



# Repositioning Waste Management Architecture for Sustainable Upstream Performance in Lagos, Nigeria

Akintade Samuel Afolayan<sup>(✉)</sup>

Department of Estate Management,  
University of Lagos, Akoka Yaba, Lagos 101017, Nigeria  
akinafolayan@gmail.com, aafolayan@unilag.edu.ng

**Abstract.** The Lagos Mega City witnessed a breakdown of refuse upstream evacuation mechanism more than ever before. New and sustainable approach needs to be found for improvement, in the face of looming environmental health hazards. This study examines public policy on solid waste management in Lagos Waste Management Authority (LAWMA) enabling law, 2007 and explores human and technological resources available for a sustainable operation. It also utilises interviews with refuse evacuation stake holders; the waste-cart pushers and survey on households to appraise the current state of refuse management. The study discovers a massive displacement of grass-root mechanisms which could have been harnessed for effective waste evacuation. It also finds that scale of plant was underutilised and wrongly applied, resulting in inefficiency of Private Sector Participation (PSP) refuse collectors. The study recommends a restructuring of the evacuation mechanisms through means of the ‘refuse sale’ approach on three major levels.

**Keywords:** Refuse Cart Pushers · Refuse sale · Waste collection · Waste generation · Waste management

## 1 Introduction

The built environment is a product of the construction industry in its old, refined and conceptual models. The aim and a major indicator of the success of the construction industry is the wellbeing and satisfaction of man in his basic, social, recreational and economic uses of built environment. This is where design, construction and management of the created structures and infrastructure become very critical. While the technicalities of design and the construction stages determine the prospects of actualisation of the physical structures, the management and administration stage determine the level at which the aims of all inputs into the creation of built environment would be achieved. Management or/and administration was acknowledged as the ‘software’ aspect of built environment and thus styled it “*humanware*”, as distinct from other physical components of the built environment which was referred to as ‘hardware’ elements [1]. The source agreed that these ‘soft issues’ constituted a key factor based on which users make their decisions about the overall quality of structures.

Management and administration occur at the post-occupancy stage of the value chain. Most crucial at this stage is environmental maintenance for livability which, is anchored much on performance of the structures created, as well as health and safety of users towards achieving satisfaction therein. Environmental user satisfaction and well-being is a composite of ratings from several domains. These include those of housing, health and environment [2]. [3] had also earlier established positive correlations between the well-being of man and his physical environment which, today is the focus of upgrade in Construction 4.0 framework. Environmental factors and conditions are very crucial in the determination of satisfaction and subjective well-being of man in built environment [4]. One of the major determinants of user satisfaction and well-being as a focus of construction industry is cleanliness and sustainable solid waste management (SWM). However, urbanisation and its accompanying complexities tend to weigh down our cities' environment in Africa. A major sector usually affected in this process is in maintenance of cleanliness. Lagos mega-city, Nigeria exhibits a typical failure of SWM among African cities. Unfortunately, Nigeria as a nation, was also attested to as witnessing a regime of refuse generation which outweighs the evacuation rate [5]. Even the whole of the global south was acclaimed to be bedeviled with inequitable and inconsistent solid waste collection services resulting from rapid urbanization [6].

Lagos state had landfills and dumpsites including those of Olusosun, Solous, Ikorodu, and Igando as well as new constructions in Epe to handle SWM. The Lagos State Waste Management Authority (LAWMA) in conjunction with Private Sector Participation (PSP) operators appeared working hard to rid the State of filth. Notwithstanding these, the streets are filled with refuse, creating midstream complications. The problem, however, is not a midstream issue per se. The preponderance of refuse on the streets exhibits the failure of the upstream (source-centre) evacuation mechanism. The focus of this paper is thus, on the enhancement and sustainability of upstream evacuation processes. Furthermore, only household wastes, light commercial and institutional wastes which usually find their way, albeit illegally, onto the streets are considered. Industrial and medical wastes which have specialised channels of disposal are left out. Also, the efficiency or otherwise of the downstream sector are not covered here.

## **2 Statement of Research Problem**

The current view of refuse on the streets of Lagos mega-city is unprecedented. The efforts of LAWMA and PSP operators among others have not yielded positive results for residents' satisfaction and well-being enough to justify the aim of immense activities of the construction industry. A common feature at such refuse heaps is the batching of components in one form of container or the other ranging from cellophane wraps, baskets, sacks to other forms of characteristically poor bagging meant to be disposed of, alongside the contained refuse. The implication of this is that such refuse had been carried over a distance to be dumped there. If there had been effective evacuation machinery at the various source-centres, the illegal spots would not have received waste products.

The situation had degenerated so much that it gave birth to the whims of various schools of thought. Three of such schools could be identified here. The Public Policy School took advocacy approach through erection of signposts canvassing against dumping of refuse in some locations while, in the Political School, evolving effective SWM approach had become a campaign slogan for political aspirants. In the School of Traditions, bizarre slogans came up threatening wrath of the gods on those illegally dumping refuse in certain locations. If all efforts of the evacuation and street cleaning agents had failed to guarantee clean and healthy environment, big epidemics loom. The effects of this would be felt not only in Lagos but all over Nigeria and across West African subregion from where traders move in and out of Lagos.

### **3 Methodology**

The research is exploratory and adopted a survey approach encompassing service of questionnaire, interview as well as direct and indirect observations. Towards achieving its objectives, the paper firstly perused the LAWMA enabling Law of 2007. The provisions therein for public policy execution and management of SWM as well as enablement under the law were identified. The in-situ operation and strategies of the SWM operatives were explored to see both conceptual and operational lacuna which led to the Cleaner Lagos Initiative (CLI) of 2017. The process further evaluated the current practices to identify shortfalls in the achievement of operational visions towards an emergence of remedial actions as well as new innovations to arrive at a truly cleaner Lagos.

Questionnaires were served on systematically sampled residents in the Lagos Mainland local government area on the observations about SWM operatives, the household attitudes and response as well as operational machinery of refuse evacuation. Interviews were also held with other stakeholders along the value chain including private sector participation (PSP) group and refuse cart pushers (RCPs). A total of 136 copies of the retrieved questionnaire from households were coded and analysed for the study.

### **4 Excerpts from Lagos Waste Management Authority Law 2007**

The Lagos Waste Management Authority Law 2007 is a 30-section promulgation by the State House of Assembly [7]. The S.1 (1) of the law created Lagos Waste Management Authority (LAWMA) as a body Corporate with perpetual succession and common seal. It was empowered in S.1 (2) c as capable of holding, purchasing, acquiring and disposing of movable and immovable property for the purpose of its duties. S.2 (3) a-i specified the composition of the Board of Directors of the Authority as encompassing a broad spectrum of officials including the Commissioner for the Environment and even a representative of the State University's Department of Civil Engineering. The S.4 (1) a-h earmarked duties for the Authority. The Body was also empowered to prepare and update from time to time the master plans for waste collection and disposal in the State. It was further to draw agreement with, license and regulate acts of private-sector waste collectors.

The law gave the Board a somewhat blank cheque to 'do all such acts as are necessary or incidental to the proper discharge of its duties under this Law.' Section 5

spelt out powers of the Board of LAWMA. Section 5(1) (j) granted the Board the power to acquire any land for its purpose, in accordance with existing Laws of the State. It also had powers to provide other related SWM services not mentioned in the law. The S.9 to S.11 dealt with operation license for waste collectors. The procedures for licensing and prescription of fees payable for same were also contained herein. The mode of transporting and dumping of wastes were covered in S.14 and S.15 of the law. Monitoring, enforcement and stipulation of offences as well as penalties and modes of seeking redress under the law were spelt out in Sections 17–19 of the Law.

## 5 Findings and Discussions

The following were findings from analysed data and the discussions on them.

### 5.1 Demographic Details of Respondents

The demographic details of respondents in the study area are as summarised in Table 1 below. From the Table, 58.8% of the respondents were female as the male took up

**Table 1.** Demographic details of respondents

Characteristics		Frequency	%
A: Gender	Male	56	41.2
	Female	80	58.8
	Total	136	100.0
B: Education status	O',level	54	39.7
	NCE/OND	31	22.8
	HND/B.sc	9	6.6
	Others	42	30.9
	Total	136	100.0
C: Employment status	Employed	42	30.9
	Self employed	54	39.7
	Artisan	31	22.8
	Others	9	6.6
	Total	136	100.0
D: Length of residency in the area	Below 5 years	25	18.4
	5–10 years	58	46.6
	11–15 years	36	26.5
	21–25 yrs	17	12.5
	Total	136	100.0
E: Average number of residents in building	1–10	9	6.6
	11–20	31	22.8
	21–30	54	39.7
	Above 30	42	30.9
	Total	136	100.0

41.2%. This is particularly significant in that female members of the households were more directly involved and thus knowledgeable in refuse disposal as an appendage of home management.

The spread of educational attainment by the respondents endowed them to understand the importance of environmental cleanliness. Furthermore, 87.5% of the respondents were old residents, quite familiar with developments in refuse collection situation therein over time. The table also shows that the building (residences) were well populated with attendant implications for refuse generation. In line with [5], factors including those in the table above and related household features are germane in influencing the per capita waste generation rate in urban environment.

## 5.2 The Enabling Law

By provisions of S.1(2) c, the Board could acquire land within each district for primary pooling of wastes from which PSP operators could load for onward conveyance to landfills. The specification of membership of the Board was broad-based as given in S.2(3) a-i. While the inclusion of the representative from Civil Engineering Department of the State University was in order, the non-inclusion of representative from the Department of Environmental Management appeared to be an oversight. So also, was the silence about representation from Lagos State Environmental Protection Agency (LASEPA). The provisions of S.4 (1) d allowing for updates on SWM masterplan have implications for strategic management. The provisions for licensing of evacuation operators criminalised refuse cart pusher (RCP) operators. It also provided the pedestal for festering refuse-related corruption within the local government area. That the criminalisation did not deter the RCPs' actions or/and patronage by households suggests an overlooked importance of their roles in upstream evacuation and general contribution to urban economy.

## 5.3 Major Sources of Refuse Generation

The respondents' perception of the major sectors contributing to refuse generation in the neighbourhood was summarised in Table 2 below. Here, the general notion of population size in the city ranked first with a mean value of 3.812. The population of Lagos which was put at 22million about 2011 constitutes a formidable base for generation of wastes. [8] attested to the importance of overall population in generation of refuse in Lagos Metropolis. Households' lifestyle was identified as another contributor to refuse generation here. It ranked second with a mean figure of 3.620. Household food items were identified to include direct farm produce the consumption of which, brings into town both edible food and its waste-coverings.

Economic and trade activities ranked next with a mean value of 3.482. By the nature of land use planning in the study area, most neighbourhoods have mixed residential cum light commercial zonation. Small and medium Enterprises (SMEs) generate immense waste. Furthermore, roughages from outside the State come into town in form of packages for food and commercial items. Social gatherings were highlighted

**Table 2.** Identified major sources of refuse generation

Source	Opinion	Frequency	%	Cum. %	Mean	Ranking
Overall population activities	Strongly agree	40	29.4	29.4	3.812	<b>1st</b>
	Agree	52	38.2	67.6		
	Undecided	28	20.4	88.0		
	Disagree	11	8.4	96.3		
	Strongly disagree	5	3.7	100.0		
	<b>Total</b>	<b>136</b>	<b>100.0</b>			
Life style of households	Strongly agree	46	33.8	33.8	3.620	<b>2nd</b>
	Agree	44	32.4	66.2		
	Undecided	24	17.6	83.8		
	Disagree	15	11.0	94.8		
	Strongly disagree	7	5.2	100.0		
	<b>Total</b>	<b>136</b>	<b>100.0</b>			
Economic/trade activities	Strongly agree	70	51.5	51.5	3.482	<b>3rd</b>
	Agree	53	39.0	90.5		
	Undecided	13	9.5	100.0		
	disagree	00	0.0	100.0		
	Strongly disagree	00	0.0	100.0		
	<b>Total</b>	<b>136</b>	<b>100.0</b>			
Social gatherings/parties	Strongly agree	48	35.3	35.3	3.412	<b>4th</b>
	Agree	49	36.0	71.3		
	Undecided	21	15.4	86.7		
	Disagree	14	10.3	97.0		
	Strongly disagree	4	3.0	100.0		
	<b>Total</b>	<b>136</b>	<b>100.0</b>			
Institutions	Strongly agree	40	29.4	29.4	3.402	<b>5th</b>
	Agree	52	38.2	67.6		
	Undecided	20	14.7	82.3		
	Disagree	11	8.1	90.4		
	Strongly disagree	5	3.7	94.1		
	Missing item	8	5.9	100.0		
	<b>Total</b>	<b>136</b>	<b>100.0</b>			

with mean figure of 3.412 at the fourth position. Activities which involve bringing people together in celebrations, protests, crusades and several outdoor engagements generate considerable refuse. Also identified were wastes from institutions such as schools and colleges, business centres, offices and markets.

## 6 Assessment of Solid Waste Evacuation Practices in Lagos

The mechanisms for evacuation of wastes in the homes and streets included the direct official pick-ups along the streets by LAWMA, the quasi-formal arrangement of PSP operators and the informal RCPs harvesting wastes from the homes. Another approach was in the form self-help efforts by households throwing wastes into gutters and on the roads.

### 6.1 The PSP Operators, in Visiting the Homes Hardly Kept to Schedule

The system of poor pre-evacuation storage of refuse in the homes, and the unstandardised nature of refuse containers and vans which, necessitated manual loading of refuse, were further inhibitions to successful evacuation. The payment system was through regular monthly billings on households. However, public policy came to a head in 2017 when the status of PSP operators was changed to Waste Collection Operators (WCO) to deal with only commercial wastes. A new WCO (Visionscape Sanitation Company) took their place under a new Cleaner Lagos Initiative (CLI). LAWMA was only left to regulate the operations of the WCOs. Confusion was created in the process. Litigations came up and waste collection efficiency came to a halt.

### 6.2 The Unofficial Refuse Cart Pushers Were Another Set of Refuse Evacuation Operators

These were the group referred to by [6] as informal waste pickers, the local realities which conventional urban waste management largely ignored. They were persecuted by public policy for their penchant for tipping collected refuse on the streets and blocking up most drainage channels. Local governments saw them as evasive and uncontrollable. However, the interview with a group of the RCPs showed that they were plagued by problems, wriggling free from which would determine their economic survival. In the interview, they admitted it was a very viable business notwithstanding the persecution from public policy and exploitation by local government officials. However, because of its criminalisation, RCP operations could not be captured under government's local tax net. They were a critical group variously perceived either as solution providers or culprits in SWM situations in Lagos State. In fact, notwithstanding their prominence and inputs into refuse evacuation in the urban area, the RCP elsewhere, as in Lagos, were relegated in favour of foreign and imported technology [9]. The payment system was direct cash from the households though as extra burden on the households in addition to regular LAWMA bills. Based on some selected broad criteria, the summary of ratings and perception of respondents about RCP operators are as given in Table 3 below.

From the Table, it was agreed by 93.38% of respondents that RCP operators were very close to the homes. They were, in most cases, more regular in patronage than PSP operators. They could also access channels and alleys more easily than the big PSP trucks. However, they were susceptible to exploitation by local government officials. In order to make as many trips as possible to cover both payment to local government touts and also earn a living, they were always illegally tipping refuse anywhere.

**Table 3.** Respondents' perception of Refuse Cart Pushers (RCPs)

Characteristics		n	%
A: The closeness to households	Agree	127	93.38
	Neutral	2	1.47
	Disagree	7	5.15
	Total	136	100.0
B: Regularity of operations	Agree	129	94.85
	Neutral	7	5.15
	Disagree	0	0.0
	Total	136	100.0
C: Ease of access to households	Agree	117	86.03
	Neutral	10	7.35
	Disagree	9	6.62
	Total	136	100.0
D: Susceptibility to exploitation by local government officials	Agree	82	60.30
	Neutral	30	22.06
	Disagree	24	17.64
	Total	136	100
E: Contribution to illegal dumping	Agree	105	77.21
	Neutral	16	11.76
	Disagree	15	11.03
	Total	136	100.0
F: Overall prospects for improved refuse evacuation operation	Agree	76	55.88
	Neutral	39	15.44
	Disagree	39	28.68
	Total	136	100.0

77.21% agreed that the RCP operators contributed much to blocked gutters and drains in the Metropolis. On the whole, only 28.68% of the respondents disagreed that RCPs could, in the end, be the solution to refuse problems in the state, given strategic handling.

## 7 Conclusion

The rate of refuse generation was high in Lagos because of the volume of population as well as interpersonal actions in social, economic and institutional settings. The rate of household refuse generation was higher than its evacuation. The performance of PSP operators was poor. RCP's activities were also criminalised. Refuse evacuation mechanism ran into hitches due to policy somersault, misapplication of plant scale and shortfalls in the application of the enabling laws. There were also inadequate zonal refuse transfer centres. Available ones were far from what small-scale refuse collectors could access without motorised appliances. Corruption was noticed at grassroots as



perpetrated by rent-seeking local government officials. This aided cart pushers' resolve to dump refuse just anywhere, in order to make marginal adjustments in earnings. The study also noted the strong survival instinct of cart pushers as an attribute which, could be harnessed for public good as entrepreneurial base for sale of refuse.

## 8 Recommendations

The LAWMA enabling Law contained several empowerment clauses which, the Board needed to tap into. With the finding that RCPs were not deterred by public policy persecution, and with the hindsight of trust the households had in them, they should have been considered a ready manpower block to tackle refuse evacuation. They could be organised, trained, registered and equipped for refuse evacuation from the homes into neighbourhood loading centres from where PSP trucks would load. This would curtail the waste of PSP plant time in the epileptic journey around homes.

The rewarding system for reformed RCP operations should be such that the operators would not be paid any money by the households. They should, instead, be reimbursed at the loading centres to the tune of weighted and recorded amount of sourced refuse brought in. The payment period could be weekly or any stretch of time considered equitable enough to create an atmosphere of dignified, salaried workmanship. The PSP operators and other WCOs too should not enjoy any blanket contract sum but be paid based on the weighted and recorded amount of refuse they deposited at mega landfills from the transfer zonal centres. These add up to 'refuse for sale' approach to mitigate upstream evacuation problems. The overall funding would come from the normal monthly billings on the households by LAWMA.

In this approach, there would be three levels in solid waste transfer; from homes (upstream), transfer center (Mid-stream) and unto landfills (downstream). Specific measures could then be integrated for efficacy of each level. The organisation, training and engagement of the RCPs would provide employment for teaming number of small-scale private sector willing operators who could also form another local income tax base for the government. The regularisation of the RCPs would eliminate the extortion by local government officials and accord RCPs human dignity in employment. Again, corruption in the form refuse round-tripping would have to be guarded against in the operations.

## References

1. Auchterlounie, T., Hinks, J.: The measurement of customer satisfaction in the private house building sector. In: COBRA 2001 Conference Papers (2001). [www.rics-foundation.org](http://www.rics-foundation.org). Accessed 25 Sept 2016
2. van Praag, B.M.S, Frijters, P.: The anatomy of subjective well-being. Discussion Paper 265, Deutsches Institut für Wirtschaftsforschung, Berlin (2001)
3. Ryff, C.D., Keyes, C.L.: The structure of psychological well-being revisited. *J. Pers. Soc. Psychol.* **69**, 719–727 (1995)

4. van-Hoorn, A.: A short introduction to subjective well-being: its measurement, correlates and policy uses. Paper Prepared for the International conference: Is happiness Measurable and What Do Those Measures Mean for Policy? 2–3 April. University of Rome ‘Tor Vergata’ (2007)
5. Abel, O.A.: An analysis of solid waste generation in a traditional African city: the example of Ogbomoso, Nigeria. *Environ. Urb. SAGE J.* **19**(2), 527–537 (2009)
6. Dias, S.M.: Waste pickers and cities. *Environ. Urb.* **28**(2), 375–390 (2016)
7. Lagos State Government: Lagos Waste Management Authority (LAWMA) Law. Government Press, Ikeja (2007)
8. Idowu, O.B.A., Omirin, M.M., Osagie, J.U.: Outsourcing for sustainable waste disposal in Lagos metropolis: case study of agege local government, Lagos. *J. Sustain. Dev.* **4**(6), 116–131 (2011)
9. Medina, M.: *The World’s Scavengers: Salvaging for Sustainable Consumption and Production*. Altamira Press, Plymouth (2007)