WASTE MANAGEMENT IN MALAYSIA: THE NEED FOR REGULATORY CONTROLS

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Abstract

The aim of this paper is to explore the reasons why Full Cost Accounting (FCA) has not been adopted for the development of regulatory controls by solid waste management (SWM) in Malaysia. A case study methodology is used for the exploratory research undertaken in this study. Thematic analysis is used and it reveals that lack of regulation is a central barrier to the adoption of FCA. FCA emerges as a supported but little understood concept among participants who are environmentally sensitive. The findings are theorised against Roger's (1995) innovation-adoption model and revealed that two types of innovations relations to adoption of FCA in SWM in Malaysia. One was the behavioural change aimed at better SWM. The other was the awareness of the need for FCA.

Keywords: regulatory controls, solid waste management, Full Cost Accounting, environmental management

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1. Introduction

There is growing awareness of the benefit of public participation in environmental management. The shift by corporations and governments towards sustainable development has led to increasing recognition of the need for a measuring system which integrates economic, social and environmental costs. Solid Waste Management (SWM) is one of those industries that recognise the need for integration of the costs into a control and management system and is seen as a suitable candidate for the use of Full Costing Accounting (FCA). FCA is regarded as one of the most comprehensive approaches that embraces economic, social and environmental dimensions, and strives to address all three dimensions at the same time. As much of the research concerned with FCA in SWM is drawn from organisations in developed countries, there is limited knowledge about this issue in developing countries like Malaysia. The aim of this research study is to explore why FCA has not been adopted in the formulation of regulatory controls and measures for SWM in Malaysia.

The paper is structured as follows. Section 2 reviews the extant literature on the areas of FCA and waste management and discusses the need to incorporate social and environmental costs as part of the wider policy and regulatory control mechanism. The methodology of the paper, including the data collection and analysis techniques are detailed in section 3 followed by the discussion of the main findings of the research study in section 4. The paper concludes by drawing out the main implications of this study, acknowledging the limitations of the paper, and setting an agenda for future research in this SWM area.

2. Literature Review

The volume of total waste generated in cities and urban areas across the globe is steadily increasing due to rapid industrialisation and population growth. This trend is also evident in solid waste (Ogawa 2007). Specifically, solid waste arising from human domestic, social and industrial activities is increasing in quantity and variety as a result of growing population, rising standards of living and the development of technology (Achankeng 2004). Achankeng (2004) specifically identified the need to manage this trend and the Consumers' Association of

Penang (CAP 2001) suggested that governments are increasingly concerned with finding methods to address this challenge. Waste management lacks glamour but is vitally important to the survival of communities (Ogawa 2007; Kaseva and Gupta 1996; Achankeng 2004). Solid waste management is becoming increasingly complex and important. It is now a priority activity for a clean and healthy country.

Solid waste is becoming a major public health and environmental concern in many developing countries due to rapid urbanisation and this has gained increased political awareness (Goh 2007; Henry, Yongsheng and Jun, 2006; Ogawa 2007). The costs of municipal solid waste management services have risen steadily over the past decade (Macve 2000). Local governments are trying to control SWM costs through a variety of measures, including restructuring waste services and encouraging waste reduction. However, making effective decisions and developing cost-effective waste management strategies can be difficult without complete cost information (USEPA 1998; USEPA 2006). The research discussed in the USEPA studies recognises the need to obtain complete cost information by incorporating environmental and social costs into traditional accounting tools. This enables informed decisions about SWM, the identification of opportunities for streamlining services, facilitating cost-saving efforts, and improving future planning.

Movement toward an integrated approach for measuring economic, social and environmental factors in policy and decision-making has taken a number of different pathways over the past 20 to 30 years (Gale and Stokoe 2001; Jasch 2003; Hung, Ma and Tang, 2007). Sustainable development is perhaps one of the most universally known of these paths, having been accepted and adopted by many influential international bodies (Joseph 2006; Morrissey and Browne 2004; Achankeng 2004; Kerr 2004; Wong 2004).

It is crucial to recognise that concerns about sustainable development and economic prosperity are interconnected. Historically, the environmental and social effects of SWM have been treated as external costs that have not been incorporated into standard managerial and financial accounting practices. It has been claimed that values arising from transactions beyond commercial transactions are excluded from the decision tools advocated within conventional management accounting (Bebbington and Gray 2001b; Milne 1996). The shift by corporations and governments towards sustainable development has led to increasing recognition of the need for a measuring system and accounting tool which integrates economic value, environmental value and social value. This supports Tanaka's (2006) view that globally, in keeping with the UN initiative, most countries are aware of the transition toward a sustainable society and are seriously attempting to attain it. Achieving sustainable development means considering all the dimensions of economic, environmental and social costs as a whole. In this way, the damaging trade-offs between them (which have resulted in unsustainable development) can be identified and avoided.

The adoption of FCA as a way to implement sustainable development was one of the suggestions to emerge from Agenda 21, a significant document arising from the Earth Summit (Bebbington, Gray, Hibbitt and Kirk, 2001a). To help municipalities improve the cost-effectiveness of their solid waste systems the U.S Environmental Protection Agency (EPA) promotes the use of FCA and Kerr (2004) argues that FCA is a comprehensive form of incorporating economic, social and environmental costs. FCA can help prevent misconceptions that arise from a simple lack of cost information and support effective and informed judgments by citizens and clear management decisions (Florida Department of Environmental Protection 1997).

Failure to develop adequate cost data can have serious consequences as for example; agencies might reject potentially cost-effective options or overlook opportunities to expand recycling and waste reduction programmes (USEPA 2006). The Malaysia Country Report (CAP 2001) states that organisations have been asked to undertake a detailed study of the economic valuation of environmental externalities, cost benefit analysis and social impact assessment. This is yet to occur in a comprehensive way. Medley (1997), from an accounting perspective, argued that how to identify and measure the environmental costs and benefits will become clearer with a better understanding of how environmental issues interact with management processes and control within an organisation.

FCA embraces economic, environmental and social dimensions, and strives to address all three dimensions at the same time. The simultaneous progression of economic, environmental and social goals is essential if development is to be sustainable (Gale *et al.*, 2001; Bebbington *et al.*, 2001a; Bebbington, Brown and Frame, 2007). The overriding principle is to integrate and involve all the concerned sectors in solid waste management so as to achieve sustainable goals. Bebbington *et al.* (2001a, 2001b) argue that there is little evidence of stewardship of sustainability among the actions of humankind. Tanaka (2006) specifically identified the major cause of the continued deterioration of the global environment as the unsustainable pattern of consumption and production, particularly in industrialised countries.

FCA is an accounting methodology which allows environmental considerations to be incorporated into decision-making for any kind of business (USEPA 1996; USEPA 1998; Bebbington *et al.*, 2007). It is a tool through which environmental impacts on factors such as stratospheric ozone layer depletion, air

pollution, waste for cooling and land for waste disposal together with social impacts such as freedom from diseases and quality of life are considered. It enables decision-makers to consider the external impacts and cost/benefit data associated with environment and human health. FCA also allows for more thorough qualitative analysis when some impacts cannot be monetised. For example, impacts such as health care costs from specific air pollution events require a more thorough analysis to assign monetary value (Kerr 2004).

There is also growing awareness of the benefit of public participation in environmental management (Achankeng 2004; Jasch 2003; Gale 2006; Srinivas 1997). If local governments desire to promote good relationships with residents in the community, data generated by FCA systems can be used to address specific concerns voiced by the community about the cost and quality of SWM. This approach allows the local governments to have more accurate measures for waste management which in turn would assist in developing appropriate control and disposal regulations.

FCA has been widely used in SWM in developed countries such as the United States and Canada. In these countries regulation exists that supports the need for annual disclosure of the cost of SWM impacts. For instance, Florida law requires that local governments disclose annually to the public and to the Florida Department of Environmental Protection (FDEP 1997) the full cost of SWM. The law addressed concerns on the part of the legislation that the public was largely unaware of the substantial cost associated with the SWM services provided to communities by local governments (FDEP 1997).

There are significant pressures upon SWM entities to shift towards sustainable development. Waste management is now seen as part of the broad global concern for sustainability and it clearly overflows national boundaries in terms of problems and possible solutions (Morrissey and Browne 2004; Bovea and Powell 2006). Further, there is urgent need for integration of waste management into strategies for sustainable development (International Atomic Energy Agency (IAEA 2005). However, the degree of success with which developed countries and NICs cope with the problem differs. Achankeng (2004) has argued that developed countries are far more able to cope with the problem than other countries because they have sought effective solutions to help them move up the solid waste hierarchy. Most newly industrialised countries are still in the early process of the concept of sustainable development. Therefore, practices have been slow even though there appears to be initiative within the SWM industry to implement such a concept (Ogawa 2007; Diaz and Golueke 1985; Newly Industrialised Countries (NICs) 2007).

Newly industrialised countries differ from developed countries in many ways. Newly industrialised countries are countries whose economies have not yet reached first world status but have, in a macroeconomic sense, outpaced their developing counterparts (Henry *et al.*, 2006; Holmes 1984; NICs 2007; Ogawa 2007). Newly industrialised countries are usually export orientated and consist of nations undergoing rapid economic growth and countries that share common features including increased social freedoms and civil rights.

A review of the literature concerned with FCA in developed countries reveals that there may be certain conditions, both internal and external to the SWM entities, which must be in place before FCA can be successfully adopted. These include factors that favour the implementation of FCA in the United States or Canada such as regulation, moral commitment by organisations and community awareness and participation (Gale et al., 2001). As no study has fully explored the importance of these conditions to the adoption of FCA, it is unclear whether these factors have a significant influence.

Research regarding the use of FCA has been widely concerned with developed countries such as the United States and Canada (USEPA 1998; Boone and Rubenstein 1997; Bebbington *et al.*, 2001b). However, there have been very limited numbers of past attempts to understand the use of FCA as a tool for the environmental and social accounting and reporting within newly industrialised countries. This gap in knowledge led to the concern of this research study to consider the applicability of FCA to SWM in the newly industrialised country of Malaysia.

3. Methodology

The research methodology used in this research study is an exploratory case study which attempts to address the limited knowledge about FCA in the context of SWM in Malaysia. The case used is that of the SWM department of the Kuching council and was selected because it is an exemplary SWM operation in Malaysia that does not use FCA. The researcher attempted to achieve an in-depth understanding of the issues relevant to the research problem and to generalise these according to the standards identified by Yin (1994, 2003). For this reason the data for this research study was collected using face-to-face interview method. Thematic analysis is used because the researcher aims to obtain an in-depth understanding about the lack of use of FCA in SWM in Malaysia. As the research study is exploratory it is preferable to let the codes emerge from the primary data gathered rather than restrict the coding to what could be determined from existing literature prior to beginning the interviews.

This research study involved participants from the SWME in Kuching and from the local community. This research study used informed consent and confidentiality to ensure the research study met ethical standards. Confidentiality was ensured through

the use of pseudonyms. Physical records of all data collected were assigned a code to ensure anonymity.

The researcher undertook in-depth, semi-structured interviews with the participants. In total, 12 interviews were conducted (6 with council members in the SWME, 6 with residents). The interview questions were developed based on key issues in the literature. Open-ended questions were used to allow the interviewees the flexibility to expand upon their experience and volunteer further useful information. Each interview took between two and three hours to complete. All interviews were conducted by the researcher and were audio taped with the permission of the interviewee. These were subsequently transcribed by the researcher. Interviews were conducted in English and each interview took between two and three hours to complete.

Braun and Clarke's (2006) process of thematic analysis was used as the protocol for analysis of the interview data. The approach to data analysis was influenced by Yin's argument that the data must be linked to the purpose of the research study. The qualitative data were analysed using the steps of thematic analysis identified by Braun and Clarke (2006). Transcription facilitated the researcher's familiarisation with the interview data by assisting the researcher to understand the concepts emerging from data and identify incidents that gave insight into the phenomenon being studied. The researcher utilised the process of highlighting key phrases, sentences or paragraphs that appeared to be important and labelled these with a word or short phrase that reflected the concept. Data extracts referring to issues relating to SWM, FCA and Malaysia were coded. The coded data were sorted into themes. Memos of the decisions made throughout the sorting process were kept. The researcher kept a visual data base of themes by arranging them as labelled boxes. To further assist in managing the database the researcher numbered each theme.

Through the process of constantly comparing the themes and considering how they related to each other, categories were developed. This process of constant comparison was undertaken until all coded data extracts were placed in a category. Category labels were refined to ensure they reflected the dominant themes and working definitions were developed to retain the meaning of the category label. Before the categories were finalised the researcher reviewed them and the working definitions associated with them to be sure they captured the story in the data. Once satisfied the researcher sort to clarify the relationships among each category.

4. Results and Discussions

The need for regulatory controls regarding SWM is a prevalent concern among residents and council members. However, council members were more likely to identify regulation as something that could alleviate the pressure on SWM by reducing illegal dumping, encouraging recycling and waste separation and facilitating the external cost reporting. They felt that this may assist them in providing the type of transparent information they and residents desired. The absence of regulation is also identified as a barrier to residents' engaging in recycling and waste separation. The council cannot enforce these practices and has limited resources which constrain their ability to provide the types of strategies needed.

Residents are also aware of the importance of regulation although they do not specifically identify this as affecting their behaviour. Rather, they were more likely to identify the indirect impact of regulation upon their SWM practices. The belief underlying comments by residents is that regulation would improve practices within the SWM industry, including transparency in reporting external costs to residents, and that once such regulation is in place residents would be more willing to undertake waste separation and recycling. There is clearly some recognition among residents that the council has difficulties in enforcing change in residents' SWM behaviour and, like the council members, view regulation as a way of facilitating this.

The participant's views that regulation is necessary before council could, or would, undertake external costs reporting identified that regulation is also central to adopting FCA. It is therefore concluded that regulation is the central factor in understanding why FCA is not in use in the case study SWM entity that is seeking to improve the sustainability of its SWM.

Participants want to see improvement in SWM in order to protect the environment of the Kuching region and the health of the City of Kuching. Council members express concern for the City of Kuching and the need to reduce reliance on landfill and protect the environment by engaging in more environmentally sustainable practices. Some council members frame their concern in a broader context identifying that ignoring the impact of SWM practices on the local environment would also have social consequences. Most council members, however, identify more concrete reasons such as their pride in the Healthy Cities programme which has been operating for 15 years and which they see as a direct contributor to a clean city, and Local Agenda 21 which focuses on urban waste and water quality in the Sarawak River. The link between a clean city and tourism is also identified as a reason for their desire to change the SWM practices of the council and improve the waste separation and recycling behaviour of residents.

Residents are very aware of the need to change their SWM behaviour by engaging in recycling and waste separation and participating in initiatives provided by the council. A prevalent theme in their explanations is their concern for the City of Kuching. Among those who have travelled to developed countries for work, holidays or education, there is a

heightened awareness of the social and environmental consequences of the current SWM practices, particularly in relation to illegal dumping. For many residents there is a sense of urgency about the need to change because of their concern for Kuching. The Healthy City campaign is greatly appreciated by residents but the lack of clear understanding of the social and environmental costs of SWM is a considerable frustration to them. Residents argue that they are willing to participate in council initiatives and co-operate with council for the good of Kuching.

The findings are theorised against Roger's (1995) innovation-adoption model. This issue of innovation has been explored in many industries including the public sector, agriculture and the private sector. Rogers' innovation-adoption model has been widely used and has some relevance to the findings of this research study.

It is useful to define the term innovation to provide a brief introduction. An innovation can be defined as a practice or object which symbolises an idea that is perceived as new. Rogers (1995) argues that innovation need not be a new idea but rather a useful and novel one. In a situation where an innovation has been known for some time without any development of attitude toward it and in the absence of adoption or rejection, it would be perceived as new idea.

The findings revealed that there were two types of innovations relating to adoption of FCA in NIC SWM entities. One was the behavioural change aimed at better SWM. The other was the awareness of the need for FCA. Behavioural change is considered an innovation because it was largely perceived by participants as a new behaviour and was seen to offer advantages over existing SWM practices. FCA is considered an innovation for similar reasons; it was a new concept to participants and was seen to offer advantages, although the concept still lacks clarity in the minds of participants.

Elsey and Sirichoti (2001) state:

> *Innovation implies the diffusion of knowledge and the acceptance of what it has to offer by those willing to adopt it for their purposes. The adoption of an innovation involves change, which can be at an individual, organisational or a whole society level.*

FCA is still considered as an innovation in developed countries in the SWM industry as only some SWM entities in these countries have adopted FCA. FCA has still not been fully utilised in these SWM entities in terms of reporting environmental and social costs (Gale, *et al.*, 2001).

An innovation can be classified as 'hard' or 'soft'. The adoption of FCA is considered a 'soft' innovation as it is an accounting practice or concept that the SWM can use. It is not a 'hard' innovation as it does not utilise equipment, tools, or drugs.

Rogers (1995) identified five groups of social behaviours relating to innovation-adoption namely *Innovators*, *Early adopters*, *Early majority*, *Late majority*, and *Late adopters*. These groups are briefly discussed below:

- *Innovators*: These are keen to try new ideas. They are mobile and communicate among the wider community. They have the ability to grasp abstract ideas and are comfortable with a high degree of uncertainty. Innovators are the first to adopt new ideas.
- *Early adopters*: These are well integrated into the local system, have a high degree of opinion leadership and are well respected by their peers. They serve as a role model for others and decrease uncertainty by adopting the new idea and communicating its benefits with others.
- *Early majority*: These adopt new ideas after obtaining information from early adopters. They have a high level of interaction in the community but are rarely in a position of leadership.
- *Late majority*: These adopt new ideas only once it is necessary due to economic necessity or pressure from their social network. They are skeptical and cautious and have to be persuaded of the benefits of adoption.
- *Late adopters*: These adopt new ideas only when it is compulsory. They are suspicious of innovation and make their decision slowly. Their awareness of new ideas is limited and resistance to adoption is high.

Applying Rogers' model to the findings, it is apparent that there are two factors that can be considered as innovations: environmental behaviour and support for FCA.

The first is the environmental behaviour of the participants. Their desire to engage in this new behaviour such as recycling and waste minimisation, suggests that they would be most closely aligned with early adopters. These participants were well integrated into the local community and were very aware of the needs of that community. Some appeared to have a high degree of opinion leadership, such as the council member who championed the Buy Back Centre and other initiatives, and the residents who were heavily involved in the community. All opinion leaders appeared to have the respect of their peers. Conclusions cannot be drawn about their ability to serve as a role model for others and decrease uncertainty as this was outside the parameters of the research study.

The second factor is the support for FCA. In terms of adopting FCA, specific conclusions cannot be drawn. The desire among participants for a tool such as FCA suggests that should institutional factors facilitate its use, for example should regulation be implemented, FCA would be adopted quickly.

Because the participants, in particular the council members of the SWM entity, are considered early adopters in their environmental behaviour it is likely that they would perform the same role for FCA. However, the emphasis upon regulation to drive adoption of FCA would suggest that while these participants have many of the characteristics of early adopters, they may in fact be more closely aligned with late adopters.

5. Conclusion

The management of solid waste has been of concern for over 40 years and is an integral part of the urban environment. The end goal of SWM is to reduce waste quantity and the environmental pollution associated with it. The need for effective SWM including awareness of social and environmental costs is a problem faced by all countries.

In summary, the lack of regulation is central to explaining why FCA has not been adopted and is unlikely to be so until regulation is in place. The concept of FCA is strongly supported by participants who identified appropriate regulatory controls as something that can help create effective SWM. The absence of regulation was also identified as a barrier for residents engaging in recycling and waste separation because the council could not enforce these practices. The findings of this study reveal that the council is ability to provide the type of information and education strategies needed for effective SWM is constrained by the availability of resources.

But in order to get a more accurate account of the SWM requirements and the development of appropriate regulatory controls, it is important for the council to undertake social and environmental cost reporting as part of the FCA. The study reveals that FCA is a new concept for many of the interviewees who were not familiar with the system. However, the principle of social and environmental cost reporting is strongly supported by them and the need for a reporting system that incorporates the feautures of FCA is recognised even among those who are not yet in a position to adopt such a tool. Several participants, particularly those from the council, identified concerns with the transparency that would be a consequence of adoption FCA. Such a fear of the consequences of utilising a tool that would highlight unsustainable practices is consistent with the findings in the accounting literature. Concern for Kuching emerged as a driver due to the desire to see improvement in SWM in order to protect the environment of the Kuching region and the health of the City of Kuching. This city pride emerged from this research study as a possible explanation for participants' desire to engage in more sustainable SWM. The literature has not previously mentioned this as a driver for the desire to engage in environmental management. It is concluded that although Kuching community is environmentally sensitive it is not yet at the stage where FCA could be effectively supported. At present it is hindered by the lack of regulation.

This research study contributes to knowledge by determining the applicability of FCA to the newly industrialised country of Malaysia. With the aim of contributing towards closing the gap in the existing research in the area of FCA in Malaysia in the need for regulatory controls in the SWM industry, this research study included residents' awareness and knowledge in relation to the SWM. Residents' perspectives have been largely overlooked in many previous research studies.

The strength of this research study is the case study's setting which is the newly industrialised country of Malaysia. Specifically, the case study explores a SWM entity in the Municipality of Kuching making it one of the few studies to explore the concept of social and environmental reporting in a SWM entity in Malaysia. Furthermore, this research study incorporates the views of the Kuching community to explore their level of understanding of environmental and social costs and the value they place on these.

The focus of the research study is on one SWM entity within a single industry and this limits the generalisability of the findings. While the findings of the study cannot be generalized beyond the SWM entity studied in this case, it is likely that the findings will have relevance to other SWM entities in Malaysia.

This research study has found that city pride is a driver for behavioural change in this regard. This finding emanates from the responses of the residents and provides insights into the motivation and mindset of the community. In the context of SWM or FCA, city pride has not previously emerged as an important concept and future research could explore the role of city pride in environmental behaviour in developed countries and compare it to the findings from a NIC as outlined in this study.

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