

Private Sector Participation in Municipal Solid Waste Management in Osogbo, Nigeria

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Abstract

This study intends to investigate the participation of the private sector in the management of municipal waste in Osogbo, Nigeria. The desktop approach was used to review the existing literature in the area while questionnaires were used to elicit data on the type and quality of services rendered by private sector participants. Similarly, the involvement of government agencies in the monitoring and administration of private sector participation (PSPs), and residents' willingness to pay for the services rendered by the private sector were investigated. Data obtained were summarized with averages, percentages and tables. Also, Resident Satisfaction Index (RSI) was developed to evaluate residents' satisfaction with PSPs in the state. There are 23 PSPs allocated to different residential areas in the metropolis covering a minimum of 200 developments and about 300 – 400 households. 70% of the operators work for over 14 hours in a day yet there is a 60% deficit in the overall waste collection by PSPs in the metropolis leading to residents' dissatisfaction. As a result, only 10% of the residents pay for waste timely. Unfortunately, the absence of laws and policies to guide the operation of PSP operators limits their activities. The study, therefore, among others, recommends full government support for PSP operators in the state.

Keywords: Solid Waste, Private Sector, Sustainability.

1. Introduction

Municipal Solid Waste Management (MSWM) all over the world is posing serious challenges to human society as a result of the unprecedented increasing magnitude of generation attributed generally to urbanization and rapid population growth. For instance, the World Bank (2016) estimated that the annual solid waste generation by the cities of the world was about 2.01 billion tons which accounted for 0.74 kg per person per day, with this annual waste generation rate is expected to increase by 70% from 2.01 billion tons in 2016 to 3.04 billion tons by 2050 (World Bank, 2016). Madak et al. (2010) projected that annual Municipal Solid Waste (MSW) will be about 27 billion per year by 2050 with a 1/3 expected to come from Asia with China and India as major contributors. The concern about this is that the developed countries have built enough capacity to cope with the waste generation, turning it into wealth; but the developing countries especially the urban poor are seriously negatively impacted where 90% of the waste is often dumped in unapproved locations or openly burnt (World Bank, 2016). This practice has serious repercussions on the environment, safety, economy and public health of residents since most of these open dumps serve as breeding sites for disease vectors such as mosquitoes, rodents, flies, vermin, and other dangerous insects (Biswas et al., 2010). According to the Narayan

(2008), in India 90% of MSW is dumped due to a lack of proper landfill facilities. India is amongst the very high MSW generating nations with 133,760 tons, which ranges from 0.17kg per person per day in small towns to 0.62kg per person per day in cities (Kumar et al., 2009). Similarly, UNCHS (1996) reported that 40% of MSW in Karachi and 60% in Jakarta are not collected. This is unlike the situation in developed countries, particularly in Europe and United States, where state-of-the-art waste management technology is used to manage waste (Mmereki et al., 2016).

In sub-Saharan African countries the situation is pathetic where it is reported that between one-third and one-half of the MSW generated in most cities is not collected and therefore likely to end up in unauthorized dumpsites, open spaces, and wetlands (UNCHS, 1996). For instance, in Tanzania, it is reported that less than 25% of MSW collected in Dare es Salaam is disposed of while 80% to 90% of MSW in the poorest communities are not collected (UNCHS, 1996; Ogu, 2009). The MSW situation in Nigeria is not very different where annually, 32 million tons are generated and only 20-30% is collected with the rest indiscriminately disposed of in unauthorized dumpsites, drainages, open spaces, and vacant plots (Oroye, 2020). It has equally been observed that effective MSWM is quite costly and consumes 10-50% of the municipal budgets in most developing countries (Ohri and Singh, 2009). It has also been reported that across six regions of the world, the World Bank has spent about \$4.7 billion since 2000 in financing more than 340 solid waste management programs (World Bank, 2016). Despite the intervention of the local and international organizations in the management of municipal solid waste, its management has been ineffective and inefficient which has led

to private sector involvement popularly known as Public-Private Partnership (PPP) (Alabi et al, 2020).

Public-Private Partnership (PPP) approach to waste management is inevitable because government at all levels has been identified to be grossly ineffective. Government alone, cannot, therefore, provide adequate capital, technological know-how, human resources, and other logistics needed for effective waste management in the Osogbo metropolis. Public-Private Partnership arrangement becomes necessary in combating the various environmental problems associated with waste in the country (Abila & Kantola, 2013; Lakshamanan, 2005; UNHabitat, 2017; Alabi, 2010 Ojomo, 2011). Despite several works that have been done on waste management globally much has not been done on municipal waste management strategies in Osogbo hence the focus of this study. To achieve this, the following objectives were sought: identification of private operators and appraisal of their types, mode, and quality of services; assess the serviceability and effectiveness of the private operators.; appraising of residents' satisfaction with the services rendered by private operators; assess the willingness of residents to pay for waste management services, and evaluate governments' involvement in the management and administration of private sector participation in the study area.

2. Literature Review

Municipal waste management is the collective process of collection, sorting, storage, transportation, processing for resource recovery, recycling, and disposal of waste (Ashok, 2019; Alabi & Kasim, 2015; and Morelli, 2015). It is a primary source of environmental hazards not only in Osogbo but in Nigeria at large. For instance,

a large quantity of waste management has remained a source of environmental problems in Nigeria (Alabi, 2010), due to the absence or insufficient adequate waste reuse and recycling plans in place (Afon, 2012; Offiong, 2010). Also, current waste management measures in the country have been ineffective and inefficient (Abila and Kantola, 2013). This poses the challenge of finding alternatives and private sector involvement (Fadahunsi, 2007; Ojomo, 2011; Adeboyejo, 2011; Alabi, 2010).

Waste management has been a major responsibility of the State Government in Osogbo but unfortunately, Osun State Waste Management (OWMA) saddled with the responsibility of waste management is not capable of fulfilling this mandate. Thus, it is common in the city, like others in the country, to find streets and roads littered with solid wastes (Daramola and Ibem, 2010). With this background, government alone cannot meet up with the required capital, technological knowledge and human resources needed for effective waste management (Afon 2012; Alabi and Kontola, 2013; Osibanjo, 2009; FGN, 2012; and World Bank and IMF, 2006). This calls for the privatization of waste management.

In developed and developing countries, privatization of urban waste services has become extremely widespread (Alabi et al, 2020; Abila and Katola, 2013; Offiong, 2010). Public-private partnerships in urban waste management have witnessed significant interest in recent years primarily to reform the weak performance of the public sector, reduce cost, improve efficiency, and ensure environmental health (Afon, 2012; Adeboyejo, 2013; Bah and Artaria, 2021; Morelli, 2015). It gives room for competition and regular

performance monitoring. Urban waste management is a non-exclusive and non-rivalled service, which means that once it is supplied to some parts of the community, it benefits the entire community. The application of public-private partnerships as a management tool requires active and continuous examination of rendered services to determine whether they are more appropriately and effectively performed by the private sector.

PPPs, according to Hutchinson (1996), are the transfer and control of a good or service currently provided by the public sector to the private sector, in whole or in part. Participation of the private sector in public services can be used as a strategic management tool. Solid waste management is a complex issue and an essential public service in developing countries (Olukanni 2013, Hoornweg and Bhada-Tata, 2012). The public sector's role is to ensure that the PPP provides value for money for the government and better services for customers through indirect involvement in building and service provision. Continuous population growth in many cities has resulted in a surge in garbage generation that public agencies have been unable to manage, exposing Nigeria to international ridicule and resulting in waste-filled roadways in some states (Aliu et al., 2014).

In metropolitan regions, a collaboration between the public and commercial sectors delivers effective MSWM services. According to Olukanni and Nwafor (2019), there are numerous prospects for private sector involvement. Partnerships with the private sector, on the other hand, can exacerbate the state of solid waste management if all parties involved are not committed to fulfilling their respective roles, which range from direct involvement in waste

management and service provision to ensuring that the PPP provides value for money and better services to users.

Sabra (1994), Jeffrey (1996), Shami (1998), and US EPA (1998) attributed increased interest in PPPs to improved performance of the public sector through employing innovative operation and maintenance methods, reduced and stabilized costs of providing services, improved environmental protection by dedicating highly skilled personnel in ensuring efficient operation and compliance with environmental requirements. According to the World Bank (2014), low-cost recovery, the use of inferior waste collection and transportation equipment, limited scheduling, short contract duration, inefficient refuse fee collection, lack of planned waste recycling systems, inaccessible roads, and weak implementation of relevant municipal policies and by-laws put the private sector in a difficult position. Massoud and El-Fadel (2002) identified a lack of financial resources as well as a qualified and motivated human resource base, were identified as the major challenges militating against effective and efficient public-private partnerships for MSWM. In Dar es Salaam City, Aminatha et al. (2015) assessed the effectiveness of private sector engagement in solid waste collection and transportation. The study looked at 20 private service providers in the municipalities of Kinondoni, Temeke, and Ilala, and found that they collected and transported only 9% of the 29,764 tons of solid waste generated each week, as well as employed over 350 people who are helping to keep the city clean and increase national income through the payment of various taxes. In Osogbo, the efforts of PSP have been reportedly limited non-willingness of residents to patronize, weak government

regulations for the operation and patronage of PSPs (Adeboye et al, 2022). This has informed the challenge of poor waste management and associated poor health outcomes in the core residential areas of the town (Bello et al., 2022).

Solid waste management in many developing countries, particularly Nigeria, is not where it should be (Adeboyejo, 2013). Gaps in the collection, treatment, and disposal work against effective waste management in many major cities, as many rely on public-private partnerships (PPPs) without providing the necessary legal and institutional framework for them to produce the desired results, resulting in their inefficiency (World Bank 2017). As evident in Plate 1, waste is a major environmental problem in the traditional city of Osogbo because heaps of waste are dumped in most unwanted places like highways, undeveloped plots, streams, streets, and uncompleted buildings. It is highly worrisome to note that, despite the operations of PSPs in the metropolis, waste challenges still persist. This, therefore call for the assessment of the PSPs in the management of municipal waste in the metropolis.



Plate 1: Heap of Wastes on road median along Oroki Estate, Osogbo, Nigeria

Source: Authors' work, 2022

3. Study Area and Method

The study was conducted in Osogbo Municipality the capital city of Osun State, Nigeria which is located at longitude 7° 46'N and 7°76'07" N, and latitudes 4°34'E and 4°56'07" at an altitude of 320m above the sea level. The city has a population of 235981 as of the 2006 census and is projected to 28267 with a landmass of 47 square kilometers (Popoola, 2016). Osogbo Municipal city area is made up of three different local governments which include: Osogbo Local Government, Olorunda Local Government, and Egbedore urban. The city is linked to the northeast of Ibadan by 88 kilometers road, to the south of Ilorin by 100 kilometers road, and to the northwest of Akure by 115 kilometers road. Osogbo is bounded by cities like Ikirun, Ilesa, Ede, Awo, and Iragbiji, and is easily accessible to any part of the state due to its central location (Wikipedia, 2019, 2009). Osogbo due to its economic importance during the colonial era lies on the railway line from Lagos to Kano, to facilitate the evacuation of agricultural products from the northern part of the country to the Lagos seaport for exportation (Wikipedia, 2019, 2009).

Osogbo is also known as the centre of Arts because of the special interest her people take in making sculptures (in Yoruba "Ere"), clothes designs "asoadire" and some other things which still exist to date and can be found in Osun Groove, Nike Gallery, Nike House, and also Chief Jimoh Buraimo arts gallery. Osogbo is also popularly known as Ile-Aro due to its major dyeing center. This traditional industry marks one of the major industries in Osogbo. Later, several industries started rising, after the independence, which is mainly a contribution of the Federal

government such as Nigeria Steel Rolling, Machine tools and Transmission Company of Nigeria (TCN) which makes the city accessible to electricity which increases her ability to attract investments all located at the outskirts of the town. Osogbo serves as the trade center for the farming region within the state as farm products like; cassava, yam, grain, and tobacco are grown in this city which makes it of high economic significance in the agricultural industry. Osogbo is also a peaceful city that has several hotels, and a stadium of 10,000 capacity with other parks for recreation. Osogbo is also the venue of the Osun-Osogbo festival which is along the River, a sacred grove of the river goddess Osun which is a UNESCO world heritage site. For the study, both qualitative and quantitative data were used. The desktop approach was used to sort and review existing literature on the subject matter. Waste records and related policy documents from the state were obtained from Osun State Waste Management Agency (OWMA) popularly referred to as O – WASTE. To obtain data on private sector participation, the list and addresses of government-approved private operators were obtained from O-Waste. An inventory of the type and condition of facilities used by each operator was made. Also, an assessment of the human capacity and technical facilities of each operator was done. The site location of the PSPs was mapped with the aid of ArcGIS 10.6. One hundred and twenty questionnaires were administered to residents to evaluate their satisfaction with the services rendered by the PSPs, and their willingness to pay. Another set of questionnaires was administered to operators to evaluate their funding as well as to identify the challenges associated with their operations. Interviews were conducted

with the managerial staff of O-WASTE to elicit information on the supervision and evaluation of private operators' performance. Data obtained were subjected to descriptive and inferential analysis.

Particularly, the Deficiency Index (DI) was developed to evaluate the efficiency of private sector participants (PSPs) in achieving Sustainable Development Goals (SDGs) (U4SSC, 2020). To assess the effectiveness of private operators, a deficiency index was developed. The deficiency index is calculated as a percentage of the difference between the actual optimal service and current service. Actual optimal service is calculated as the expected days of service multiplied by the number of vans and further by the number of the daily trips. The current service is calculated as the number of service days multiplied by the number of vans and further by the number of daily trips and average daily waste carried. Correlation analysis was used to examine the relationship between the efficiency of PSPs and their facility – particularly vehicles.

4. Results and Discussion

This section presents the findings that were made in the study area. The discussion is tailored to address each objective stated above.

4.1. PSP Operations in Osogbo: Types, Mode, and Quality of Services

The franchise of waste in Osun State is in tandem with the conventional principle of allocation practiced across the world. However, the system is designed to cater to the state capital (Osogbo metropolitan area) and provincial towns in the state such as Ile-Ife, Ilesha, Ikirun, Iragbiji, Iree, Ilobu, Iwo, and Ede. That these provincial headquarters are linked to their

suburbs and serve as centers of administrative functions for their respective regions aids the collection of waste from their suburbs by the PSP operators. As villages in these provincial areas are excluded from the system, it makes waste management in the state an urban and sub-urban affair; a gap that is not explored in this paper. In total, there are thirty-eight Private Sector Participants (PSPs) registered with the Osun State Waste Management Authority. The latter allocates PSP to different residential clusters in the metropolis and other provincial headquarters. Allocation of PSP to a residential cluster is exclusive, hence PSP can only be allocated to a residential cluster within an area within the state. Registration of PSP, which is renewed annually, is done at the rate of #50,000 – usually done at the beginning of every year. Upon registration, the enumeration of potential customers in each allotted area is done. Although, currently, no law in the state mandates residents to patronize PSPs – hence enumerated areas reportedly did not amount to eventual customers.

In Osogbo metropolitan area, the subject of this study, a total of 23 PSPs are allocated to different residential areas (Figure 1). Each PSP operator covers a minimum of 200 developments and about 300 – 400 households. PSPs are allocated in the state irrespective of their human, technical, and mechanical capacity. Delineation of cluster areas without cognizance of their capacity has, in a way, compelled some of the operators to either have uncovered areas, or overwork themselves. This is as 70% of the operators reveal that they work for over 14 hours in a day. Some of these operators also reported that they collect waste from around 7:00 am to midnight.

At the moment, there is no yardstick for the allocation of PSPs to clusters, except registration with O-WASTE. There are more waste companies allocated to high-density residential areas compared to other areas. The emergence of new areas and outward growth of the metropolis have left some areas uncovered and, sometimes, illegally covered. This calls for a new allocation of PSP operators. Unfortunately, the registration of new PSP operators has been temporarily suspended by the state government.

Based on the franchise agreement, the service providers are to charge a minimum of ₦500 for waste collection. However, because waste is not scaled for pricing, operators collect a fee from respondents based on their perception of the socioeconomic characteristics of their customers. Customers either pay directly to PSP operators or into their respective accounts. This situation has made some of the customers to be overcharged while others are surcharged. Also, the amount obtained from residential properties is lower than those obtained from commercial and institutional properties – irrespective of the size. This bias and uncoordinated pricing system needs to be addressed.

For waste operations in the metropolis, the role of PSPs is limited to the collection and transportation of wastes. The door-to-door waste collection approach is utilized in the study area. Where PSP operators collect waste from residents waste receptacles are not provided by PSP operators hence residents use different types of materials such as sacs, nylons, and bins as receptacles. Upon collection, the PSPs transport wastes to waste collection sites – only to dump them without sorting. At the dumping sites, scavengers, who are mostly crew members of PSPs, pick re-usable items

including iron, plastics, and others. Thereafter, the wastes are burnt at the sites. Although not covered in this study, the management of waste collection sites in the state is worrisome.

The PSP operators in the state have a capital investment of ₦51.7 million (approximately, 172,622 US Dollars) and a total workforce of 69 persons. Each PSP has a minimum of three crew members comprising a driver and two waste collectors, while about 50% of the PSPs have 5 crew members including an administrative staff and revenue officer. Each operator has a minimum of two vans while they, at least visit their site five times a week. However, about 60% of the PSPs do not collect waste from their clusters three times a week. To adjust for waste collection, PSP operators develop personal arrangements between themselves and clients. Usually, the date of waste collection is fixed for the clients, and each household knows the time and period that waste collection will be done. On these days, waste receptacles will be placed in front of respective houses.

An average of ₦450,000 (about 1800 US Dollars) is earned by PSP operators monthly, while not less than 70% of the operators earn less than 400,000 (1600 US Dollars) in a month. The monthly operation cost, including recurrent expenditures, salaries, and maintenance of the waste collection van is ₦250,000 (1000 US Dollars). From the foregoing, PSP operators have a minimum gain of 150,000 monthly. An increase in diesel and the cost of maintenance are the challenges affecting the economic strength of the PSP operators.

About 5% of crew members are OND holders, 10.2% are

secondary school holders, 18% finished primary school, and above 50% are illiterates. However, 75% of PSP operators have at least a first degree while about 20% have a minimum of HND and only one of the operators has SSCE. The impression that waste collection is a dirty job

informs the involvement of graduates in waste collection services as crew members. Also, poor pay, lack of social prestige, and related services could have discouraged these individuals.

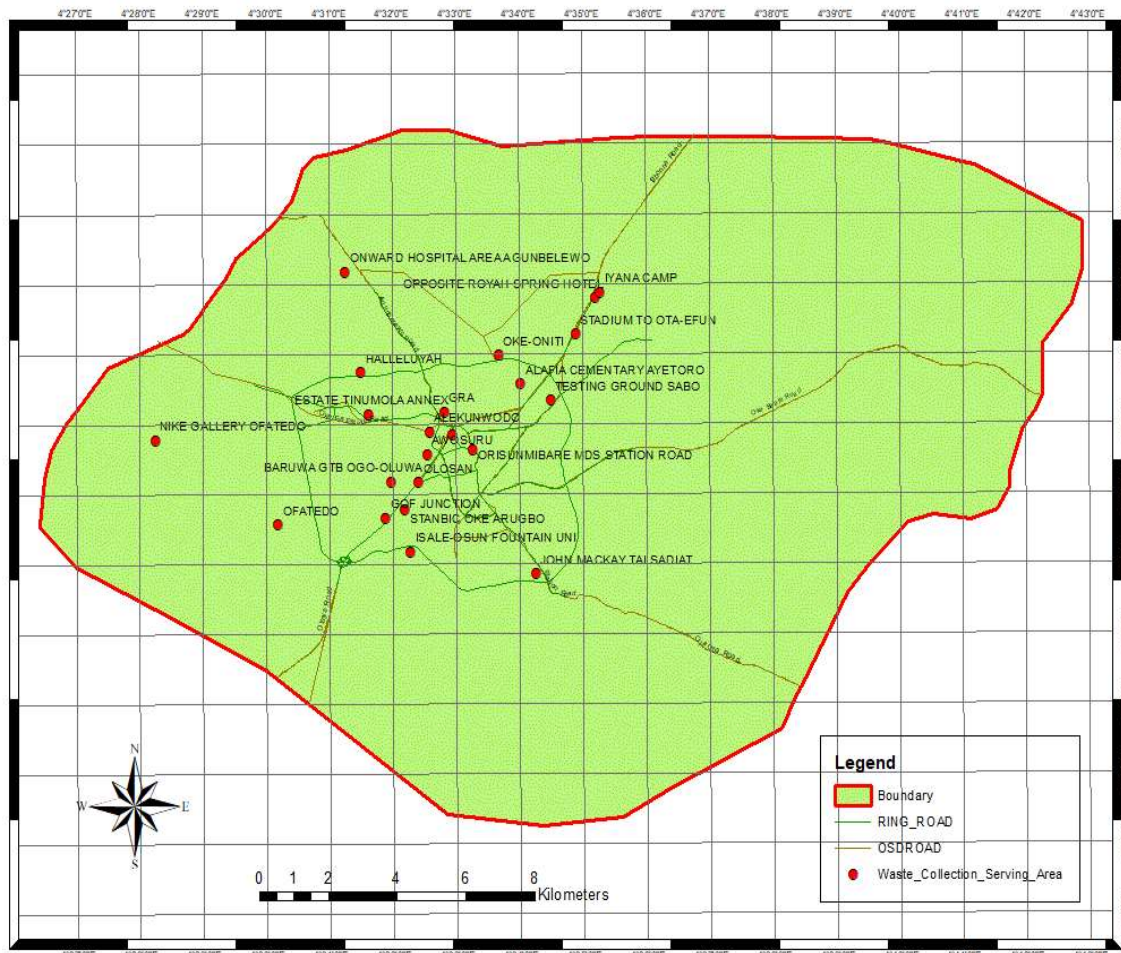


Figure 1: Site Location of the PSPs. Source: Authors work, 2022

For instance, the highest-paid crew member earns #30,000 (120 US Dollars) monthly, while some of the crew members earn as low as #10,000 (40 US Dollars) monthly. There is no health insurance package for crew members – this is despite their exposure to situations and wastes that can make them susceptible to diseases and infections. About 70% of crew members revealed that they resort to the job because of a lack of

alternatives. They went further to maintain their hope for a pullout from the job once they are economically stable. Crew members feel socially stigmatized and to address this, some of them engage in the use of hard drugs and alcohol.

4.2. Serviceability and Effectiveness of the Private Operators

As summarized in Table 1, there is about a 60% deficit in the overall waste collection by PSPs in the metropolis. Also, only six of the PSPs (representing about 30%) were able to meet up to 50% per cent service – a situation that depicts a challenge in the service of PSP operators in the state. Some of the operators have a deficiency of as high as 80%. Sadly, ownership of a large fleet of waste vehicles does not translate to the effectiveness of the PSPs (PPMC $r = 0.275$; $p = 0.204$).

When questioned, the operators narrated the frequent damage to vehicles and the challenge associated with their operation. Some claimed that mechanics reject the repair of their vehicles due to the impression that these vehicles smell. Plate 2 shows a faulty PSP waste van along one of the major roads in the metropolis. Leachates from wastes are also reported to corrode these vehicles and further affected their efficiency. Lack of government support and absence of access to loans by the bank – due to the perceived impression that the latter cannot afford to pay back, since there

are no government legislations- have further affected their operations. Some of the operators claimed that government intervention in the supply of waste vans in the past was fraught with suspicion- as the vehicles were of poor quality and do not have spare parts. Hence, PSP operators can be regarded as not effective in the collection of waste from their respective clients. Although currently, there is no index for the measurement or appraisal of the services of PSP operators by O-Waste, the use of a deficiency index to appraise their efficiency can be adapted.



Plate 2: Faulty Waste Vehicle of Glory Sanitation – A PSP Operator in Osogbo Metropolis

Source: Authors' work, 2022

Table 1: Serviceability and Effectiveness of PSP in Osogbo

S/N	PSP Name	Expected Service days	Number of service days	Number of Vans	Number of daily trip(s)	Capacity of Van (Kg)	Average daily waste carried	Maximum Expected Output (5000kg)	Deficiency
1	Dee-TFT Global Service	7	2	2	2	1000	8000	28000	71.42857143
2	Morklin Services	7	5	3	1	1000	8000	21000	61.9047619
3	Peter Bradford	7	2	2	2	1000	8000	28000	71.42857143
4	Living Hope Ventures	7	4	3	1	1000	8000	21000	61.9047619
5	Adracc Communication	7	5	2	3	1000	8000	42000	80.95238095
6	Jaomufat Ventures	7	5	2	2	1000	8000	28000	71.42857143
7	OBS Cleaning Services	7	2	2	1	1000	8000	14000	42.85714286
8	MTL ENV. Services	7	4	2	2	1000	8000	28000	71.42857143
9	DHYSKY	7	3	2	2	1000	8000	28000	71.42857143
10	Ade-Ade Nig.Ltd	7	5	2	2	1000	8000	28000	71.42857143
11	Kamaha Unigue Concept	7	3	2	1	1000	8000	14000	42.85714286
12	Kayus and Sons	7	4	1	2	1000	8000	14000	42.85714286
13	Rhodemed Nig Ltd	7	2	2	1	1000	8000	14000	42.85714286
14	Victory Sanitation	7	1	2	2	1000	8000	28000	71.42857143
15	Latas Nigeria Ltd	7	5	2	2	1000	8000	28000	71.42857143
16	Ola-Olayemi	7	3	2	1	1000	8000	14000	42.85714286
17	D-Dees	7	2	2	2	1000	8000	28000	71.42857143
18	Dahud & Sons	7	3	2	2	1000	8000	28000	71.42857143
19	Akinlat Ventures	7	1	2	2	1000	8000	28000	71.42857143
20	Alanco	7	4	2	2	1000	8000	28000	71.42857143
21	Donets Env. Services	7	5	2	1	1000	8000	14000	42.85714286
22	Pius Okunlola Env. Sanitation	7	2	2	2	1000	8000	28000	71.42857143
23	Loyal Drive	7	3	3	2	1000	8000	42000	80.95238095
	Average	7					8000	24956.522	63.97515528

Source: Authors' work, 2022

4.3. Residents' satisfaction with the services rendered by private operators

It can be deduced from Table 2 that the level of satisfaction with the activities of PSP in the study area using the Likert

scale revealed the Resident Satisfaction Index of 3.41, and respondent's satisfaction with frequency of waste collection ranked the highest with 3.74 which may be as a result of PSP collection of the waste from house to house and packing the refuse at any point they are being dumped, Cleanliness due to

operation of PSP ranked 2nd with 3.66 which shows that the PSP has been carrying out their duty regularly. The method of Waste collection and quick response to customer complaints were ranked 3.54 and 1.88 respectively, these fall below the Resident Satisfaction Index. This implies that some of the complaints made by the customers were not responded to adequately and the level of satisfaction with this method of waste collection was not pleasing to the respondents.

Table 2 shows the mean score of the Likert scale rating of the services of PSP operators' in the study area, such as cleanliness due to operation of PSP, and method of payment which is ranked 1st with 3.85, this also corresponds with the level of satisfaction from table 2. This shows that PSP is active in discharging their responsibility. Method of waste collection ranked 2nd with 3.82, Time of waste collection and Reliability at waste collection was also ranked 3rd with 3.80 while Quick customer response to complaints ranked 3.65 and Crew attitude / Approach ranked 3.60 which fell below the mean score of 3.76. These two factors were considered to limit the services of PSP in the study area as some houses were not reached during collection and accumulation of their waste created a nuisance to the environment and at the same time served as blockage of drainages during the rainy season.

From the Table 2, the services of PSP were assessed with 8 variables. From the table, the services of PSPs that residents felt were done properly were the cleanliness of their operation (RSI = 3.85) and Method of Payment (0.09). The foregoing may not be divorced from the method of collection of waste in the area – where operators upon collection of waste clean the surrounding of the

receptacles. Also, the flexible payment pattern of waste at the end of the month has made it easy for residents. Although, the free nature of the complimentary service of government-owned waste collection, made individuals patronize the latter despite this flexibility. Residents are still not comfortable with the frequency of the waste collection (0.00) and such concludes that PSP operators are not reliable (0.004). The customer service of PSP operators is reportedly poor as it is rated with a negative value (-0.11).

4.4. Willingness of Residents to Pay for Waste Management Services

Waste collection in the state is done by both government and PSP operators. The former is done for free and the latter is done for a fee – this is discussed in the previous section. As a result, 100% of the residents are not willing to pay for waste in the study area. As a result, only 10% of the residents pay for waste timely, and about 25% pay lesser than charged. Almost 30% have owed PSP operators money for waste. In their view, PSP operators overcharge them. Since there is no regulation enforcing patronage PSP in the state, operators implore and encourage rather than force them to pay. In worse instances, operators write off bad debts of their customers.

4.5. Governments' involvement in the Management and Administration of Private Sector Participation

The government's role in the affairs of PSPs in the state is limited to that of a regulator. This is done through a unit, PSP office, in O-WASTE. However, the regulatory role of government is limited as there are many evident challenges with waste management in the

Table 2: Level of Satisfaction of Residents with PSP Operations

		WVS	WS	WI	WDS	WVDS	CW	N	CW/N	$(\frac{x}{x}) -$
1	Cleanliness due to operation of PSP	195	188	32	10	15	440	120	3.66	0.24
2	Method of Waste collection	135	240	57	18	15	425	120	3.54	0.13
3	Time of Waste collection	115	248	36	20	13	432	120	3.60	0.19
4	Method of Payment	130	256	21	16	15	438	120	3.65	0.24
5	Crew attitude / Approach	145	196	64	14	17	435	120	3.63	0.22
6	Frequency of waste collection	115	248	48	20	13	449	120	3.74	0.33
7	Reliability at waste collection	130	216	21	16	15	438	120	3.65	0.24
8	Quick response to customer complain	145	16	34	14	17	226	120	1.88	- 1.13
	Total						3291		27.33	

Source: Authors' work, 2021

RSI= Resident Satisfaction Index $27.33/8= 3.41$

WVS= Weighted Very Satisfied; WS= Weighted Satisfied; WI =Weighted Indifferent;

WDS = Weighted Dissatisfied; WVDS = Weighted Very Dissatisfied,

CW= Cumulated weight, N=Number of Respondents.

For instance, price control and efficiency are not monitored by the agency. Also, customer complaints and conflict resolution are not handled and are not catered for. The absence of law and policies to guide the operation of PSP operators has limited the activities of PSPs in the state, thereby posing a challenge.

The PSP operators, in a bid to handle some of the challenges associated with their operations, organized themselves to form an association. These challenges serve as an interface between members and the regulatory agencies.

5. Summary, Conclusion and Recommendations

5.1. Summary

The study beamed a searchlight on the activities of PSPs in solid waste management in Osogbo. Results of the

study chronicled the inadequacies of the PSPs operations in finding a lasting solution to the reoccurring and intractable problem of municipal solid waste management in the city. The myriad of challenges identified in the study which hinder the smooth functioning of the PSPs amongst others includes; lack of capacity in terms of financial, human, technical and mechanical; poor coordination by O-waste for the allotted PSPs; does not cover the entire municipality thereby giving room for a lot of illegal dumping, particularly along the main streets bordering the PSPs area of operation. There is also the issue of poverty mentality where residents deliberately refuse to pay for their waste because they feel it's the responsibility of the municipal authorities yet they don't pay taxes. Though there seems to be no law compelling the citizens to patronize the PSPs in their locality for there is a High Court order prohibiting the

dumping of waste on the highway or central divide, enforcement of regulations on illegal dumping is weak. The overall assessment of the PSPs operations shows that residents were very dissatisfied with their operations as illegal dumping persists in the adjoining neighbourhoods.

5.2. Conclusion

Urban solid waste management is one of the problems many cities are facing today globally, particularly in countries of the global south with no headway. Waste generation is inevitable as long as life exists. The impact of poor waste management is evident everywhere in Osogbo metropolis. If waste disposal is left in the hands of the government there will continue to be a gross disparity between waste generation and disposal which can lead to the growth of an unhealthy city. Except in an exceptional governance system, the public alone cannot finance the cost of urban waste management. Again, the private sector alone cannot adequately and effectively manage municipal waste satisfactorily. Therefore, there is need for effective collaboration between the public and private sectors to strategize the modalities that will enhance effective waste management in the cities, especially in the global south.

5.3. Recommendations

To curb the menace caused by poor solid waste disposal in Osogbo the following recommendations are offered. There is a need to lift the embargo on the registration of private sector participation to accommodate more private sector participants, especially those who can deliver. Furthermore, there is need for the Osun state government to enforce the High Court order which instituted a fine of #50,000 on anyone caught dumping waste illegally or in an unauthorized place in

any area covered by PSPs. This enforcement would ensure that residents patronize private operators for their solid waste disposal services. This would equally boost private operators' revenue generation that would sustain them in the business. All the private operators in Osogbo are operating below the maximum expected output; there is need for incentives and motivation from all stakeholders in environmental management to support them to increase their level of performance. It was observed that charges by private operators in Osogbo are regressive. Their charges are not following the quantity of waste generation but rather on residents' socioeconomic status. This is sub-optimal; there is a need to generate charges that should be commensurate with the quantity of waste generation. Charges can be per kilogram or at a flat rate and if the current charges are not adequate to break even they can be increased. The vehicles used by private solid waste operators in Osogbo are old and not also conventional vehicles designed to handle waste which explains why they easily break down after a few months of operation. There is a need for modern vehicles in good condition and designed for such a purpose that can work at maximum capacity per day without hitches. In addition, residents' willingness to pay for disposing of their waste is not very encouraging. This may be due to poverty or the wrong mentality that waste disposal should be the sole responsibility of government and therefore, it should be for free. PSPs operators need to device means that will be persuasive and at the same time strict to collect their money at the end of the month for services rendered to residents on the collection, transportation, and disposal of their waste if they choose to collect their money monthly. Finally, the

government should support private individuals with adequate knowledge in waste recycling and reuse to reduce the menace of heaps of dumps of waste which have significant effects on human health.

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