Entertaining Risks to Health: The State of Human Faecal Matter Managemnt in Wa, Ghana

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DOI//http://dx.doi.org/10.4314/gjds.v15i1.8

Abstract

Wa, a fast growing municipality in Ghana, is at the first stage of the urban environmental transition where most of the environmental problems tend to occur within or close to the home, including the management of human faecal matter. This study examined the state of faecal matter management in Wa. A stratified sample of residential areas and a systematic sampling of households were employed for the selection of respondents and data was collected using questionnaire survey and key informant interviews. The results indicate that 52% of households in the municipality do not have their own toilet facilities and open defecation appears to be an acceptable practice for them. Surprisingly, public perception about faecal matter handling generally indicates that there are no dangers posed by exposure to humans. The finding suggests a considerable demand for improvements in the management of faecal matter but efforts to improve the situation might be thwarted by misconceptions of the risks posed by exposure to humans. Local government authorities need to re-engineer their efforts of providing a liveable environment by developing a regulatory framework that incorporates subsidies for the construction of household toilets and enforcement of sanitation bye-laws.

Keywords: Sanitation, Human Excreta, Management, Perceptions, Wa

Introduction

Good sanitation is important for ensuring a better health. Living in an environment with improved sanitation facilities offer the opportunity to save the lives of over 1.5 million children a year who would otherwise had suffered diarrheal diseases (WHO/UNICEF, 2012). In Ghana, in 2014, over 17,000 cholera cases, with more than 150 deaths, were recorded across the country from January to September that year (Ghana News Agency, 2014), with many describing the outbreak as the worst in 30 years. This is an indication that human excreta management and minimum levels of personal and domestic hygiene are essential for protecting public health. However, faecal matter management is a monumental challenge in Ghana. The country has low coverage of improved sanitation, particularly in urban and peri-urban communities (Nimo et al., 2014). According to UNICEF (2016), Ghana is ranked second behind Sudan in Africa for open defecation, with about five million Ghanaians not having access to any toilet facility. In Ghana, public toilet is the commonest form of toilet facility used by households, accounting for 35.7%. Households using flush toilets, pit latrines and KVIPs constitute 13.9%, 19.1% and 12.1% respectively. About 19% of households have no toilet facilities and therefore use the bush, field or beach. Among the urban households, a little over four in every ten (42.1%) use a public toilet while 23.3% use a flush toilet and 9.5% have no toilet facilities (Ghana Statistical Service, 2014).

As urban populations grow, and the majority of households depend on on-site sanitation facilities, the few public toilets in these areas are overstretched and human excreta management has become a challenge since the sewer excreta systems, such as flush latrines, are rare due to the high costs of construction and the scarcity of water (Cofie et al., 2004). Moreover, access to disposal sites for human excreta is problematic (Nimo et al., 2014).

A study by Osumanu and Kosoe (2013) shows that open defecation has increased over the years putting residents at risk of environmentally related health problems. The few public toilets available are usually unattractive with children defecation around the premises. The use of household toilet facilities, which could help curtail this menace, is also usually overlooked by some households and house owners. The lack of information on human faecal matter management, and sanitation in general, in Wa makes it difficult to develop measures to deal with the problems associated with it. The aim of this paper is to assess the state of human faecal matter management in Wa by detailing the practices and perceptions of households.

Overview of Faecal Matter Management in Ghana

In Ghana, human excreta management covers the safe and hygienic disposal of faecal matter using both the on-site and off-site systems including pit latrines, Ventilated Improve Pits (VIPs), Kumasi Ventilated Improve Pits (KVIPs), Water Closet (WC) / Septic Tanks, Aqua Privies, and variations of ecological sanitation facilities, and waterborne sewerage systems (Ghana, 2010). These excreta management alternatives are used for both household-level and communal-wide systems (public toilet facilities). According to Larbi (2006), in Ghana, the two predominant forms of sanitation used are communal toilets and pit latrine facilities. This observation corroborate with the Ghana Living Standards Survey Round 6 (GLSS 6) of 2014 which recorded that 35.7% of households rely on public toilet facilities and 19.1% use pit latrines (Ghana Statistical Service, 2014). A World Health Survey in 2003 reported that data on the use of toilet facilities in Ghana is disjointed for both urban and rural areas as well as for private and public facilities. However, the Ghana Living Standards Survey Round 6 reports that only 45.1% of the population today are using improved household toilet facilities ranging from flush toilets connected to septic tanks, VIP latrines and pit latrines with slabs (Ghana Statistical Service, 2014). Meanwhile, regarding differences between northern and southern Ghana, the GLSS 6 reports that majority of the households in the Upper East, Upper West and Northern Regions have no toilet facilities and result to the bush or practice open defecation. Since majority of the households in these regions depend on on-site sanitation facilities, a lot of faecal matter is generated posing several management challenges.

Human excreta management, according to Strauss and Montangero (2002), deals with issues such as costing, economics and the management of the entire faecal sludge system. It is a continuous process that involves the on-site household-level installations, collection, haulage, treatment, and reuse/storage or disposal. Human faecal matter collection in Ghana is done by vacuum tanker operators who empty majority of household and public facilities. The service is rendered by both public and private (licensed and unlicensed) operators with most operators coming from the private sector (Boot and Scott, 2008). Collection is however plagued with some challenges including access to the latrine facilities due to poor building arrangements, dry-waste sanitation facilities due to lack of water for liquefaction, and limited regulation of operators (accounting for the influx of illegal operators).

Theory of Planned Behaviour and Faecal Matter Management

The Theory of Planned Behaviour (TPB) (Ajzen, 2001) is used in this paper to assess individuals' perceptions on the patterns and practices of faecal matter management so as to be able to make a formal and comprehensive assessment of human excreta management in Wa. The TPB was developed based on an existing theory of reasoned action, and has been applied to a range of human enterprise (Egbu et al., 2015). The TPB states that people are rational human beings and for that matter consider the implications of their actions (Tonglet et al., 2004) on themselves and/or on others. The TPB explains the behaviour of humans and how such behaviours can be shaped by other people. It attempts to predict human behaviour since behaviour can be thoughtful and planned. The TPB posits also that people have reasons for a given choice of behavioural action. In other words, "an individual's behavioural choice is the intention to perform or not to perform that behavioural action" (Egbu et al., 2015:3). The theory states again that attitude toward the behaviour, subjective norms, and perceived behavioural control, together form an individual's intentions and behaviours.

Accordingly, the TPB contend that human behavioural intention or the behaviour is guided by three considerations (Figure 1):

- Behavioural belief/Attitude toward the behaviour.
- Normative belief/Subjective norm
- Control belief/Perceived Behavioural Control

These considerations are the key determinants of an individual's intention to perform or not to perform a behavioural choice.

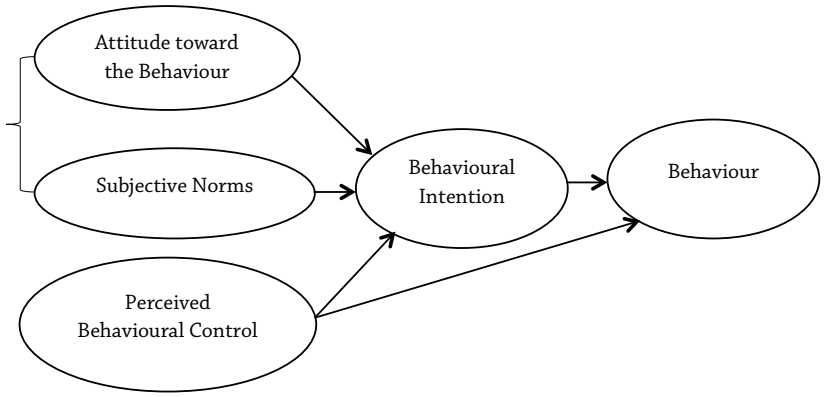

Figure 1: Theory of planned behaviour

Source: Ajzen (2001).

In human faecal matter management, the TPB is used to underline the fact that handling of faecal matter is in one way or the other a behavioural choice either to dispose of it properly or otherwise. Thus, individuals make rational decisions regarding the type of technology they use to manage faecal matter. For instance, while some households make conscious efforts to put up toilet facilities, such as VIP, pit latrine, aqua privy and WC, others consciously resort to open defecation, commonly referred to as "free range". The TPB accentuates also that while households and individuals make such choices, most (if not all) fail to factor in the external cost (environmental, social or economic) of their actions on the wider society (OECD, 2008; Egbu et al., 2015). Individuals' attitude towards human faecal matter management may also be influenced by the subjective norm (Figure, 1), that is, the individual's perception of social (normative) pressures or the beliefs of relevant others that he or she should or should not perform a certain behavioural action (Amjad and Wood, 2009). In such instance, individuals may form a behavioural intention that is parallel with societal expectations. For instance, in most estate neighbourhoods it is unlikely for one to "free range" around because that is not the norm. Instead, households have various facilities to manage human excreta. However, in most slump areas open defecation and unguided human excreta management is common and a 'norm'.

Study Area and Methodology

The Study Context

The study area is Wa, which is the regional capital for the Upper West Region of Ghana. It lies between latitude 10 55' 0" N and 10 10' 07" N and between longitude 2 37' 30" W to 2 20' 0" W. Figure 2 indicates the study area map. Wa covers an area of approximately 1,180 square kilometres which is about 32% and 2.56% of the region and nation respectively. According to the Ghana Statistical Service (2014), Wa's population was estimated to be 135,638 (female 65,887/Male 69,751) by the year 2010 with a growth rate of 2.7% per annum. The spatial distribution of the population displays a typical character of a young municipality – a heavy concentration of population in Wa town surrounded by smaller towns and rural settlements. Using the 2010 Population and Housing Census (Ghana Statistical Service, 2014) figures, Wa's population is 50 times higher than the next populous settlements (Busa, Sagu, Charia, Kperisi and Boli) each with populations below 3,000 people. The significance of this type of distribution is that Wa town provides the highest level services (first level services and functions) in health, education, finance, administration of justice and security, commerce and transportation

amongst others to its hinterland and patent services for resource mobilization, peace building and community needs identification.

Figure 2: The study area

Materials and Methods

The study relied on the mixed methods but largely on the qualitative approach taking into consideration the data demands of the study. Both primary and secondary sources of data were used. The primary data were generated from the field as first-hand information whereas secondary information was gathered from documented sources such as books and published articles from journals for purposes of reviewing literature on the subject under study and profile of the Wa Municipal Assembly. Household questionnaires survey were used as its primary data collection method and complemented with key informant interviews and personal observations. Considering the nature of the sanitation situation in Wa, preliminary visits to suburbs, houses and public places were undertaken to have an in-depth knowledge and understanding of the nature of households and public toilet facilities in the town.

Two hundred respondents (representing households) were interviewed using the household questionnaires. A two-stage sampling methodology was adopted in the selection of households for the interviews. The first stage was the clustering of residential areas into three core zones based on town planning demarcations. Zone One covered the unplanned residential areas, which includes the Central Business District or the business hop of the town and its immediate surroundings that constitutes the earliest settlements prior to urbanisation. Zone Two is made of the planned suburbs, including SSNIT Residential Area and Konta Extension which has most government bungalows. Zone Three comprises the newly developing areas, part of which is made of the surrounding villages which have been absorbed into the urban agglomeration as a result of urban sprawl. Simple random sampling was employed to select Zongo, Konta Extension and Chorkor (see Figure 2) respectively from Zone One, Zone Two and Zone Three. The second stage of the sampling comprised a systematic selection of houses within residential zones using a sampling interval of 8, 12 and 15 houses respectively. The questionnaires were administered to household heads (either a male or female) or their representatives in the selected houses using the interview method. In a house where there were multiple households, only one household was interviewed, i.e. the household willing and ready at the time of the data collection. In each selected house, where the household head being interviewed was not the owner of the house, the house owner was interviewed since the questionnaires included questions that bothered on ownership of houses. In addition to the household surveys, in-depth interviews were held with key informants at the Wa Municipal Assembly, private toilet operators, and an officer from Zoomlion Ghana Company Ltd. (a private waste management company).

The data that was obtained in quantitative form was transformed into frequency counts, percentages, and cross-tabulations for purposes of analyses and interpretation. Qualitative data was analysed manually using content analysis. Content analysis refers to "a variety of techniques for making inferences by objectively and systematically identifying specified characteristics of messages" (Holsti, 1969:14). Coding was used to group the texts into various categories in accordance with the sub-themes of this study. The categories identified included defecation practices, perceptions of faecal matter management and the challenges of sanitation.

Hand-held Global Positioning System (GPS) receivers were used to pick geographic coordinates of various public toilet facilities in the municipality. The coordinates were taken in the Degree-Minute-Second (DMS) format. These were converted to Decimal Degree (DD) in Microsoft excel spreadsheet using the formula: DD = ± (,

where D = Degree, M = Minutes and S = Seconds. The coordinates were imported to ArcMap software and converted to a Shapefile. The projection parameters were changed from World Geographic System 1984 (WGS 84) to projected Universal Transverse Mercator Zone 30 North. It was then overlaid with existing country Shapefiles and layout maps were produced showing how the various toilet facilities are spatially distributed within the municipality.

Results and Discussion

Latrine Technologies and Defecation Practices

The study revealed that 48% of households within the study area had at least one toilet facility at home whilst 52% did not. This contravenes the Wa Municipal Assembly Bye-Law of 2006 (Osumanu et al., 2016), which requires all households to have an approved toilet or sanitation facility on the premises which they occupy. This finding, however, shows an improvement over Osumanu and Kosoe's (2013) observation that only 4% of households in Wa had toilet facilities in their homes. The study showed further that out of the 104 respondents without household toilet facilities, only 32.7% use public and community toilet facilities whereas 67.3% practice various forms of open defecation such as defecating in polythene bags and disposing it into the bush or on a refuse dump. This agrees with what Larbi (2013) observed in Prampram that majority (64.9%) of the adult interviewees resorted to open field defecation whilst 35.1% of them used the public toilet. However, Osumanu et al. (2016) and Osumanu and Kosoe (2013) have noted that households without any form of toilet facilities in their homes, and who claimed to be using public toilets go to available bushes, uncompleted buildings and open spaces within their vicinities to attend to nature's call (open defecation).

This study identified four types of household toilet facilities; VIP, pit latrine, aqua privy and WC. Out of the 96 respondents with household toilet facilities, 51% had WC, 29.2% had VIP, 16.7% used pit latrine and 3.1% used aqua privy (Table 1). The results also show a marked variation in the availability and type of toilet facilities according to the nature of the dwelling with flats located in Zone Two having the largest number of WCs while most VIPs are found in compound houses found throughout the town. The houses without toilet facilities were mainly single (72.8%) and semi-detached (27.2%). This finding is in agreement with the contention of Boot (2008) that on-site sanitation is the main form of excreta disposal in most sub-Saharan African cities.

Table 1: House type and latrines (%)

House Type	Type of Toilet Facilities				Total
	VIP	Pit latrine	Aqua privy	WC	
Compound	18.2	13.1	1	7.3	39.6
Single	0.0	1.1	0.0	2.0	3.1
Semi-detach	5.0	1.3	0.0	11.4	17.7
Flat	6.0	1.2	2.1	30.3	39.6
Total	**29.2**	**16.7**	**3.1**	**51.0**	**100.0 (N=96)**

The study revealed a total of 41 public toilet facilities in Wa (Figure 3) of which 14.6% are KVIPs, 75.6% are Aqua Privies and 9.8% are WCs (Table 2). This commensurate with the Population and Housing Census of 2010 which recorded that more than 31% of households rely on public toilet facilities mainly WC, KVIP and Aqua Privies. Meanwhile, all the three public WC facilities are privately owned. The public toilet facilities have been constructed at vantage points within the business hop and the surrounding settlements where household facilities are generally lacking.

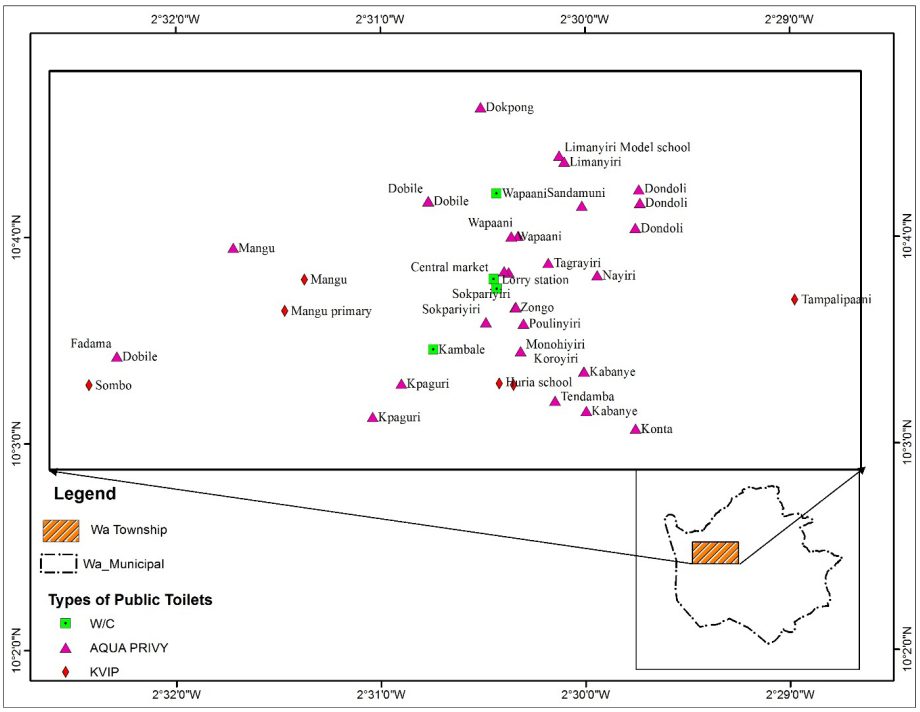

Figure 3: Spatial distribution of public toilets in Wa

Table 2: Types of public toilets

Zones	Type of Public Toilet Facility	Number of Public Toilet Facility	Percent
Zone One: Central Business District and its immediate surrounding settlements	Aqua Privy	19	46.3
	KVIP	2	4.9
	WC	3	7.3
Zone Two: Planned suburbs	Aqua Privy	-	-
	KVIP	-	-
	WC	-	-
Zone Three: Newly developing suburbs	Aqua Privy	12	29.3
	KVIP	4	9.8
	WC	1	2.4
Totals		**41**	**100 (N=41)**

UNICEF/WHO (2008) refers to improved sanitation as access to personal sanitation facilities that are able to hygienically separate human waste from human contact. These facilities may include pit latrines with slabs, ventilated improved pits (VIPs), and flush toilets or WCs that empty into a septic tank or sewer. The situation in Wa town is not any different with what WHO stipulates since majority of the sanitation facilities such as VIPs, pit latrines, WCs and Aqua Privies are easily identified. Majority of households, especially those with toilet facilities can be termed as having improved sanitation. However, households without toilet facilities cannot be said to have improved sanitation or cannot be seen as using hygienic facilities. This is because, although the Municipal Assembly treats as illegal open defecation and defecating in polythene bags, majority of the households still resort to the practices which, according to UNICEF/WHO (2008), are inappropriate methods of disposing of human excreta.

While some of the household toilet facilities, such as the KVIPs and WCs, were kept clean in order to prevent odour and flies to ensure user comfort, the public toilet facilities were in deplorable conditions. Analysis from the study revealed that 69% of household toilet facilities were in good conditions while 31% were in poor conditions. Those that were not in good shape (mostly aqua privy and pit latrines) were with a number of cracks and had old roofing sheets with holes in them as well as broken vent pipes which make them unsafe for use. All the VIPs had a lot of spaces in the latrine building. This means that the idea of the room being kept relatively dark with light coming from only the vent pipe and the ventilation space on top of the door was defeated. The households with WCs had a problem

of inadequate and irregular flow of water which made the flushing of faecal substances very difficult at certain times.

A 56-year-old respondent intimated that inadequate water flow is a big blow to the use of WC:

> *The use of WC is so problematic that without constant flow of water it is inconvenient to use. Sometimes for a whole week we don't get water flowing through the tap. This means we don't use the WC. We tend to use toilet facilities at the office or defecate openly in such instances.*

Although households may have toilet facilities such as the WC, access to adequate water supply may influence the rate of usage and cleanliness of the facility. With no frequent flow of water some households resort to indiscriminate defecation practices like open defecation. All households had containers for storing cleansing materials which are burned when they get full, a finding which supports that of Larbi (2013). This is, however, not a good practice since the materials can litter the environment during the burning process. Per the principles of WHO (1992), it is inappropriate to store anal cleansing materials within the privy rooms since they generate odour and invite flies. Instead, it is appropriate for users of toilet facilities to drop the anal cleansing materials (toilet rolls) into the pit as they are factored in the designing of the size. Meanwhile, the study revealed that many households store anal cleansing materials because per the nature of the materials they cannot be left in the pits since some of them are not soft enough for easy decomposition. According to a 34-year-old respondent:

> *The problem is that only a few people use toilet rolls. Majority of the people use hard materials such as cement papers, newspapers and exercise books or cloths. We have the notion that putting these materials into the pit may make it full within a short period.*

The implication of this is that users and owners of the toilets do not understand the principles governing the construction and use.

Households without toilet facilities attributed the problem to inadequate financial resources to put up their own facilities. Some revealed that putting up a toilet facility come with financial burdens which they were not in the position to take up. This is in line with the findings of Osumanu and Kosoe (2013) that a predominant reason for lack of household toilet facility in the Wa Municipality was financial constraints. Arguably, according to the Wa Municipal Assembly Bye-law (2006), a person commits an offense when he/she fails to provide an approved toilet or sanitation facility on the premise which they occupy (Osumanu et al., 2016). The

argument is that if the landlord or household is capable of building a house to stay in, why is it that they cannot build toilet facilities on their premises? Also, the National Building Regulation, 1996 (LI 1630) requires all residential buildings to have toilet facilities as part of the building plan. However, it is surprising to note that not all residential housing has met the requirement of the LI 1630 because they have not gone through the required supervision by the Building Inspectorate of the Local Authority. This questions the integrity of the local government institutions to live up to their required tasks.

The study gathered that the reasons for non-usage of public toilets (where they are available) were because of the stench and lack of cleanliness at the facilities. This supports the position of Adjei et al. (2009) that in Ghana public toilets or sanitation facilities are besieged with odour and fly nuisance aside a host of other problems. Eventually, people resort to defecating in open spaces, such as bushes and uncompleted buildings. They revealed that in as much as they do not like the idea of defecating openly, they have no alternatives. According to a respondent open defecation is a shameful act:

> *Over here, whenever you see someone coming out from an uncompleted building, it means the person went there to defecate. It is a normal thing around here, though it is not appropriate.*

Although some of the inhabitants were not happy with this practice they were compelled to do so under the current circumstance of not having access to a toilet facility close to where they live. This stems from the fact the National Building Regulation (LI 1630) and the Wa Municipal Assembly bye-laws are not being enforced.

Management of Household Toilet Facilities

Bye-laws of most MMDAs in Ghana require that households maintain toilet facilities in order not to pollute the environment or cause diseases to people in the vicinities where they are located. A dirty latrine is not only unpleasant to use, especially with bare foot, but smells and attract flies, bringing more diseases (Larbi, 2013). This study revealed that faecal matter, through open defecation, is not managed in any acceptable way. It was observed that faeces in the open, bushes and uncompleted buildings are not collected and are left to dry. This results in unsavory smells within the surroundings.

The study, however, showed an appreciable level of Operation and Maintenance (O&M) activities for household toilet facilities. The responsibility to clean the toilet facility usually rests on the owner or user of the facility. Available practices

include sweeping only (11.5%), cleaning with water and broom (15.6%) and detergent and disinfecting of the toilet seat (especially WCs) and adding *dichloro diphenyl trichloroethane* (DDT) to the contents of VIP/KVIP and pit latrines to reduce the quantity of sludge (67.7%) as well as the indigenous method of pouring ash into pit latrines to prevent unsavoury scent and flies (5.2%) (Table 3).

Table 3: Household maintenance technologies (%)

Household toilet type	Technology				Total
	Sweeping Only	Water and Broom	Water and Detergent	Ash	
VIP	5.5	8.5	11.0	0.0	25.0
Pit latrine	6.0	5.0	9.9	5.2	26.1
Aqua privy	0.0	2.0	2.0	0.0	4.0
WC	0.0	0.0	44.8	0.0	44.8
Total	**11.5**	**15.6**	**67.7**	**5.2**	**100.0 (N=96)**

On the frequency of cleaning, respondents revealed that depending on the kind of activity, operation, maintenance and overall management of toilet facilities are done on daily, weekly, or monthly bases. According to a 53-year-old female household head, because of the cost/availability of detergents they clean the toilet weekly: *we do cleaning on weekly basis because we have to buy detergents. Besides, the detergents we use are very strong so there is no cause to worry.*

However, an encounter with respondent in a compound house where they use pit latrine had a different story:

> *We are many in this house depending on the toilet facility so cleaning is done every day. Every household in this house has a day to clean the facility.*

Assessing the cleanliness levels from the perspective of respondents, as much as 68% rated as good the cleanliness of their household toilet facilities. These respondents were those using WCs and VIP latrines. However, 32% of the respondents indicated that the management of their toilet facilities in terms of cleanliness was bad. These respondents were usually users of KVIP and pit latrines. This contradicts the findings of Larbi (2013) who indicated that majority of people classify as bad the cleanliness levels of their household toilet facilities.

Management of Public Toilet Facilities

According to the Ghana Waste Management Guidelines, MMDAs are supposed to cede about 80% of waste collection to private managers. Most Ghanaians are of the view that governments (both national and local) are responsible for the entire process of sanitation provisioning; hence they pursue government to deliver them from unhygienic conditions (Amoah & Kosoe, 2014). This study showed that 93% of the public toilet facilities in Wa are owned by the the Municipal Assembly. The Assembly, however, leases the facilities through a Public-Private-Partnership (PPP) process. With this arrangement, the assembly leaves the operation and maintenance activities of the facility to private operators. The Operators are also expected to pay a monthly amount of GHS 30.00 per facility to the the Assembly to be used for renovation of the facilities. However, according to the operators, this is not usually the case since the assembly has failed to redeem its mandate of renovating the facilities or take part in its maintenance.

As a common practice, most people wake up early in the morning to ease themselves so that they can prepare and go to their various workplaces. The study, therefore, observed that public toilet facilities are opened around 4:00am and closed at about 9:00pm daily. However, the closing time could extend beyond or before the usual time depending on how busy the facility may be. This is typical of the market toilet facilities.

Users of public toilets are charged an amount of 20 Ghana pessewas per use of the latrine type and are provided with anal cleansing materials as well as water for hand washing. However, a user can pay less (10 Ghana pesewas) if he/she brings an anal cleansing material. The private commercial toilet facilities, on the other hand, charge 50 Ghana pessewas for use of the WCs and provide cleansing materials as well as water for hand washing. Cleansing is done in the privy area and the material left for the cleaner of the facility to pick and dump daily onto the refuse skip located close to the toilet. This supports what Adjei et al.'s (2009) finding in Madina, a suburb of Accra. In Wa, majority (60%) of the respondents who use public toilet facilities are Muslims and for that reason are provided with toilet rolls as well as water to wash themselves as their religion demands. This is normally done in the privy room and the water directed into the pit.

According to users, they usually find it difficult to pay the user fees. The ability to pay largely depends, among other things, on the size of the household. A respondent indicated that:

> *There are 10 people in my house so if it happens that each of us visit the toilet twice a day, it means I have to spend about GHS4.00 on defecation*

> *a day. To the majority of people here, this amount is too high and for that matter we find it very difficult to pay for the use of the public toilet.*

For such reasons, people end up either defecating around the facility at night or go to bushes and other places to defecate. This confirms earlier studies (Adjei et al., 2009; Larbi, 2013) that unwillingness or inability of users to pay toilet fees leaves them to the unhygienic and indiscriminate defecation practices.

For operation, cleaning and maintenance of the facilities, operators have employed attendants and cleaners who see to the day-to-day activities of the facilities. The cleaners are in-charge of sweeping the corridors of the cubicles, cleaning the seats (in the case of WCs), and collecting anal cleansing materials for burning or empting into skip containers and moping the immediate vicinity of pits. However, the latter is hardly done. These activities are supposed to be in line with the strategies disclosed by the Environmental Sanitation Policy (2007). It was observed that daily cleaning of the facilities as well as general cleaning on every first Saturday of each month is carried out. The inadequacy of water supply, as disclosed by a cleaner, at site pose a major challenge to them since it makes their work difficult. Some of the operators cleaned the toilet themselves and do so as and when there is dirt. The cleaners use various types of disinfectants for thorough cleaning of the facility, especially the private toilets.

Collection and Dislodging of Faecal Matter

In Ghana, dislodging of toilets is the responsibility of the MMDAs who partners with private companies for service delivery. The Wa Municipal Assembly and Zoomlion Ghana Company Ltd. (a private waste management company) undertake the dislodging of toilets in the municipality. The study found that there are only four tankers in the Wa Municipality of which two are owned by the Assembly and the remaining owned by Zoomlion Ghana Company Ltd. All the four tankers have equal capacity of $6m^3$ and can dislodge a quantity of 6,500 litres of faecal material per a trip. These vacuum tankers are used to empty both household toilet facilities and public toilets. Operators of the tankers said that dislodging is sometimes easy since the contents are usually mixed up with water: *Majority users of the toilets are*

Muslims who use water to cleanse themselves when using the facility. This makes the faecal matter watery (Key Informant Interview, 2015).

The dislodging of KVIPs posed problems since users often dump in solid materials which could block the hose of the tankers. This in turn increases the time of dislodging and, sometimes, have a trickling effect on price charged for dislodging. Charges for dislodging of cesspits depend on the capacity of the vacuum tanker. According to a Key Informant at the Wa Municipal Assembly, charges of GHS40.00, GHS45.00, and GHS70.00 are taken from public toilet operators, households and institutions respectively. A study by Boot (2008) in Accra revealed that private companies charge high prices for dislodging than public institutions. In Wa, while the Assembly charges a maximum of GHS70.00, the private service provider charges a minimum fee of GHS100.00 for a trip. These charges cater for both the collection and transportation of the material. In an interview with a tanker operator, he said: *Emptying of public toilets is a very daunting task. Our tanks are not that large, usually on one public toilet facility the truck will go about four times and this is done every month. Sometimes getting to the facility of most households is also not easy since there are no access roads.*

There is no specific time of the day that dislodging is done. The operators only respond to demand of their clients. According to the Zoomlion Company Ltd., the company is able to meet between 80-90% of the demand for dislodging services.

Disposal and Treatment of Faecal Matter

As regards environmental standards in Ghana, all liquid wastes should be totally treated and disposed in appropriate treatment plants. However, the operation and maintenance done by truck operators in Wa defy these standards. As the case may be in other towns and cities of Ghana, there is no treatment plant in the Upper West Region; hence human faecal matter is not treated before final disposal. The process is so linear; collection, transport and disposal. This vindicates the report of NESSAP (Ghana, 2010) that treatment of wastewater in all regions of Ghana is very abysmal. This study reveals that both the Assembly and the Zoomlion Company Ltd. transport the collected faeces and dispose it of at a nearby village, called Siriyiri, which is about 8kms east of Wa. Observations at the Siriyiri site showed that liquid from the deposited faecal material has negatively influenced nearby farms as well as water bodies. In spite of this observation, the officer in-charge of the site indicated that the Assembly periodically perform disinfestation exercises every month at the site to prevent the spread of diseases.

Public Perception of Faecal Matter Management

Assessing the perception of respondents on faecal matter in management in general and open defecation in particular, 65.4% revealed that there is nothing wrong with the current practices. These respondents argued that the public toilets are not 'safe' for use since they are unclean and most of them are in dilapidated conditions. Another 28.8% perceived the cost of paying for the use of public toilets as prohibitive, and 5.8% were of the view that the lack of bye-laws to check open defecation accounts for the continuation of the practice. These findings can be likened to the theory of planned behaviour (Ajzen, 1991), in that individuals make rational decisions on the appropriate method and technology of human excreta management. The findings also agree with Osumanu and Kosoe (2013) that in Wa, most people resort to the use of open defecation because of the poor conditions of public toilet facilities and cost involved in using these facilities.

When asked why the Assembly had failed in managing faecal matter appropriately, a host of issues were highlighted by respondents. These are: governments' failure to provide subsidies for household latrine construction; failure to educate people on the importance of having household latrines and general awareness creation on proper and good sanitation practices; inadequate trained sanitary inspectors for effective inspection and monitoring of sanitation conditions of houses and their immediate surroundings; and failure to implement sanitation rules and regulations. The major problem, according to most respondents, was the Assembly/Urban Council's failure to implement the sanitation rules and regulations effectively. This negligence of the Assembly defeats the Revised Environmental Sanitation Policy of Ghana (2010) which recommends that the key outputs to sustainable environmental sanitation development of an area should be that environmental standards and sanitary regulations are strictly observed and enforced (Ghana, 2010). Although the Assembly was failing to implement its sanitation bye-laws, majority (69.3%) of the respondents were of the opinion that the Assembly should try to prosecute all people who engage in open defecation or dump faecal matter at inappropriate places since such practices pose serious threat to the environment and human health. According to a 52-year-old respondent: *If the Assembly could go round and arrest open defecators and have them prosecuted, the problem would go down*.

This opinion was supported by other respondents when asked what could be done to improve the faecal matter management practices in Wa. Majority (69.3%) of them indicated that all sanitation related offenders should be prosecuted. However, others were of the view that offenders should not be prosecuted since they do not have money to build toilet facilities for themselves or pay for the use of public

toilets. It was revealed that some newly developing communities, such as Bamahu, have no public toilets. In addition, some houses in such areas do not have their own toilet facilities. Therefore, respondents in those areas thought that it would be unfair to punish people engaging in open defecation. The study showed that 54% of the respondents were not satisfied with the current state of faecal matter management in the municipality whereas 46% were satisfied with the situation.

Challenges in Faecal Matter Management

According to a key informant at the Assembly, there is the lack of financial resources for the management of toilet facilities in Wa, especially the public toilets owned by the Assembly. This problem is centred on the renovation of old public toilet facilities, and fuelling of cesspit emptier truck to dislodge septic tanks. It also includes the construction of additional public toilet facilities to cater for the demand of growing population, especially in the newly developing areas. According to a key informant, the funds raised from charges on public toilets and dislodging of cesspits are not adequate enough to cater for their operation and maintenance activities in so far as faecal matter management is concerned. According to a Key informant:

> *...there are financial challenges as regards the repair of trucks since the amount charged is far less than what we should be charging for the dislodging of a particular facility. The Assembly usually subsidises the fee due to the economic hardship within the area. This is necessary because most of the inhabitants are not engaged in any income earning activity which would enable them to cater for all these expenses.*

This revelation supports Boot and Scott (2008) that the Waste Management Departments (WMDs) of MMDAs responsible for monitoring the operations and management of human excreta have insufficient capacity and resources to ensure that disposal is safely carried out.

A critical issue is refusal to pay for the use of public toilet facilities by many users. This action was noted by operators to have retarded effective management of the facilities. Another challenge was the lack of electrical power in most of the public toilet facilities. This situation makes the toilet facilities unsafe for users at night. As a result, users resort to open defecation in and around the facilities, using available open spaces and uncompleted building structures or defecating in polythene bags. The lack of electricity contributes to defecation on the floor of facilities or beside the pits. This creates nuisance in and around the toilet facilities and, as a result, the high incidence of flies and bad odour within and outside the facilities. According

to a 26-year-old respondent, who frequently use public toilet facilities: *One has to remove all his/her clothes before entering the toilets because of the odour present and sometimes later come out to find their clothes taken away by other users or bad people who pass by.*

This revelation supports Larbi (2013), who indicated that to smell good after using a public toilet, users hang their clothes at the entrance of the facility or even far away from the facility. Additionally, children do not have toilet facilities of their own and cannot also use the public ones and have to defecate around the public toilet facilities. This situation makes the surroundings of public toilets unsightly. There are also instances where people soil the toilet seats each time they use the WC facilities which make the cleaning of the place very difficult. The toilet attendants also always find it difficult to get the tanker operators to come to dislodge the toilet pits when they get full. Improper settlement planning impedes the operations of dislodging tanker operators as there are no clear routes to some toilet facilities which make it very difficult to get access to them.

Lack of implementation of building regulations in Wa (Osumanu et al., 2016) continues to impede sanitation management. The only way the Assembly ensures that house owners have toilet facilities in their houses is through the granting of building permits. In the application documents submitted to the Assembly for building permits, house owners include within their plans toilet facilities but fail to provide the facilities after the permits are given. According to a Key Informant at the Assembly: *developers end up building different structures contrary to the design in the building plans submitted for permits.*

These offenders when found are sometimes prosecuted, but this is hardly seen since there are no mechanisms in place to check the existence of the facilities even after the structures are in use. Another key informant indicated that the use of the Criminal Code Law (Act 29 of 1960) and the Assembly Bye-laws, which in combination with Ghana's Environmental Sanitation Policy, are to ensure good sanitation practices are hardly properly enforced.

Conclusion

This study focused on one of the common challenges of urbanisation in Ghana – inappropriate management of faecal matter – by providing a comprehensive assessment of the state of faecal matter management in the Wa Municipality. The study has revealed that the state of human faecal matter management in the municipality is poor and challenged by lack of household toilet facilities, inadequate public provision of services and rampant open defecation. The study

concludes that association is not causation: households might lack toilet facilities because they do not have the capacity to construct one, or they lack one because they are not motivated to own such. But it is difficult to avoid the conclusion that there is an interaction at play.

This study support existing opinions (see Adjei et al., 2009; Osumanu and Kosoe, 2013; Amoah and Kosoe 2014) in calling for raising funds to support faecal matter management at the household level through the provision of subsidies for the construction of household latrines. Helping households to finance toilet construction can be a more effective use of public funds than investing in costly treatment of diseases resulting from unacceptable faecal matter management. Good local governance is equally important because faecal matter management, like any other environmental service, is generally provided and financed publicly or at least publicly regulated. Rehabilitation of existing public toilet facilities and the construction of more of such at vantage points, especially in the newly developing residential areas, by the Assembly, private enterprises and individuals should also be encouraged.

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