Towards an Integrated Approach to Solid Waste Management in Ghanaian Cities

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Abstract

Solid Waste Management (SWM) in cities has become a theme of utmost importance in urban geography compared to studies in rural areas which have smaller population sizes and limited consumption options that are relatively more manageable. Existing studies reveal that integration of formal and informal SWM actors is the needed mechanism to overcome SWM challenges. Integration is also at the heart of the 2012 Ghana National Urban Policy, yet urban spaces are zoned under public-private partnership (PPP) arrangement with private formal SWM actors. How to integrate the burgeoning numbers of private informal SWM service providers still remains unaddressed owing to a host of disparate institutional, political, and socio-economic factors. Using field-based data collected in three open-air markets in Accra, this paper examines the integration pathways used to include informal SWM actors in the context of PPP and thence argues for the need to rethink current SWM approaches in a participatory manner since most Ghanaian cities are facing limited financial and infrastructural resources, growing inequalities and increasing informality regarding urban metabolism flow.

Keywords: Accra, informal sector, market, integration, solid waste management, switch waste contracts.

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Received on September 27th, 2022/Accepted on May 7th, 2023

Ghana Journal of Geography Vol. 15 (2), 2023 pages 33-60
Doi: https://dx.doi.org/10.4314/gjg.v15i2.2

Introduction

Solid waste management (SWM) in African cities has become a theme of utmost importance in urban geography compared to studies in rural areas which have smaller population sizes and limited consumption options that are relatively more manageable. In particular, the combined effect of poverty, urbanisation, growing rates of national debt and fast-growing quantities of diverse streams of waste have tended to exacerbate the SWM situation in many African urban marketplaces. With current levels of solid waste generation in the sub-continent projected to triple from 2016 to 2050, the implementation of sound waste management collection strategies is therefore needed to curtail environmental hazards, improve urban environmental health, and promote sustainable development.

Along this vein, a number of studies have proposed the Integrated Sustainable Waste Management (ISWM) approach as the most appropriate strategy to deal with the urban SWM 'monster' (Van de Klundert & Anschütz, 2001; Oteng-Ababio, 2011; Wilson et al., 2013; Oduro-Appiah et al., 2020). However, how to integrate informality with formality still remains unaddressed. This study fills the gap in literature by paying attention to everyday SWM partnerships existing in the surveyed marketplaces, which could aid the rethinking of SWM towards an integrated approach in Ghanaian cities.

This paper is organised under six themes. The introductory section is followed by a review of the theoretical perspectives on ISWM and literature on the public-private partnership (PPP) system, particularly in the Ghanaian context. Thereafter, the study areas and methods are presented after which the research findings are outlined and discussed. The final section concludes with a summary of the key findings, citing the strengths and limitations of the study and making recommendations for policy and future research.

Theoretical perspectives on integrated sustainable waste management (ISWM)

The ISWM is a systems theory[1] approach which largely focuses on how to integrate various technical elements, strategies and actors (formal and informal actors) to achieve a more complete system of SWM (Wilson et al., 2013). This approach was proposed because globally accepted SWM measures are deemed overly technical, superficial and unrealistic in the African context (Pieterse, 2004; Wilson, 2007). Since ISWM's introduction, several studies have used it to analyse SWM problems (Van de Klundert & Anschütz, 2001; Oteng-Ababio, 2011; Oduro-Appiah et al., 2020; Sheburah Essien, 2021). For instance, through the lens of ISWM, Sheburah Essien (2021) unveils how urban market environments are governed by a confluence of formal and informal actors. The results of the author's study give deeper understanding into the unique ways in which local market institutions and informal SWM actors participate in urban market environmental management in Accra's open-air markets (OAMs). Hence, the ISWM approach is recommended for Ghanaian cities because it recognises the role of the informal sector in SWM. By so doing, ISWM opens up SWM governance through the acknowledgement of the existence of multiple SWM governance frameworks and it prescribes a proper mix of alternatives to meet local challenges without compromising on legislative demands (Wilson, 2007).

Furthermore, unlike the conventional SWM hierarchy, the ISWM approach was developed from the experience of low- and middle-income countries in the global South. As this allows city authorities to address various issues that emanates from the management of solid wastes

[1] A systems theory approach emphasises the arrangement of and relations between various parts of an entity or element that connect them into a whole.

through understanding the who (actors), the what (scope), the why (purpose) and how (method) strategic SWM objectives should be addressed (Scheinberg et al., 2010; Wilson et al., 2013). The approach therefore aims to avoid many of the failings of previous technology-driven SWM approaches. Hence, at the heart of the ISWM concept are principles of equity, effectiveness, efficiency and sustainability. Equity promotes the inclusion of all citizens in SWM decisions and management. Effectiveness implies that SWM should not be limited to certain places and/or systems. Efficiency ensures maximum benefit with minimum cost. Whereas sustainability implies that the systems can operate at a stable level, replace its resources and maintain its operations without losing its potential to do so in the future (Van de Klundert & Anschütz, 2001).

Some studies have shown that the ISWM approach can aid the development of different participatory models for managing solid waste in Ghanaian cities. For instance, studies by Grant & Oteng-Ababio (2021), as well as Oduro-Appiah et al. (2020), have shown the interdependency of a wide range of SWM actors in Accra's SWM system. To reiterate, these studies have shown how formal SWM circuits are inherently connected to informal circuits and vice versa in SWM. Grant & Oteng-Ababio (2021) specifically show how formal actors look up to informal actors for post-consumption of recycled products, and dismantlers. Whereas informal SWM actors rely on formal actors for smelters, refineries, and landfill/incinerator. Consequently, the authors have argued that there is no clear split between the two, they overlap and highly relate to each other; and hence the need for policy makers to integrate the two SWM sectors. Similarly, Sheburah Essien & Spocter (2022) show in the case of SWM in urban OAMs how switch partnerships are enacted by public actors and local market institutions when private formal SWM actors fail to deliver efficient SWM services. This study reveals how informal actors were included in Accra's market SWM and further argues for their integration in the broader PPP system for managing urban environments.

Public and private sector involvement in waste management

The active involvement of both public and private sectors in SWM is well established in the literature (Awortwi, 2004; Samson, 2009; Simatele et al., 2017; Olukanni & Nwafor, 2019). Massoud & El-Fadel (2002: 621) define public–private partnerships (PPPs) as "the transfer and control of a good or a service currently provided by the public sector, either in whole or in part, to the private operators." Municipal or city authorities at the national, regional and local level typically represent the public sector, whereas the private sector is represented by the privately-owned enterprises that mainly aim at profit realisation. It can be formal or informal enterprises, hence the name private formal and private informal SWM actors used in this study. However, the involvement of the private sector in SWM services differs from country to country and can take on several forms depending on the degree of risk and the duration of the contract (Olukanni & Nwafor, 2019).

In Ghana, Oduro-Kwarteng & Van Dijk (2013) found that the forms of private sector involvement in SWM range between full privatisation of public service to minimal private sector participation. Whereas Tilaye & Van Dijk (2014) report that in Ethiopia, the privatisation of SWM services is based on the principle of public ownership and private operation of public services. Under this specific arrangement, the public partner owns the assets with only the operational responsibility being given to the private sector. In cases where the government has completely privatised public services, the government transfers the ownership, risk and control of the asset either partially or in full to the private sector (Olukanni & Nwafor, 2019).

In instances where there is full privatisation of solid waste collection, studies have shown that residents pay the fees directly to the private sector (Olukanni & Nwafor, 2019; Van Niekerk & Weghmann, 2019). For instance, in Kigali, Rwanda, SWM services have been fully privatised since 2012 with each household being responsible for its own bills while also participating in

the compulsory community cleaning scheme, popularly referred to as 'Umuganda'[2] (Van Niekerk & Weghmann, 2019). This notwithstanding, public–private partnerships (PPPs) are the preferred alternative to full privatisation in most African countries since there is a substantial extent of risk-sharing between the public and private sectors (Ahmed & Ali, 2004). While some commentators doubt the efficiency (in terms of cost reduction) and effectiveness (in terms of service quality) of private sector involvements to overcome government failures (Myers, 2005; Prasad, 2006; Bel & Warner, 2008; Oduro-Kwarteng & Van Dijk, 2013; Oduro-Appiah et al., 2019), others have concluded that PPPs improve the efficiency of the entire SWM system (Post et al., 2003; Ahmed & Ali, 2004; Yeboah-Assiamah et al., 2017). Hence, it is believed that "through these partnerships, the advantages of the private sector – dynamism, access to finance, knowledge of technologies, managerial efficiency and entrepreneurial spirit – [will be] combined with the social responsibility, environmental awareness, local knowledge and job generation concerns of the public sector" (Ahmed & Ali, 2004:471).

Despite these advantages, the process of PPPs in many African cities has been complex and bedevilled by numerous constraints. The existing literature portray the private sector to be facing similar problems that challenged the public sector, namely financial challenges, limited human capital, inadequate equipment, laborious procurement procedures, rigid working schedules, constraints on management changes, poor supervision and corruption (Awortwi, 2004; Spoann et al., 2019). Discussed in the next subsection is the case of PPPs in Ghana where the above constraints are no exception.

[2] Umuganda literally means community work in Kinyarwanda, the local language spoken throughout Rwanda. Under the current government, Umuganda is compulsory for Rwandese and is generally undertaken on the last Saturday of every month.

Public–private partnerships in Ghanaian context

The Public-private partnerships (PPPs) were introduced in Ghana alongside many other public sector reforms such as the Structural Adjustment Programme (SAP) and Economic Recovery Program (ERP) to address the deteriorated sanitation systems and the systemic downturn in public sector performance. Prior to the prominence of PPPs in the early 1990s, central government departments such as the city councils and the public works department (PWD) were responsible for providing SWM service in major regional capitals (Oteng-Ababio, 2010; Fobil et al., 2010; Oduro-Kwarteng, 2011; Oduro-Appiah et al., 2019). However, during the economic recession in the late 1970s and early 1980s, the public sector could no longer manage the SWM services effectively (Awortwi, 2004). Consequently, in 1985 the central government, through the Federal Republic of Germany, established the waste management departments (WMDs) with the sole responsibility to collect, store, transport and dispose of wastes generated in Ghana's cities (Fobil et al., 2008). The WMDs became one of the many departments of the local government assemblies (e.g., Metropolitan, Municipal and District Assemblies) to provide SWM services either by house-to-house (HtH) collection method in high-income areas or through the communal container collection (CCC) method in low-income areas (Oduro-Kwarteng, 2011; Oteng-Ababio, 2010). As part of the Ghana decentralisation process in 1988, the WMDs received SWM directives from the Ministry of Local Government and Rural Development (MLGRD). In turn, the ministry, together with the Environmental Protection Agency (EPA), monitored the activities and supervises the SWM activities of WMDs and other service providers. Since waste was considered more of a public good at the time, beneficiaries of the CCC system did not pay service charges to WMDs (Oduro-Kwarteng, 2011). The huge financial burden, along with limited capacity, led the public sector to collaborate with the private sector to improve revenue mobilisation, increase both waste collection efficiency and the coverage of SWM services (Oteng-Ababio, 2010). The private -formal sector has ever since

the 1990s been part of the public SWM sector with local government authorities acting on behalf of the public to regulate and monitor their activities. Figure 1 gives an overview of the Ghanaian institutional arrangements for private sector involvements in SWM.

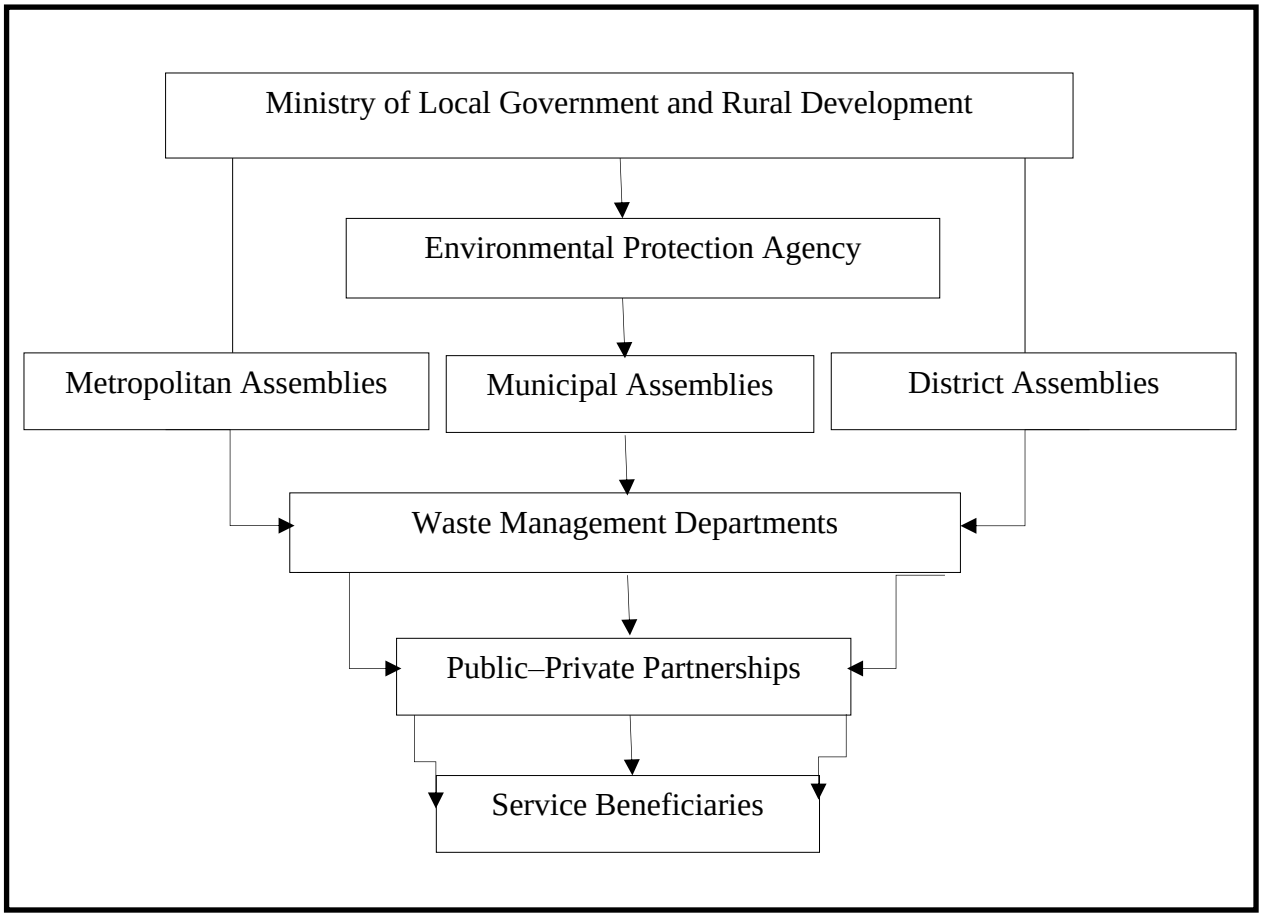

Figure 1: Institutional framework for public–private partnerships in Ghana

Source: Authors' construct, 2020

As depicted in Figure 1, all the WMDs in Ghana are headed by the Ministry of Local Government and Rural Development (MLGRD). The ministry decentralises SWM directives to the EPA and the WMDs in the various Metropolitan, Municipal and District Assemblies. On behalf of the MLGRD, the WMDs regulate the private- formal sector by assigning them into zones to provide SWM services to the beneficiaries. The zones are awarded to private companies for fees which are charged according to the specific contractual agreements they have with the city authorities. Among the numerous private formal SWM actors in Ghana,

Zoomlion Ghana Limited, a subsidiary of the Jospong Group of Companies, has the largest contract with the public sector (Adzawla et al., 2019; Van Niekerk & Weghmann, 2019). Zoomlion operates in almost all the cities in Ghana and in other African countries such as Togo, Angola, Zambia, Equatorial Guinea, and Liberia. These private formal actors often distribute waste bins to households or at communal locations, and they empty the bin as per the nature of the contract (i.e., whether daily, weekly, or monthly). In Ghana, studies have shown that more than two-thirds of solid waste is collected by private companies (Oduro-Kwarteng & Van Dijk, 2013). The private -formal SWM actors are the most preferred actors in the Ghana's PPP model because of their ability to prefinance SWM services (Oduro-Kwarteng, 2011; Sheburah Essien & Spocter, 2022).

Despite the pieces of evidence on the crucial role that the private formal waste sector play ensuring efficient SWM in Ghanaian cities (Obiri-Opareh & Post, 2002; Awortwi, 2004; Oduro-Kwarteng & Van Dijk, 2013), it has failed to improve collection coverage in densely populated areas, neither has it solved the problems encountered with revenue collection (Oduro-Appiah et al., 2019). Consequently, the central government incurred a debt of US$8.4 million for waste collection and disposal charges by private formal SWM actors between 2000 and 2007 (Oteng-Ababio, 2010; Oduro-Appiah et al., 2019). The contribution of the private-formal sector to collection coverage also dropped from 60% to 55%, while the informal collection coverage increased slightly higher (Oduro-Kwarteng & Van Dijk, 2013; Oduro-Appiah et al., 2019). Unfortunately, the informal private SWM sector lacks the arrangements and privileges enjoyed by formal private SWM companies (Sheburah Essien & Spocter, 2022). The many roles of the informal sector in solid waste collection, reuse, and recycling, vis-à-vis their plight of living in poverty now encourage various stakeholders to give more recognition to the contributions that private informal actors make in urban environments.

This has led to international consensus for an integrated approach to SWM. However, the role of the informal SWM actors in urban environmental management and how to integrate the burgeoning numbers of informal SWM service providers remain problematic. Whereas Sheburah Essien (2021) cites the case of three municipalities in Accra where integration challenges related a host of disparate institutional, political and socio-economic factors, Simatele et al. (2017) cite a case in South Africa where part of the reason for this negligent state of affairs is a lack of knowledge on how to align and integrate formality and informality into the development and planning policy agenda. This paper fills the gap in literature by examining the various ways informal SWM actors participated in the mainstream SWM system.

Research Methods

The data on which this paper is based was collected in three open-air markets (OAMs) in Accra; Madina, Kaneshie and Kantamanto markets. The three markets are located in La Nkwantang-Madina Municipal Assembly (LaNMMA) and the Accra Metropolitan Assembly (AMA) respectively. They were purposely sampled because they are the leading markets for residents of north-western, north-eastern and southern parts of the city of Accra. Apart from their vibrancy, these OAMs are among the biggest markets located in Accra with daunting SWM challenges. Hence, the aim of the study was to understand how informal SWM actors work within the already allocated zones of private formal SWM actors to ensure healthy environs for traders, and to figure out the possibilities of their integration with the formal SWM sector. Using the qualitative research design, this objective of the study was achieved through primary and secondary data collection. Primary data have been collected through observation, in-depth

interviews, participatory workshops and unstructured group interviews whereas secondary data was retrieved from municipal waste management database and other relevant literature.

The purposive and snowballing sampling techniques were used to recruit 30 market leaders, 6 formal SWM actors, 10 informal SWM actors and 14 participants for two separate participatory workshops, making an overall total of 60 participants. Their educational backgrounds and levels of experience were fairly high indicating the informants' agency in responding to the subject under investigation. Through thematic analysis of the collected data, the current models of participation by informal SWM actors were identified and presented with the aid of verbatim quotations from research participants. The essence is to enhance the evaluation and visualisation of the various pathways for rethinking integration interventions. Additionally, it is helpful in determining what areas need further attention in future and allow quick comparison with other existing systems elsewhere. The next section discusses the different participatory pathways existing in the three case-studied OAMs.

Results and Discussion

Several requirements for participation in urban market environmental management (UMEM) for informal SWM actors have been revealed and discussed by Sheburah Essien & Spocter (2022). This paper builds on the authors' findings by identifying three current SWM participation models for informal actors in the surveyed open-air markets (OAMs) in Accra. Even in cases where all the three models coexisted (as in the case of the Kaneshie OAM), a dominant model remained noticeable. The three subsections that follows each delves into the nature of SWM partnerships revealed in the case-studied markets.

Participation based on formalisation in organised groups

This approach for engaging informal SWM actors directly by municipal assemblies was the dominant UMEM practice in the Madina OAM and in the Kaneshie OAM peripheries.[3] In these areas, the municipal authorities (i.e., public actors) require informal actors to be organised in associations as a pre-condition to be formalised, regularised and legalised as switch waste contractors (SWC)[4] for SWM participation purposes. The SWM collaborations only exist directly between public actors on one hand and private formal actors and organised informal SWM associations on the other hand. In Figure 1, informal SWM actors are indirectly employed, monitored and regulated through private formal SWM actors and organised informal SWM associations, such as the *borla* taxis and tricycle association. Private formal SWM actors and informal SWM associations directly report challenges to informal SWM actors, whereas any issue relating to formal (commercial) SWM contracts and SWCs are reported to public actors.

The association of informal SWM actors is expected by its members to fight for their rights, secure direct contracts from city authorities and protect their interests. Yet, having been formerly ignored and neglected in PPPs, the city authorities in 2018 initially appeared interested in formalising and facilitating the work of informal SWM actors (Oduro-Appiah et al., 2019). A leader of the informal group in Madina pointed out:

> *This [sticker] is from AMA [Accra Metropolitan Assembly] it was [in] 2018 when this University of Cape Coast people finished their research. They also present it to AMA and they present something to the ministry and the waste management as well and they ask them that they have to regularise the tricycle because we are many in the system. So, they have to register so there they come to [the] conclusion that they should count us, giving us stickers so that they can know us. So, as at 2018, AMA manage to register*

[3] Whereas the core refers to areas with high density of trading activities and with the presence of local market institutional arrangements (i.e., the region with market and commodity queens or chairmen as leaders) the peripheries are characterised by low density of trading activities and the absence of local market institutions.

[4] Sheburah Essien & Spocter (2022:8) define SWCs as 'legitimised informal SWM actors who are liable to partner with a wide range of actors at different scales for the provision of SWM services.'

> *about 30 tricycles with their stickers and some of them also ran away because they are afraid that after the registration the AMA will sack them from the system. But at that time, we were about 1500 in number in the system. Now as am talking to you Madina the tricycle that is working at Madina is more than 300.*

The city officials recognised the need to formalise and integrate informal SWM actors along with self-organised groups because their numbers were increasing and they were capable of collecting more solid waste at a reduced cost than the public SWM actors. A similar approach is found in South Africa, the Philippines, Brazil, Colombia and Peru (Gupta, 2012; Aparcana, 2017). In South Africa, for instance, the informal waste sector is hired by municipal waste management contractors as a means of securing their livelihoods and making the urban SWM sector a pro-poor PPP (Scheinberg, 2012). The difference between the South African case and the case of the OAMs is that switch contracts with the municipal assembly were precariously established through stickers, oral communications and without a formally signed cooperative agreement. In the words of a public actor this entailed:

> *So, we introduced stickers for them so that the stickers were given to the association. If you want to operate within the franchise area or with the assembly, you pay something [a fee], then you have a sticker. Then we now tell you the dos and don'ts. When you collect refuse, you must cover the refuse, don't litter on the streets, when you collect the refuse, you must send it to the appropriate designated place and then it is working. So, what we do is that if you find any borla taxi collecting waste, we ask you to go and then see the Nkosuo waste [informal SWM association] and then register with them so that we can regulate and monitor your operation.*

In such a partnership, public actors are seen as the sole providers of legitimacy and recognition that facilitate social acceptability while stimulating the activities of SWCs. Gerdes & Gunsilius (2010) proposed that when city authorities recognise the socio-economic and environmental contributions of informal SWM actors and substantiate them through robust policies, it gives them a voice, visibility, validity and viability (4Vs). Voice is about how the informal sector is organised into membership-based bodies accountable to their members and where they represent the interest of members in relevant policy-making arenas. Through favourable

policies like SWC, the informal SWM actors are made visible and considered a valid SWM group. Validity then grants them the right to access solid waste in formerly prohibited spaces with the ultimate aim of gaining commercial viability to operate with some level of economic autonomy. The latter variable is considered by Gerdes & Gunsilius (2010) as an essential prerequisite for any successful formalisation and integration policy. Under the prevailing hegemonic system of SWM, municipal authorities in the study area may be right in their decision to integrate the informal SWM actors through SWC so that the informal SWM actors can continue to flourish in their activities and contributions to UMEM.

SWCs operating according to this model are expected to be professional in their work. Professionalism, according to Scheinberg (2012), includes actions taken by the informal SWM actors and their associations to 'modernise' and improve their knowledge, skills, equipment, method of SWM and general behaviour. In the OAMs, the informal SWM actors were expected to discard solid waste at appropriate designated sites and avoid any act of dispersing refuse in transit to final disposal sites by using equipment such as fishnets to cover tricycles loads of solid waste. However, the cost of legality and remaining legal in this approach to SWM partnership, has a detrimental effect on the willingness of the informal service providers to participate in the existing competitive SWM market conditions. Nevertheless, as hinted in the above excerpt, the main essence of this approach is to allow the local assembly to directly partner (or collaborate) with SWCs under organised informal groups, while monitoring and regulating the operations of SWCs and unlicensed informal SWM actors with the assistance of the informal associations.

A public actor at Madina OAM recounted the role of an informal association in arresting unlicensed ISPs:

> *"The people we [public actors] have arrested, it is the association that gives us the hint. They know the owners of the borla taxis and they also know who is registered and who is not registered."*

The city authorities in this participatory SWM approach tends to have full control over the activities of SWCs. As acknowledged in this quotation and also in the first extract of this subsection, informal SWM associations are knowledgeable with members' details, equipment particulars and operations. As the roles of private formal and market leaders minimise, municipal authorities collaborate more with and rely increasingly on informal SWM associations for information that would allow them to manage the increasing number of informal service providers in Accra and its OAMs. The regulatory relationship between city authorities and self-organised informal groups therefore offered the platform for the latter's social acceptance:

> *Now that we are getting closer to join the train because AMA [Accra Metropolitan Assembly] recognise us, some of the formal contractors also recognise us. Some of the municipals too recognise us, some of the assemblies recognise us even some of the new assemblies accepted us to work with us alone… (Leader, informal actor, Madina).*

Thus, participation based on the formalisation in organised groups creates the space for recognition and acceptance by other actors, namely private formal actors, local communities, newly created local assemblies and markets, all of whom also have a direct relationship with the city authorities. The informal SWM actors are confident that gaining economic autonomy to manage aspects of the city's solid waste independently, will not allow the powerful SWM firms to take over the entire SWM system:

> *Because we are many, may be AMA can give us all the Madina market, let assume, now if we come together to team up strong chain, Madina market alone we can share it among ourselves. I don't know why they [Public actors] don't trust our competence. (Licensed informal actor, Madina).*

Unfortunately, city authorities and the private formal SWM actors continuously perceive and often treat SWCs like unlicensed informal SWM actors although formalisation implies a change in status from informal to formal entities (Scheinberg, 2012). The desire of the informal SWM actors to enjoy commercial viability and other SWM opportunities, such as working alone with city authorities and newly created district assemblies did not come to full fruition due to limited state resources towards SWM. Given the context in which SWCs operate they appear to be deeply entrenched in the term 'informal sector'. The desire for continuous existence of the informal sector is captured in an interview with one of the leaders of the SWCs in Madina. The informal actor connected this to claims that their voices will be audible, and their demands granted in the informal groups rather than otherwise:

> *The informal sector name will forever be there, and we want it to be there. Because we are many and that name alone [is] also pushing us up. Because in every country we know that the informal sector is normally those who are well organised and has voice and government listen to it, some of the countries their government [is] afraid of [the] informal sector. Because they know what they can do and what they can't do. That is why we also prefer it that way. So, if we turn into formal sector then who will be informal sector? (Switch waste contractor, Madina).*

This preferred informal status offers economic opportunities. Because of their claim to be well organised, they are in a position to devise diverse ways to make their voices heard, defend their rights and gain access to solid waste. Hence, the current SWM situation in the study area has created alternative pathways through which informal SWM actors can participate in market and/or municipal SWM operations. The next subsection presents an alternative path for their participation in the context of a privatised SWM system.

Participation through integration of informal actors with municipal solid waste management actors

Unlike the case of the Madina OAM where private informal SWM actors could collectively partner with public actors for commercial SWM projects, the Kaneshie OAMs (notably core

and semi-peripheral areas) is different because of the market's privatisation policies that do not permit the operation of the informal service providers. As a result, the principal SWM approach in which informal SWM actors participate in solid waste collection and disposal services in the Kaneshie OAM is through partnership with private formal SWM actors such as Zoomlion Ghana Limited (ZGL), Meskworld Company Limited (MCL) and J-Stanley Owusu Limited (JSOL). By this approach, informal actors indirectly access the market solid waste through private formal SWM actors only. The private formal SWM actors are directly accountable to public actors (i.e., the municipal authorities) since public actors have partnered with the private formal SWM actors for market SWM contracts and other SWM related activities such as clean-up exercises. Whereas informal SWM actors were expected by the local city authorities to partner either with private formal actors or vice versa. The direct relationship between private formal and informal SWM actors allows for reporting of SWM challenges, monitoring, regulation and possible SWM employments in the form of switch waste contracts (SWC):

> *We have about 820 registered informal service providers. So, we know everyone's code. So, when we write your details, we attach your code. And so that when you violate the law when you behave when someone takes your code from here, we can track you. And so, the law we put before them is that when you collect wastes put net on it. And in the area in which you are, see your service provider [private formal actors]. The service provider must also look for them [informal SWM actors]. Know them and give them work but someway somehow, they have become like threats. Is like my cocoa farm I eat from. But we gave them a code that in every area where the service provider doesn't render services you [informal SWM actors] can go to collect wastes from there. And it's working in some areas. So that is what we've done. So, we expect them [private formal SWM actors] to localise these informal sectors. (Public actor, Kaneshie)*

The formalisation of the informal SWM actors by recruiting them for private formal SWM actors is a much-preferred approach in the privatised SWM services context (Oteng-Ababio & Amankwaa, 2014; Aparcana, 2017). Aparcana (2017) reported the existence of a similar model in Peru, Indonesia, the Philippines, India and Argentina. In Brazil, Scheinberg et al. (2010) encountered private formal SWM actors delivering recyclables to informal actors while

informal actors made arrangements with formal actors regarding the processing and selling of the recyclables. Grant & Oteng-Ababio (2021) identify this model in Ghana in their description of how e-waste sector players are connected to the formal and informal economy. According to the authors, the private formal players rely on the informal players for e-waste products while the informal actors rely on the private formal actors for landfills, smelters and refineries. Oduro-Appiah et al. (2019) recount the intriguing outcome of a two-year pilot project based on this model for integrating informal SWM actors in Accra. The authors argued that when this model was rolled out in 2016, the number of formalised informal service providers (ISPs) in Accra drastically increased from 350 to 600 in 2018 with the concomitant daily contribution to municipal solid waste collection increasing from 385 to 720 tons. As cited in the above excerpt, there are about 820 licensed informal SWM actors working in the Accra Metropolitan Assembly (AMA) alone. These growing numbers symbolise their service capacities, hence the collaborative relationship between private formal and informal SWM actors. Participation based on this second approach also ensures that formal and informal actors are involved in everyday SWM operations in franchised zones, especially in areas that are inaccessible to vehicles and/or unattended by formal actors, due either to unaffordable service charges or an unwillingness to pay for SWM. In turn, the informal SWM actors rely on transfer stations and landfills belonging to private formal actors to support their commercial SWM activities. In this way, the informal SWM actors fill the SWM gaps created by formal actors, and they avert contestations between market dwellers and neighbouring residents. On the other hand, the private formal actors ensure effective and efficient SWM services by providing the needed technical assistance to the informal actors. In some cases, the collaborative relationships between formal and informal SWM actors become contentious. As exemplified with the analogy of the ownership of a cocoa farm, the illustrated conflictual situation arises when the informal SWM actors become a threat or competitor to the private formal SWM actors. A

private formal actor in the Kaneshie OAM attributed such conflicts to differences in service charges along with the insecurity associated with working with informal actors. He argued:

> *There is a conflict of interest because sometimes what we [private formal actors] charge because they don't have overheads, they charge a little lower than us. But we have overheads, and we are dealing with bigger equipment. Our cost is higher than theirs so sometimes, they charge less. Then too, some of them are 'thieves.' They come to your house like they are picking your borla [waste], they watch the loopholes in your house and in the night, they say the borla [waste] people you brought [private formal actors] have come to steal our items. How do you prove? So, these are some of the challenges we have with them.*

The informal actors become a threat to private formal SWM actors when their customer base increases, thereby leading to a reduction in the volume of solid waste collected by formal actors which consequently cuts into their profits and affects the operations of the latter. In such a scenario, Gerdes & Gunsilius (2010:25) recommend that "[s]eeking convergent interests or complementary action between formal sector enterprises and the informal sector can strengthen the position of the informal sector." Gupta (2012) rather calls for integration through organised groups as a means for policymakers to ensure that informal actors have equal access to and the right to urban market solid waste. This call appeals for formalisation processes to aim at helping the powerless informal SWM actors to gain economic autonomy to compete with the already existing powerful SWM firms. In the instances where the two participatory approaches failed, the study provides evidence of how market leaders used informal SWM actors to address market SWM problems and also as a means of participation in UMEM. The nature of this third alternative pathway is explained next.

Participation based on recognition by market associations

Like many other informal associations, market associations are formed when traders organise themselves around various commodities to exert varying degrees of socio-political and economic influence. Market associations are the largest category of UMEM actors in the SWM service chain where they have multifaceted relationships with SWM activities (i.e., as solid

waste generators and SWM service clients). Headed by market leaders such as market queens or chairmen and commodity queens or chairmen, market and commodity associations collaborate with formal and informal SWM actors so as to achieve improvements in market SWM conditions. Previous studies have shown how market and commodity queens or chairmen rely on a combination of formalised and informalised relations for organising market space and maintaining a clean urban market environment (Asomani-Boateng, 2015; Sheburah Essien, 2021). This study reveals that informal SWM actors enter into different kinds of solid waste collection terms and conditions with traders and/or market leaders. In the case of the Kantamanto OAM, it was revealed how these local market institutions proved effective in managing their urban market environment through partnership with informal SWM actors and the consequent implementation of pay-as-you-dump (PAYD) and pay-as-you-generate (PAYG) systems. Whereas PAYD charges were paid at the point of disposal, PAYG arrangements were associated with monthly or weekly fees.

Unlike the first two SWM participatory approaches in Madina and Kaneshie OAMs, this model of participation shows some level of economic autonomy for informal SWM actors where access to market solid waste is dependent on recognition by market actors (including traders) rather than on a formalisation with either public or private formal SWM actors. A certain market leader in the Kantamanto OAM emphasised the need to work with informal SWM actors because they constitute an integral part of the UMEM system:

> *We are in the informal sector! We want to work with the informal sector! They know us better and they understand our conditions. We have put this need before the authorities that they should let every market get, first a vehicle [not necessarily tricycle], they [the market] will employ their own driver and workers so that we the market leaders will supervise, then give us a dumping site but they (authorities) have rather neglected their responsibilities to us [market leaders]. As a result, whatever works for us and it will be beneficial that is what we do. We have held this leadership mantle for [a] long time.*

The extract above contradicts the axiom that like poles repel and unlike poles attract.[5] In this case, like poles do attract because informal market actors perceived the hiring of informal SWM actors for solid waste collection, transportation, transfer and final disposal as economically viable and sustainable. Perhaps, market leaders are attracted to informal SWM actors because of the shared urban (market) experiences of marginalisation, neglect by city authorities and poor working conditions, which have fostered a form of informal collaborative relationship. Here the formal, which refers to city authorities, act as mediators with the intention of providing waste trucks or vehicles and dump sites for the informal actors employed by market leaders, the direct supervisors of the assigned informal SWM actors. In their role as supervisors, market leaders regulate and monitor the activities of the assigned informal SWM actors and report about them accordingly to public actors. The market informal SWM service providers, as expected in the above excerpt, load solid waste manually, either from stall to stall and shop to shop or from a central collection point into waste collection trucks and then transport the waste to the appropriate destinations, that is either to a transfer station or landfill site or to a recycling centre. This arrangement further reveals a well-coordinated method of managing market waste that functions in the informal sector. What is needed is a favourable policy space within which the economic aspirations of informal actors would be actualised in an integrated approach.

Unlike the first model for SWM participation, this approach offers informal actors much needed commercial viability while still being regulated directly under the auspices of market actors and indirectly by local government assemblies. For instance, in the Kantamanto OAM, the informal actors could work directly with traders under PAYD arrangements with supervision from market queens and chairmen. This third model of SWM participation also

[5] Law of magnetism.

shows less likelihood for contestation due to conflict of interests because market leaders have the opportunity to choose the SWM service provider (formal and informal) whom they prefer to deal with directly. Moreover, embedded in this participatory approach is the potential for practicing the 3Rs of reduce, reuse, recycle and recovery as a means to reduce the quantity of solid waste that is discarded while reducing the attendant burden on transfer stations and disposal sites. An important instrument of resource recovery in the urban metabolic system is sustainable material management which involves using and reusing materials more productively over their entire life cycle. A market leader explained how the 3Rs can be achieved:

> *We tell their leaders [commodity queens and chairmen] to inform their children [traders] to take out papers. There are also seamstresses and so we tell their leader to tell them to put aside the fabrics. And so, the leaders for cassava and plantain we do the same. Let me give an example of something like fish, the carton. In the evening around 5 or 6 you'll see aboboyaa [tricycle] will be there coming to collect it away. We do reuse and recycling with the informal sector and then we [market actors] reduce waste by segregating our wastes in an informal way. In the informal way, the government should give us containers. We will organise the waste from the associations and should give us either NGOs who are interested in our [segregated] waste or better still we can arrange with the informal guys who are interested.*

This market leader put forward an effective strategy about the volume of discarded solid waste by submitting that the segregation of waste is organised in some of the commodity associations headed by commodity queens and chairmen. Within the service chain of SWM, the market associations count on commodity queens or chairmen to teach, train and inform the traders under their supervision to gather appropriate organic and inorganic solid waste materials for further processing and recovery by suitable actors such as waste picking NGOs and informal SWM actors. The role of public actors is to partner with private formal actors and provide waste segregation containers for market and commodity associations to smoothen the value and service chains. Market leaders also have direct arrangements with informal waste pickers on a local market level. This implies that such 'informal' practices or arrangements which were

not part of the mainstream PPP system but are now visible in 'gray spaces' (Lindell & Ampaire, 2016),[6] are upgraded and integrated.

Conclusion and policy implications

This study identified several pathways for rethinking how informal actors can be included in existing PPP systems for managing solid waste in Ghanaian cities. The experiences of SWCs in the city of Accra following the introduction of models 1 (i.e., participation based on formalisation in organised groups) and model 2 (i.e., participation based on integrating informal actors with private formal SWM actors) exemplify the different modes of domination rooted in notions of urban modernity and related governance systems. Such dominations have been created because existing integration conceptualisation fails to take into consideration the variegated relationships between urbanites and informal SWM actors thereby undermining the plurality of SWM systems existing in the urban marketplace. Based on these findings, we call for a critical look at the existing social relations between informal SWM actors and the larger system of UMEM networks for the promotion of an integrated approach that is sustainable, pro-poor and inclusive.

The integrated approach is deemed appropriate, especially in the African context where most cities are facing limited financial and infrastructural resources, growing inequalities and increasing informality regarding urban metabolism flow. The detrimental impact of an inadequate SWM approach on public health and the environment underscores the relevance of this research. Hence, the paper directs attention to the urgent need to update the Ghanaian environmental sanitation policy to address the identified deficiencies of the policy by

[6] Lindell & Ampaire (2016) used the concept of 'gray space' to represent the various innovative ways that informal actors used to negotiate formal structures in order to successfully attain a measure of recognition.

embracing the diverse pathways for integrating informal SWM actors. Legislative changes that incorporate inclusive policies and approaches to SWM involving the informal actors will increase the resilience of the urban system, create an awareness of and improve people's attitudes towards SWM.

Given that this study applies SWM data from only three markets in Ghana, future research that employs much larger sampled data would be useful. Additionally, the aim for future research would be to find a common ground in which these three models can be integrated to create an enabling environment for a successful participation by all SWM actors. Such an exercise must bear in mind the factors that play influential roles regarding who works where, and how SWM services are discharged.

Acknowledgements

We wish to thank Prof Manfred Spocter of Stellenbosch University, South Africa, for the supervisory role as well as all the research participants for providing valuable information. We are also grateful to the Directors of Waste Management Departments at the La Nkwantanang Madina Municipal Assembly (LaNMMA) and Okaikoi South Sub-Metro of the Accra Metropolitan Assembly (AMA) for providing the needed assistance. And to our anonymous reviewers, we appreciate the valuable work which helped us to improve the manuscript.

Author Contribution

All authors contributed to this paper. The initial conceptualisation, material preparation, data collection, and analysis were performed by Rosina Sheburah Essien. The draft manuscript was written by Rosina Sheburah Essien whereas the remaining authors commented and reviewed all versions of the manuscript. All authors read and approved the final manuscript.

Funding

The funding support for this research came from the Graduate School of the Faculty of Arts and Social Sciences at Stellenbosch University.

Ethics Approval

Ethical approval was granted by the Stellenbosch University's Research Ethics Committee under project number 9765.

Consent to Participate

All informants participated voluntarily after given their informed consent.

References

Adzawla, W., Tahidu, A., Mustapha, S., & Azumah, S. B. (2019). Do socioeconomic factors influence households' solid waste disposal systems? Evidence from Ghana. *Waste Management & Research, 37*, 51–57.

Ahmed, S. A., & Ali, M. (2004). Partnerships for solid waste management in developing countries: Linking theories to realities. *Habitat International*, *28*(3), 467–479.

Aparcana, S. (2017). Approaches to formalization of the informal waste sector into municipal solid waste management systems in low- and middle-income countries: Review of barriers and success factors, *Waste Management*, 61, 593–607.

Asomani-Boateng, R. (2015). Local networks: Commodity queens and the management of organic solid waste in indigenous open-air markets in Accra, Ghana, *Journal of Planning Education and Research*, *36*(2), 182–194.

Awortwi, N. (2004). Getting the fundamentals wrong: Woes of public–private partnerships in solid waste collection in three Ghanaian cities. Public Administration and Development*: The International Journal of Management Research and Practice*, *24*(3), 213–224.

Bel, G., & Warner, M. (2008). Does privatization of solid waste and water services reduce costs? A review of empirical studies. *Resources, Conservation and Recycling*, *52*(12), 1337–1348.

Fobil, J., May, J., & Kraemer, A. (2010). Assessing the relationship between socioeconomic conditions and urban environmental quality in Accra, Ghana. *International Journal of Environmental Research and Public Health*, *7*(1), 125–145.

Fobil, J. N., Armah, N. A., Hogarh, J. N., & Carboo, D. (2008). The influence of institutions and organizations on urban waste collection systems: An analysis of waste collection system in Accra, Ghana (1985-2000). *Journal of Environmental Management*, *86*(1), 262–271.

Gerdes, P., & Gunsilius, E. (2010). *The waste experts, the enabling conditions for informal sector integration in solid waste management: Lessons from Brazil, Egypt and India*. Eschborn: Deutsche Gesellschaft für Techische Zusammenarbeit (GTZ).

Grant, R., & Oteng-Ababio, M. (2021). Formalising e-waste in Ghana: An emerging landscape of fragmentation and enduring barriers. *Development Southern Africa*, 1–14.

Gupta, S. K. (2012). Integrating the informal sector for improved waste management. *Private Sector and Development*, 15, 12-15.

Lindell, I., & Ampaire, C. (2016). The untamed politics of urban informality: "Gray space" and struggles for recognition in an African city. *Theoretical Inquiries in Law*, *17*(1), 257–282.

Masood, M., & Barlow, C. Y. (2013). Framework for integration of informal waste management sector with the formal sector in Pakistan. *Waste Management and Research*, *31*, 93–105.

Myers, G. A. (2005). *Disposable cities: Garbage, governance and sustainable development in urban Africa*. Aldershot: Ashgate.

Obirih-Opareh, N., & Post, J. (2002). Quality assessment of public and private modes of solid waste collection in Accra, Ghana. *Habitat International*, *26*(1), 95–112.

Oduro-Appiah, K., Afful, A., Kotey, V., & De Vries, N. (2019). Working with the informal service chain as a locally appropriate strategy for sustainable modernization of municipal solid waste management systems in lower-middle income cities: Lessons from Accra, Ghana. *Resources*, *8*(1), 1–16.

Oduro-Appiah. K., Scheinberg, A., Afful, A., & De Vries, N. (2020). The contribution of participatory engagement strategies to reliable data gathering and inclusive policies in developing countries: Municipal solid waste management data in the Greater Accra Metropolitan Area of Ghana. *African Journal of Science, Technology, Innovation and Development*, 1–12.

Oduro-Kwarteng, S. (2011). *Private sector involvement in urban solid waste collection*. Leiden: CRC Press.

Oduro-Kwarteng, S., & Van Dijk, M. P. (2013). The effect of increased private sector involvement in solid waste collection in five cities in Ghana. *Waste Management & Research, 31*, 81–92.

Olukanni, D. O., & Nwafor, C. O. (2019). Public-private sector involvement in providing efficient solid waste management services in Nigeria. *Recycling*, *4*(2), 1–9.

Oteng-Ababio, M. (2010). Private sector involvement in solid waste management in the Greater Accra metropolitan area in Ghana. *Waste Management and Research*, *28*(4): 322–329.

Oteng-Ababio, M. (2011). Missing links in solid waste management in the Greater Accra metropolitan area in Ghana. *GeoJournal*, *76*(5), 551–560.

Oteng-Ababio, M. M., & Amankwaa, E. F. (2014). The e-waste conundrum: Balancing evidence from the North and on-the-ground developing countries' realities for improved management. *African Review of Economics and Finance*, *6*(1):181–204.

Pieterse, E. (2004). Untangling 'integration' in urban development policy debates. *Urban Forum*, *15*(1), 1–35.

Post, J., Broekema, J., & Obirih-Opareh, N. (2003). Trial and error in privatisation: Experiences in urban solid waste collection in Accra (Ghana) and Hyderabad (India). *Urban Studies*, *40*(4), 835–852.

Prasad, N. (2006). Privatisation results: Private sector participation in water services after 15 years. *Development Policy Review*, *24*(6), 669–692.

Samson, M. (2009). Wasted citizenship? Reclaimers and the privatised expansion of the public sphere. *Africa Development*, *34*(3–4), 1–25.

Scheinberg, A. (2012). Informal sector integration and high performance recycling: Evidence from 20 cities [online]. Available at https://www.wiego.org/sites/default/files/publications/files/Scheinberg_WIEGO_WP23.pdf [Accessed 22 June 2022].

Scheinberg A, Rodic-Wiersma L & Wilson D (2010). *Solid waste management in world's cities*. London: Earthscan.

Sheburah Essien, R. (2021). Rethinking solid waste management in Accra's open-air markets. PhD thesis. Stellenbosch: Department of Geography and Environmental Studies, Stellenbosch University.

Sheburah Essien, R., & Spocter, M. (2022). Overcoming obstacles to the integration of informal actors in Accra's open-air marketplaces. *Urban Forum*, 1–9.

Simatele, D. M., Dlamini, S., & Kubanza, N. S. (2017). From informality to formality: Perspectives on the challenges of integrating solid waste management into the urban development and planning policy in Johannesburg, South Africa. *Habitat International*, *63*,122–130.

Spoann, V., Fujiwara, T., Seng, B., Lay, C., & Yim, M. (2019). Assessment of public–private partnership in municipal solid waste management in Phnom Penh, Cambodia. *Sustainability*, *11*(5), 1–19.

Tilaye, M., & Van Dijk, M. P. (2014). Private sector participation in solid waste collection in Addis Ababa (Ethiopia) by involving micro-enterprises. *Waste Management & Research, 32*(1), 79–87.

United States Environmental Protection Agency (USEPA). (2002). Solid waste management: A local challenge with global impacts [online]. Available from http://www.epa.gov/epaoswer/non-hw/muncpl/ghg/f02026.pdf [Accessed 15 June 2022].

Van de Klundert, A., & Anschütz, J. (2001). Integrated sustainable waste management: The concept. In Scheinberg A (ed) *Integrated sustainable waste management: Tools for decision-makers, set of five tools for decision-makers - experiences from the urban waste expertise programme (1995–2001)*,7–39. Gouda: WASTE.

Van Niekerk, S., & Weghmann, V. (2019). Municipal solid waste management services in Africa. *Public Service International*, 1–68.

Wilson, D. C. (2007). Development drivers for waste management. *Waste Management & Research, 25*(3), 198–207.

Wilson, D. C., Velis, C. A., & Rodic, L. (2013). Integrated sustainable waste management in developing countries. *Proceedings of the Institution of Civil Engineers: Waste and Resource Management, 166* (WR2), 52–68.

Yeboah-Assiamah, E., Asamoah, K., & Kyeremeh, T. A. (2017). Decades of public-private partnership in solid waste management: A literature analysis of key lessons drawn from Ghana and India. *Management of Environmental Quality: An International Journal, 28,* 78–93.