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**SUSTAINABLE WATER AND SANITATION SERVICES
FOR ALL IN A FAST CHANGING WORLD**

**Socio-economic demography of waste workers on Lagos
dumpsites: analysis of gender differences**

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This paper examines the socioeconomic activities of solid waste workers at five dump sites in Lagos, Nigeria. It draws on doctoral fieldwork which adopts a feminist approach using the mixed methods of participant observation, questionnaire survey and interviews. The survey included questions on age, gender, education, marital status, and years on the job, ethnicity, working hours, income, and family data, such as number of children and other family income earners. The findings revealed the impact of gender on livelihood strategies. Age, marital status, religion, ethnic origin, working hours and income are some of the characteristics which were found to differ by gender among waste workers. In terms of earning capacity, the average mean income of all the workers was greater than the minimum wage as at the time of the study. This paper calls for an inclusive policy design which integrates the informal waste sector, bridges gender differences and also promotes sustainable development.

Introduction

The inability of the municipal authorities to provide adequate solid waste management services in low income countries has led to the emergence of the private sector participation (Cointreau-Levine, 1994; Lohri et al., 2014). While this has increased the level of solid waste management, waste is still being left uncollected in certain areas (Kassim & Ali, 2006). The informal waste sector also operates, not only to collect, but also to recycle waste materials (Kassim & Ali, 2006). This provides a level of sustainability in waste management through recycling and also acts as a source of livelihood to the urban poor engaged in this (Medina 2000; Wilson et al., 2006). However, these activities are seldom formally recognised and integrated into the formal waste management system. Understanding the socio-economic characteristics of waste workers is important to inform policy makers on their economic contribution to support their integration into the formal solid waste management system. Very few studies exist which have identified the significant roles women play in solid waste management (Noel, 2010; Chikarmane, 2012; Brechbuhl, 2011) and none have focused on comparing the socio-economic characteristics of these male and female workers.

In Lagos, Nigeria, solid waste management is characterized by both formal and informal waste actors who are involved in the process of waste collection, disposal and treatment. While the formal sectors are involved only in waste collection, the informal sector is active in all the three identified areas. Despite the contribution of the informal waste sector and the role it plays in recycling and as a source of livelihood, there is a dearth of information on the socio-economic impacts of this group. Olugbenga, (2006), Nzeadibe & Iwuoha (2008) and Afon, (2012) focus on the informal waste sector in Lagos identifying the age groups, marital status and the income of waste scavengers at Olusosun dump site, Lagos but not fully differentiating by gender. However, gender is an important factor in consideration of solid waste management as a livelihood opportunity to overcome poverty. Gender differences exist in the level of access and control of resources (UNDP, 2013); therefore, gender differences in relation to livelihoods are important as inequality can reduce women's bargaining power (UNDP, 2013). Livelihoods are not only affected by political, social, and economic factors but also by internal household dynamics (Dolan, 2002). This paper analyses the socio-demographic characteristics of waste workers identified at five Lagos dumpsites in relation to gender differences in these characteristics of work within Lagos dumpsites and its effect on income.

Research methodology

The data for this paper were collected by participant observation, questionnaire surveys and interviews. Access to the four government-managed dump sites (Olusosun, Solous 2 and 3 and Ewu-elepe, see Figure 1) began with an initial request to Lagos State Waste Management Authority (LAWMA) and Lagos State Environmental Protection Authority (LASEPA) for permission to visit these dump sites. On getting permission, the next step was to gain access to waste workers through the chairman of Workers Associations at both Olusosun and Solous 3 sites. These two dump sites were observed to have an organized waste union. It was not possible to speak to the association executives at the other two dump sites, so the researcher was introduced to a small number of waste workers by LAWMA staff on site; this number was then increased through snowballing sampling. Akanimodo dumpsite, an illegal dump site was where the largest numbers of cart pushers were assessed. In total, 305 questionnaires were completed which provided information about characteristics of these workers. Data was analyzed using Mann-Whitney and Kruskal-Wallis tests to reveal the effect of the different parameters of gender on income. The actors involved in solid waste management at the dump sites included private sector participants (PSP) operators and the informal waste scavengers, waste buyers, cart pushers and waste merchants.



Figure 1. Map of Lagos showing location of dumpsites visited

Source: <https://www.google.co.uk>

The socio-demographic profile of waste workers

The socio-demographic profile of the workers is presented as:

- Personal characteristics: age, marital status, education, ethnicity, religion and years spent working.
- Workplace characteristics: hours spent working daily, days worked per week, dump site location and income.
- Household characteristics: number of other family income earners, income from other family members and number of children supported.

Personal characteristics

Differences according to gender were observed among waste scavengers on age, marital status, ethnicity, years spent working and religion (Table 1). Age was an important attribute as the activity has been identified to require people that can run for waste materials (Magaji & Dakyes, 2011) and the level of women's involvement in economic activities (Naqvi & Shahnaz, 2002; Azid et al., 2001). In the study, none of the female scavengers was less than twenty years old, with the largest numbers of scavengers (both male and female) in the age group 31 to 40 years. This was in contrast to a study of scavengers at Nsukka, Nigeria which found that the highest number of scavengers was in the 20 to 30 years age group (Nzeadibe, 2009).

Marital status was another significant characteristic as the informal waste economy, especially the role of scavengers is a safety net for widowed, deserted and single women, as well as those who are head of households (Chikarmane, 2012; Nguyen, et. al. no date). Nearly 70 per cent of male scavengers were

married compared with only 30 per cent of females. Similarly nearly 90 per cent of male waste buyers were married, with the remainder single, while for women 20 per cent were married, 50 per cent were separated, 25 per cent were divorced and the remainder was widowed. Studies have usually revealed waste scavengers to be migrants, out to make a living in the city and with their occupation usually dominated by their ethnic group (Hayami et.al. 2006). In the study, the Hausas, who are migrants from the northern part of Nigeria, have the highest male representation. The ethnic diversity among the waste buyers and waste merchants was similar to that observed among the scavengers but with less male Hausa's. The women were split ethnically between the Yoruba's and the Igbos, but there were no female Hausas. PSP operators male have more than 80 percent as Yoruba's, the rest Igbo's while all their women were all Yoruba's. The cart pushers are all male Hausa's.

Table 1. Waste scavengers personal characteristics by gender								
Age (years)	Male (%)	Female (%)	Marital status	Male (%)	Female (%)	Years on occupation	Male (%)	Female (%)
Less than 20	14.5	0	Married	68.4	30.6	5 years & Below	29.1	21.0
20 - 30	22.2	19.4	Single	29.1	4.8	6 – 10	42.7	32.3
30- 40	29.9	41.9	Divorce	0	11.3	11 – 15	24.8	40.3
40- 50	25.6	24.2	Separated	0	43.5	16 – 20	3.4	6.5
Above 50	7.7	14.5	Widowed	2.6	9.7	Above 20	0	0
Ethnic origin	Male (%)	Female (%)	Religion	Male (%)	Female (%)	Education	Male (%)	Female (%)
Yoruba	20.5	90.3	Christianity	16.2	59.7	None	48.7	48.4
Hausa	69.2	0	Islam	82.9	40.3	Quranic school	19.7	0
Igbo	1.7	9.7	Traditional	0	0	First School leaving	16.2	35.5
Others	8.5	0	Others	0.9	0	Secondary school	12.0	14.5
						Higher degree	3.4	1.6

In terms of religion, more than 80 percent of male scavengers are Muslim, 16 percent Christian and the rest with other religions which could not be classified as traditional. For the women, 40 percent are Muslim and the rest Christian. All the cart pushers are also Muslim being from the Hausa ethnic group (who are predominantly Muslims). More than 60 percent of waste buyers and waste merchants are Muslim while the rest are Christian. However, PSP operators have a higher number of Christians than Muslims.

Higher proportions of male scavengers have been working five years or less, and up to ten years. The women in contrast are more likely to work for twenty years. They explained this as not having the financial resources required to move up the waste chain. Among the waste buyers, none of the women have worked for less than five years, while 16.7% of the men have. PSP operators have all worked from between 11 to 20 years. Education was also an important characteristic, and past studies have identified waste workers with low education levels (Asim et al, 2012; Adeyemi et al. 2001). However, this study revealed some of the workers were educated and some had higher degrees (e.g. Higher National Diploma, National Certificate of Education). This was not limited to the waste scavengers as 5.6 percent of male waste buyers, 14.3 per cent of male waste merchants, 85.7 per cent of male PSP operators and 50 per cent of female PSP operators were all educated to higher degree level. This the workers attributed to the high rate of unemployment and their inability to get a better job.

Household characteristics

Female waste workers reported that they had lower incomes from other family members except among waste merchants and PSP operators (Table 2). Table 2 revealed cart pushers have least income coming from other family members. Since all cart pushers are Hausa men, this can be attributed to two reasons. Firstly, their wives are always in Purdah with male Hausa's being responsible for family upkeep. It is therefore difficult to carry out economic activities so they pursue activities while confined to their house (Schildkrout, 1982). Female scavengers and dump waste buyers also have low income from other family members, so there is a strong economic need for them to work. Women are predictably less likely to participate in economic activities in households with a higher income (Naqvi & Shahnaz, 2002). Marital status of women scavengers and waste buyers also impacts on their need for work (Table 2).

Past studies have identified the number of children, most especially those in the age group from birth to five years often negatively affects women's participation in economic activities (Naqvi & Shahnaz, 2002; Klasen & Pieters, 2012). Female waste workers reported they care for more children from birth to five years and six to 12 except among waste merchants and PSP operators (Table 2). However, men reported having more children over the age of 12 years although this is not the case for waste merchants and PSP operators. Finally, although men reported the number of children they have in the three categories, they acknowledged childcare is the responsibility of the mothers. Thus, all the male workers revealed they are often uninvolved in childcare.

Table 2. Household characteristics of waste workers by gender and occupation					
Average income of other family members by gender and occupation			Average number of children 0 to 5 years supported by waste workers		
Occupation	Male (Naira)	Female (Naira)	Occupation	Male	Female
Scavengers	1,068	1,048	Scavengers	0.37	0.47
Cart pushers	407	N/a	Cart pushers	0.28	N/a
Dump waste buyers	1,944	500	Dump waste buyers	0.25	0.39
Waste merchants	3,393	4,583	Waste merchants	0.33	0.61
PSP operators	4,375	10,000	PSP operators	0.86	0.00
Average number of children 6 to 12 years supported by waste workers			Average number of children above 12 years supported by waste workers		
Occupation	Male	Female	Occupation	Male	Female
Scavengers	0.62	1.03	Scavengers	1.19	1.47
Cart pushers	0.51	N/a	Cart pushers	1.26	N/a
Dump waste buyers	0.83	0.90	Dump waste buyers	2.06	1.90
Waste merchants	0.82	0.33	Waste merchants	1.79	3.00
PSP operators	0.86	0.00	PSP operators	1.86	3.75

Workplace characteristics

The number of hours worked daily and the average number of days a week spent working show important differences according to gender with men working longer hours and more days (Table 3). The income of waste workers also depends on gender, with men earning more than women in all occupations (except PSP

operators) (Table 3). The income of all waste workers was also higher than the minimum wage at the time of the study (7,500 Naira).

Table 3. Waste workers workplace characteristics by gender								
Average daily working hours of waste workers by gender			Average days worked weekly by waste workers by gender			Mean income of waste workers by gender		
Occupation	Male	Female	Occupation	Male	Female	Occupation	Male (Naira)	Female (Naira)
Scavengers	9.25	5.52	Scavengers	5.85	4.58	Scavengers	15,278	8,790
Cart pushers	9.58	0.00	Cart pushers	5.93	0.00	Cart pushers	11,802	N/a
Dump waste buyers	9.67	5.85	Dump waste buyers	5.78	4.35	Dump waste buyers	21,389	10,000
Waste merchants	9.46	6.50	Waste merchants	5.75	5.00	Waste merchants	21,607	17,500
PSP operators	9.57	9.50	PSP operators	6.00	5.75	PSP operators	22,500	22,500

Effect of workers basic demographic characteristics on income

A Kruskal-Wallis test was carried out to examine the relationship between waste workers characteristics and income. The Kruskal-Wallis test was chosen for its suitability for data that is not normally distributed and where there are three or more conditions that need to be compared. Table 4 shows increases in scavenger's income with an increase in daily hours worked among men and women. It also reveals the difference in income by ethnic origin and marital status.

Table 4. Mean income of waste scavengers differentiated by gender								
Average income by daily working hours by gender			Average income by ethnic group by gender			Mean income of waste workers by gender		
Daily hours worked	Male	Female	Ethnic group	Male	Female	Marital status	Male (Naira)	Female (Naira)
2 to 4	7,500.0	7,500.0	Yoruba	17,083.3	8,750.0	Married	16,375.0	8,026.3
5 to 7	12,500.0	9,062.5	Igbo	20,000.0	9,166.7	Single	12,941.2	10,833.3
8 to 10	15,000.0	10,000.0	Hausa	14,166.7	N/a	Divorce	N/a	10,357.1
Above 10	17,016.0	N/a	Others	19,000.0	N/a	Separated	N/a	9,351.8
						Widowed	12,500.0	5,833.3

Scavengers

- The age of waste scavengers and the dump site location were found not to have a significant relationship with income.
- Factors which showed high correlation with income are: marital status, years on occupation or experience, ethnicity, education, hours worked, days worked per week, number of other family members earning income, income from other family members and number of children 0 to 5 years.

Cart pushers

- None of the variables were statistically significant with income.

Waste buyers

- Ethnicity, marital status, number of other family members earning income, hours worked daily, days worked per week and education were all statistically significant with income.
- Age, religion and location of waste buyers were not statistically significant with income.

Waste merchants

- There were statistically significant relationships between gender, education and income.

PSP operators

- There was no statistically significant relationship between the variables and income.

Conclusion

This study shows that the activities of waste workers in the informal waste sector offer definite economic benefits. Informal waste workers particularly scavengers are mainly uneducated, although some respondents in this study were educated but had to make their livelihood from solid waste due to unemployment. The effect of household characteristics, such as number of children cared for was also an important issue with women caring for younger children (0 to 5 years) rather than the men. This is consistent with the reduction in women's ability to participate in economic activities with an increase in children (Naqvi & Shahnaz, 2002). The solid waste economy is seen to provide an important source of livelihood for the urban poor, with incomes above the minimum wage. Incomes were differentiated by gender, with the main points of comparison being by the hours worked daily, ethnic group and marital status.

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