IMPACT OF WASTES MANAGEMENT AND Viable DEVELOPMENT IN NIGERIA: CASE STUDY OF GWAGWALADA AREA COUNCIL, ABUJA IN NORTHERN NIGERIA

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Abstract
Background/Objective: To investigation waste administration and viable development in Nigeria with precise reference to Gwagwalada Government Council Waste Management Agency (GGCWMA). Method: The zone was divided into three regions namely: Region A (Park - market road), Region B (Bako – Zuba road) and Region C (Gwagwalada – Kwali road). Survey research strategy was espoused with questionnaire as principal tools utilized for data gathering which were assigned to twenty five families selected randomly a total of 75 households that were studied. Findings: Illeratecy and income level was revealed as cause of waste management problem likewise civic waste characterization for the Gwagwalada area council reveals paper, water sachets and food waste as the highest waste generated, while sack and plastic bag are often used to dispose waste since bags are easy to dispose and cheaper. The waste storage frequency is between 12 – 24 hours whereas waste disposing frequency follows mostly once and bi-weekly collections. Some respondents have open dumps within their neighbourhood where waste is store and discarded. Nevertheless, there is high recycling frequency for bottles and metal because they are reuse at home and 7 % sell. Common solid waste management practice in Gwagwalada area council are storage and dumping of waste either road side or canal whereas recycling and reduction which are waste minimization performs in the three hierarchy scheme, which also form strength of most waste administration systems is faintly practiced. Application: For wastes management and viable development in the developing countries.

Keywords: Waste management, viable, sustainability development, Gwagwalada, Abuja.

1. Introduction

Solid wastes are the unserviceable and unwanted goods in the solid state resultant from the society activities. The term civic solid waste (CSW) customarily assumed to embrace all waste produced in communal with the exclusion of industrial process besides agricultural discarded. Although main CSW sources entails institutional, housing, commercial, construction and annihilation, civic services excluding treatment services, treatment plant places and metropolitan incinerators. Appropriate management cannot be accomplished without an ingenious waste administration plan. Thus civic solid waste is a rejected accretion from merchants, shop owners, families, market women besides other commercial activities in the built-up settings. The structure and characteristics of metropolitan solid waste is predisposed by certain issues, which embrace the area (housing, commercial, etcetera), the level of economic
variances between high and low-salary areas), the period and weather (dissimilarities in the populace amount throughout the year as well tourist places) and mankind beliefs that are living or performing business activities in the region. High-income zones generally produce more inanimate materials like plastics as well paper whereas low-salary areas generate relatively more of carbon-based waste. Uninhibited or improperly located exposed solid waste dumps institute health exposures and mutilate the aesthetic magnificence of many municipalities in Nigeria. The problem of civic solid waste management in Nigeria metropolises has been fascinating the attention of scholars and most of the research outcomes point to the need for a justifiable and an effectual solution to solid waste nuisance in Nigerian metropolises. advocated for substitute to the conventional methodologies to civic solid waste administration used by development agencies and transnational donor agencies in developing nations because the conventional methodologies is bureaucratic and flouts informal sector. The conformist approach focuses on the advanced technology usage of collection and disposal, nevertheless its capital intensive nature can be a main reason why official recycling or resource retrieval programmes are scarce in Nigeria.

Significantly, it has been advocated that effectual recycling plus composting can save eighteen point six percent waste management prices and fifty seven point seven percent landfill cost. Also suggest recycling acceptance as a step towards espousing an integrated solid waste administration method. Civic solid waste administration should embody a comprehensive study of the waste characteristics. When diverse waste classifications are not considered throughout collection and discarding, operational solid waste management becomes problematic. This research will cover solid waste management study in three zones within Gwagwalada Local Authority Council, Abuja. The research limits will embrace the scheme elements of the incorporated solid waste administration system through using unified solid waste management (USWM) as an assessment device.

2. Material and Method

2.1 Study Area:- In this study Gwagwalada town in Abuja were chosen as example of rural settlement growing to urbanites besides prevalent situation of diverse waste management difficulties, size, and tasks. Gwagwalada was under the Kwali Region of the prior Abuja emirate currently Suleja emirate before the establishment of Federal Capital Territory. Gwagwalada Area Council was formed on 15th October 1984 with formal population number of 158,618 populace at the 2006 census. Gwagwalada Area council is one among the five Local Government Area (LGAs) Councils of Federal Capital Territory (FCT) of Nigeria, others are Kuje, Abaji, kwali, Bwari and Abuja city itself. Seat of government relocation from Lagos to Abuja in 1992 as well latest demolition of unlawful buildings in the Federal Metropolitan Center brought enormous invasion of people into the Area Council. Being among the swiftest growing built-up centers in the FCT, the population to over three million people, the locations are shown in Fig. 1.

2.2 Research Techniques:- The specimen frame entails of individuals living within case study areas, data was gathered by questionnaire as well field survey. The research tools construction is through USWM that was used to framework the valuation areas and the survey content whereas the housing questionnaire is closed. The study engaged numerous statistical test meant for scrutiny and data interpretation beside social bundle for social sciences (SBSS) style.

2.3 Sampling Stratagems:- The questionnaires was disseminated using simple random sampler within each stratus and circulated to families in open places and gardens in the metropolises. This random sample technique was selected owing to the enormous area, targeted at covering all the boroughs so as to facilitate a universal and precise valuation of the sample unit.

2.4 Study Area and Population:- Gwagwalada local council made up of ten wards namely; Dobi, Gwagwalada centre and Staff quarters, Gwako, Ibwa, Ikwa, Kutunku, Paiko, Tungan maje and Zuba. Gwagwalada has a land area of 1069.59 km² with a population of approximately three million.
2.5 Sample Size: Sekaran (2010) proposed sample size should be larger than 30 and less than 500, which would be appropriate for research purposes. The sample size for the residential questionnaires was calculated from the formula below. This formula has been used to derive an appropriate size for the study area. A 95% confidence level or \( p=0.05 \) is assumed for Equation 1

\[
n = N \div \{1 + N(e^2)\}
\]

Eqn 1

Where:

- \( n \) is the sample size,
- \( N \) as population size and
- \( e \) as the precision level.

For Gwagwalada, \( n = 101.02 \)

From the formula and calculations above, the trial size is almost 101 for each case study.

2.6 Validity and Reliability: The questionnaire used was from erstwhile studies but it was modified to suite this research purpose besides authenticated by three experts and verified via pilot study and retried after modified.

2.7 Instruments: The picking of scale comprises of nominal scale applicable to the categorical data. Questionnaires used for the investigation incorporated the components of the USWMs which is the frame used. The questionnaire with close ended questions divided into segments in Table 1. Section A made up of general demographic questions (age, sex, metropolis, salary and residents number per family), section B entails questions categorised based on USWM system components which will enable universal overview of identifying both amount of solid wastes created in the city as well as the solid waste administration practice. Also to be used to imitate portions of the modern state of solid waste administration based on the respondents practice in waste generation, storing, gathering, lessening, recycling as well separation expressions.

2.8 Field Survey: This entails visits to municipalities and collection points located within Gwagwalada Area Council, Abuja.

3. Results and Discussions

3.1 Demographic Analysis

A) Sex and Occupation: The demographic analysis (Gender and Occupation) produced using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 3.

B) Age Group: The Age group analysis produced using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 4.

C) Education: The Education level produced using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 5.

D) Salary: The salary produced using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 6.

E) Size of Families: The size of household produced using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 7.

Figure 1 – 7 shows that demographic data (sex, occupation, age, education, income and families size) for each of the three regions, female discarded waste more than men, while Non-government workers that dispose waste is more than government workers, the age limit from 26-45 years handled waste most, while literate group handle waste management more than non-literate but higher income group discarding of waste is higher than low income group, meanwhile families of four to six handling waste higher than seven families which also higher than four families below. These results imply that in income and educational level of the populace determine proper waste management.

3.2 Waste Management

3.21 Civic Waste Characterization: The civic waste characteristics quantities and percentages for the waste generated using the three regions in
Gwagwalada council area presented in Table 2 and graphically illustrated in Figure 8.

Figure 8 shows the frequency shape based on the kind of waste created. It can be grasped from the pie chart, paper, water sachets and food waste have greatest percentages which is in agreement with research work made by 15.

3.22 Waste Storage Techniques:- The storage techniques gathered using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 9.

The trend for the waste storage shows those for sack and plastic bag are frequently since bags are easy to dispose and cheap.

3.23 Storage Frequency:- The storage frequency gathered using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 10.

Figure 10 shows the style for waste storage frequency for the three regions in Gwagwalada council area, between 12 – 24 hours storage is widely used.

3.3 Waste Disposal method and frequency:- The Collection and Discarding Frequency gathered using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 11.

The trend for the waste disposing frequency follows mostly once and bi-weekly collections of waste. Some respondents have open dumps within their neighbourhood where waste is store and discarded (burning, recycling) which is in agreement with research work made by 14.

3.4 Waste minimization (Frequency of Items Recycling) :- The Collection and Discarding Frequency gathered using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 12.

There is a high recycling frequency for bottles and metal because they are reuse at home and 7 % sell which is in agreement with research work made by 14&17.

3.5 Solid Waste Management Practices :- The solid waste practices among resident gathered using the three regions of Questionnaire that were assigned to twenty five families selected randomly making total of 75 households are presented in Figure 13.

The trend shows high frequency of storage and dumping of waste either road side or canal as waste management commonly practice in Gwagwalada area council. Recycling and reduction which are waste minimization performs in the three hierarchy scheme, which also form strength of most waste management systems is slightly practiced which is in agreement with research work made by 16.

4. Conclusion

This study investigated the impact of wastes management and viable development in Gwagwalada Area Council, Abuja Northern Nigeria. Demographic data of the three regions reveals illeratecy and income level has cause of waste management problem likewise civic waste characterization for the Gwagwalada area council reveals paper, water sachets and food waste as the highest waste generated, while sack and plastic bag are often used to dispose waste since bags are easy to dispose and cheaper. The waste storage frequency is between 12 – 24 hours whereas waste disposing frequency follows mostly once and bi-weekly collections. Some respondents have open dumps within their neighbourhood where waste is store and discarded. Nevertheless, there is high recycling frequency for bottles and metal because they are reuse at home and 7 % sell. Common solid waste management practice in Gwagwalada area council are storage and dumping of waste either road side or canal whereas recycling and reduction which are waste minimization performs in the three hierarchy scheme, which also form strength of most waste admi

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practices like waste burning and dumping within neighborhoods.

To record success of the above subject matter, repeated and periodic environmental alertness programmes using diverse communication mediums is necessary to change the resident’s attitude. Waste reduction need to be seriously addressed in Gwagwalada, Abuja and stratagems need to be instigated to increase the recycling rate, composting and minimizing of waste. More so, Indiscriminate littering requires an upgrading gathering points to miniature transfer stations, rising in civic bin number in closely populated zones with daily emigrations during office hours to elude traffic jams by hauling truck. Also institutional body must integrate laws and policies about environmental issues, obviously stated guideline for staff and residents to follow as well implemented, or formulated and improved for each part of waste administration processes, while the institutions answerable for waste administration need to be unified under a sole body with the appropriate instrument put in place to facilitate its proper function.

5. References


Figure 1: Gwagwalada maps

Figure 2: Open Dump within a Residential Area (left) and Discarding on the road (Right)

Government workers (GW) and Non-government workers (NGW), Male (M) Female (F)

Figure 3: Gender and Occupation of respondent in Gwagwalada Area council.

Figure 4: Age group for Gwagwalada area council Resident

No education Qualification (NEQ), Secondary school education (SSE), College Education (CE) and University Education (UE)

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Figure 11: Waste Frequency by Residents of Gwagwalada Area council

Figure 12: Items recycling frequency by Residents of Gwagwalada Area council

Figure 13: Solid waste practices for Gwagwalada area council Resident

Table 1: Questionaire format

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Scale Type</th>
<th>No. Of Items</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>Demographic Information</td>
<td>Categorical</td>
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</tr>
<tr>
<td>B</td>
<td>Waste Management Practices</td>
<td>Binary</td>
<td>12</td>
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Table 2: Civic Waste Characterization for the Gwagwalada area council

<table>
<thead>
<tr>
<th>Civic Waste Composition</th>
<th>Quantities (tons)</th>
<th>%</th>
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<tbody>
<tr>
<td>Paper</td>
<td>20136.81</td>
<td>26.05</td>
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<tr>
<td>Textile</td>
<td>1724.36</td>
<td>2.29</td>
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<tr>
<td>Plastics</td>
<td>4567.57</td>
<td>5.90</td>
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<tr>
<td>Water sachets</td>
<td>9678.74</td>
<td>12.51</td>
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<tr>
<td>Glass</td>
<td>2467.38</td>
<td>3.19</td>
</tr>
<tr>
<td>Metals</td>
<td>2656.96</td>
<td>3.43</td>
</tr>
<tr>
<td>E-waste</td>
<td>1823.76</td>
<td>2.36</td>
</tr>
<tr>
<td>Organic materials; food &amp; garden waste</td>
<td>32236.95</td>
<td>41.67</td>
</tr>
<tr>
<td>Other organic materials</td>
<td>2056.45</td>
<td>2.66</td>
</tr>
<tr>
<td>TOTAL</td>
<td>77368.98</td>
<td>100.0</td>
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Source: (GAC, 2017)