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Challenges and prospects of private sector participation in solid waste management in Dar es Salaam City, Tanzania

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ABSTRACT

The objective of this research was to evaluate effectiveness of private sector participation in solid waste collection and transportation in Dar es Salaam City. The study covered 20 private service providers in municipalities of Kinondoni, Temeke and Ilala. Information was collected through questionnaires, interview guides, physical observation and field studies. Data were sought from 5 private companies, 15 Community Based Organizations, Dar es Salaam City Council, Waste Departments of Municipal authorities and local governments of ward and streets. The results show that private sector service providers collected and transported 9% of the 29,764 tons of solid wastes generated per week. They have also provided employment opportunities to over 350 people, who are helping to keep the city clean and increase national income through payment of various taxes. It was also observed that private sector operates in difficult conditions because of low cost recovery, the use of inferior wastes collection and transportation equipment, limited scheduling, short contract duration, inefficient system of refuse fee collection, an absence of planned wastes recycling systems, inaccessible roads and weak implementation of relevant municipal policies and by-laws. It was further noted that the success of the system will depend on accountability of municipal authorities by raising the awareness of the communities in order to improve willingness to pay for refuse fees and discourage illegal dumping of waste by individuals, enforcing municipal by-laws, and planning and promotion of environmentally friendly waste management practices.

1. Introduction

Solid waste management is a serious concern in developing countries although these countries generate less quantity of wastes (0.4–0.6 kg/cap/day) than developed countries (0.7–1.8 kg/cap/day) (UNEP, 2005; Zurbrugg, 2003). This problem is increasing because of rapid population growth, low technical capacity and financial constraints that have overloaded the public sector (Ababio, 2009; Okot-Okumu & Nyenje, 2011; Saidou & Aminou, 2015). In accordance with van de Klundert and Muller (1998), while 80–90% of households have access to water supply in Dar es Salaam, only 10–20% of the population have waste collection system. Uncollected or improperly managed solid wastes can reduce aesthetic quality of the environment and cause health and safety risks (Napoleon, Kingsley, & Joan, 2011; Wilson, Velis, & Cheeseman, 2006). Numerous species of pathogenic bacteria including *Salmonella dysenteriae, Citrobacter freundii, Citrobacter amalonaticus, Aerobacter aerogenes, Proteus vulgaris, Klebsiella oxytoca* and *Escherichia coli* have been identified in solid wastes in Tanzania (Chengula, Lucas, & Mzula, 2015). Solid wastes are also known to attract waste pickers and animals such as rodents, dogs and pigs (Oberlin, 2013; Wilson et al., 2006). Other researchers have reported the presence of heavy metals in solid waste, which, if present in high concentrations, can impede the growth or metabolism of cells of organisms and the death of several species of phytoplankton and the eggs of some fish of Open Ocean (Adefemi & Awokunmi, 2009; Sommers, Nelson, & Yost, 1976).

Solid wastes management service is an essential public service, which is non-exclusive and non-rivaled (Levine, 1995). Therefore it is not feasible to exclude from service those who do not pay, because public cleanliness and the safe disposal of wastes are essential to the public health and environmental protection. Unfortunately, solid wastes collection services of cities in developing world generally serves a limited part of the urban population and the inhabitants who are left out without solid wastes collection

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services are usually in low income population (Zhu, Asnani, Zubrugg, Anapolysky, & Mani, 2008). The problem is more pronounced in squatter settlements of the urban population where the necessary infrastructure and social services are inadequate or absent (Kasala, 2014; Kirama, 2013; Visvanathan & Glawe, 2006). It has been repeatedly reported that the management of solid wastes constitute one of the most serious public health risks and environmental problems in many urban areas of Africa including Tanzania (Chengula et al., 2015; Mayo & Mashauri, 1989); Uganda (Okot-Okumu & Nyenje, 2011; Tukahirwa, Mol, & Oosterveer, 2010), Nigeria (Abila & Kantola, 2013; Adefemi & Awokunmi, 2009), Kenya (Gakungu, Gitau, Njoroge, & Kimani, 2012; Odhiambo, 2007), Niger (Saidou & Aminou, 2015), Egypt (El-Messery, Ismail, & Arafa, 2009; Sweepnet, 2010), Ghana (Ababio, 2009) and Cameroun (Achankeng, 2003). It is estimated that about 30–80% of the solid wastes generated in developing countries are never collected (Palczynski & Scotia, 2002; UNEP, 2005). Reports from Cairo in Egypt suggest that one third of the generated solid waste was not collected, while in Kenya, nearly 70%–80% of solid wastes remain uncollected (Palczynski & Scotia, 2002).

For the areas where public sector can't provide the solid wastes management services, authorities in charge of waste management worldwide have in recent years decentralized the service by involving private sector (Ahmed and Ali. 2004; Ancog, Archival, & Rebancos, 2012; Coad, 2005; Mongkolnchaiarunya, 2005) in order to minimize the cost for service provision, reduce activities of local governments and to increase coverage and supply of various waste management services. Studies in Canada have shown that private sector service costs are at least 25% lower in most provinces while in Latin America private sector costs are about 50% lower due to higher labor and vehicle productivity (Levine & Coad, 2000). In Tanzania, Jica study report indicated that solid wastes management private contractor Multinet Africa Co. Limited unit cost of US$ 13.14 is only 52.9% of the cost incurred by Dar es Salaam City Council (van de Klundert & Muller, 1998). In accordance with United Nations Centre for Human Settlements and Ford Foundation (1998) Nairobi City Council (NCC) in Kenya successfully redeployed 525 workers and vehicles to their departments, saving US$ 30,000 exclusive of fuel and vehicle maintenance costs, after offering contract to private refuse handlers. Such privatization increased the Council's refuse collection performance efficiency and effectiveness from 40% to 90% although delays in payments to the private contractors have negatively affected their operations (United Nations Centre for Human Settlements and Ford Foundation, 1998).

Privatization of municipal solid waste (MSW) collection has become a major environmental policy for years in United States and the United Kingdom where more than 80% of waste collection was done by private companies in 1990 (Lin & Kao, 2008). However, between 1990 and 1997, less than 0.2% of all private sector investments in water and sanitation in the developing world involved Sub-Saharan African countries (Davis, 2005). In recent years, privatization policy was conceived in several African countries including Ghana (Ababio, 2009), Tanzania (Kaseva & Mbuligwe, 2003; Ndubuya, 2006), Kenya (Rotich, Zhao, & Dong, 2006) and Uganda (Tukahirwa et al., 2010). By the end of 2000, at least 93 countries had privatized some of their water, wastewater or solid waste services through leases, concessions, Build Operate and Transfer (BOT)-type agreements, and/or divestiture (Davis, 2005).

In 1992, the Sustainable Dar es Salaam city project (SDP) introduced the Environmental Planning Management (EMP) process with the aim of supporting Dar es Salaam City Council to promote new partnership among public, private and community sectors (Kassim & Ali, 2006; United Nations Centre for Human Settlements (Habitat) Nairobi, Kenya and Ford Foundation, 1998). Public Private Partnership is considered as cooperation between public authority and private sector to provide better services to the community (Nkya, 2006). Private sector participation in waste management came to effect officially through a by-law enacted in 1993 under the initiative of sustainable city program (Kaseva & Mbuligwe, 2003), which was passed to enable the privatization of solid waste collection in some central areas of Dar es Salaam city as a strategy of expanding solid waste collection and disposal services provision by private sector. In Tanzania, in many places formal and informal small- and medium-level private-sector participation, including private companies and Non- Governmental Organizations (NGOs), Community Based Organizations (CBOs) are involved (Kirama, 2013).

In accordance with United Nations Centre for Human Settlements and Ford Foundation (1998), after privatization in 1994, when Multinet Africa Co. Limited was awarded the sole contract, there was a remarkable improvement in solid waste management with up to 75% of the wastes generated in privatized zones being collected. In recent years, the total number of registered private companies in the city has increased to 49 (Kaseva & Mbuligwe, 2003), but 12 contractors (mostly CBOs) were not operating due to financial constraints (Kirama, 2013). According to the Dar es Salaam City Council, by 2010 only 23 private companies were involved under the franchising system and 44 out of 73 (60%) wards in the city are being serviced under this system. Even after introducing private sector participation in solid wastes collection only 38.5% of 29,764 tons generated per week was collected and transported to the Dar es Salaam city dumpsite. Inadequate collection and disposal was because of inadequate budget allocation for management of wastes, poor institutional capacity and infrastructures. Other factors include poor logistics, management skills, technology and financial resources and high rate of urbanization. The objective of the research is to evaluate effectiveness of private sector participation in solid waste collection and transportation in Dar es Salaam City.

2. Methods and materials

2.1. The study area

Dar es Salaam city, with a total surface area of 1397 km^2, is the centre for administrative, commerce and industrial activities of Tanzania (Dar es Salaam Strategic Plan 2010/2011-2012/2013). It lies along the Western Coast of Indian Ocean between 6 and 7° South of the Equator and between longitudes 33 and 39° East of Greenwich. It borders with Coast Region in the North, West and South while to the East, the Indian Ocean (see Fig. 1). The city experiences hot and humid climate throughout the year with an average air temperature of 26 °C.

In accordance with population and housing census of 2012, Dar es Salaam city has a population of 4.36 million, which is accounting for 10% of the total Tanzania Mainland population of 43,625,354 people (URT, 2012). The average rate of growth for the period of 2002–2012 was 5.6% per annum, which was the highest in the country and is above the national population growth rate of 2.7% (URT, 2012). Administratively, the city is divided into three municipalities of Kinondoni, Ilala and Temeke each with independent administrative framework. Each municipality has its own procedures for management of solid wastes such as by-laws, budgets, equipment and human resources.

2.2. Sample size and sampling technique

The population of the study included private service providers, municipal authorities, the local government authorities and Dar es Salaam City Council, which is the overall overseer and adviser of