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Exploring the challenges facing the solid waste sector in Douala, Cameroon

Abstract

In Douala, Cameroon, solid waste volumes and disposal costs are rising, placing pressure on a municipality that has a small tax base and multiple demands for its meagre resources. Initially the municipality outsourced the collection and disposal of solid waste to the private sector, but collection rates are declining. Informal solid waste pickers operate in the sector, but their collection rates are low. The Cameroonian government now sees a public private partnership approach as a cost efficient solution to the problem. This study interviewed key decision makers within the solid waste sector to establish how the sector could become profitable, while improving collection and recyclable recovery rates. Results show that the Cameroonian government has not fostered an enabling environment for the private sector to flourish. Unless this changes, the number of enterprises, operating profits and recyclable recovery rates will not increase. An inadequate organizational structure; poor logistical support; lack of capital and technical expertise; inhibiting government policy and regulations; as well as low levels of awareness and education at the household level inhibit growth of the sector. All stakeholders wanted the government to create a favorable climate for change through engagement and collaboration.

Keywords: Cameroon, sustainability, public-private partnerships, stakeholders, solid waste.

JEL Classification: Q580.

Introduction

As with many developing countries, Cameroon is experiencing exponential growth in the generation of municipal solid waste due to rapid, unplanned and unmanaged urbanization; rising urban population numbers and increased economic activity (Minghua et al., 2009; Guerrero et al., 2013). Cameroon generates approximately 6 million tons of municipal solid waste per annum, making solid waste a significant environmental and public health hazard (Palouma, 2013). The rate of generation far exceeds the capacity of local municipalities to deal with it due to inadequate financial resources, organizational capacity and technical expertise (Sujuddin et al., 2008). So far little effort has been directed towards understanding the solid waste chain holistically (Morrissey & Browne, 2004). Coupled with this, is the view that solid waste management is a 'removal and disposal' issue, resulting in the adoption of inappropriate, highly engineered solutions (Chang et al., 2011). After attempting a wholly formal private sector approach, Cameroon has now adopted a public private partnership approach to manage solid waste. This study sought to establish what challenges the Cameroonian government must overcome to foster the enabling environment such a public-private partnership requires. Firstly, an outline of the international experience, is presented, then there

is a description of research aims, objectives and methodology, before the results and findings are presented.

1. Motivation/rationale

Understanding how the various stakeholders engage with issues and collaborate, is a key determinant of successful delivery of municipal solid waste management services. Collaboration between stakeholders often determines service delivery success (or failure). These stakeholders are multiple – the community, NGOs, CBOs, business (formal and informal) and local/national government. As Medina (2008) found that roughly one percent of all urban dwellers in developing world depend on waste picking to sustain themselves, and waste picking is a well-known feature of life in Douala, this study elected to focus on how informal operators could be better integrated into the solid waste management chain as SMMEs. In particular, then, the study wished to determine how small, medium and micro-enterprises could help Douala manage its solid waste problem.

2. Literature review

For developing countries, the increase in municipal solid waste can be attributed to population increase; rapid urbanization; better incomes and poor urban town planning (Minghua et al., 2009; Yango, 2014). Solid waste problems are compounded if cities are under serviced, have poor infrastructure and poor road networks (Melara Arguello et al., 2013). Although internationally the trend is to move beyond solid waste disposal to resource recovery and/or incineration for energy production, both options are

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limited for developing countries as roughly 55% of their solid waste is organic material (Troschinetz & Mihelcic, 2009). Additionally, many developing countries lack the money, skills, administrative systems and infrastructure required to manage solid waste disposal adequately (Zurbrügg et al., 2012a). Other challenges include: constantly changing government policy and regulations; poor or no waste categorization (which inhibits waste separation); low levels of household awareness of good solid waste management practices; a limited market for recycled-materials and lack of available space for solid waste facilities (Troschinetz & Mihelcic, 2009). Thus, an integrated, multi-stakeholder approach is recommended, involving the development of a solid waste management framework focusing on the hard [physical] (collection, sorting and recycling) and the soft [social] issues of governance (stakeholders, financial instruments, legislation and policies, NGO's/CBO's) (Wilson & Scheinberg, 2010; Zurbrügg et al., 2012a).

Good solid waste management requires a multidimensional approach involving all stakeholders (Medina, 2010). Stakeholders include planning agencies; environmental regulators; politicians; sector agencies; residents; NGOs; the formal and informal private sector; agents of mass communication and technical/scientific communities (Joseph, 2006). Unfortunately, not all these stakeholders feel that they have a role to play. Communities, for example, often think solid waste management is solely a government function and politicians are often focused on other issues (Alavi Moghadam et al., 2009). Part of the problem is the traditional approach to solid waste management is a centralized, undiversified, bureaucratic, capital intensive and formalized one (Medina, 2010). While some developing countries, such as Uganda, have attempted a decentralized model, the full benefits were not realized due to institutional, infrastructural and legislative deficiencies (Oosterveer & Van Vliet, 2010). Ahmed & Ali (2004) found that conflict between local and national government over the legal framework and financial resources to govern a decentralized model hindered implementation and so feel that public private partnerships (PPPs) are the best way forward with respect to stakeholder involvement. Thus, public private partnerships (PPP's) are on the rise (Minghua et al., 2009; Medina, 2010; Guerrero et al., 2013).

Some PPPs have been successful. A PPP in Khulna, Bangladesh, resulted in cleaner streets and significant behavioral change (Ahmed & Ail, 2006). Medina (2010) found that PPPs could be a source of low-cost, low-tech, labor intensive, decentralized

solutions to solid waste management. A shared vision is a prerequisite. Important too is the need for government to ensure that it tables effective, consistent laws and policies that are flexible enough to adapt to changing circumstances (Oosterveer & Van Vliet, 2010; Guerrero et al., 2013). Joseph (2006) argues that well enacted laws and policies that integrate the public and private sector into the management of solid waste is essential, a view shared by Asase et al. (2009) who found a positive correlation between an efficient, integrated solid waste management system and an adequate legal framework. Without this, business operates in uncertainty which inhibits economic risk taking (Ahmed & Ali, 2004; Kruljac, 2012). Mahalingam et al. (2011) believe that government must play a regulatory and supportive role, as an active client who facilitates the development of stakeholder knowledge and capacity. A successful PPP needs good leadership and active community participation (Wilson et al., 2015). But most PPP's in developing countries have not worked due to distrust between the stakeholders; lack of political will to ensure collaborations work and poorly designed and structured PPPs. Government officials also lack the ability to work well with the private sector (Deutz et al., 2006).

PPPs are borne out of the notion that involving the private sector is panacea for the municipal solid waste problems (Oosterveer & Van Vliet, 2010; Guerrero et al., 2013). Thus, PPPs are often linked to privatization efforts, with the aim of getting the private sector to build facilities and provide services (Medina, 2010). But often the private sector struggles to raise capital, due to high transaction costs and/or a lack of collateral (Busse, 2012). Thus, private sector investment requires 'financial carrots' such as tax exemptions; concessional rates for land, power and water and the signing long term contracts (Guerrero et al., 2013). For the most part, it works if private enterprises see a gap in solid waste management that they can exploit for profit (Ahmed & Ali, 2004). There are some unintended negative consequences to private sector involvement, however. In Egypt, plans to privatize municipal solid waste management attracted the interest of multinational companies with mechanized and industrialized approaches, thus, threatening the livelihoods of informal waste pickers (Fahmi & Sutton, 2010). Additionally, while private enterprises might have better collection rates often only households who can pay are serviced (Zia et al., 2008).

Consequently, failure of either the formal private sector, or the government, to successfully deal with municipal solid waste results in a rise of informal operators (Paul et al., 2012). Wilson & Scheinberg

(2010) describe these informal operators as small-scale actors engaged in recycling or waste recovery, not officially recognized, existing in parallel to the public or formal private sector. They are seldom integrated into the solid waste management framework (Guerrero et al., 2013). Despite this, they play a significant role in reducing solid waste volumes and often post better recycling rates than any other stakeholder (Fahmi & Sutton, 2010; Paul et al., 2012). For example, in Lima and Callao, Peru, they collect almost 19.2% of all recyclables, compared to 0.3% by the formal sector (Salhofer et al., 2013). Economically, waste picking provides many with an income. Thus, Nissim et al. (2005) and Sharholly et al. (2008) argue that regulating and organizing the informal sector is a cost effective way to manage municipal waste management. This includes helping micro-recycling ventures become established and easing their access to the recyclable market (Minghua et al., 2009). Nonetheless, China found it difficult to formalize and organize the sector. Waste pickers also generate a lot of litter when they sort through waste to remove the recyclables. Thus, there is a negative perception of these people (Zurbrugg et al., 2012a). Lastly, rummaging through waste has serious health implications for the waste pickers. In summary, although the informal sector can achieve remarkable recycling rates, their social, economic and environmental contributions are often overlooked and as a vulnerable group they need protection (Salhofer et al., 2013).

Another key stakeholder are NGOs, who either complement or add value to municipal waste management services by facilitating collaboration between stakeholders; training and organizing waste pickers and/or implementing composting plans (Zurbrugg et al., 2012b). Scholars such as Rathi (2006) and Wilson et al. (2009) found that NGOs play a significant role in formalizing informal operators in India, Brazil, Peru, Columbia and the Philippines. But NGOs are reliant on an enabling environment and so regulations promulgated by central or local governments can either help or hinder their activities (Mayhew, 2005). NGOs must also comply with the legal framework of the donor agencies, further constraining them (Abou Assi, 2012). Ahmed & Ali (2004, 2006) found that often the durability of NGO initiated projects depends solely on the extent to which the NGO is interested and has sufficient donor funds. Other researchers found issues such as the age of the NGO, the number of staff members and levels of expertise to have significant impact on their ability to play a positive role in solid waste management (Lina et al., 2014). Despite the aforementioned challenges, the role of NGOs should not be overlooked (Tukahirwa et al., 2010).

Community based organizations (CBOs) are also key players in achieving sustainable solid waste management solutions (Ahmed & Ali, 2004). CBOs often have a better understanding of community issues and, thus can help plan and implement solid waste management interventions (Tukahirwa et al., 2010). Despite this, the relationship between CBO's and the local authorities is often poor (Hardoy et al., 2014). This may be because building collaborative relationships with CBO's is time consuming (Kearney et al., 2007). Despite this, there is increasing recognition that engagement with civil society is essential (Tukahirwa et al., 2010). Another aspect of civil society is individual households, as they generate the waste and have an important role to play in waste separation at source (González-Torre & Adenso-Díaz, 2005). But, households are diverse, with different social, professional, income levels, religious/cultural orientation, so achieving their collaboration and participation can be difficult (Joseph, 2006).

Seik (1997) suggests four factors, which could help minimize household waste production: (a) Financial Incentives; (b) Educational levels; (c) Awareness through communication and (d) Operational aspects. As household finances affect the ability to pay for waste collection and disposal, financial incentives are required to encourage waste separation at source (Troschinetz & Mihelcic, 2009). However, Schultz et al. (1995) warn that financial incentives may not be viable for cash strapped local authorities. Financial rewards may also encourage short-term behavior, and when the rewards end, old behaviors return. Sujauddin et al. (2008) found in Chittagong, Bangladesh that bigger families and households that are more educated, generate more waste. In Accra, Ghana, lack of awareness was found to be linked to illegal waste dumping (Oteng-Ababio et al., 2013). Marketing and communication are essential if perceptions, motivations, knowledge, and behaviors of households are to be changed (Thomas, 2001). Communication should be regular and of a good quality, although some argue that mass environmental education by authorities is required (Evison & Read, 2001). Household waste separation is also hampered by a lack of resources and facilities, such as inadequate collection systems, improper routing, lack of information on collection schedules, insufficient infrastructure, poor roads and few collection trucks (Alavi Moghadam et al., 2009). For example, illegal dumping occurs when no proper roads link households to central collection points, or there is an absence of disposal bins and/or the relative distance between disposal points is large (Guerrero et al., 2013).

3. Methodology and research questions

This study sought to determine how small and medium sized enterprises (SMMEs) operating in the solid

waste sector, in Douala, Cameroon, could be supported. An exploratory approach was adopted, using in-depth open-ended interviews. Non-probability purposive sampling was used due to time and cost constraints, but representatively of stakeholders was ensured, by creating a sampling frame. Interviews were conducted with representatives of community based organizations (CBOs); non-governmental organizations (NGOs); the public sector; households and the private sector. There were ten respondents, two from each stakeholder group (see Table 1). Interviews were conducted in French and later translated. Data analysis was done using the Atlas.ti software package. Themes were identified using the literature and an analysis of the transcripts. The themes were giving operation definitions, for example “*Financial resources*” was defined “*as anytime there was a quotation that referred to finance*”. Codes which emerged as more pertinent were labeled as categories or primary codes.

The research questions were: (1) What is hindering the emergence of SMMEs specializing in solid waste disposal? (2) How easily can SMMEs access and operate in the market for recyclables? (3) What role can NGOs and CBOs play in assisting SMMEs to become established and/or grow in Douala, Cameroon? and (4) What role can households play in assisting SMMEs operating in the solid waste management sector?

Table 1. List of stakeholders interviewed for the study

Respondent 1	Head of environmental affairs – Douala urban council	Actively involved in various municipality waste management programs and recently was in charge of supervising the activities of the NGO, ISDERA ¹
Respondent 2	Employee of HYSACAM	Part of the management team
Respondent 3	Community based leader	Who also works with NGOs
Respondent 4	Community based leader	Who also works with NGOs
Respondent 5	Employee of the NGO, ISDERA	Actively involved in Douala Urban Council and the Foundation Camerounaise de terre Vivante (FCTV)
Respondent 6	Waste and wealth NGO	British based NGO, supervises various projects in Cameroon
Respondent 8	President of the Association of Waste Pickers in Douala	Manages the activities of all waste pickers in and around the central depot of Douala
Respondent 7	Waste picker & itinerant buyer	Buys scrap metals scavenged by the Malians from various dumpsites
Respondent 9	Director of BOOM	Significant player in the recycling industry, has recently built a plastic recycling plant
Respondent 10	Consultant Global Environmental Consultation Inc	Knowledgeable on Douala and waste management in the city.

¹ Innovative Service in Difficult Environment for Recycler Artisan.

The study area: Douala, Cameroon: Douala, Cameroon home to 3 million people, and accounts for 33% of Cameroon’s GDP (City Alliance, 2014). Douala suffers greatly from urban sprawl and an influx of rural migrants. Although economic growth is strong (6% pa) many Cameroonians are poor and the formal economy is weak (City Alliance, 2009). Douala faces significant financial, institutional and logistical challenges relating to solid waste management (Oteng-Ababio et al., 2013). In 1969 Douala outsourced the collection and disposal (in landfills) of solid waste to Hygiene est Salubrite du Cameroun (HYSACAM) (Ymele, 2013). But, HYSACAM is not coping with rising waste volumes and collection rates are declining. Consequently, there has been an increase in informal waste operators (Manga et al., 2008; Mbeng, 2013). Logistically it is difficult to provide solid waste removal services in a situation of rising population numbers, a small tax base, poor urban planning and inadequate infrastructure provision (CLUVA, 2012). For example, Douala’s municipal officials still rely on outdated urban plans designed in the 1960’s (Yango, 2014).

Cameroon is party to several international conventions on solid waste management, namely: The Stockholm Convention (effective May 2002); The Rotterdam Convention (ratified in 2002) and The Bale Convention (of 5 May 1992). Cameroon has also ratified the Bamako Convention of 1996 (which banned the importation, and movement of dangerous waste on the African continent) (Palouma, 2013). Additionally, several policies and laws have been enacted to prevent environmental pollution, specifically solid waste generated at the municipal level (Manga et al., 2008). These decrees and laws are listed in Table 2. Decree N°2011/2581/PM of 23 August 2011 gives authority to the Ministry of Environment to regulate the importation, transit, use and disposal of toxic and dangerous chemicals. Decree N°004/MINEPDED/MINCOMMERCE of 24 October 2012 categorizes non-biodegradable substances and confers the responsibility of managing them to the importing or manufacturing company. All dealers in non-biodegradable substances must have a valid environmental permit. The current solid waste management situation in Cameroon is further complicated by the multi-layered nature of the administration (Manga et al., 2008).

4. Findings

The following emerged as key impediments to the evolution of SMMEs specializing in solid waste management in Douala:

4.1. An inhibitory statutory and regulatory framework.

The regulatory and statutory framework

is tough and rigid due to the many international conventions and local laws governing the sector. The complex, costly and multi-layered system also reduces compliance, especially by SMMEs who lack the capacity to comply compared with large organizations. Additionally, the majority of informal stakeholders are poor and uneducated, unable to understand and adhere to the legal requirements. In fact, some informal stakeholders are exiting the sector instead of getting permits. Permits are not easy to obtain (and bribes may have to be paid); few informal operators feel it confers benefits and most are fearful of the tax implications. Nevertheless, lack of formalization is limiting their profitability and growth prospects. Respondent 5 said that without permits: “it is impossible to sign contracts with companies like Brasseries du Cameroon, HYSA-

CAM and other multinationals ... this is a huge market they are losing”. Worse, even ordinary community members are now ceasing to do any solid waste management, as Respondent 5 said “*even those who were just cleaning their neighborhoods felt they should no longer do so because they now need an environmental permit*”. *BOCOM recycles used batteries but now to sell to BOCOM you must have a tax license*”. This comes at the same time when informal traders are trying to form associations but, as Respondent 9 said “*there are so many taxes and government regulations which we have to comply to, which makes the system complicated and unprofitable*”. In a situation like this, informality inhibits growth and blocks access to markets and finances, but the legal hurdles are maintaining a vicious circle.

Table 2. Roles and responsibilities of ministerial departments regarding waste management in Cameroon

Key responsibilities	Statutory order	Ministry
Ensures that the Councils implement regulations. Oversees expenditure execution of Council support fund (FEICOM). Urban Councils are responsible for follow-up and control of industrial waste, hygiene and public sanitation, which includes sweeping of streets and collection, transportation and treatment of household waste.	Circular letter No.0040/LC/MINAT/DCTD of 04/04/00 Order No.00072/MINAT/MINVILLE of 21/05/00 Law No.714/23 of 5/12/74 Law No. 2004/18 of 22/07/04	Ministry of Territorial Administration and Decentralization (MINTAD)
Develops strategies for the control of classified and commercial installations regarding pollution, security, hygiene and industrial nuisance. Defines norms for industrial pollution. Lists dangerous, obnoxious and polluting facilities. Develops regulations governing installation and exploitation of facilities classified as dangerous, obnoxious and polluting.	Decree No. 99/818/PM of 9/11/99 Order No. 13/MINMEE/DMG/SL of 19/04/77,02/MINMEE/DMG/ SDAMI of 4/01/9	Ministry of Mines, Industries and Technological Development (MINMITD)
Ensures financial controls of Urban Councils are adhered to. Responsible for enforcing the Finance Law.	Constitution Decree No. 2004/320 of 08/12/04	Ministry of Economy and Finance (MINEFI)
Develops and implements urban restructuring, management strategies, sanitation and drainage. Draws up and enforces norms of hygiene/sanitation, collection and/or treatment of household waste.	Order No. 00072/MINAT/MINVILL of 21/05/00	Ministry of Urban Development and Housing (MINDUH)
Collaborates with other agencies to define measures for the rational management of natural resources. Investigation of pollution in the field. Specifies the criteria (project specific) and supervises environmental impact assessments.	Decree No. 2005/0577/PM of 23/02/057 Order No. 006/MINEP of 08/03/05	Ministry of Environment and Nature Protection (MINENP)
Creates Hygiene and Sanitation Units in Councils and renders technical support for them. Stipulates norms for collection, transportation and treatment of industrial, domestic waste and emptying of septic tanks. Designs and implements public education campaigns on hygiene and sanitation.	Order No. D67/NS/NN/ST/SG/BMPHP/NNPA of 11/08/87, Circular letter No. D69/N6/DMHK/SHPA of August 1980	Ministry of Public Health (MINPH)

Source: Manga et al., 2008, p. 2.

4.2. Poor structure & disorganization of the sector.

The unstructured and disorganized state of the industry inhibits growth as role players operate in isolation [Respondent 1]. For example, although there is demand for recyclables, standalone waste pickers cannot accumulate significant quantities to satisfy local production requirements. Although an association could help the waste pickers by pooling resources and lowering costs, one still has not emerged. Isolation was partly attributed to a lack of a national waste management plan [Respondent 10]. The entire solid waste management chain is unstructured with no clear responsibilities and roles. Respondent 5 cited a dispute with municipal agents “*when we try to organize guys on (sic) the field we face obstacles and questions from the municipalities on why we are taking on a responsibility which is theirs*”. Part of the problem is that several government departments are in charge of implemen-

ting different aspects of the legislation. With documentation and certification required from different ministries, starting a company is administratively cumbersome and costly. Respondent 5 indicated that there is a need to “*lessen the government regulatory burden...because the regulatory frame work is very complex and this does not favor the emergence of micro-enterprises*”.

4.2.1. Inadequate logistical support & poor infrastructure. Informal operators rely on bags or a “pousse-pousse¹” to move the waste. The use of better transport equipment is desperately required. This is because there a mismatch between where significant volumes of recyclables are located and

¹ A bicycle with a sidecar/basket attached once used to move farm produce.

where they can be sold. However, the sector lacks the logistical capacity to move large volumes cheaply. Respondent 8 explained: *“when we recover large quantities we cannot move it by “pousse-pousse” or motor-bikes, we need trucks. Then it becomes very expensive... we then have to stockpile it before we can move it”*. Some waste pickers are located at a central dumpsite where there are facilities to buy the recyclables, but prices here are low and competition high. Others, therefore trek long distances to source the waste materials [Respondent 7]. Thus, Respondent 6 suggested a communication forum to allow waste buyers/pickers to know where they can buy/sell the waste. Transport, however, is not their only problem. Respondent 1 commented: *“There is also the problem of storing the goods and packaging them according to procedures which regulate the sector”*. Respondent 3 went on to add that technology is also an issue *“Very few companies have the technology (shredders for plastic waste for example) to recycle solid waste, because the equipment necessary involves a large capital investment”*. In addition, most waste pickers make too little money to buy basic Personal Protective Equipment (PPE). Consequently, the President of the Waste Pickers felt that the lack of PPE at the QUAI deport caused waste pickers to become ill and die: *“I have witnessed several deaths emanating from accidents...a simple puncture from a used syringe can infect you with diseases”*.

4.2.2. A lack of financial resources. The limited financial resources of waste pickers/buyers also inhibit the emergence of SMMEs. Firstly, there is insufficient capital to upscale operations to make them more efficient and profitable. Secondly, access to loans or government financial incentives is limited despite the existence of government aligned funding agencies. This is because their rules and requirements (such as demanding operators have a bank account) do not accommodate the informal traders. In addition, formal registration is a requirement for a loan [Respondent 8]. Respondent 6 also commented *“The law of 2007 regulates artisanal grants, loans and training. The government also setup a bank to support this sector. But most role players are informal and so do not qualify and cannot usually provide the myriad of documents required to qualify”*. Thus, starved of capital, the sector is locked in a vicious circle of low volumes.

4.2.3. Low levels of technical expertise. Due to its nature and the negative perception of waste held by the public, most individuals use the sector as a means of survival only. Such individuals are from the most underprivileged strata of society, poorly educated and have no knowledge or technical expertise on solid waste management [Respondent 6].

Thus, the sector needs to build capacity *“through workshops and seminars”* [Respondent 3]. In Douala, lack of business skills and experience also limits the emergence of SMMEs. Respondent 5 explained *“we launched an initiative where we asked role players to produce business plans. We hoped that one of the challenges that would emerge was transportation but surprisingly this was left out... an indication of the perception held by these role players. They failed to evaluate the required equipment needed to implement their activities*. Respondent 6 made this contribution: *“In some cases the role players undervalue their products and consider them as low quality products and (so) sell them at very low prices”*. Thus, recycled products are sold at prices that do not take into account labour and raw material costs.

4.2.4. NGOs – low levels of interest and capacity. Lack of donor funds means that only a few NGOs are involved in solid waste management activities. Currently donor agencies favour environmental awareness campaigns and so NGOs align themselves with this in order to guarantee funding [Respondent 6]. NGOs also seldom assist SMMEs in the most appropriate manner due to financial and staffing constraints. For example, the waste pickers and buyers are scattered all over the city but as NGO personnel numbers are limited, only a few are reached. Consequently, most waste pickers had never dealt with an NGO. NGOs also seldom attract quality and/or skilled personnel and so the quality of the training offered is low. For example, most NGOs lack good information or data on the issues facing the solid waste management sector in the city. Respondent 1 said: *“Some NGOs try to formalize the activities of waste recovery without any real impact, due to their failure to conduct preliminary studies to identify issues, challenges and opportunities”*. Respondent 8 added: *“The only effective NGO is ISDERA and they have not really started working on recyclables (yet), they are making plans to create a platform for us to sell locally and internationally”*.

4.3. Public perceptions. There is a general perception that government is solely responsible for all solid waste matters. Conferred to government are the following responsibilities: Structuring and organizing of the sector; training and financing informal sector agents; the creation of markets and a platform for trade and the provision of logistical and infrastructural support for the sector. As such, respondents felt that the government must create a system to engage all the stakeholders and regulate the sector. Respondent 3 said *“government has to step in and ensure proper regulations ...who is doing what*

and where at what time but...this is an area that the government does not really pay attention to". They also felt government could assist with exporting recyclables. Lastly, Respondent 1 called for the government to support the sector through training, assistance to formalize, funding, creating a buy back center, certification of recyclable products, marketing of such products and assisting operators to sell using the fair trade organization.

4.4. Awareness raising & training on recycling and waste sorting at source. The study found that all stakeholder groups would benefit from awareness raising. Many in the private sector knew nothing of the initiatives and platforms government had set up to support solid waste orientated SMMEs [Respondent 6]. Coupled with this, most stakeholders were unaware of the potential economic and environmental benefits of recycling and selling waste, or even the potential to create a business out of it. Respondent 6 said: *"What the government should be doing is mass communication awareness campaigns like those they host for HIV and other health related issues... if role players are sensitized and their capacity built ... they can grow"*. At the household level, there is little knowledge on how to deal with municipal solid waste and the role the private sector can play is not well understood. Respondent 10 commented: *"People are not aware of how they should manage their waste...everything hazardous and non-hazardous are mixed and dumped in one bin"* adding *"we could institute programs in our schools to teach kids ... on waste management. It becomes very difficult to change these habits when the people are adults..."* At the household level, there is also negative perception of waste pickers and recycled products are viewed as being of lower quality. Respondent 8 said: *"This job is often looked down on by others... people see those who search trash bins as mad or not normal. When I started this job most of the people in my neighborhood thought I had gone crazy. It is only now they are beginning to realize I was just looking for a means to survive"* and adds *"Sometimes we get mob justice from the public who consider us as thieves... you could pick up something and when the owner sees you they may call you a thief and you could be beaten to death"*. The ability of the private sector (both formal and informal) to run an efficient and financially viable solid waste management business is hindered by the lack of solid waste separation at source. Waste pickers would far rather buy sorted waste directly from households but with no legal requirements or economic incentives for households to categorize, sort or segregate their waste, this is not possible [Respondent 7]. Respondent 6 said

"Imagine what will happen when members of households are aware that they can sell their waste and make some money."

5. Discussion

The Cameroonian government has created a legislative and statutory framework to govern solid waste, however, the regulatory framework is complex, centralized and top-down. Enacting laws without putting in place structures and systems to facilitate compliance has caused confusion and is pushing many out of the recycling sector altogether. Costly – and difficult-to-obtain permits – make it difficult for informal traders to operate legally. For example, traders must interact with multiple government departments (each with poorly defined roles). Informal operators also fear (correctly, it seems) that formalization will result in them having their meager earnings taxed. Furthermore, the benefits of formalization (such as access to loans) have not been well communicated. The rigid statutory and regulatory framework is also limiting access to both local and international recyclable markets. Although the Cameroonian government advocates a public private partnership approach, they have assumed a regulatory role rather than facilitating one. Studies from other parts of the developing world show that it is not feasible to focus solely on regulatory aspects if a public private partnership approach is to work.

Lack of capital is a key growth inhibitor for this sector. Informal operators lack both operational capital and fixed capital. For example, turnovers will increase with pick-up trucks (or tri-cycles) and with more operational capital. Better turnovers will increase profitability, enable the purchase of PPE which will improve working conditions and reduce ill health. Although in 2012, Cameroon established a bank specifically to fund SMMEs, this funding comes with onerous statutory and regulatory requirements, so few informal operators can access the money, even if they were aware of the bank, which most are not. Furthermore, to help the sector access capital, tax exemptions and loans at favorable interest rates, are recommended.

Cameroon's government has given scant attention to the structural and organizational challenges facing the sector, despite systems and structures being an essential component of a municipal service delivery system. HYSACAM, the main private stakeholder cannot afford to build the level of infrastructure required, what is more, construction thereof is beyond the mandate of the company. Although demand for recyclables is high, supply chains require communal waste infrastructural and logistical support. Currently, communal bins are inadequate in

both size and number and access to them is inhibited by distance and the poor condition of the roads. Households also lack a triple bin system required for waste separation. Thus, illegal dumping and mixing of waste prevails. This, in turn inhibits recycling as sorting solid waste becomes difficult, time consuming, hazardous and cross contamination reduces its value considerably. Douala also lacks central solid waste depots, so waste pickers/buyers walk/cycle long distances every day. As most feel this is not practical, they usually cluster at the dumpsites. Consequently, 'pop-up markets' at the dump sites, where the pickers can sell their plastic in very small volumes, have emerged. However, extremely low prices prevail. Moving large volumes of recyclables is challenging, not only from a financial point of view, but also because special permits are required. Specialized modes of transportation and parking are necessary if high volumes of lightweight, low value recyclables are to be traded.

Awareness, education and technical expertise

Despite various forums created by the government and international organizations, stakeholders still know little about one another, seldom interact with one another and lack information on solid waste management. A communication campaign to raise awareness is advised to help entrepreneurs seize opportunities to build or expand their recycling businesses. The waste pickers/buyers also need to learn how to identify toxic from non-toxic waste, why PPE is necessary, acquire technical expertise and business skills. In addition, government needs to engage with households and CBOs to change negative public perceptions of recycling and waste picking. This will help encourage households to engage in active solid waste management, such as waste separation at source, rather than perceiving themselves as simply passive recipients of municipal services.

Recommendations

Using SMMEs will help to keep waste solid management costs low and maximize the generation of job opportunities. Thus, the government, as a key player and using a stakeholder inclusivity approach, needs to assume responsibility for the creation of an enabling environment for SMMES to flourish. A large-scale awareness campaign to increase public understanding of the sector, facilitate the uptake of government loans (to invest in solid waste management businesses) and encourage SMME formation is suggested. The awareness campaign will help households understand the valuable role waste pickers play in the recovery of recyclables, see solid waste as valuable, separate waste at source and sell

it to waste pickers. In addition, a survey to establish household willingness to pay for private collection of solid waste is advised. Government, educational institutions or NGOs, must address the technical and business skills gap. Although few NGOs operate in the sector due to financial and capacity constraints, it is suggested that the government explore ways to support them better. This can include collaborating with NGOs and CBOs and encouraging donors to fund those dedicated solid waste management. The consolidation of regulations under one ministry, to reduce the time and cost of obtaining permits is proposed, along with an in-depth analysis of the regulatory framework to identify what must be done to create an efficient, effective yet enabling regulatory environment. In terms of infrastructure, government needs to build recycling depots (with a spatial survey to identify suitable locations) and buy-back kiosks.

Conclusion

Douala has a significant solid waste management problem. There is little to no sorting of waste at source and illegal waste dumping is the norm. Not only is this a public health and environmental hazard, it also contaminates the solid waste stream, reducing its value and exposes waste pickers/buyers to serious health risks. Currently recovery rates for recyclables are low and enterprise and job opportunities are minimal. It is unlikely that the number (and operating profits) of private enterprises will grow or recyclable recovery rates increase unless the constraining factors are addressed. The sector is unstructured and inappropriately regulated. Policies and laws are counterproductive and the implementation of solid waste legislation is hindered by a lack of systems and processes. As several governmental agencies manage the sector, a multi-faceted, overly complex (and thus, disabling) administrative network results. Worse is that the laws criminalize informal waste collection. Poor communication, lack of skills and capital is causing business opportunities to be missed. Generally, then, there is a lack of capital and skills, trapping the sector into using inappropriate methods and equipment. Consequently, recyclable volumes are constrained, recovery costs are high and profits are low. Thus, private sector operators are few and most informal waste pickers use waste collection only as a survival strategy. Government needs to focus on creating an enabling business environment where the costs of collection are reduced, the value of the recyclables is increased and the market for recyclables strengthened. Overall, the recyclables industry in Douala is in its infancy, although the potential for growth is great.

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