health Belief Model (HBM)

1. **Perceived Susceptibility:** This refers to an individual's belief regarding their vulnerability to health issues arising from poor solid waste management. In Southern Taraba, residents may recognize that inadequate waste disposal can lead to diseases such as cholera or malaria. By understanding their susceptibility, individuals may be motivated to engage in recycling practices.
2. **Perceived Severity:** Individuals' beliefs about the seriousness of health consequences associated with improper solid waste disposal play a crucial role in their behavior. If residents perceive the health impacts

of pollution or disease transmission as severe, they may be more likely to adopt positive waste management practices, such as recycling.

3. **Perceived Benefits:** The model posits that individuals will engage in behaviors they perceive as beneficial. In the context of solid waste recycling, if residents believe that recycling reduces waste and mitigates health risks, they may be more inclined to participate in such initiatives. Public health campaigns can emphasize these benefits to enhance participation.

4. **Perceived Barriers:** This refers to the obstacles individuals face in adopting health-promoting behaviors. In Southern Taraba, barriers may include lack of access to recycling facilities, inadequate knowledge about recycling processes, or financial constraints. Identifying and addressing these barriers through education and community resources is essential for improving recycling behaviors.

5. **Cues to Action:** External factors can trigger individuals to engage in health-promoting behaviors. In Southern Taraba, community awareness campaigns, workshops, and visible recycling bins can serve as cues that encourage residents to recycle and manage waste effectively.

Application of HBM to Solid Waste Recycling in Southern Taraba

By applying the HBM to the context of solid waste management in Southern Taraba, we can better understand the factors influencing individuals' willingness to engage in recycling. If residents believe they are at risk of health issues due to poor waste disposal and understand the severity of these health risks, they may be more likely to adopt recycling practices. Furthermore, if the perceived benefits of recycling—such as a cleaner environment and reduced health risks—are effectively communicated, participation in recycling initiatives may increase.

Conversely, if barriers such as lack of awareness, inadequate infrastructure, or cultural beliefs about waste management persist, individuals may continue to engage in harmful waste disposal practices. Therefore, targeted interventions should focus on enhancing knowledge about recycling, addressing barriers, and promoting the health benefits of proper waste management.

Above all, the Health Belief Model serves as a valuable framework for analyzing and promoting solid waste recycling in Southern Taraba, Nigeria. By understanding the beliefs and attitudes of residents toward solid waste disposal, public health officials and community leaders can design effective strategies that encourage positive behaviors and ultimately enhance public health outcomes. Integrating this model with other behavioral theories, such as the Theory of Planned Behavior, can further strengthen initiatives aimed at improving waste management practices in the region.

METHODOLOGY

This research utilized a cross-sectional survey design, selected for its effectiveness in rapidly gathering pertinent data from a representative sample. This design enables findings to be generalized to the larger population of interest. We determined a sample size of 1,200 for distributing questionnaires, calculated using Taro Yamane's formula, based on a total study population of 1,068,367. From the 1,200

questionnaires distributed, we received 1,090 completed responses, resulting in a robust response rate of 91.0%, deemed adequate for analytical purposes.

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

Findings on recycling as a method of solid waste disposal showed that most of the respondents were aware of recycling method of solid waste, many of the respondents rated the practice of recycling as the most effective method of solid waste disposal, only few of the respondents maintained that recycling had no health effect, many of the respondents rated solid waste recycling/re-use as a major source of livelihood for scavengers and recycling merchants. A greater number of the respondents rated that solid waste recycling was not expensive, and many people maintained that, it was the best way of solid waste disposal, some of the respondents rated that recycling of solid waste was not harmless to human health.

Table 4.1 Respondents Ratings of Recycling as solid waste disposal system

Statements	Strongly Agree	Agree	undecided	Disagree	Strongly Disagree	Mean	STDV
1. I am aware of recycling method of solid waste disposal	583	41	227	38	15	3.93	1.378
2. I practice recycling of solid waste	468	20	59	448	95	3.29	1.570
3. Recycling system of solid waste disposal has less effect on human's health	117	14	21	660	278	2.07	1.443
4. Solid Waste recycling/re-use is a major source of livelihood for scavengers and recycling merchants	448	57	90	481	14	3.40	1.443
5. Recycling methods is not expensive	438	90	128	365	69	3.41	1.471
6. It is the most effective method of solid waste disposal	616	394	55	4	21	4.42	0.893
7. It is not harmless to human health	328	442	139	128	53	3.78	1.021
8. It is more technical to practice	488	515	22	11	54	4.41	0.771

9. Not all solid waste that are good for recycling	580	428	38	36	8	3.88	1.021
10. It does not cause any pollution	368	453	125	55	89	4.41	0.771

Source: Field Work, 2024,

Note: STDV= Standard Deviation

From Table 4.1, it can be inferred that, only the statement which stated that recycling system of solid waste disposal has less effect on human's health had a mean score of 2.07 and standard deviation of 1.443, which indicated less acceptance of the statement. It therefore means that, all other statements relating to the recycling of solid waste were accepted with the mean score of above 3.50. The standard deviation values ranged from 0.771 to 1.570, indicating the proximity of these values to the mean. Therefore, there is harmonization of opinions among respondents.

DISCUSSION OF FINDINGS

Findings on the recycling of solid waste in Southern Taraba revealed that only few of the respondents were of the opinion that recycling had no health effect. [9] found that the distance to the recycling bins decreases, the number of fractions that people separate, sort and collect their solid waste at home increases. Ike, Ezeibe, Anijiofor, and Nik Daud (2018), solid waste recycling in Nigeria range from poor collection and disposal methods; lack or poor waste management database; insufficient financial resources; non-compliance to laws and lack of awareness on dangers of poor sanitary habits.

Solid waste recycling/re-use was a major source of livelihood for scavengers and recycling merchants. Solid waste recycling is not expensive, it was the best way of solid waste disposal, the statement that recycling of solid waste was not harmless to human health, however, it was reported that it was more technical to practice but not all solid waste were good to recycle, and one advantage of the method is that by extension, it does not cause either air or water pollution. The findings were in line with Adebola (2006), who found that recycling is not only meant to reduce the tons of solid waste been generated but it's also a multi-million-naira investment, where some specialized equipment and machines are used for the conversion of the recovered items to finished products or raw materials that are also used in several other applications. Also, the study findings agreed with [5], who found that the practice of collecting, treating, and managing solid waste prior to disposal has become a necessity in developing and modern societies. Also, in agreement with the findings of [8] waste recycling has a significant environmental benefit to the reduction of waste in landfills and the environments, hence a reduction of waste toxicity transferred to the soil and water bodies within and surrounding landfill areas.

The study carried out by [5] at the Covenant University, Ota, Ogun State, the study involved the use of structured questionnaires, on-site observations, and measurements; the study revealed that the average

amount of recyclable waste generated per day in the institution were 55.56% food waste, 13.46% PET bottles, 12.64% other plastic, 9.63% nylon, 4.68% tin cans, and 4.03% paper. The study established that adequate waste characterization is a requirement for effective integrated solid waste management, which would boost resource recovery, reuse, and recycling.

Waste recycling has a significant environmental benefit to the reduction of waste in landfills and the environments, hence a reduction of waste toxicity transferred to the soil and water bodies within and surrounding landfill areas. In general, there will always be some materials that cannot be recycled, simply because they have lost all usefulness. A well-articulated solid waste recycling system will have positive effect for a cleaner environment, good health of urban residents and create a more balanced allocation of resources [8]. Waste reuse and recycling are often undertaken as a survival strategy by scavengers and recycling businesses, thereby reducing the total amount of solid waste headed for the landfill.

Waste recycling is an interesting approach to achieve an efficient, integrated manner of managing municipal solid waste. However, MSW recycling is restricted to well segregated and clean high value materials. [1], opined that municipal solid waste recycling in Lagos is at an early phase, just like in Thailand. Although it exists, recycling and resource recovery as forms of waste management have not received the attention of the government and the waste management authorities, neither in the past nor in the present. Also, there is no officially known material recovery facility (MRF) in the state.

In terms of pricing for solid waste disposal, [6], reported in their study that there are indications that high rates of recovery for recycling are associated with tipping fees at the site of disposal. This showed that high disposal pricing has the positive effect on recovering the generated solid waste. This goes to the beneficial reuse or the value chains of solid waste. Social influences, altruistic and regulatory factors are important reasons why certain communities can develop strong recycling habits. Moreover, people who frequently go to dispose their general refuse in the bins are more likely to recycle certain products at home. In most cases, as the distance to the recycling bins decreases, the number of fractions that people separate, sort and collect their solid waste at home increases [3].

[4], contended that the solid recycling is a major environmental challenge in most Nigerian cities. It is largely monopolized by the agencies of state governments (sub-national governments) which have limited capacity.

CONCLUSION AND RECOMMENDATIONS

The findings of this study underscore the critical role of recycling in managing solid waste and its implications for public health in Southern Taraba. While most respondents recognized the health effects of recycling, challenges such as inadequate waste management practices, lack of public awareness, and insufficient financial resources hinder effective recycling efforts. Recycling not only provides a livelihood for scavengers and recycling merchants but also presents a viable solution to mitigate environmental

pollution and promote better health outcomes. The research highlights the need for a comprehensive solid waste management strategy that prioritizes recycling as a means of reducing landfill waste and its associated health risks.

Based on the study findings, it is recommended that, to enhance public health and environmental sustainability in Southern Taraba, it is imperative to establish a structured recycling program that includes increasing public awareness about the benefits of recycling, improving access to recycling bins, and providing adequate training on effective waste segregation practices. Additionally, local authorities should collaborate with stakeholders to develop a robust waste management infrastructure that supports resource recovery and encourages community participation in recycling initiatives.

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