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An assessment of municipal solid waste management system in Oshogbo, Osun State Nigeria: Challenges and prospects

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Abstract

The study empirically assessed the challenges and prospects of municipal solid waste management system in Oshogbo, Osun State, Nigeria. The study specifically looked into the current - status, the performance of municipal solid waste social control system of the city, and the households solid waste social control practice. Primary data were used and sourced through a well-design survey questionnaire, field observation, reviewing published and unpublished documents, and on spot access. Descriptive statistics was used for the data analysis. The main factors aggravating the present poor state of municipal solid waste social control of Oshogbo were revealed in the study. The results further showed that Osun state waste management agency is not leaving up to its responsibility and delay in collection of wastes, the activity of municipal solid waste social control of the town is majorly executed by micro and macro scale enterprises with very limited contribution of the agency saddled with such responsibilities. Besides this, there is no involvement of non-governmental organization and private sectors as the government of the day portrayed it. Inadequate solid waste social control pattern of the households. The first inadequacy of households is poor handling of short-lived storage material of various houses. That is, trash disposal around the waste container. Likewise, they are uncovering in the rain, light and heat, they do not take cognizance of sustainable solid social control actions for instance, reprocessing, reclaim and composting. Except, for the prohibited solid waste disposal. In addition, they are less motivated to clean their immediate environment. Thus, the study recommends that government waste management agency in conjunction with non-governmental organization should commence training on waste social control practices, with focus on women as agent of change in a community, while the institutions should leave up to their responsibilities.

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Introduction

Nigeria's towns and cities have grown in number, physical size, and population over the past two centuries. The cities and towns are exploding growing in leaps and boundaries. This fast-urban growth poses enormous issues and difficulties. One of them is

the generation and social control of solid waste. One of them being the urban solid waste generation and social control (Onibokun and Kumuyi, 1996) [16].

Solid waste is characterized to be liquidness, non-gases waste products from national, commercial, agricultural, industrial, and public facilities operations. (Olaniyan *et al*., 2015) [12]. Solid waste social control may be viewed as the field connected with managing solid waste generation, holding, assembling, reassign and transportation, handling and disposal from points of view that is compatible with the highest values of health, economics, technology, conservation, esthetics and other environmental factors and also sensitive to government attitudes. Solid waste social control involves in its compass all administrative, economic, statutory, design, and technology tasks engaged in solving all solid waste issues. The resolution may include advanced interdisciplinary knowledge base such as geopolitics, urban and territorial design, geography, economics, government welfare, social science, demographics, communication and conservation, materials technology and mathematics (Walling *et al*., 2004) [21].

Urban solid waste could be characterized as an airless, municipal waste product, including household waste, commercial waste, rubble building and wipeout, inanimate animals and abandoned vehicles. (Walling *et al*., 2004) [21]. Most solid waste materials in municipalities contain metals, plastics, paper, glass textiles, and rubber. (Walling *et al*., 2004) [21]. Municipal solid waste social control system in third world nations and around the globe is a major problem, like poverty, population growth and elevated rapid growth levels synthesize with unproductive and underfunded governments to avoid effective waste social control (Walling *et al*., 2004) [21].

Several factors distinguish municipal solid waste social control from industry leadership in developing nations besides managing in industrialized countries. First, there are distinct kinds of materials that make up most of the waste. There is a much more significant percentage of organics in developing nations and significantly fewer plastics (Walling *et al*., 2004) [21]. The substantial amount of organic material makes the waste thicker, with greater mugginess and smaller particle size. (Walling *et al*., 2004) [21]. The other difference that can be pointed to in developed countries, oftentimes technique is inadequate for developing countries. Due to the much more cumbersome, clammy, and many erosive qualities to their burden, even garbage trucks are less efficient (Walling, *et al*., 2004) [21]. Other techniques are often far too costly to be used in corrupt countries, such as incinerators. Thirdly, Oshogbo, the capital of Osun state, being the focus of the research is characterized by unwitting, indiscriminately scattered, large slums with untired roads for collecting trucks (Walling *et al*., 2004) [21].

Domestic or ménage waste often generated from a variety of sources depending on where human activity is found. Different reports indicate that a big percentage of municipal solid waste from underdeveloped countries is generated from households (55–80%), preceded by business or market areas (10–30%) with variable quantities from highways, industries, among others (Miezah *et al*., 2015) [8]. Waste such as these are extremely no uniform in nature (Miezah, *et al*., 2015) [8]. With varying physical features depending on their origins; Documents, leather, food waste, plastics, yard waste, wood, metals, rubbers, non-reactive materials, batteries, paint boxes, fabrics, con-structure and demolition materials and many others are particularly important in their arrangement. The complexity of that same waste generated is indeed huge reversal to its use with an impure material. Therefore, there is a need for waste cell lysis before any significant therapy method can be repeatedly exposed to them. Source sorting and waste separation are the foundation of standard cell lysis methods and critical initiatives in an operational waste social control scheme capable of delivering. Moreover, the accomplishment of every scheduled trash segregation method will affect primarily an efficient particle-impaction of trash sources in the diverse communities as well as how they meet the values of waste screening and classification (Miezah, *et al*., 2015) [8]. The municipality's attempts to alter the city's condition are also inadequate in comparison with the magnitude of the issue. Therefore, to decrease this situation and attain the city's effective municipal solid waste social control scheme, detailed research needful for the current condition of municipal solid waste social control.

There are countless studies in Nigeria and elsewhere in developing nations on waste issues and social control. These surveys cover towns of varying dimensions in the government, as well as numerous ecological, climatic, cultural, religious, and economic areas. Some studies highlight municipal solid waste issues and how distinct public policies have been defiled at discrete times (Uwadiegwu and Chukwu, 2013) [20].

Others regarded municipal solid waste as an informal indicator of wealth, as rich countries generate more waste than poor ones. What also triggers waste are not the quantity generated, however the magnitude of functionality of social control of solid waste in the municipality. The unknown quantity of waste that can be seen along almost all of our urban center's roads and streets demonstrate that somehow the approaches taken to deal with the eventual growth by-products are unsuccessful (Uwadiegwu and Chukwu, 2013) [20].

Many findings focused primarily on urban solid waste identification, while a few assessed the ecological effects as well as implications of intermingled plastic products recycling and solid waste generation (Uwadiegwu and Chukwu, 2013) [20]. The growing amount and structure of solid waste in Oshogbo has become a severe issue that citizens, environmental organizations, and public bodies should pay rapt attention. Above all, Oshogbo City's Municipal Solid Waste social control system was not researched with the homes required focus. This research, therefore, focused on examining the current status, Performance of the municipal solid waste social control system of the municipality and its challenges, institutional arrangement with the necessary focus on the social control of solid household trash.

2. Research Methodology

2.1 Description of the study area

Location: Oshogbo is Southwestern Nigeria's capital of Osun State (Figure 1). It is about 88 kilometers along Ibadan's northeast highway. It is as well 100 km by highway south of Ilorin by the road and 115 km southwest of Akure. It is positioned in the Latitude 9.7 ° N and Longitude 4.5 ° E. Oshogbo City is the headquarters of both Oshogbo South and Olorunda Local Government Area (Oshogbo North). Oshogbo has a population of about 280,000 individuals based on the 1991 Census (provisional outcome) (Union, 2014).

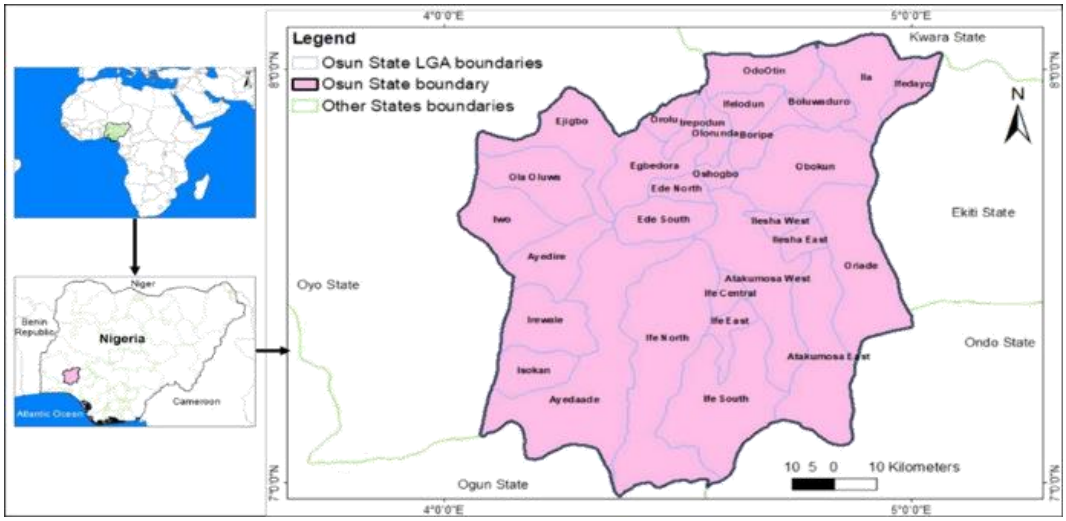

Fig 1: Map of Osun State, Nigeria

Climate: The metropolis with approximately 0.6 meters of yearly torrent primarily in the region of the broad-leaved forest that extends south of Oshogbo towards the Ikirun grassland belt. Oshogbo is located on an elevated territory well above sea level over 500 meters (800 feet), emptied by the Osun River and its auxiliaries. The weather conditions are less wet despite the slow effects of harmattan winds during the dry season. With respect to geology, the soil made up of Precambrian rocks, the alleged rough cellar from which the relatively fertile clay loam of the surrounding area is derived (Union, 2014).

Education Institutions: In Oshogbo, there are many voluntary organizations and private people active in offering primary and post-elementary qualitative education. Oshogbo has about 30 secondary / Post-Elementary Schools in total. Oshogbo Grammar School (the first in the Osun Division), Saint Charles Grammar School, Fakunle Comprehensive High School, etc. Also, in Oshogbo metropolis a Government Technical College, a Nursing and Midwifery College, a teaching hospital of the Ladoke Akintola University Teaching Hospital, jointly owned (Osun State with Oyo State). Designs are almost prepared to set up a City University to complement existing larger colleges in neighboring cities and satisfy the growing desire of Oshogbo City University for competitive and high-quality higher education (Union, 2014).

Health Institutions: In addition to the State Hospital, also a facility teaching hospital for Osun & Oyo States collectively possessed by Ladoke Akintola University in Oshogbo, innumerable number of private hospitals, clinics, clinics and chemist stores, including Fasina Memorial Hospital, Oyawoye Hospital, Biket Hospital, Oroki Hospital and a few licensed pharmacy chains such as Boorepo Chemists, Oroki Chemists, Akinola Chemists, etc. (Union, 2014).

2.2. Sources of Data and Data Collection

Primary source of information was used for this research. Primary data used in this research were gathered from the household survey, primary informant interviews, and field observations. In this research, the main means of gathering information were structured questionnaire, field measurement, face-to-face interviews and private observation. The organized household survey questionnaire involves close-ended questions. The questionnaire given in English Language and translated whenever there is need to Yoruba language. The investigator monitored the household study. Osun state waste management employees and municipal officials for the service delivery segment were performed face-to-face interviews but they gave no useful information. Field measurement was performed to investigate the rate of generation of solid waste by homes.

2.3. Sample Size and Sampling Techniques

Both probability and non-probability techniques of sampling were used in the research. Simple random methods were used to define the participants from among the probability sampling. In simple random sampling of a specified size, an equal selection probability is provided to all members of a frame. The purposeful sampling technique was used to select the study region from the non-probability sampling method. Oshogbo therefore purposely chosen because it is the capital where there is a greater concentration of the population and where recreational and high company regions are situated than other regions of the state. Above all, the town characterized by solid waste social control methods and associated issues. Importantly, the sample size calculated with the confidence level of 95 % and confidence interval of 6 %. 220 questionnaires were administered. Unfortunately, we were able to retrieved 88 back. The people were unwilling to return, I believed due to government failure over the years to provide basic amenities and the hardship in the economy now.

2.4. Methods of Data Analysis

This segment focuses on presenting, evaluating and interpreting data obtained from households. The data analyzed using both qualitative and quantitative approaches. Quantitative approaches include percentages, study of charts and cards, and distribution of frequencies. Qualitative techniques were relationships of cause and effect, inductive and deductive. Questionnaires analyzes were widely used to present the collected data using quantitative methods, i.e. tables. The data was analyzed using the SPSS computer software and the Excel computer program. The Arc GIS was used to generate the map of the study area.

3. Results and Discussion

3.1 Demographic Features of the Sampled Respondents

Table 1 reveals that about 30.25% of respondents were women and the remainder were male heads of households

suggesting that female heads controlled the survey population. It is also an indication that traditionally these community groups are very close to and linked to the daily activities associated with solid waste social control practices in households than their counterparts (Elegbede *et al*., 2023a,b) [6]. Table 1 further shows that the age bracket 31-40 years, has the highest concentration of respondents. The next highest respondent concentration is located in the age bracket of 21-30 years. It can be said from this that more than three-quarters of the respondents were between the age brackets 21 and 40. The age-gender combination assessment shows that the age-wise distribution of male and female respondents follows the same pattern as the first, second and third concentrations of both sexes in 31-40, 21-30 and 41-50 respectively. The distribution is similar to the findings from the Southwest Nigeria (e.g., Ogunyemi *et al*., 2022; Olutumise *et al*., 2023; Oparinde *et al*., 2023) [9, 17].

Table 1: Distribution by age and gender of respondents

Age Group		Gender				Total
(years)	Male	%	Female	%		%
11–20	1	0.33	2	1.1	3	1.43
21–30	15	4.95	20	11.0	35	15.95
31–40	14	4.62	25	13.75	39	18.37
41–50	1	0.33	4	2.2	5	2.53
51–60	0	0.00	1	0.55	1	0.55
Above 60	2	0.66	3	1.65	5	2.31
Total	33	10.89	55	30.25	88	

***Source*:** Result from questionnaire, 2019

As noted in the above discussion, respondents ' marital status is one of the important variables considered in this research and presented as follows in Table 2. Approximately 26 percent of respondents are married as shown in Table 3. Of the remaining respondents, approximately 13.86% were not married, 1.43% were divorced. The results are in line with the studies of Adegoroye *et al*. (2021) [1], Badamosi *et al*. (2023) [5] and Oluwalade *et al*. (2023a) [14] who reported that married households are the majority in the area.

Table 2: Marital status and gender respondents

Marital Status		Gender				Total
	Male	%	Female	%		%
Married	20	6.6	35	19.25	55	25.85
Single	12	3.96	18	9.9	30	13.86
Divorced	1	0.33	2	1.1	3	1.43
Widow	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0
Total	33		55		88	

***Source*:** Result from questionnaire, 2019

The household heads ' educational level in particular is an important quantity that can influence the household solid waste social control activity (Oladosu *et al*., 2024) [10]. In line with this, an attempt was made to determine the respondents ' educational level. Consequently, the respondents ' academic status is listed in Table 3. As shown in Table 3, a larger proportion of respondents (27.3 %) attained an educational level of undergraduate program. Next to that are the master's degree (21.6 %) and about (19.3%) can read/write. This high level of sample household learning is expected to contribute to positive impacts in order to obtain brief and specific impressions. It means that educated people have good understanding, household knowledge holds solid waste social control and related issues, and it easily gives the answer to the questionnaire. Several studies (e.g., Oluwalade *et al*., 2023b; Elegbede *et al*., 2023a; Adegoroye *et al*., 2023; Oparinde *et al*., 2023) [7, 2, 15, 17] confirmed that majority of the people had at least primary school education, which implies that many of them are literate.

Table 3: Respondents ' level of education

Educational Level	Frequency	Percentage
Can´t read/write	4	4.5
Can read/write	17	19.3
1 – 6 grade	3	3.4
7 – 9 grade	2	2.3
10 – 12 grade	1	1.1
Technical	1	1.1
Higher Technical	15	17.0
Undergraduate Program	24	27.3
Master Degree	19	21.6
Doctorate Degree and Above	2	2.3
Total	88	100.0

***Source*:** Result from questionnaire, 2019

Number of residents is one of the determinants of household-level solid waste social control. It is believed that more household-level labour-power is positively linked to successful solid waste social control activity. On the other hand, the larger the volume of the household, the more solid waste it produces. Furthermore, to investigate whether these principles are in line with the custom of the households surveyed, the size of each household was assessed as shown in Table 4. As can be seen from Table 4, approximately 40.9 % of respondents have 4-6 household members and approximately 26.1 % have less than four household sizes which suggest both the positive and negative effects of high household size as shown in the above discussion. The bigger the size of the household, the more solid waste generates. Family size has been helped in terms of labour (Ajayi and Olutumise, 2018) [4]. The results of this study are in support of the findings of Adgoroye *et al*. (2024), Oluwalade *et al*. (2023b) [14], Oladoyin *et al*. (2023) [11] and Oparinde *et al*. (2023) [23].

Table 4: Number of respondents in residence

Household size	Frequency	Percentage
1 – 3	23	26.1
4 – 6	36	40.9
7–10	13	14.8
10 and Above	16	18.2
Total	88	100.0

***Source*:** Result from questionnaire, 2019

Houses with higher incomes are thought to have greater economic potential to control active solid waste social control practices relative to counterparty households with lower incomes. However, when other deciding factors are the same in both cases, rich households produce more solid waste than poor households. It is also expected that the type of solid waste produced from different economic backgrounds will vary accordingly. Based on their monthly household income, the average monthly income of the respondents was calculated as shown in Table 5. Households are classified into six categories. Table 5 clearly shows that the respondents ' average income was quite fair. More than half of the

respondents generally earned more than 25000 Naira per month. Specifically, the mean monthly income of approximately 51.1 % of respondents was above 5000 Naira, and that of 13.6% of respondents was between 10,000 and 15,000Naira. In addition, approximately 2.3% of respondents earned 20,001-25,000Naira and approximately 11.4% earned 5001 to 10,000Naira. Just about 11.4% of respondents per month received less than 5000Naira respectively. This shows that the city's largest number of residences are middle class and able to pay for private solid waste collectors and they have chosen to dispose of their household solid waste on their house's open space, ditches and backyard. These situation makes the environment dirty offensive odor in the area. It also reveals the city's illegal dumping and unsuitable and unorganized waste social control activities. This reduces the quality and elegance of the town.

Table 5: Monthly income respondents

Average Monthly Income (Naira)	Frequency	Percentage
Less than 5000	10	11.4
5001 – 10000	10	11.4
10000 – 15000	12	13.6
15001 – 20000	9	10.2
20001 – 25000	2	2.3
Greater than 25000	45	51.1
Total	88	100.0

***Source*:** Result from questionnaire, 2019

3.2 The importance of the treatment of solid waste

Municipal solid waste social control is among the essential services that is currently receiving broad recognition in many Nigeria cities. This seems to be largely down to the lack of adequate handling and management of solid waste produced in most towns in Nigeria. However, these problems can be minimized and solved through the strict strategy and execution of various components of municipal solid waste social control. The respondents were therefore asked about the need to manage municipal solid waste social control. Moreover, most respondent's state 90.9% of municipal solid waste social control is very relevant in the city. These suggest the need for solid waste social control in the city and the relevance is very critical and needs further control, implementation of effective waste social control practices and proper planning and social control.

Table 6: The need for solid waste management in the Oshogbo

Do you agree that Oshogbo needs municipal solid waste social control	Frequency	Percentage
Yes	80	90.9
No	8	9.1
Total	88	100.0

***Source*:** Result from questionnaire, 2019

3.3 Facilities for solid waste storage and handling

This operational aspect of municipal solid waste social control is an operation conducted by the city's solid waste generators as well as solid waste managers. This includes the storage of solid waste in a certain type of material or equipment as soon as it is generated and its secure social control until it is permanently disposed of. Accordingly, the research and treatment of solid waste storage facilities has a substantial impact on enhancing the practices of urban solid waste social control. The aim is to identify the type and quantity of storage materials to be used, to determine the appropriate location (sitting), to determine the collection method to be used, and to avoid the effect of storage materials on safety, environment and aesthetics. As a result, Oshogbo City's solid waste collection and handling data was gathered and briefly clarified in two categories. The first category is the primary or temporary household storage facility. While the second category covers secondary and municipal storage facilities that include containers and dustbins for public solid waste. The following sections describe the detailed examination of both of these storage facilities.

3.3.1. Main processing and treatment of solid waste

Oshogbo residents used different storage materials that are stationary like pit and mobile like sack in their complex. It was shown in Table 7 that the type of processing materials used by the households differs. This is primarily because the quality of household storage material depends on the characteristics of solid waste (generation speed, physicochemical, waste material content, etc.), the intensity of collection and collection equipment types, free room for processing materials and household economic power. The following table displays the concrete evidence of this condition as also viewed by Sede *et al*. (2024) [18].

Table 7: Key household handling of solid waste

What kind of solid waste storage materials are used primarily in your house	Frequency	Percentage
Nylon	34	38.6
Basket	33	37.5
Metal container	14	15.9
Pit	3	3.4
Others	4	4.5
Total	4	4.5

***Source*:** Result from questionnaire, 2019

As is clearly shown in Table 7, most households (38.6%) store their solid waste in nylon (Ora). This is highly related to the lowest sack price, easily available on the market, its suitability to hold huge quantities of solid waste, and the low frequency and spatial coverage of the city's house-to-house solid waste assembling pattern. In addition to nylon, (37.5%) of households use basket.15.9% used metal container due to their regular but low waste production and economic power to use replicable storage materials such as basket. As a result, some households use private pit 3.4% as solid waste storage material in their home. This is because their compound has space available and households need to prepare fertilizer for vegetable growing. The least-used storage content, however, is 4.5% others which could mean any materials closer at that point. Unlike the preparation and use of storage material, however, most residents do not have well-established handling practices and pay little attention to them. Household storage materials are distinguished by an uncomfortable aspect resulting in improper handling, and storage material is separated from solid waste. It is also placed very close to houses by a majority of households, particularly in condominium houses, storage materials are placed inside the house due to lack of space. However, the survey shows that people living in the area store their household solid waste

properly and do not treat it properly, this condition has its own negative effect on the city's sanitation and beautification. Moreover, if it is not handled correctly, it can have serious adverse ecological effects and human health impacts.

3.4 Separation, storage and recycling of solid waste

This report, solid waste separation, recycling and recovery activities at source and by municipality apply to all recyclable, recycled, compostable waste separation activities or attempts to sell or recover assets on their own. Practicing these types of activities is very important for both waste producers and cities as it minimizes disposal costs, generates revenue, and increases the lifetime of the disposal site. Which is one of the possible explanations why solid waste social control is now finding ways to lessen the movement of compostable and recyclable products to landfill sites in many parts of the world. Such activities, however, are found at a very grass root level in the case of Oshogbo without significant results and progress. In general, the separation, processing and recovery activities were presented in the following section, both at the household and Oshogbo waste social control level.

3.4.1 Solid waste segregation, household storage and recovery

Segregating Solid Waste: The effort to track the solid waste segregation activities of the household in the city is made to distinguish only solid waste that can be traded, exchanged, and to some degree organic waste. In support of the findings, the respondents ' answers were also shown in Table 8 that about 44.3% of them store solid waste separately. Yet 54.5% of respondents did not separate solid waste from their home. This means that most respondents lack expertise and awareness of the separation of solid waste.

Table 8: Segregation of solid waste

Do you store solid waste produced in your home individually	Labels	Frequency	Percentage
1	Yes	39	44.3
2	No	48	54.5
Total		88	100.0

***Source*:** Result from questionnaire, 2019

Solid Waste Separation Activities: In effort to analyze the town's solid waste collection operations, the main forms of such waste include wearied clothes and old shoes 4.5%, metals 9.1%, plastics 20.5%, glasses 10.2%, and organic waste 8.0%, according to those respondents.

Table 9: Solid waste separation activities

Do you store solid waste produced in your home individually	Labels	Frequency	Percentage
	1.Metals	8	9.1
	2.Plastics	18	20.5
	3.Glasses	9	10.2
Which products are you separating from the	4.Organic residue	7	8.0
shop from following	5.Electronics waste	7	8.0
	6.Clothes and old shoes	4	4.5
	7.Others	8	9.1
	9.Not applicable	27	30.7
Do you understand that it is possible to recycle	1.Yes	72	81.8
separate solid waste	2.No	16	18.2
Are you conscious that urban waste is being	1.Yes	63	71.6
reused	2.No	25	28.4
Total		88	100.0

***Source*:** Result from questionnaire, 2019

Resource Recovers Activities: Recycling, recycle and composting practices were used as a benchmark to assess resource recovery activities. It is therefore noted that society's involvement is still very small, even as it is linked to solid waste separation.

From the beginning, the number of respondents who are aware of the concept of recycling, recycle and compost preparation is small (53%). This fact shows that there is a lack of awareness within the community of sustainable solid waste management practices because principles of reuse, recycling and composting are considered foundations of sustainable solid waste management.

Table 10: Resource recovers activities

Indicators (N =88)	Frequency (yes)	Percentage
Do you prepare compost from solid waste generated in your house	30	34.1
Do you understand what recycling is all about	68	77.3
Do you recycle by yourself solid waste produced from your house	22	25.0
What kind of products do you reuse		
Used plastic products	1	1.1
Others	1	1.1
Not applicable	9	10.2

Source: Result from questionnaire, 2019

3.5 Solid waste collection and Transportation system

Solid waste collection and transport involves the process of collecting waste from the generation site, transferring it to nearby public solid waste containers or transfer stations, and finally dumping it to the disposal site. This functional aspect is a very important and necessary component of municipal solid waste social control because it is highly influenced by the productivity and efficiency of this system. There are currently two waste collection methods in Oshogbo Town: door-to-door solid waste collection and municipal truck collection system.

3.5.1. House to house solid waste collection and transportation system

This method is largely used to collect residential solid waste. It is delivered by micro and small-scale enterprises and private waste collectors, although occasionally by truck collection from cities. However, micro and small -scale enterprises network is accessed by very few people. There are quite number of people who engages in these activities in providing solid waste collection services to the residents of Oshogbo town. According to most people that were interviewed in each of the area there is one micro and macro scale enterprises, but now most of them are not operating because of vehicle breakdown and financial shortages. House-to-house collection of solid waste by micro and small businesses and private collectors. As Table 11 indicates, small-scale businesses use 50.0% of respondents. This is high despite lack of resources and funding. Regarding field observation, most of the time private collectors and children collect the town's solid waste. In addition, approximately 40.9% of respondents reported that their solid waste was not collected, indicating that the solid waste in the house is not collected adequately or regularly at the right time. The sampled households did not appreciate the micro and macro scale enterprise neither for cost nor the services rendered. About 40.9% of the respondents opted for not applicability. About 25.0% of the respondents paid less than 500 Naira. Another 13.6% paid well over 500Naira this simply means, there are different categories of houses in the area.

Table 11: House to house urban waste collection

Indicators (N = 88)	Frequency (Yes)	Percentage
Do you use house to house urban waste collection from your residence by micro and small businesses	44	50.0
How many days are you getting this service?		
Daily	8	9.1
Twice a day	6	6.8
Two times a week	19	21.6
Twice a month	7	8.0
Once a month	4	4.5
Others	8	9.1
Not applicable	36	40.9
How much do you pay for this service in Naira		
Less than 500	22	25.0
501 – 1000	12	13.6
1001 – 1500	10	11.4
1501 – 2000	3	3.4
Above 2001	5	5.7
Not applicable	36	40.9

Source: Result from questionnaire, 2019

3.6 Solid waste disposal services

3.6.1 Household solid waste disposal services

As mentioned above, the city's solid waste collection from house to house is very insignificant in terms of both geographic coverage and capacity. As a result, the majority of households' only solid waste social control option is limited to two choices. The first is literally to ignite, bury or dump solid waste in its compounds. The second option is to dump solid waste on the side of the road, open fields, surrounding lakes, bridges and gullies. The respondents were therefore asked about their common disposal system in order to evaluate the routine method of household solid waste disposal practices and know the destination of uncollected solid waste. The results of the survey are presented in the Table 12. To the largest sample, the method of household solid waste disposal is uncorrected and unorganized in Oshogbo Town, as can be seen from the respondents ' table 12 (85.2%), showing that most people throw waste onto the roads, sewerage and ditches. In addition, about (58.0%) of respondents claimed that disposal containers in their neighborhood are not available. As a result of this and lack of awareness of solid waste social control, respondents dispose of waste at inappropriate locations.

Table 12: Disposal practice in Neigh hood

Indicators (N = 88)	Frequency	Percentage
Is there container for solid waste disposal in your neighborhood	37	42.0
Have you ever seen solid waste thrown (dumping) into the roads, sewages or ditches from residential home	75	85.2

Source: Result from questionnaire, 2019

3.7 Households preferred teaching to increase knowledge

The main causes underneath the unauthorized disposal of solid waste by the residents are lack of appropriate knowledge about proper solid waste social control system, lack of clear house-to-house solid waste collection service and absence of effective solid waste containers. To buttress these points, 65.5% of respondents have not taken education and training about solid waste social control by responsible

body of the town. It was observed that 65.8% of respondents are interested in obtaining knowledge about solid waste social control. The method to receive the education on solid waste social control educational programs in radio and TV 21,6%, brochures handout to inhabitants 10.2% door to door teaching 6.8%, educational program newsletter and magazines 6.8% and campaign to manage solid waste 4.5%.

Table 13: Households preferred teaching to increase knowledge

Preferred teaching techniques	Frequency	Percentage
Open seminar	14	15.9
Brochure's handout to inhabitants	9	10.2
Campaign to manage solid waste	4	4.5
Door to door teaching	6	6.8
Educational program in radio and TV	19	21.6
Educational program in newsletter and magazines	6	6.8
Not applicable	30	34.1

Source: Result from questionnaire, 2019

3.7.1 City's urban waste management laws and regulations

Osun waste management agency of Oshogbo has authority to prepare its own rules and regulations, rather implements the rules and regulations related to solid waste social control originating from the Federal republic of Nigeria environmental legislation adopted in 1992. These 64 rules and regulations highlight the responsibilities and obligations of individuals, establishments and institutions in the handling of waste. In addition, there is also low enforcement of the current rules and regulations. According to the field observation, there is no public awareness-raising activity on rules and regulations Table 14 shows the question to the respondents as to whether they understand the rules and regulations governing solid waste social control in the region. In response to this, approximately 48.9% of the responses do not know the rules and regulations relating to solid waste social control in the area. The absence of a regulatory framework and the weak enforcement of rules and regulations hindered the city's effective system of collecting, processing and disposing of solid waste.

Table 14: City' urban waste management laws and regulations

Do you understand the city`surban waste Management laws and regulations		Frequency	Percentage
Yes		45	51.1
No		43	48.9
Total		88	100.0

***Source*:** Result from questionnaire, 2019

4. Problems and Solutions, Conclusions, and Recommendations

4.1 Highlights of problems and solutions

Also becoming a problem for the area, the present state of municipal solid waste social control system among various Nigeria states. Oshogbo is one of the state in Nigeria where the proper provision of municipal solid waste social control practices is still unsatisfactory and uncompleted. In Oshogbo, illegal waste disposal in an open area, in gullies, and river courses has become daily activity for residents. Municipal solid waste social control in Oshogbo is one of the services that is observe in the city now. Nonetheless, 90.9% of the respondents suggested that municipal solid waste social control is very important in the region. Such suggest the need for solid waste social control in the city is crucial and the relevance is very critical and needs further control, implementation of effective solid waste social control practices and proper planning and management.

In the collection activities, the agency and private sector contributions are minimal. The wastes that is not collected, it ends up as illegal dumps on the roads, idle areas and sewage bodies, leading to disease increase and causing environmental health hazards. Throughout their building, Oshogbo residents used various types of storage materials that are stationary as pit and portable as nylon. There is a wide variance in the form of processing materials used by households. Besides planning and using storage material, however, most residents do not have well-established handling procedures and pay little attention to it. An uncomfortable aspect resulting in improper handling distinguishes household storage materials, and storage material is separated from solid waste. There is also no effort to recycle or reuse by the agency saddled with this responsibility, but it is fully involved in collecting and final disposal of solid waste as the only way to manage municipal solid waste. For collecting solid waste from residential areas, house-to-house solid waste collection and transport, systems are mainly introduced.

These services are rendered by micro and macro scale enterprises and private waste collectors, and rarely by the agency collection truck from the areas. However, micro and macro scale enterprises operation meet a very small number of households and is poor due to lack of vehicles, resources. Household solid waste disposal activity in Oshogbo Town is uncorrected and unorganized, many people throw waste onto the roads, sewerage and ditches. Larger percentage indicated no container disposal in their neighborhood owing to lack of solid waste social control knowledge. The solid waste disposal site of Oshogbo town and its management are inadequate and below the standard. The site known as the dumping ground (Ile-Ile) is right at the center of the city and chiefly as an open and unsanitary landfill site. In order to

build an effective and sufficient level municipal solid waste system service, the responsible organization must have primarily well-organized management operating within an appropriate organizational structure, skilled labor and financial resources, adequate rules and regulations, short and long-term strategies and good cooperation with different institutions stakeholders. If one or more of the above resources and frameworks are missing, municipal solid waste social control will remain unachievable. A rational why Oshogbo municipal solid waste social control is very poor in terms of both status and spatial coverage.

4.2. Conclusion

This study looked into the current - status, the performance of municipal solid waste social control system of the city. Specifically, the study researched the households solid waste social control practice. These was carried out by employing survey questionnaires, field observation, reviewing published and unpublished documents, and on spot access. Finally, this research examined main factors, aggravating the present poor state of municipal solid waste social control of Oshogbo. These are: 1. Structurally, Osun state waste management agency is not leaving up to its responsibility and delay in collection of wastes, the activity of municipal solid waste social control of the town is majorly executed by micro and macro scale enterprises with very limited contribution of the agency saddled with such responsibilities. Besides this, there is no involvement of non- governmental organization and private sectors as the government of the day portrayed it.

Inadequate solid waste social control pattern of the households. The first inadequacy of households is poor handling of short-lived storage material of various houses. I.e. trash disposal around the waste container. Likewise, they are uncovering in the rain, light and heat, they do not take cognizance of sustainable solid social control actions for instance, reprocessing, reclaim and composting. Except, for the prohibited solid waste disposal. In addition, they are less motivated to clean their immediate environment.

4.3. Recommendations

In respect to the discovery of this survey, the undermentioned measures are extremely crucial in overcoming Oshogbo`s challenges of municipal solid waste social control system:

Education related measures: The residents of the two local governments of Oshogbo have little awareness and understanding about solid waste social control matter. This apparently suggests the need for broad public awareness actions. The Osun state waste management agency in conjunction with non-governmental organization should commence training on waste social control practices, with focus on women as agent of change in a community.

Institution related measures: Osun state waste management agency should leave up to his responsibility since the fundamental part of municipal solid waste social control activities are the reason for its existence. Osun state waste management agency should provide infrastructure facilities by placing solid waste containers at a strategic with a close supervision. The agency should set up a powerful method of control and maintenance employee to discourage the unlawful discharge of municipal waste to prevent illegal solid waste disposal. The agency should strengthen the removal of solid waste by drawing up new plans, increasing the number of collection vehicles, using other collection methods such as lane and recycling bins collections, and fully empowered micro and macro scale enterprises. Also, non-governmental organizations and private sectors input is of utmost importance. The agency should prepare rules and norms that tackle local challenges about the town´s municipal solid waste social control process, participation among stakeholders and safe solutions for solid waste social control and strict enforcement of these safety regulations through close monitoring and muti-organizational convergence.

Stakeholder related measures: Non-governmental organizations and private sectors should ensure that they engage in preparing of urban solid waste social control activities. Boost and encourage head in various households to participate in solid waste social control. Therefore, coordinate volunteer groups working on urban solid waste social control via offering different opportunities and necessary equipment that is used for solid waste social control. Recognizing and encouraging micro and macro scale enterprises through incentives, providing sophisticated waste equipment for the production of recycled materials and business environment for it.

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