

The influence of institutions and organizations on urban waste collection systems: An analysis of waste collection system in Accra, Ghana (1985–2000)

Julius N. Fobil^{a,*}, Nathaniel A. Armah^b, Jonathan N. Hogarh^c, Derick Carboo^d

^a*School of Public Health, College of Health Sciences, P.O. Box LG13, University of Ghana, Legon, Accra, Ghana*

^b*UESP Capacity-Building & Training, Ministry of Local Government and Rural Development, PMB, Ministries Post Office, Accra, Ghana*

^c*Department of Environmental Science, College of Science, Kwame Nkrumah University of Science & Technology, PMB, University Post Office, Kumasi, Ghana*

^d*Department of Chemistry, P.O. Box LG56, University of Ghana, Legon, Accra, Ghana*

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Abstract

Urban waste collection system is a pivotal component of all waste management schemes around the world. Therefore, the efficient performance and the success of these schemes in urban pollution control rest on the ability of the collection systems to fully adapt to the prevailing cultural and social contexts within which they operate. Conceptually, institutions being the rules guiding the conduct of public service provision and routine social interactions, waste collection systems embedded in institutions can only realize their potentials if they fully evolve continuously to reflect evolving social and technical matrices underlying the cultures, organizations, institutions and social conditions they are designed to address. This paper is a product of an analysis of waste collection performance in Ghana under two different institutional and/or organizational regimes; from an initial entirely public sector dependence to a current mix of public–private sector participation drawing on actual planning data from 1985 to 2000. The analysis found that the overall performance of waste collection services in Ghana increased under the coupled system, with efficiency (in terms of total waste clearance and coverage of service provision) increasing rapidly with increased private-sector controls and levels of involvement, e.g. for solid waste, collection rate and disposal improved from 51% in 1998 to about 91% in the year 2000. However, such an increase in performance could not be sustained beyond 10 years of public–private partnerships. This analysis argues that the sustainability of improved waste collection efficiency is a function of the franchise and lease arrangements between private sector group on the one hand and public sector group (local authorities) on the other hand. The analysis therefore concludes that if such franchise and lease arrangements are not conceived out of an initial transparent process, such a provision could undermine the overall sustainability of private sector initiatives in collection services delivery in the long term, as in the case of the Accra example.

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1. Introduction

The right to health is one of the fundamental human rights, which enjoins nations to guarantee preconditions for healthy lives of their peoples. For example, in Ghana,

the key strategy currently adopted to realize this basic requirement for life of all people, both urban and rural populations, is the Primary Health Care (PHC) policy (Armah, 2001; Fobil, 2002). The overall objective of the policy among others, stipulates that, all Government Ministries, Departments and Agencies (MDAs), individually and jointly, provide services and public facilities to protect public health, the environment and settlements, which are vital ingredients for the total development of the country and its people (Armah, 2001). An important

*Corresponding author. Tel.: +233 21 517 506.

E-mail addresses: jfobil@ug.edu.gh (J.N. Fobil),
jnhogarh.sci@knust.edu.gh (J.N. Hogarh), dcarboo@ug.edu.gh
(D. Carboo).

component of the PHC is the environmental sanitation of which wastes management is a key sub-component. Wastes collection services are indispensable core activities in wastes management. Like any such economic activity, waste collection and its final disposal are governed by neo-classical economic theory of demand and supply. Market conditions that operate within a typical market environment also apply in waste collection, storage, transportation and final disposal (Fobil, 2002). However, it must be noted that the provision of these services cannot be left entirely to the dictates of market forces alone as other external factors such as social and cultural contexts of a given society play part in determining the direction of these market forces.

Generally, a chronic problem confronting all sub-Saharan African cities including Accra in Ghana is a proliferation of squatter and informal settlements, peripheral sprawl, and central city tenements, all lacking basic infrastructure services with poor sanitation (Boadi and Kuitunen, 2005; Nuno-amarteifio, 1995; Bannerman, 2000; Wurapa, 1973; Makoni et al., 2004; Mabogunje, 1995; Satterthwaite, 1993; Von Schirnding, 1996). Indeed, cities in this region are not only rapidly urbanizing, but the urban environments here are fast deteriorating and this kind of urban growth phenomenon may better be described as ‘*ruralization*’ than ‘*urbanization*’ (Bannerman, 2000; Makoni et al., 2004; Mabogunje, 1995; Von Schirnding, 1996; Taiwo, 1996; Majani, 1996). Many of the cities, e.g. Accra in Ghana, Lagos in Nigeria, Kampala in Uganda, Addis Ababa in Ethiopia, Dar-es-Salaam in Tanzania and Nairobi in Kenya are all beset with unhealthy urban environmental conditions and filth (Makoni et al., 2004; Mabogunje, 1995; Von Schirnding, 1996; Taiwo, 1996; Majani, 1996; Kgathi and Bolaane, 2001). Several interventions and urban initiatives meant to improve urban environmental conditions have been attempted in many of these cities without much success and these include the upgrading efforts in Ghana, and urban projects over the years in Kenya, Ethiopia, Senegal, Cote d’Ivoire, and Zambia (Boadi and Kuitunen, 2005; Nuno-amarteifio, 1995; Bannerman, 2000; Makoni et al., 2004; Mabogunje, 1995; Von Schirnding, 1996; Taiwo, 1996; Majani, 1996; Kgathi and Bolaane, 2001).

In many of the cities, the key observable feature is that the collection, transportation and disposal of solid waste has moved from the control of local government authorities to the increased involvement of the private sector (PS) either ‘spontaneously’ in a free market setting or encouraged through local authorities, non-governmental organization (NGOs) or community-based organizations (CBOs) (Nuno-amarteifio, 1995; Post et al., 2001) in a hybrid couple system. This is on account of the wide realization that public sector institutions have failed considerably to perform efficiently in the region. Solid waste management is no longer a (local) government monopoly but now largely a domain, open to various modes of public–private co-operation either through lease agreements or direct franchise arrangements. This hybrid-

ized couple system between public and private groups in urban environmental management has both opportunities and potential caveats, which if improperly harmonized, frequently lead to large negative externalities such as poor performance, organizational failures and resource misapplication, and which come with an inevitable consequence of environmental deterioration. Privatization of municipal services often come as a consequence of a multitude of reasons which in most cases is provoked by the onset of poor service delivery by public sector entities. As in the case of what happened in many of the sub-Saharan African cities, widespread internal dissatisfaction by residents and lack of confidence in the service delivery by the local government authorities, provided impetus for increased pressures from the Bretton Woods institutions which are major sponsors of such urban initiatives, forcing public sector organizations to either completely relinquish or share the role of municipal services delivery to PS groups, often credited with high performance. In the literature, the PS is credited with qualities such as political independence; economic rationality, efficiency, dynamism and innovation, qualities that make it measure up favorably to public sector enterprise (Post et al., 2001). The aim of this paper is to analyze the historical developments in the waste collection system in Accra during the period between 1985 and 2000, highlighting the various economic, institutional, organizational, and market determinants of such historical developments. The paper takes an analytic perspective of waste collection performance in Ghana under two different institutional and/or organizational regimes; from an initial entirely public sector dependence to a current mix of public–private sector participation.

1.1. City of this analysis

The analysis is carried out in Accra, the capital city of the Republic of Ghana. Accra is a coastal city located in the Greater Accra Region, the smallest of the 10 political regions in Ghana (Stephen, 1999). It is, however, the largest of Ghana’s 10 leading urban centers, with an estimated population of approximately 1.7 million in 1990 and 2.7 million in 2000 (Carboo and Fobil, 2004). Currently, Ghana’s population stands at approximately 20 million; and Accra alone harbors over 30% of the urban population of Ghana and nearly 15% of the country’s total population (GSS, 2004). The generation and annual rate of increase of solid waste are high in Ghana. In Accra for example, per capita production of refuse is estimated at 0.40 kg/day (Fobil, 2001). At the current 6% population growth rate, the population of Accra in 2005 was estimated at approximately 3.6 million, with a total refuse generation of 1.44 million kg/day (1440 metric tons per day), which translated into approximately 0.5 million metric tons per year. Nearly 60% by weight of this huge chunk of waste generated was organic (Fobil, 2001), representing 0.3 million metric tons of waste annually. Nearly half of solid waste currently generated in cities in Ghana is not collected

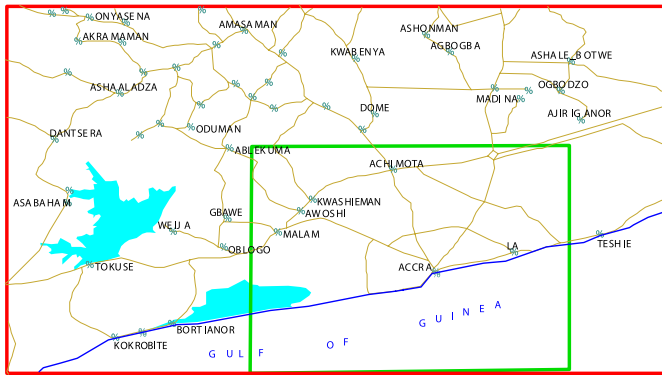


Fig. 1. The Accra Metropolitan Area (AMA), 2005.

(Fobil, 2001; Asomani-Boateng and Haight, 1999) (see Fig. 1).

2. The environmental consequence of institutional and organizational failures in waste collection in Accra

The period between 1957 and 1985 in Ghana witnessed a general deterioration and breakdown of public sanitation facilities in the major cities notably the regional capitals of the country (Nuno-amarteifio, 1995; Laryea, 2000; Martinson et al., 1999). This created complete environmental chaos in all urban centers. The deterioration in sanitation services and the systemic degradation of urban environmental quality came as a consequence of institutional failures (Boadi and Kuitunen, 2005; Nuno-amarteifio, 1995). During this period, Accra like many other cities in Ghana, experienced a serious decline in environmental sanitation, particularly in waste management (Nuno-amarteifio, 1995; Bannerman, 2000; Laryea, 2000). This was a result of the failure of institutions to respond to the planning needs of a modern city (Nuno-amarteifio, 1995). Many reasons have been cited for the systemic failures of institutions in sub-Saharan Africa. These may broadly be grouped into two, namely—human and technical factors (Fobil, 2002, 2001; Makoni et al., 2004; Mabogunje, 1995; Majani, 1996; Agunwamba, 2001, 2003; Anikwe and Nwobodo, 2002; Bruggemann, 1971; Darko and Fletcher, 1998; EPA-Ghana, 1997; Gulis et al., 2004; Gwebu, 2003; Holmes, 1983; Leschber, 2002; Makule, 2000; Mbuligwe, 2004; Mtani, 2004). Institutions are generally conceived as the rules of the game in a society or more technically, as the humanly devised constraints that shape human interaction (North, 1999). Institutions then tend to structure incentives in human exchange, whether political, social, or economic. Institutions may be contrasted from organizations in that; they do not provide a physical structure to human interaction (North, 1999). However, they set non-physical limits to societal actions. Institutions may appear feasible, but if they are not supported by clearly defined organizational arrangements, they may well be counter-productive.

2.1. Human factors

Indiscriminate erection of structures by individuals and private estate developers at unapproved sites is a common phenomenon in many parts of Accra, culminating in lack of appropriate access routes to many of these areas. This is a result of non-enforcement of physical planning and land-use laws in the city and thus, giving the built environment a confused and chaotic outlook. Accra, like many other cities in sub-Saharan Africa, is then a settlement of poorly laid structures, which lacks access routes in many of its residential enclaves. Lack of access routes makes garbage removal and lifting rather difficult if not impossible through motorized waste lifting system, a situation, which provides for rapid accumulation of solid wastes as seen in many residential areas in the city today. It is then common to find that many households in the city are not served with waste collection services.

By 1985, the problem of urban environmental sanitation had reached such a level that action could not be delayed any longer. There were huge accumulations of solid waste at several locations within most of the communities in Accra, more especially in the high density, low-income residential areas of the metropolis. The situation was the same with respect to liquid waste.

The rapid rate of urban growth made it very difficult for city authorities to meet the demand for critical public services such as potable water, sewers, public latrines, public water closet toilets, and other sanitation facilities which made it very difficult to deal with the large volume of liquid wastes from homes. Overflowing public toilets became daily norms rather than the exception. Indeed, many of these public facilities fell into long periods of misuse, abuse and disrepair, resulting in high build up of sludge in the septic tanks. This reduced the available volume of the septic tanks, and caused the tanks to overflow rapidly. In such cases, it was not unusual for such public toilets to be closed to the public. A closure often led to defecation around the facility and in open places in the neighborhoods.

The private facilities in homes, industry, shops or markets, and offices or institutions were not left out. For lack of maintenance of the sanitation equipment, only few cesspool emptiers were available and serviceable, resulting in long waiting period for desludging services to be provided.

Private pan latrine carriers¹, employed by the Accra Metropolitan Assembly (AMA) took advantage of the inadequacy of vehicles to extort from users extra payment for themselves, for emptying overflowing pan latrines, irrespective of whether or not the pan was properly registered with the Assembly. The solid waste that remained uncollected for several months often found

¹Private pan latrine carriers are private individuals who made living by going from house-to-house to manually lift human excreta using head-carrier containers.

routes into open drains thereby blocking these drains and runoff, and became a veritable recipe, not only for breeding of mosquitoes and flies, but also factories from which emanated obnoxious odors into the atmosphere with their offensive smells.

2.2. Technical and administrative factors

A study was conducted to diagnose the cause of these unacceptable and health-threatening environmental conditions with the assistance of GTZ (of the government of the Federal Republic of Germany) during the period 1983–1985 (Armah, 2001). The study found that the roles of sub-units and sub-departments within the AMA (the sole public provider of sanitation services) were not properly clarified leading to overlap of responsibilities in most cases and in some other cases complete absence of administrative oversight. This situation often developed into serious institutional and practical conflicts as has been conceptualized in Figs. 2 and 3. For instance, it was found that as the key roles were not well defined among units making up the AMA, a potential danger of running into mal-functioning of the financial system developed, and which may have led to cash-flow problems (Armah, 2001). This was because the different units scrambled for budget allocations to the detriment of the goals of the larger organization. Often, cash-flow difficulty led to irregular and low wages as well as low salaries among the workforce, which may then have resulted in job dissatisfaction, low waste collection efficiency, poor performance and corrup-

tion among the personnel and staff. There was inadequate coordination among the bodies, which had equal powers under different management. The lack of coordination and overlap of responsibilities created misunderstanding and confrontation among the groups (Armah, 2001).

The main findings of the study showed that there were the following institutional weaknesses:

- fragmentation of the waste management functions among several departments of the Assembly e.g.,
 - Metro Health Department delivered the services of solid waste collection and haulage to disposal sites, pan latrine service, desludging of septic tanks, and the Operation and Maintenance (O&M) of public toilets,
 - Metro Engineer’s Department was responsible for the construction and maintenance of the sanitary facilities,
 - Mechanical Engineer’s Department had responsibility for the repair and maintenance of the sanitation vehicles and equipment, the management of treatment and final disposal sites (landfills, compost plant and fecal treatment plants), the engagement and assignment of drivers and operators to the Health Department for services delivery,
- the waste management activities were not effectively coordinated and harmonized, resulting in overlapping in some areas, and other gray areas not assigned to any of the departments,
- inadequate numbers and/or often, inappropriate fleet and equipment resulting in maintenance problems which were exacerbated by the lack of a standardized policy on

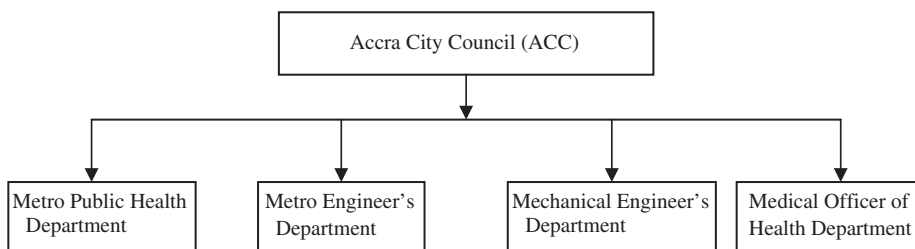


Fig. 2. Previous institutional arrangement (1957–1985).

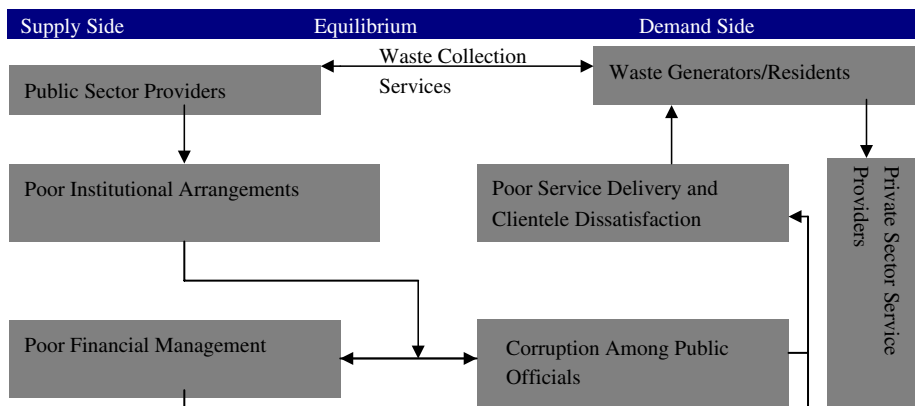


Fig. 3. Institutional and economic analytic model in waste collection services.

their operations. In most times, there were more than one model of vehicles in the sanitation fleet deployed in the municipal authority,

- serious cash-flow problems, which adversely affected the effective and efficient operation and maintenance of sanitary fleet and equipment, and this in turn, resulted in their unreliability and poor availability for services delivery. Also, service fees were charged only for house-to-house solid waste collection and this constituted less than 10% of the services delivered,
- complete absence or low involvement of PS group in waste collection services provision,
- a dearth of qualified, well-trained and motivated professionals, technicians, operation and maintenance staff to undertake with efficiency the planning, management, operation and maintenance of the services.

3. Remedial actions to correct institutional failures in AMA

In the short and medium term, a Board of Directors was composed to oversee the operations and services to be delivered by a commercially oriented entity, wholly owned by the AMA. However, to meet the exigencies in the long term, a Waste Management Department (WMD) was set up in 1985 with the sole responsibility to collect, store, transport and dispose off wastes generated in the city. In the same year, a Metro Public Health Department (MPHD) was established by re-structuring the erstwhile Medical Officer of Health Department (MOHD) and the Mechanical Engineers Department (MED). The restructuring together with other internal re-organization led to clear definition and differentiation of roles among various actors within the WMD (see Fig. 4).

The WMD was mandated to execute the waste management portfolio, consisting of the following:

- management of solid and liquid wastes,
- management of public toilets, public cleansing, namely street and pavement sweeping, drain cleansing and lawn-mowing and the repair and maintenance of sanitation vehicles and equipment.
- the WMD was also permitted to use the service fees it collected to fund its operations. This laid the foundation for the establishment of “financial autonomy” for the new WMD,
- the MPHD, with the mandate for the execution of the other components of environmental sanitation, supported the WMD with the enforcement of the relevant bye-laws, education of the public on environmental health issues, and monitoring of waste management services delivered by the WMD to the various communities of the metropolis, and
- the Legal Department supported the WMD to draft appropriate bye-laws to facilitate delivery of services, the enforcement of compliance and the prosecution of offenders.

Additionally, a Waste Management Advisory Committee (WMAC) was established with oversight responsibility for waste management and reporting to the Executive Committee of the AMA on the activities of the WMD. Membership of the WMAC was made up of:

- two Assembly Members, who were serving on the then Sub-Committee of Environmental Sanitation and Health, one of whom was appointed Chairman,

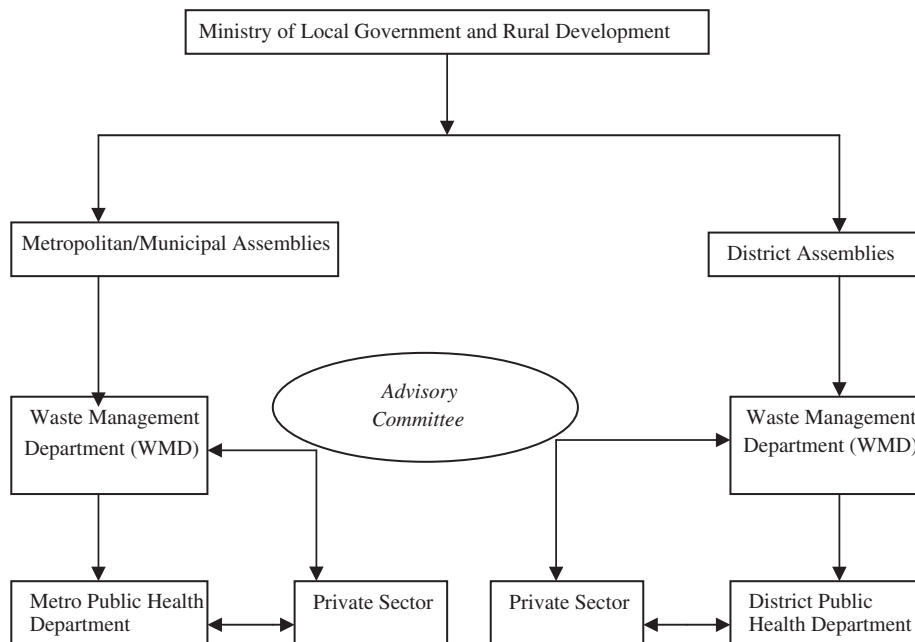


Fig. 4. New institutional arrangement (1985-Present).

- head of the Metro Finance Department,
- head of Metro Works Department,
- head of MPHD,
- head of Department of Town and Country Planning,
- head of the Environmental Health Division of the Ministry of Health,
- representative of the Council for Scientific and Industrial Research (CSIR),
- representative, School of Engineering (Environmental Department) of the University for Science and Technology,
- head of the WMD as Member/Secretary.

3.1. Introduction of public–private partnerships in waste collection in Accra, Ghana

Public–private partnerships (PPPs) are described in the literature as the transfer and control of the responsibility of service provision (e.g. public services such as healthcare, utilities, water supply and sanitation, etc.) from public sector entities, either wholly or partly, to the privately own establishments (Armah, 2001; Majani, 1996; Kgathi and Bolaane, 2001; Bruggemann, 1971; Darko and Fletcher, 1998; Gwebu, 2003; Mtani, 2004; Forsyth, 2004; Massoud and El-Fadel, 2002; Eliah, 2000; Fobil and Atuguba, 2004). The concept involves a wide range of PS participation in public services and serves as a potential strategic management tool for improved performance in public services delivery (Mbuligwe, 2004; Massoud and El-Fadel, 2002). The concept was introduced in Ghana alongside many other public sector reforms such as the Structural Adjustment Program (SAP), Economic Recovery Program (ERP), etc., so as to salvage the systemic down-turn in performance of public institutions. There is strong consensus among development experts that PPP is a “magic” solution to most inefficiency problems in public institutions. Therefore conclusions in development literature are almost always unanimous that the deployment of PPPs in public services provision in developing countries can cause a twitch in development trends by reason of the following:

- improved performance of the public sector by employing innovative operation and maintenance methods,
- reduced and stabilized costs of providing services by ensuring that work activities are performed by the most productive and cost effective means,
- improved environmental protection by dedicating highly skilled personnel to ensure efficient operation and compliance with environmental requirements, and
- access to private capital for infrastructure investment by broadening and deepening the supply of domestic and international capital (Mbuligwe, 2004; Mtani, 2004; North, 1999; Massoud and El-Fadel, 2002; Nhapi et al., 2003).

While in development literature, the concept of PPPs implementation largely subsumes effective cost recovery, efficient financial management, improved economies of scale, cost, improved public accountability, better institutional management, etc., the Accra analysis may likely point out that, for PPPs to achieve long-term sustainability, it may require active and continuous examination of rendered services to determine whether they are more appropriately and effectively performed by the PS. And that partial devolution of controls and responsibilities by local authorities may eventually lead to a complex interplay of external forces, which provides for the return of state controls and un-necessary political interference. Nonetheless experiences from countries where these have been tried show that the improved performance of public institutions through the implementation of PPPs can be counter-productive if the cultural and traditional contexts of the societies in which they are implemented are ignored at the design stages (North, 1999; Forsyth, 2004; Massoud and El-Fadel, 2002; Eliah, 2000; Fobil and Atuguba, 2004; Nhapi et al., 2003).

4. Impacts of the corrective measures

The outcomes of reorganization of these Institutions, Departments and private sector participation in waste collection are presented in Tables 1–3 and Fig. 4 (Fobil, 2002). The major observation was that the institutional rearrangement led to improved institutional efficiency and

Table 1
Planning data, targets and actual performance for liquid waste management, Accra (5-year development plan, 1996–2000)

Year	1996	1997	1998	1999	2000
<i>Population</i>					
Total	1,521,566	1,579,386	1,639,403	1,701,700	1,766,364
Growth rate (%)	3.8	3.8	3.8	3.8	3.8
<i>Waste generation</i>					
l/cap.day	0.44	0.44	0.44	0.44	0.44
m ³ /yr	244,531	253,823	263,468	273,480	283,872
<i>Targets (m³/yr)</i>					
AMA	90,000	91,500	91,000	91,000	91,000
Private sector	22,000	24,000	28,000	32,000	36,000
Total	112,000	115,500	119,000	123,000	127,000
% Coverage (%)	46	46	45	45	45
% Private sector (%)	20	21	24	26	28
<i>Performance (m³/yr)</i>					
AMA	62,230	62,600	39,700	38,980	#N/A ^a
Private sector	21,030	21,100	26,440	53,540	#N/A
Total	83,260	83,700	66,140	92,520	#N/A
% Coverage (%)	34	33	25	34	#N/A
% Private sector (%)	25	25	40	58	#N/A

^aN/A means non applicable, as data was not available.

Table 2
Planning data, targets and actual performance for solid waste management (1992–1995)

Year	1992	1993	1994	1995
<i>Population</i>				
Total	1,314,490	1,363,126	1,413,562	1,465,864
Growth rate (%)	3.7	3.7	3.7	3.7
<i>Waste generation</i>				
kg/cap.day	0.51	0.51	0.51	0.51
Tonnes/yr	244,860	253,920	263,315	273,057
<i>Targets (T/yr)</i>				
AMA	194,000	207,000	214,000	222,000
Private sector	2500	5000	7000	9000
Total	196,500	212,000	221,000	231,000
% Coverage (%)	80	83	84	85
% Private sector (%)	1	2	3	4
<i>Performance (T/yr)</i>				
AMA	195,840	153,490	199,715	110,800
Private sector	4660	18,730	23,640	29,500
Total	200,500	172,220	223,355	140,300
% Coverage (%)	82	68	85	51
% Private sector (%)	2	11	11	21

Table 3
Basic planning data for solid waste management in Accra (5-year development plan, 1996–2000)

Year	1996	1997	1998	1999	2000
<i>Population</i>					
Total	1,521,566	1,579,386	1,639,403	1,701,700	1,766,364
Growth rate (%)	3.8	3.8	3.8	3.8	3.8
<i>Waste generation</i>					
kg/cap.day	0.55	0.55	0.55	0.55	0.55
Tonnes/yr	305,664	317,279	329,335	341,850	354,841
<i>Targets (T/yr)</i>					
AMA	162,000	167,000	177,000	182,000	187,000
Private sector	75,000	90,000	105,000	120,000	135,000
Total	237,000	257,000	282,000	302,000	322,000
% Coverage (%)	78	81	86	88	91
% Private sector (%)	32	35	37	40	42

Source: WMD, AMA.

financial management. This in turn rekindled enthusiasm in the personnel and staff and led to improved service delivery. Furthermore, the introduction of private service providers resulted not only in improved collection performance, but also in increased collection coverage. This led to substantial waste clearing with corresponding improvements in urban environmental performance.

By the agreement between the PS group and the AMA, the PS paid some percentage of the income they made from the waste collection services to the Assembly. The total amount made from waste collection fees minus the

percentage given to the AMA gave the net income of the PS groups. Percentage increase in coverage (% served) and frequency of garbage removal together gave the performance index, which was measurable from daily collection quantities in kilograms. Whether or not the PS scheme were successful depended on the margin of economic rent (which represented its net income). If profit margins were huge, then it meant there was enough economic incentive to encourage private individuals to continue with the scheme. The schemes then would be sustainable if profits offset operation costs. The Assembly made a saving of €46.32 million in the first year for deploying 319 conservancy laborers to the PS. In addition, the operators paid to the Assembly €164.52 million for storage, haulage and final disposal facilities it provided. In the immediate past, the Assembly would have earned within the same period €21.60 million from the 4500 registered pans paying €400.00 per month each. A plausible explanation of the low returns if AMA were to provide these services was that the AMA had not been efficient in its revenue generation. For example, flat rates that were charged for waste collection by the AMA were not realistic in economic terms as compared to charge per kilogram weight of waste collected by PS entities.

More pans were registered by the service providers, thereby reducing the numbers of unregistered pan users, which hitherto had been serviced by the laborers of the Assembly, without any payment of service fees to the AMA.

The experience was that fees were paid directly to the service providers for their services with low default rates of less than 15%, even though there was no effective law enforcement as there were no appropriate bye-laws to support the policy of PS participation in the delivery of the service.

Table 1 describes a 5-year development plan on liquid waste collection services in Accra. It shows targets and actual performance of liquid waste collection service providers. Targets were set based on the quantity of liquid wastes to be collected and institutional as well as logistics capacity of the metropolitan assembly (i.e. in terms of resources: human, financial, trucks, etc.). There were wide differences between AMAs's targets and actual performance because the assembly had over the several years of operation become so weary and fatigued that performance declined considerably. It maintained its ambitious targets, yet work capacity dwindled resulting in the observed widening gaps between targets and actual performance. On the other hand, the PS started with low targets because of restricted access to workforce but gained momentum over the years as the AMA gradually relinquished responsibility of waste collection service delivery to the PS which had performed creditably well within a short time bringing about substantial improvement in collection coverage. Although, much credit had been bestowed to the PS of having been successful in waste collection service delivery, it was not without shortfalls. There had been complains from residents about high rates of default of waste removal

which generated substantial public nuisance. Additionally, we note that the PS involvement in waste collection only begun to come under experimentation in Ghana in 1985, an important observation was that it had shown to outperform the AMA in the liquid waste service delivery. Actual performance of PSP in desludging services increased steadily since 1996 with output beyond expectation from mid-term of the 5-year plan period. This was as a result of a large influx of cesspit emptiers brought in by resident businessmen. Also the returns on investment were so lucrative that Ghana nationals living abroad procured second-hand vehicles and shipped them to their relations to invest in private waste collection services so as to generate income and to lessen the burden of remittances to relations at home. The AMA reduced its duties/fees to a mere cost of supervision and monitoring.

Table 2 shows a cautious combination implementation of both AMA's traditional system of solid waste collection and the PS collection experimentation over a 4-year stretch from 1992 to 1995. During these pilot trials, the AMA held to its targets. However, with time, the PS gained some confidence from residents and submetro authorities, which reflected in the increased collection coverage and performance during the period under review. From the figures in Table 2, the AMA seemed justified in the cautious step it took in the PSP pilot program because of the low equipment holding of the contractors. Performance, however, increased progressively over the period as a result of acquisition of additional vehicles and equipment. Heap collection with hired tipper trucks undertaken early in 1992 accounted for the high AMA performance. However, the pilot provided a useful guide in planning for Phase II for PS participation in solid waste collection services for all income levels and for the two service types, namely house-to-house and communal container services.

In the second and expanded phase of PS participation in solid waste collection, the PS groups received tremendous support, which saw the transfer of greater solid waste collection service responsibility onto them. This was shown by a substantial increase in coverage of solid waste collection in the PS (see Table 3). However, the rapid growth in PS involvement and the subsequent increase in performance soon declined due to the reluctance of the assembly to monitor the private groups and political interference in the organization of waste collection service sector.

5. Lessons learnt: Ghana's experience of PPP in waste collection

The observations noted and lessons learnt from the implementation of PPP in waste management in Ghana are that:

- in identifying stakeholders, an assembly must undertake a careful study of the areas to be covered by the service, which should include any NGOs and CBOs, corporate and non-corporate entities operating within the communities,

- consultations with the identified stakeholders to discuss and establish roles and responsibilities,
- the Assembly must establish within its structures the lead organization and supporting units to plan, manage and monitor the delivery of the services as the Client and Regulator of the waste management responsibility,
- resources must adequately be provided for the monitoring of privatized services if value for money and the satisfaction of all stakeholders were to be achieved through PS participation in waste management,
- the Assembly's Strategic Waste Management Plan should be developed, clearly indicating the Plan period, the projections, targets, priorities and packaging of the services to be delivered and the areas for PS participation,
- preparation of appropriate and relevant documentation (tenders, agreements, etc.) and procedures for contract/franchise procurement; franchise services should be prepared well ahead of call for tender wherever possible,
- development of regulatory mechanisms to ensure participation of beneficiaries, efficient delivery of services and application of sanctions to penalize infractions and defaults backed by relevant and enforceable bye-laws of the Assembly, and
- undertake risk analysis to pre-empt conditions that may derail the PS participation process, typically political interventions at various levels. This may usefully be accomplished in conjunction with the Assembly's Strategic Waste Management Plan, which can be given legal force through its adoption by the Assembly.

6. Conclusions

The institutional arrangement for waste collection and management in Accra and within the country at large is elaborate. Hierarchically, the Ministry of Local Government, Rural Development and Environment is responsible for nation-wide drawing of guidelines for waste management. Under a decentralized policy, Metropolitan, Municipal and District Assemblies (DAs) are responsible for the implementation of these guidelines with some modifications if needed to meet local conditions. The status of waste collection and management in the Accra metropolis is unimpressive. It lacks long-term planning as well as faces an undue political interference. It does not seem to have canvassed the support of community members and residence. However, although the collection schemes have had some implementation drawbacks and imperfections, the institutional restructuring and the involvement of private sector groups had achieved some gains in the medium term (especially within the first 15 years after reforms) in the following respect:

- that there had been marked improvement in quality of services, especially in the Operation and Management (O&M) of public toilets,

- that service coverage for solid waste collection and disposal had improved from 51% of accessible areas in 1998 to about 91% in the year 2000. However, improved coverage did not necessarily result in waste clearing as many of the private entities defaulted,
- that the private sector in the waste sub-sector had shown growth in numbers as well as in capacity,
- that the Assembly had relinquished the role of direct involvement in delivery of services and had developed skills and strategies for effective supervision and monitoring, and finally
- that the residential areas that remained to be linked to the sewer system had been leased out on contract to private sector waste service providers who are now performing well above what AMA did prior to the privatization program.

In spite of the short-term gains, the achievements made seemed to have waned and the enthusiasm of private sector groups appeared to have eroded and its performance had substantially dwindled in the long term. After 20 years of reforms, the conditions that prevailed during the era preceding the institutional reforms and the private sector participation in waste management sector begun to re-emerge and appeared to have already engulfed the low-income communities. Whilst acknowledging that a formal evaluation of the performance of the waste management sector institutional reforms and the participation of private sector groups had not been conducted, it may, however, be concluded from the analysis of post-reform trends, institutional data, and synthesis of public documents that the private sector participation probably did not show long-term sustainability because of the following lapses in the design and implementation:

- that lack of transparency in the award of waste collection contracts, franchises, and leases may have weakened the selection process and that the award of contracts was not necessarily made to qualified contractors,
- that ill-defined implementation plans for public–private sector mix of waste collection system may have provided for its practical execution tremendously difficult and/or cumbersome,
- that non-monitoring of private waste collection contractors, franchisees and leases, and lack of enforcement of contract terms by the metro and sub-metro authorities may have given way for poor services delivery in the long term,
- that lack of qualified manpower within the metropolitan authority may have led to poor planning and execution of effective and sustainable programs and compromised their sustainability,
- that political interference in the administrative matters of the metro authority may have led to loss of initial focus of the public–private sector initiative in Accra and thus compromising their long-term sustainability, and lastly,
- that the complete absence and lack of involvement of the community members and residents; for whom the waste collection services are provided, during privatization of waste collection services, in waste management decisions and program design as was obvious in contract award documents may have led to lack of support of the program.

References

- Agunwamba, J.C., 2001. Analysis of socioeconomic and environmental impacts of waste stabilization pond and unrestricted wastewater irrigation: interface with maintenance. *Environmental Management* 27 (3), 463–476.
- Agunwamba, J.C., 2003. Analysis of scavengers' activities and recycling in some cities of Nigeria. *Environmental Management* 32 (1), 116–127.
- Anikwe, M.A., Nwobodo, K.C., 2002. Long term effect of municipal waste disposal on soil properties and productivity of sites used for urban agriculture in Abakaliki, Nigeria. *Bioresource Technology* 83 (3), 241–250.
- Armah, N.A., 2001. Private Sector Participation in Waste Management in Accra, a Case Study. *Carl Bro Intl, Accra*. pp. 1–37.
- Asomani-Boateng, R., Haight, M., 1999. Reusing organic solid waste in urban farming in African cities—a challenge for urban planners. *Third World Planning Review* 21 (4), 411–428.
- Bannerman, R.R., 2000. Conflict of technologies for water and sanitation in developing countries. *Schriftenreihe des Vereins für Wasser-, Boden-, und Lufthygiene* 105, 167–170.
- Boadi, K.O., Kuitunen, M., 2005. Environment, wealth, inequality and the burden of disease in the Accra metropolitan area, Ghana. *International Journal of Environmental Health Research* 15 (3), 193–206.
- Bruggemann, H.B., 1971. Some practical aspects of water and waste water management and pollution control. *Royal Society of Health Journal* 91 (3), 144–146.
- Carboo, D., Fobil, J.N., 2004. Physico-chemical analysis of municipal solid waste (MSW) in the Accra metropolis. *West African Journal of Applied Ecology* 5 (2), 116–117.
- Darko, E.O., Fletcher, J.J., 1998. National waste management infrastructure in Ghana. *Journal of Radiological Protection* 18 (4), 293–299.
- Eliah, E., 2000. Work from waste. *World Work* (34), 18–20.
- EPA-Ghana, 1997. Guidelines for the construction and implementation of sanitary landfills. In: EPA of Ghana Quarterly, Accra, pp. 12–25.
- Fobil, J.N., Atuguba, R.A., 2004. Ghana: changing urban environmental ills in slum communities. *International Journal of Environmental Policy and Law* 34 (4–5), 206–215.
- Fobil, J.N., 2001. Factors to be considered in design of an integrated municipal solid waste management in the Accra metropolis. In: *Environmental Science Programme, Faculty of Science, University of Ghana, Legon, Accra*, p. 169.
- Fobil, J.N., 2002. Municipal wastes collection and urban environmental management in Accra, Ghana. In: *International Symposium on Environmental Pollution Control and Waste Management (EPCOWM'2002)*. Tunis, INRST and JICA, Tunisia.
- Forsyth, T., 2004. Building deliberative public–private partnerships for waste management in Asia. In: *Conference on Democratic Network Governance*. Roskilde University, Roskilde University, Denmark.
- GSS, 2004. Ghana Statistical Service Information.
- Gulis, G., et al., 2004. Health status of people of slums in Nairobi, Kenya. *Environmental Research* 96 (2), 219–227.
- Gwebu, T.D., 2003. Population, development, and waste management in Botswana: conceptual and policy implications for climate change. *Environmental Management* 31 (3), 348–354.

- Holmes, J.R., 1983. Metropolitan waste management decisions in developing countries. *Journal of the Royal Society of Health* 103 (1), 25–32.
- Kgathi, D.L., Bolaane, B., 2001. Instruments for sustainable solid waste management in Botswana. *Waste Management Research* 19 (4), 342–353.
- Laryea, N.O., 2000. Challenges for health and water resources in the Birim districts of eastern Ghana. *Schriftenreihe des Vereins für Wasser-, Boden-, und Lufthygiene* 105, 53–57.
- Leschber, R., 2002. International report: sludge management and related legislation. *Water Science and Technology* 46 (4–5), 367–371.
- Mabogunje, A.L., 1995. The environmental challenges in Sub-Saharan Africa. *Environment* 37 (4), 4–9, 31–35.
- Majani, B.B., 1996. Coping with urban growth and development through environmental planning and management (EPM): the sustainable Dar es Salaam project. *Urban Health Newsletter* 1 (28), 26–31.
- Makoni, F.S., et al., 2004. Impact of waste disposal on health of a poor urban community in Zimbabwe. *East African Medical Journal* 81 (8), 422–426.
- Makule, D.E., 2000. Pollution of water sources due to poor waste management—the case of Dar-es-Salaam. *Schriftenreihe des Vereins für Wasser-, Boden-, und Lufthygiene* 105, 117–121.
- Martinson, F.E., Marfo, V.Y., Degraaf, J., 1999. Hepatitis E virus seroprevalence in children living in rural Ghana. *West African Journal of Medicine* 18 (2), 76–79.
- Massoud, M., El-Fadel, M., 2002. Public–private partnerships for solid waste management services. *Environmental Management* 30 (5), 621–630.
- Mbuligwe, S.E., 2004. Assessment of performance of solid waste management contractors: a simple techno-social model and its application. *Waste Management* 24 (7), 739–749.
- Mtani, A., 2004. Governance challenges and coalition building among urban environmental stakeholders in Dar es Salaam, Tanzania. *Annals of the New York Academy of Sciences* 1023, 300–307.
- Nhapi, I., Gijzen, H.J., Siebel, M.A., 2003. A conceptual framework for the sustainable management of wastewater in Harare, Zimbabwe. *Water Science and Technology* 47 (7–8), 11–18.
- North, C.D., 1999. Institutions, institutional change and economic performance. In: Alt, J., North, D. (Eds.), *The Political Economy of Institutions and Decisions*. Cambridge University Press, Cambridge.
- Nuno-amarteifio, N., 1995. The Accra experience. *Countdown to Istanbul* 1 (5), 14.
- Post, J., Broekema, J., Obirih-Opareh, N., 2001. Trial and error in privatisation, experiences with urban solid waste collection in Accra (Ghana) and Hyderabad (India). In: *Space and Place in Development Geography Conference*, Utrecht.
- Satterthwaite, D., 1993. Securing water for the cities. *People Planet* 2 (2), 13.
- Stephen, C., 1999. Urban environment, health and poverty in developing countries: an analysis of differentials using existing data. In: *Faculty of Medicine*. University of London, London, UK.
- Taiwo, D., 1996. Creating a strong working relationship between the governments and the community for sustainable development of Ibadan city, Nigeria. *Urban Health Newsletter* 1 (28), 70–76.
- Von Schirnding, Y.E., 1996. Environmental planning and management in Greater Johannesburg. *Urban Health Newsletter* (28), 77–86.
- Wurapa, F.K., 1973. Typhoid in Accra: a follow-up study of typhoid fever patients at the Korle-Bu Teaching Hospital. *Ghana Medical Journal* 12 (2), 184–188.