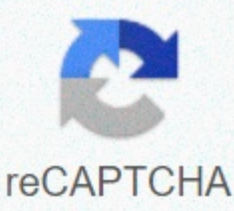




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Solid domestic waste policy in lagos nigeria

The management of solid household waste is a widespread urban problem worldwide. Although several strategies for the efficient management of solid municipal waste have been applied in developing countries, their level of performance has not been critically examined. Among these strategies, the public-private partnership has the broadest appeal. This study examines the findings of public-private partnership in household solid waste collection in Lagos, Nigeria. We collected primary data using a municipal survey of solid waste in three residential areas of the Lagos megacity. Descriptive and inferential statistics were used to analyse the data. Two indices of service performance, namely the service reliability index and the operational quality index, were created to provide evidence of public-private partnership results for the collection of fixed municipal solid waste in Lagos. The results show that the average amount of household solid waste per week varies between 22.75 kg in the medium-sized residential area and 30.39 kg in the high housing density in the city. The estimated per capita waste generated in Lagos Megacity is 0.95 kg day⁻¹. Regression models show that the results of the public-private partnership are strongly influenced by economic status, affordability, flexibility, consistency, cleanliness, coverage and availability, as well as the number of waste collection vehicles, vehicle maintenance, capacity, speed of trip, frequency, number of staff and staff quality. The results of this study show that Lagos residents have a strong positive view of public-private partnership as a waste collection policy framework. The study has important political and practical implications for the management of urban waste, public health and sustainability in developing countries. Keywords: Developing countries; Lagos megacity; fixed municipal waste operation quality public-private partnership operational safety Waste management. Solid waste management is the most pressing environmental challenge facing urban and rural areas in Nigeria. Nigeria, with a population of over 170 million, is one of the largest producers of solid waste in Africa. Despite a wide range of policies and regulations, fixed waste management in the country is subject to alarming proportions with each passing day. Nigeria generates more than 32 million tonnes of solid waste a year, of which only 20-30% are collected. Reckless disposal of fixed and anl. Most of the waste is generated by households and in some cases by local industries, craftsmen and traders, who litter the immediate surroundings. Improper collection and disposal of municipal waste leads to an environmental disaster, as the country currently lacks adequate budgetary integrated waste management programmes across the States. According to U.N. Habitat Watch, African city populations will more than triple over the next 40 years. African cities are already flooded with slums; a phenomenon that could triple the urban population and lead to disaster unless urgent measures are taken. Of the 36 states and a federal capital in the country, only a few have shown a significant degree of willingness to take proactive steps to combat this scourge, while the rest have merely hypocritized waste management issues, suggesting a huge lack of interest in developing the waste sector. Scenario in Lagos Lagos state, the commercial center of Nigeria, is the second fastest growing city in Africa and seventh in the world. The latest reports estimate its population to be more than 21 million making it the largest city in all of Africa. With a per capita waste production of 0.5 kg per day, the city generates more than 10,000 tons of urban waste every day. Despite being a model for other states in the country, municipal waste management is a major challenge for the Lagos State Waste Management Agency (LAWMA) to manage alone, and therefore it is necessary to engage with private waste companies and other franchisees to reduce the burden of waste collection and disposal. A fundamental issue is the delayed collection of solid household waste. In some cases, the waste is collected only after a week or two, and the waste bin therefore flows and litters the surroundings. Mis-disposal of waste and lack of reliable transport infrastructure mean that collected waste will soon spread to other sites. Another unwanted practice is to overload collection trucks with 5-6 tons of waste to reduce the number of trips; This has necessitated calls from environmental activists to prevail in the relevant legislature to comply with the modern waste transport standard. The situation of Oyo Away from Lagos state, Oyo is another ancient city in Nigeria with an estimated population of six million people. Here, solid waste is regulated by the Oyo State Solid Waste Management Authority (OYOWMA). Unlike Lagos state, Oyo state does not have a proper waste management scheme that goes across the nooks and crannies of the state, except for Ibadan, the capital, people from other cities like Ogbomoso and Iseyin resorting to waste incineration. If the waste generators consider that the quantity charged by the waste taker is outside their means, they will dump the waste along flood paths, thereby exacerbating waste treacherity. The burning of municipal waste is a common practice in Nigeria Kano and Rivers State with its fair share of the population also suffering the same fate in controlling and handling solid waste. Overall, population growth in Nigeria has led to an unprecedented growth in the country's economy, but with a devastating effect on the environment, gradually more waste is generated due to the need for housing, manufacturing and an increase in the volume of trade. Future prospects The government at the federal level must urgently revive its regulatory framework that will be attractive to the private sector to invest in waste collection, recycling and recycling. Environmental health officer registration councils in Nigeria would do well to step up greater efforts to monitor and enforce sanitation laws as well as regulate the activities of franchisees on good sustainable practices. Under advocacy further on waste management, to avoid littering the environment, some manufacturing companies (e.g. the chemical and paint industry) have introduced a recall process that will reward individuals who return empty/used plastic containers. This cash incentive has been proven over time to validate the waste to wealth program initiated by production companies. It is also expected that the government will build more composting and recycling facilities in addition to those in the Ekiti and Kano state to ensure good sustainable waste management. The waste management situation in Nigeria currently requires a concerted effort to raise public awareness of the need for the proper disposal of solid waste. In addition, officials should be well trained on professionalism, service delivery and ensure that other states in the country have access to quality waste managers who are within reach and can help with the best approach to dealing with their waste before collection. Related Tagged Africa, Garbage, Canoe, Lagos, LAWMA, MSW, Municipal Waste, Nigeria, Rivers State, Slums, Solid Waste Management, Waste Disposal in Nigeria, Waste Management in Lagos, Waste Management in Oyo. Bookmark permalink. The strategy of providing high-quality modern public services and promoting competition in the waste management sector leads to participation in the private sector for the management of solid waste in the State of Lagos. The results show that the quality of service among PSP operators was more successful in high-income areas than in low- and middle-income areas. On average, industry productivity was 6.63 tonnes per day per vehicle. Eighteen out of 30 companies in the survey area were above this average, and by meeting increased productivity, years of experience with operations, number of trips, number of times trucks were serviced, and compliance with regulatory agency requirements were among the factors influencing company productivity in the state. The study therefore recommends that supervisors should be more aggressive in its statutory role in managing psp operators.1. The management of solid waste by the Municipality of Initiation is one of the most crucial health and environmental problems facing the governments of African cities. This is because although these cities use 20-50 percent of budget for the management of solid waste, only 20-80 percent of the waste is collected. The unclaimed or illegally dumped waste constitutes a disaster for human health and environmental degradation [1]. More so population growth, high urbanisation, industrialisation, economic growth rates result in a huge increase in the amount of waste generated daily in countries with inefficient and underfunded governments, and poverty prevent effective waste management [2-4]. Another problem is that the cities of developing countries are characterised by unplanned, randomly landscaped, sprawling slums with narrow roads inaccessible to pick-up vehicles [5,6]. More so, there has often been a much smaller population of environmental and social capital in developing countries. The management of solid urban waste in Nigeria is constitutionally responsible for the third levels of government, i.e. the local government (Federal Republic of Nigeria, 1999). Financial, material and human resources that have been engaged in waste management of this level by the government have not matched this responsibility. However, this has led to a lack of effective waste management systems in the country's urban areas. As a result, most urban households resort to accidental dumping, burning or burial of solid waste. The common system in the few urban communities where there is a system is that waste management authorities regularly collect waste from households and public containers using a collection truck. Unfortunately, the operations managed by the waste management authorities have mostly been inefficient and inefficient, as evidenced by the heaps of rotting waste that have become a regular sight in many urban areas. This is clear from the reasons previously stated, the poor management of many landfills and soil and groundwater pollution caused by the frequent mixing of household, industrial and toxic waste [7]. Given the environmental situation described above in many urban areas, many Nigerian cities have been described as dirty, unhygienic and aesthetically disturbing in the world [8]. Waste production at national level is alarming, increasing at an estimated annual rate of around 0.5-0.7% and current figures from 0.4 to 0.8 tonnes per capita per year. The complexity of waste is also increasing and biodegradable waste currently accounts for over 50% [9]. This amounts to an annual average of around 50 million tonnes of waste burden on the nation with less than 10% waste management capacity [10]. Management has emerged as one of the biggest challenges for state and local government environmental protection agencies in Nigeria as the amount of solid waste generated increases at a faster rate than the ability of agencies to improve the financial and technical resources needed to growth. The also found that the population's habit of waste disposal, corruption, attitude to work and inadequate facilities and equipment, among others, speak against effective waste management in Nigeria.As as a result of the errors recorded by local authorities in the field of solid waste management, many state governments have introduced regional bodies (i.e. covering more than one local government). For example, Lagos created the State Waste Disposal Board [11], which is now being converted into the Lagos State Waste Management Agency (LAWMA). The Agency faces the task of effectively managing waste of about 18 million residents in the state and delivering a clean environment through transport, waste management and recent recycling. LAWMA therefore joined the public-private partnership initiative to run the scheme. It is public in the sense that LAWMA acts as a supervisory authority for both resident and private partners. While PSP provides services, LAWMA sets prices for residents and businesses. Waste collection charges are based on direct charges to households and other businesses. The amount to be paid for waste collection is not based on the amount of waste generated, rather on the location and type of households/businesses. The services have been made to be patronized by all Lagos residents under state law as a way to keep the state clean. This situation has also been exacerbated by the reluctance of some long-term households to pay for waste disposal because of poverty and unwilling to pay. One of the reasons for not being willing to pay in the country, and especially in Lagos state, is that the Waste Management Council was set up as a non-profit-oriented sector and their services as being a public good that attracts little or no fees. Based on the above challenges and the fact that Lagos is a mega city (highly industrialized) with a population estimate of about 9,113,505 (2006 Census Commission), growing at a rate of 6-8% annually, and generating about 9000 tons of waste daily at 0.5 kg per capita per day, which is quite a large amount, that is a huge burden on the state. It was found in a higher form that waste management involving disposal is a labour and capital intensive function, often consuming 20-50 % of the municipal operating budget [12]. In light of this, the state has concluded the fixed waste collection and disposal to private sector operators with the hope that a clean Lagos can be maintained at no additional cost consequences for the government. The question here is how sustainable the project is in the state to ensure that all waste from residents and businesses is collected without landfills on the streets of Lagos state and also a cleaner Lagos state for a long time Conservation measures can only be successful in the long term if their objectives and activities are accepted by local people [13]. On the other hand, a decisive factor in accepting the perceived fairness of the distribution of costs and benefits of the intervention [13] is crucial. As a result of the above, the study intends to analyse the results of private sector participation in the management of solid waste in Lagos. It specifically evaluates the general characteristics of private sector participation measures in the field of solid waste management at home and users in the State of Lagos. Also attempt to assess the extent to which the service target is met in practice, evaluate the effectiveness (quality of the services provided) of the efficiency of the production of public service operators in waste management of the selected areas, examine the factors affecting the production efficiency of PSP operators and highlight limitations in the efficient operation of PSP operators in the State22. Theoretical and conceptual frameworkSustainable development refers to a form of human development in which the use of resources is intended to meet human needs while ensuring the sustainability of natural systems and the environment, so that these needs can be met not only in the present but also in future generations [14]. It links concerns about the carrying capacity of natural systems with the social challenges facing humanity. In the past, the concept of sustainable development has often been divided into three components: environmental sustainability, economic sustainability and socio-political sustainability. The idea of sustainability has its roots in system theory. Systems are sets of interacting and adaptive structures and processes that together produce functional outputs and results. They are characterized by their ability to maintain their functional outputs and results within desirable parameters, while adjusting and adapting to variations in inputs. Feedback mechanisms adjust system processes and structures in response to input variation to maintain output and results. Change is an inherent feature of systems. Although systems are able to adapt to input changes, they remain relatively sustainable. When they cannot be adjusted, discontinuity occurs until a new equilibrium has been achieved or the solution takes place [15]. The theory of systems has been widely applied to the understanding of social organisations [16]. For human service organizations, programs are organized sets of inputs (people, facilities and equipment) that perform strategies (processes) designed to achieve specific outputs and results. The three main characteristics of sustainability are the benefits produced over time for individuals and populations, unforeseen costs that cause the benefits and the cost of the programme resources that are to achieve them. Programs can be considered unsustainable because (1) sufficient benefit is not produced, (2) the unforeseen expenses that cause results cannot be produced or maintained, and (3) the cost of the program resources required to obtain the benefits is too high [15]. These ideas on sustainable development must be well integrated into the management of solid waste and other environmental action programmes. Solid waste management (SWM) is an important environmental health service and is an integral part of the basic urban services. Research on urban SWR in developing countries has been developed on the back of two main problems: public sector reform (including privatisation issues) and sustainable urban development [17]. The former is closely linked to the neoliberal doctrine that proclaims a resurgence of the market and a reduction in state control. The latter focuses on the participation of the private sector in the provision of services; It raises issues of public interest and acceptance [17]. These ideas give rise to a demand for an effective management system. An efficient waste management system is a true way of ensuring economic development. In Nigeria, a state that has really defended the course of environmental sanitation through efficient waste management is Lagos state. Against the backdrop of being considered one of the dirtiest states by the world press after the celebration of FESTAC '77, this satisfaction was achieved through public-private partnership of LAWMA and PSP operators. LAWMA engages, coordinates and evaluates the activities of the private sector participant (PSP) in the municipal solid waste collection. It is important to examine the opportunities and challenges of allocating the delivery of environmental supplies in terms of PSP operations in Lagos State. Interventions can only succeed in the long term if their objectives and activities are achieved. The state project for the management of the operation of the private sector must be evaluated by the quality of the service provided to consumers and the challenges its nutrition faces. A number of previous studies on solid waste have been carried out in Ghana. There were studies focusing on private sector involvement in solid waste management and the result showed that house-to-house service proved to be more efficient and valued by most residents [18-20]. In Nigeria, the studies centred on the characteristics of solid waste and composition [21, 22], disposal and handling [1, 23-26] perception of payment for solid waste collection [27, 28]. In most cases, the economic tools used were percentages, seriousness indexes, chi-square and ordinary least square models. There have rarely been a few or no studies on the performance assessment of the participation of the Lagos state in the private sector. This aims to fill this gap. The result generated from this political intervention in Lagos state and the great country.3. The Methodology Survey area is Lagos State. The state consists of 20 local government areas. It has a land size of 999.6 km2 and a population of about 9,113,505 (2006 Census Commission). Lagos State has a total of 337 domestic private sector participation in solid waste management, serving all residential areas in the state. The participation of private operators is well distributed in local management areas (LGA(e)), and the number of operators in an area varies according to the population and the needs of the area. Primary data were requested using structured questionnaire and interview to determine the authenticity of the responses. Data was collected from domestic waste management operators and users of the services provided by the operators. Stratified sampling techniques were used to explore the heterogeneous population in the study area. The state was stratified based on the socioeconomic group (high, medium, and low income economic groups). A local government area was randomly selected from each stratum. The final phase involved a random selection of households/residents and PSP operators in a ratio commensurate with the size of the selected operators in the selected local government areas. As regards the socio-economic group, Eti-Osa local government area (LGA), Ikeja LGA and Alimosho LGA were selected from high, middle and low income groups in the state respectively. Of the groups, 4 PSP operators were randomly selected from among the 10 operators in the Eti-Osa LGA, 6 out of 18 were randomly selected from the Ikeja LGA, and 20 out of 56 were randomly selected from the Alimosho LGA in the state. Users were randomly selected according to size based on the number of PSP operators in the areas. All 30 PSP operators and 262 users were sampled in the study.3.1. Financial tools used for the surveyDe economic tools used in this study include the following. Descriptive statistics such as percentages were used to assess the general characteristics of private participation contractors and residents. Service providers' performance was assessed using productivity analysis and service assessment quality (scorecards). The productivity analysis was carried out using the productivity analysis ratio and the average productivity ratio of the industry was used as a benchmark. The quality of services was assessed using the severity index. Productivity was based on the last 24 months of production. The severity index (SI) was calculated from the following equation. This measure is also applied according to the pattern of al-Hammad and Assaf [29]. Consider where is the index of a class, constantly expressing the weight given to the class; is the frequency of responses and described as below are the

which corresponds to , , and , respectively. The classification was analyzed according to the classification pattern of Majid and McCaffer [30], which read as (i) low or extremely ineffective , (ii) low or ineffective , (iii) moderate or effective (iv) high or highly effective .v) very high or extremely effective .3.2. The productivity analysis model adopted for the study follows from the pattern of Sampson Oduro-Kwarteng [19]. The productivity of a vehicle is defined as the average amount of waste production during a period as follows: where vehicle productivity during the period ; the actual production volume of the vehicle during the period and the working time in the days of vehicles during the period. The productivity of an undertaking is defined as the weighted average of each vehicle over a period of time . It is expressed as follows: at the end of the period of productivity; the maximum production capacity of the vehicle during the period. Productivity (PR) is the sum of an enterprise's production capacity over a period divided by the number of productive inputs. Consider how productive inputs are used for operator production . Therefore, the average productivity of the industry , where the company's productivity during the period in question , is productive raw materials used by the sampled operators during the period in question and the number of operators in the sample where .3.3. The Econometric ModelProbit model was used to analyze the relationship between productivity and factors that influence it among private sector partnerships in home solid waste management in the state. Probit regression, also called a probit model, is used to model dichotomy or binary result variables. In the probit model, the inverse normal default distribution of probability is modeled as a linear combination of predictors: where the dependent variable is a binary response. It only takes two values, 0 and 1: and is the explanatory variables that can affect . Therefore, the productivity of the company belonging to category (1, for productivity above average per day, is 0 otherwise). explanatory variables include (operating year, training of service manager, number of daily journeys in the company, number of vehicles used for operation, number of households covered and daily operating costs.) In the probit model, the conditional distribution function of the standard normal distribution, which is the functional form of the probit model: where is the normal density function, the expected probabilities are limited between 0 and 1.De marginal effects of the function are generated. Marginal effect is the result of a unit change in the explanatory variable on probability, as all other explanatory variables are constant. It is the net effect that keeps the second variable the other way. Marginal effects are therefore partial derivatives of probabilities in terms of the explanatory variables on their test means. Consider the index is the independent variable's observation. The marginal effects depend on (typically the means). The coefficients and marginal effects have the same signs because . Therefore, the marginal effect of the probit model 4. Results and discussions4.1. Providers The privatisation of solid waste collection has given rise to the emergence of a fairly large number of operators in the State. Of the contractors surveyed, 67% came from the low-income area of the Alimosho LGA, 20% from the middle income area of the Ikeja LGA and 13% from the high-income area of the Eti-Osa LGA. All operate in different sizes or capacities in terms of manpower and available equipment. The strength and quality of staff with available facilities is often a sign of the company's waste collection capacity. All companies have offices in their locations; It will therefore be easier for their customers and monitoring bodies to locate them in the event of difficulties in terms of service regulations. All service providers use compression trucks of approximately 5 tonnes of capacity provided by the Lagos state government. The companies own either the trucks or in a few cases on leases. About 57% of companies operate two compact closed trucks, 26% of companies operate three trucks, 13% of companies operate four trucks and only 3% use five trucks in the various areas of the state studied. The average age of their trucks varies from 3 years to 7 years. The staffing force of the enterprises varies from 7 to 19. Other facilities owned and supplied by companies for the efficient provision of services include vehicles for logistics, shovels and protective equipment such as gloves, boots and pullovers to protect the crew from damage and direct contact with pathogenic organisms. The waste collection system is mainly door-to-door collection. In the low income area and part of the medium income area, when the collection truck arrives on the street to be served, it warns households by honning. In the high-income areas, waste is collected by the herds from the dustbin stored in front of the house. The rate of waste collection varies from area to area. About 73% of the contractors interviewed reported that the collection occurs once a week in a particular area. However, they admitted that most of the collection rate depends on the mechanical condition of the collection trucks and on the agreement between the contractors and the residents of the area. It is noted that most collection trucks purchased from LAWMA are new except few rightly used ones. Most contractors' collectors are casual workers with little or no training and they are low paid, with a salary between 7,000 to 20,000 naira (naira is represented as ₦) (i.e. from ₦ 7,000 to ₦ 20,000) of the area. Low-income waste crew earn between ₦ ₦ and ₦ 14,000. Middle-income workers earn between ₦10,000 and ₦ 18,000, while waste collection staff in the high-income area earn between ₦ 10,000 and ₦ 20,000. The number of crews varies between 3 and 4 per truck in all areas of the state. While drivers earn higher pay from ₦20,000 to ₦30,000, the supervisors or managers who are mostly trained serve between ₦18,000 to ₦40,000. Other benefits to workers include daily food, scholarships, free accommodation and holidays in the low-income area. In the middle income area, contractors offer benefits such as allowances, loan and vacation options, while high-income providers offer benefits such as provision, daily food, fellows, loans and free accommodation. All domestic solid waste collection takes place between 08:00 and 18:00 from Monday to Saturday. The monthly operating costs of PSP operators vary from ₦ 500,000 to ₦ 900,000 in the low income range, from ₦ 600,000 to ₦ 800,000 in the middle income area and from ₦ 640,000 to ₦ 1,000,000 in higher income areas. Operating costs cover the cost of refuelling trucks, other vehicles, the cost of maintenance and repair of trucks, vehicles and generators, the cost of renting other inputs in some cases such as trucks and the cost of payroll for workers or employees. Each contractor caters to varying numbers of houses in coverage areas of departments. In the low-income sector, contractors are responsible for houses between 180 and 231; in the middle income area it is between 192 and 230 houses; and in high income area, it is between 125 and 240 houses. Payment for services provided in all areas is primarily through the issuance of bills and payment through banks. About 60% of contractors demanded payment with this means and 40% in cash. Contractors face challenges of late or refusal of payment. Few operators recover more than 50% of their user fees. The user charge depends on the property value and the range of the state. User charges range from ₦1000 to ₦1500 per month per house in low income area, from ₦1500 to ₦ 1800 per month in medium income range, and from ₦ 1500 to ₦ 2000 in high income area. The collected waste is disposed of in landfill. No waste minimisation technology is used. rakes and shovels are used to clean waste at the collection point.4.2. Residents Among the residents/users sampled, 47% were men and 53% were women with an average age of 40 years. 78% of respondents were married with an average family size of 5 members. About 45% of them were educated in addition to high school education, while about 30% were high school students. The graduates earn an income between ₦ 20,000 and ₦ 1,000,000 and above depending on the area. All users who are samples of, prefer and accept collection of door-to-door-waste door-to-door waste; Some 79% of users were satisfied with the current level of cleanliness as a result of their own PSP operator's efforts in the area (78% in the low-income area, 77% in the middle income area and 81% in the high income area). This is due to the reasons why they have witnessed waste overflow from trash cans or containers, bad smells, and strewn premises due to low collection frequency or delayed waste collection in the areas previously. The most practised allocated frequency of waste collection in designated areas from users' experiences was once a week (88% in low income, 65% in the middle income area and 40% in the high-income area) followed by frequency twice a week (12% in low income area, 45% in the middle income area and 60% in the high-income area). However, 44% of users in the low income area, 55% in the middle income area and 18% in the high-income area were not satisfied with low frequency of waste collection. Against this background, it is obvious that residents would appreciate an increase in the allocated frequency of waste collection services in the area. About 10% of users in the low-income area are willing to pay for higher user taxes, but in medium and high-income areas, residents agree not to pay higher user taxes. Only 48% of users expect fees to be set by payment service providers and the public. From the point of view of the supervisory authorities/LAWMA, their monitoring and evaluation of the whole exercise has been poor, as around 78% of consumers are unlikely to experience their presence in the areas.4.3. Service quality The quality of the waste collection service was assessed in two ways. First, by classifying companies (on a five-point scale from very bad to very good) for service quality attributes (reliability collection, waste overflow, and sanitary conditions at bin/container locations and response to customer complaints and crew position on waste collection). Secondly, residents were asked to indicate service satisfaction by responding as satisfied or not satisfied with the quality of the service provided in the field of study. In a customer satisfaction survey, service satisfaction is the customer's perception of the service received (perceived quality) in relation to their expectations of the desired quality of service. Table 1 shows the results of service quality in cities. Residents across income areas perceived a degree of service provided by PSP operators in the areas. The results show that higher income range (Eti-Osa LGA) had the highest quality of service (74%), followed by medium income area (Ikeja LGA) with 62% and the low income area (Alimosho LGA) with 61%. Chi-square analysis shows that there was a significant difference (; :) in the quality of service across income areas of the state. Income areasSample size Reliability when collecting condition of bins (%)Rapid response to customer complaints (%)Crew attitude (%)Overall (%)Overall service (%)Low1765059535755Middle54666586162High327675717574Source:Field survey 2013.Furthermore, the results of the severity index used to analyse the quality of service in the different areas show that the sanitary state of household waste collection in house-to-house is moderate (), while in medium and high income areas they were assessed as high () and very efficient respectively (). The later areas have a moderate to high clean environment with less spill-over waste. The reason for a high sanitation in high-income areas can be attributed to a high level of rapid response from service providers to customer complaint (71%), high reliability in waste collection rates (76%) and a high degree of positive attitude on the part of the waste collector's crew on services.4.4. Service satisfactionA shown in Figure 1, approximately 56% of users in low-income areas and approximately 61% of users in the high-income area appear to be satisfied with the current quality of service provided by domestic solid waste suppliers.4.5. Productivity Productivity is an efficiency measure of operators' performance. Each operator's productivity was calculated using the sum of the total weighted average individual vehicle waste collected. The productivity rate is estimated by the ratio between the total waste production collected in tonnes by each operator and the operating inputs (vehicles). Table 2 shows the performance distribution of all 30 companies surveyed in the different income areas based on the industry's average performance. The industry's average productivity was 6.63 tonnes per day per vehicle and 18 out of 30 companies had values above this average. In low-income areas, companies C9, C10, C11, C12, C14, C15, C16, C17, C19, C20 and C23 performed below average, while C5, C6, C7, C8, C13, C18, C21, C22 and C24 fared above average. In middle income areas, C27 is below average and C25, C26, C28, C29 and C30 were above average, while companies C1, C2, C3 and C4 performed above average in high-income areas. This implies that companies with above-average vehicle productivity had a higher average daily amount of waste collected than those with below-average productivity. Figure 2 shows the productivity capacity of each undertaking during the IP. PerformanceIncome groupSample sizeBelow averageAbove averageLow20119Middle615High404Source:Field Survey, 2013.4.6. Econometric results In the field of study, the relationship between the productivity performance of service providers and their factors as a result of wilson et al. [31]) is examined using the probit regression model (see Table 3). The results showed that operating years, number of trips per day, number of time monthly and compliance with the regulatory arrangement are significant impact on the productivity performance of psp suppliers for solid waste at home. The results also show that a one-year increase in the years of service provision will result in an increase in productivity of around 15% in the service provider's business. Once again with service operators truck per month will require 77% increase in the productivity of providers. An additional frequency of monitoring of service providers in terms of quality of service control, access to their roles and obligations in partnership will lead to an increase of around 55% in productivity, and a further increase in the frequency of solid waste collection (number of trips per day) will increase the company's productivity by 34%. Explanatory variablesEstimatesEly operation 0.496* (0.2975) 0.1531+Number of vehicles used0.5656 (0.6737) 0.1740+Number of houses covered-0.1 0.116 (0.0145) - 0.0036+Regulatory compliance3.1568** (1.3583) 0.5470+Average number of times truck services per month2.4100** (1.0571) 0.7692+Number of daily trips1.1 0.3390+Share of user fee recovered1.4410 (2.9540) 0.4434+Operating costs for operator-1.7271 (2.5769) 0.7140+Source: Field survey result 2013.Log probability = -9.3185***; chi-square = 21.74***; pseudo ; number of observations = 30 numbers in parentheses are standard errors in the coefficient. +Marginal power coefficient. indicates that the variable is significant at 1%. **Indicates that the variable is significant at 5%. *Indicates that the variable is significant at 10%.4.7. LimitationsThe common limitations for psp-solid waste contractors include customer challenges in the low-income area (75%), middle income (21%) and high-income (3%). Such challenges include debt and late payment of user fees. Poorly managed landfill poses a major challenge during the rainy season as it results in incurring more costs on repairs and services of collection trucks. Other limitations include poor policy implementation and rare monitoring of the quality of contractors' services in the various fields.5 ConclusionIn this study, the results of private companies were analysed in terms of the quality of the services provided and the productivity of a company. Restrictions on the performance of companies were also examined. Responses from residents/users to the quality of service on PSP operations can be said to be very effective in the state. While the quality of service is rated highest/very effective in the high income area, it is moderate in medium and low income areas, which means there is a difference in the quality of service across income groups in the state. The difference in productivity results was examined by analysing two groups of companies: below and above average by means of a criterion for industry average. The results show that 18 out of 30 30 values above the average productivity value of 6.63 tonnes per day per vehicle. While most businesses in middle and high-income areas performed above average, most businesses in low-income areas performed below average. The factors explaining the difference in individual company productivity included the many years of experience in operation, the number of trips per day, the number of time vehicles serviced per month, and compliance with the regulatory regime. Therefore, effective results can be limited by a lack of funds from operators, poorly managed landfill during the rainy season and poor service monitoring and policy implementation. In order to increase efficient productivity, it is recommended that all operators of payment service providers strictly comply with the regulatory regime and operational policies, ensure frequent waste collection and increase the number of daily trips. It is essential that LAWMA encourages tougher and healthy competition among PSP operators that the programme should be sustainable. There should also be a public forum where PSP service providers meet regularly to find ways to overcome the challenges facing the company in their operating areas. Above all, the government should make and implement favourable policies aimed at the sustainability of intervention. LAWMA should, as a body, assume full responsibility for the proper maintenance of landfillsites and seek funds to promote PSP operations for waste minimisation and recycling technology in order to better use waste. 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