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Financial sustainability in municipal solid waste management – Costs and revenues in Bahir Dar, Ethiopia ☆

Christian Riuji Lohri *, Ephraim Joseph Camenzind [1], Christian Zurbrügg [1]

Eawag: Swiss Federal Institute of Aquatic Science and Technology, Department of Water and Sanitation in Developing Countries (Sandec), Überlandstrasse 133, P.O. Box 611, 8600 Dübendorf, Switzerland

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ABSTRACT

Providing good solid waste management (SWM) services while also ensuring financial sustainability of the system continues to be a major challenge in cities of developing countries. Bahir Dar in northwestern Ethiopia outsourced municipal waste services to a private waste company in 2008. While this institutional change has led to substantial improvement in the cleanliness of the city, its financial sustainability remains unclear. Is the private company able to generate sufficient revenues from their activities to offset the costs and generate some profit?

This paper presents a cost-revenue analysis, based on data from July 2009 to June 2011. The analysis reveals that overall costs in Bahir Dar's SWM system increased significantly during this period, mainly due to rising costs related to waste transportation. On the other hand, there is only one major revenue stream in place: the waste collection fee from households, commercial enterprises and institutions. As the efficiency of fee collection from households is only around 50%, the total amount of revenues are not sufficient to cover the running costs. This results in a substantial yearly deficit. The results of the research therefore show that a more detailed cost structure and cost-revenue analysis of this waste management service is important with appropriate measures, either by the privates sector itself or with the support of the local authorities, in order to enhance cost efficiency and balance the cost-revenues towards cost recovery. Delays in mitigating the evident financial deficit could else endanger the public-private partnership (PPP) and lead to failure of this setup in the medium to long term, thus also endangering the now existing improved and currently reliable service.

We present four options on how financial sustainability of the SWM system in Bahir Dar might be enhanced: (i) improved fee collection efficiency by linking the fees of solid waste collection to water supply; (ii) increasing the value chain by sales of organic waste recycling products; (iii) diversifying revenue streams and financing mechanisms (polluter-pays-, cross-subsidy- and business-principles); and (iv) cost reduction and improved cost-effectiveness.

We argue that in a PPP setup such as in Bahir Dar, a strong alliance between the municipality and private enterprise is important so that appropriate solutions for improved financial sustainability of a SWM system can be sought and implemented.

1. Introduction

Solid waste management (SWM) often represents a significant proportion of the total recurrent municipal budget in cities of low- and middle income countries (Scheinberg et al., 2010). Despite the high financial burden, the local authorities often struggle to provide adequate and reliable services for all. According to the World Bank and USAID, it is common for municipalities in developing countries to spend 20–50% of their available municipal budget on SWM, which often can only stretch to serve less than 50% of the population (Henry et al., 2006; Memon, 2010). Public sector inefficiencies and continuously increasing cost has led local authorities to analyze if this service can better be provided by the private

Abbreviations (see Fig.1): ANRS, Amhara National Regional State; BDU, Bahir Dar University; FfE, Forum for Environment; GIZ, German Agency for International Cooperation; GOs, Governmental Organizations; SBPD, Sanitation, Beautification and Park Development; SME, Small & Medium Enterprise; UNDP, United Nations Development Programme; UNEP, United Nations Environmental Programme; WB, World Bank.

* Corresponding author. Tel.: +41 58 765 54 20; fax: +41 58 765 53 99.
E-mail addresses: christian.lohri@eawag.ch (C.R. Lohri), ephraimcamenzind@hotmail.com (E.J. Camenzind), christian.zurbruegg@eawag.ch (C. Zurbrügg).
[1] Tel.: +41 58 765 52 86; fax: +41 58 765 53 99.

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sector (Massoud and El-Fadel, 2002). Increasingly public–private partnerships (PPP) have emerged as an alternative to improve municipal solid waste service performance at lower costs (Cointreau et al. 2000; Zhu et al., 2007; Abdrabo, 2008). But even with a new partnership approach the financial aspects of municipal SWM remain critical for ensuring sustainability of the system. This concerns budgeting, cost accounting, financial monitoring and evaluation aiming at recovering sufficient money to cover recurrent operational expenditures of the collection service as well as to stock up capital for new investments or large maintenance. These methods are too seldom employed and the municipality rarely knows the actual cost of providing the service (Bartone et al., 1990; Diaz et al., 1999; Schübeler, 1996; Wilson et al., 2012). While external capital may often be needed for major investments, the recurrent costs should by preference be covered by a combination of user fees, and local taxes, but some degree of cross-subsidization and/or financing out of governmental sources may be needed to ensure equitable access to service (Schübeler, 1996; Wilson et al., 2013). However, before taking any strategic decision on how to proceed, it is, as a first step, indispensable to establish a full understanding of the current costs for provision of the services and the respective revenues (Hoornweg et al., 2005). Typically total costs are underestimated by up to 50% (Coffey and Coad, 2010). To safeguard financial sustainability it is important that all short-term as well as long-term financial costs are taken into account and that procedures are in place for obtaining regular revenues to cover these costs. The lack of specific financial monitoring and analysis of data is one of the major barriers for not being able to sustain any envisaged improvement of the SWM system (Hanrahan et al., 2006; Zurbrügg et al., 2007; Parthan et al., 2012). This study aims at filling this gap by analyzing cost and revenues of the private waste company in Bahir Dar and pointing out options on how financial sustainability can be improved in SWM of developing countries.

Bahir Dar, a city with 220,000 inhabitants in northwestern Ethiopia, is one of the fastest growing cities in the country (UNEP, 2010a). If the current annual population growth rate of 6.6% continues, the city population will double in 11 years. Thus the need for adequate SWM is unquestionable and well acknowledged by the municipality (Mekete et al., 2009). In 2008 the local government was approached by a newly formed private waste company, who offered to take over the services of waste collection, transport and disposal. The municipality acknowledged that despite high expenses, it had not been able to achieve sufficiently satisfying services, resulting in low collection coverage. Hence it agreed to outsource their main SWM activities by contracting the private waste company. Excluded from this new arrangement were tasks which remain the duty of the municipality. These are monitoring of service provision and quality control, which remained the responsibility of the public sector, the City Administration. As a consequence of this organizational setup, obvious improvements in city cleanliness have been achieved (UNEP, 2010b). Nevertheless a major challenge remains to ensure that this partnership can endure, whereby one important factor is the degree of financial sustainability, i.e. that ongoing expenditures for providing the service can be sufficiently recovered through an efficient but equitable revenue system.

The research conducted in Bahir Dar was guided by the question if the private company is able to generate sufficient revenues from their activities to offset the costs and generate some profit. Or in other words, how financially sustainable the current system is and if necessary, where and how it can be improved. This paper presents a delineation of the institutional and organizational structure and presents and discusses the results of the financial assessment. In conclusion, based on the data available, some recommendations are proposed how the current financial aspects might be improved.

2. Methodology

Methods used for this research involve qualitative as well as quantitative approaches, and are briefly summarized as follows:

- Document and literature analysis: On one hand literature on financial assessments in SWM related to the low- and middle-income country context, on the other hand documents directly or indirectly related to the SWM situation in Bahir Dar.
- Participatory observations concerning the SWM situation in Bahir Dar and its surroundings to understand the system setup.
- Material flow analysis with secondary data sources (Brunner and Rechberger, 2004) involving a system description for solid waste flows in Bahir Dar which was then depicted in a process (and material) flow diagram (Rodic et al., 2010).
- Stakeholder identification and assessment (Schmeer, 1999) delineating the institutional and organizational structure, as well as assessing the influence, interest and attitude situation.
- Semi-structured interviews with a wide range of stakeholders to obtain information on staffing, infrastructure, costing and working conditions.
- Information obtained through the interviews were cross-checked with the objective to reassess gaps and divergences of information. Reassessment questions were based on issues of divergences.
- Analysis of disaggregated costs into SWM activities (process cost accounting) and of revenues into sources.

The financial assessment and cost-revenue analysis was restricted to the activities of the private waste company, aiming at understanding the financial sustainability of this main service provision stakeholder in the SWM system of Bahir Dar. Other financial flows and important stakeholders such as the informal collection and recycling sector were not included in this analysis due to limited availability of data. Two cost categories were distinguished in the analysis, up-front investment costs – also called capital expenditures (Capex) – and operational expenditures (Opex). Capex are business expenses to create future benefit such as acquisition of assets like infrastructure, machinery, equipment or upgrading of existing facilities so their value as an asset increases. Expenditures required for the day-to-day functioning of the business like salaries, maintenance and small repairs fall under the category of Opex. This includes the annual depreciation of infrastructure and equipment by 20%, a figure used by the private waste company. Back-end costs (long term costs and externalities) were not considered in this analysis, since these costs are generally difficult to quantify and are most often completely neglected in the budgets by the responsible authorities, e.g. the budgeting for site closure or post-closure care, environmental pollution mitigation costs, etc. All monetary values are listed in US Dollars (USD), whereby 1 USD is 17 ETB (as of April 2011). To understand the processes and events that led to the current situation or context historical narratives, timelines and time trend analysis were used which were integrated as questions for the semi-structured interviews. Nevertheless the quantitative financial data collected represents only a snapshot in time and covers the 2-year period from July 2009 to June 2011.The site visit, interviews, and data collection occurred in Bahir Dar from April to July 2011. Analysis was conducted conjointly with data collection but then extended further over a period of one year after the site visit.