A Case Study of Solid Waste Management in Malaysia: Issues, Challenges and Its Business Management Practices

Rosliza Mat Zin *[a], Siti Norezam Othman [b] , Zarifah Abdullah [c]
[a] *Universiti Malaysia Terengganu, Kuala Terengganu,, Terengganu, Malaysia*
[b] *School of Technology Management and Logistics, College of Business, Universiti Utara Malaysia, Sintok, Kedah, Malaysia*
[c] *Tunku Puteri Intan Safinaz School of Accountancy, College of Business, Universiti Utara Malaysia, Sintok, Kedah, Malaysia*

Abstract

The paper aims to explore the business management practices and the implications for its use in tackling the issues and challenges faced by a solid waste management company in Malaysia, FreshAir. Experiencing rapid industrialization, with warm climate and high humidity, Malaysia is exposed to serious environmental and health related hazards. The case study research used semi-structured interviews conducted with the key participants of FreshAir in order to understand the use of business management techniques in tackling the issues and challenges faced by the solid waste company. Waste implies unwanted resources, which clearly create additional environmental costs and health related issues if they are not well managed. The study proposed that to sustain and remain competitive, organizations must ensure that the issues and challenges they face are managed effectively, which can be achieved by adopting relevant business and management accounting techniques. The findings suggest that the primary purpose of having business management and accounting information is to help FreshAir to make appropriate decisions to tackle the issues and challenges in solid waste management. The business management practices of FreshAir serve as an integral part of strategic, operations management and quality management, which lead to its sustainability. The study is of benefit to academics and managers by implying that the management functions of planning, organizing, directing and controlling should be in place to support sustainable waste management solutions.

***Keywords*:** Case study, solid waste management, business management practices, sustainability

1.0 Introduction

Waste implies unwanted resources, which clearly create additional costs and environmental issues if they are not well managed. There is a need to help Malaysia,

* Corresponding author: Tel: +604-9286879
E-mail address: rosliza.matzin@umt.edu.my

as a developing country, to implement a good waste management system, especially in managing the issues and challenges pertaining to the collection, transportation, handling of solid waste and also the issues of public cleanliness. A good waste management system will ensure both sustainable and environmental friendly operations by solid waste management companies. Hence, the study proposes that the primary purpose of having business management practices, which serves as an integral part of strategic and operation management, is to help organizations make appropriate decisions while dealing with the risks and challenges.

In order to ensure sustainability and remain competitive, organizations must ensure that their resources are managed effectively, which can be achieved by adopting appropriate business management techniques. It is recognised that business management practices are important to the success and sustainability of an organization (Horngren, Datar, & Rajan, 2012). In Malaysia, almost all profit-oriented companies are currently facing challenging times, especially with the increase in cost due to the current global recession. Hence, there is a need to use sound business management practices in tackling issues and challenges for any type of organizations in a developing country such as Malaysia.

The objective of this study is to explore the business management practice and the implications of its use in tackling the issues and challenges faced by a solid waste management company. The focus is on the practice of FreshAir, one of the companies appointed by the Malaysian Federal Government to be responsible for managing solid waste in Malaysia. Prior studies suggested the need for business management practice as a supporting tool for managing business operations, as well as in making strategic decisions.

The structure of this paper is as follows: Next section reviews the issues and challenges faced by solid waste management companies. Section three explains the research methods adopted. Section four describes the background of FreshAir. Section five provides the findings on the business management practices in FreshAir and the final section presents the discussion and conclusion.

2.0 Issues and Challenges in Solid Waste Management Companies

Waste management has become a very interesting and controversial issue since the past decade or so in Malaysia. The Malaysian Government has been taking many initiatives to enhance the waste management system in Malaysia in order to protect the environment and sustain the quality of life experienced by its citizens. Nevertheless, most of the researches conducted thus far, emphasizes on the general issues of waste management in Southeast-Asia and the methods in use by different countries, both developed and developing countries, to improve their waste management systems.

The Malaysian Government, in 2007, has approved a Bill on Solid Waste and Public Cleansing Management (Act 672) which is the guiding framework for the solid waste concessionaires to provide their services. However, the provoking question is how effective and how efficient has the concessionaires been in managing their services? What are the problems and difficulties they face and how are those problems handled by the concessionaires' managements? To answer these questions, we need to investigate the business management techniques used in providing the proposed solutions to the relevant management issues that leads to sustainability of solid waste management companies.

The managing of waste in Malaysia is the responsibility of the Ministry of Housing and Local Government (MHLG). However, to handle the municipal solid waste (MSW) through an integrated management system, Malaysia initiated privatization in 1993 and granted concessions to four concessionaires. These organizations are in charge of the collection and transportation of waste from residential and commercial sites to final disposal centres. The main mode of municipal waste disposal and treatment in the country is landfilling. Nevertheless, these landfills are quickly filled up and rapid urbanization inhibits land acquisition for new landfill sites (Sharifah, Zainal Abidin, Sulaiman, Khoo, and Ali, 2008). Recently, new problems from both active and closed landfills due to water source pollution has forced the government to form a special Cabinet Committee to propose a more comprehensive waste management structure for the country, especially in the densely populated regions. One of the recommendations is incineration as an alternative to landfill for MSW treatment (Sharifah et al., 2008).

Municipal solid wastes (MSW) is often described as the waste that is produced from residential and industrial (non-process wastes), commercial and institutional sources with the exception of hazardous and universal wastes, construction and demolition wastes, and liquid wastes (water, wastewater, industrial processes) (Tchobanoglous & Kreith, 2002). Waste management involves the collection, processing or disposal, treatment, recovery, managing and monitoring waste materials. Public Cleansing involves cleaning the public streets, the public places, the public toilets, the drains, the public markets / hawking centers, the illegally dumped waste, the beaches, the grasses in public places, and animal carcasses. The increase in human population has increased the amount of waste being generated. If solid waste is not managed properly, the citizens would be exposed to environmental risks such as flash floods, blocked drainages, polluted water from waste dumps and disposal sites, and polluted water due to leachate flowing from waste dumps and disposal sites. The nature and composition of solid waste varies between areas and this has implications for handling and disposal.

Among the main and current issues in waste minimization is the increased amount of solid waste and the increased cost of SWM, lack of basic data on solid waste management (SWM) and recycling, lack of awareness on waste minimization, lack of policies to promote waste minimization and limited information and linkage among the stakeholders (MHLG Malaysia Report, 2006). Other than that, Malaysia also

encounters problems in terms of technology, manpower, land scarcity and insufficient facilities in coping with the increased rate of waste generation (Dawda Badgie et al., 2012). The main component of Malaysian MSW is the organic waste, which contributes approximately 40% of the total waste stream (Agamuthu et al., 2011). This has implications for the selection of containers, vehicles and systems that are needed to be able to cope with such high-density wastes.

Many studies are also concerned with the effectiveness of SWM in Malaysia including the methods of disposing household and municipal waste (Sharifah et al., 2008), and integrated SWM and the 'reduce, reuse, recycle' (3R) approach (Memon, 2010). However, only a few studies have actually looked at the efficiency of the concessionaires in managing their services and the problems and difficulties they face. One of such studies is by Zaini Sakawi (2011). This paper, however, examines how a concessionaire manages its services and the problems and challenges they face with the practices of various business management techniques.

3.0 Research Methods

In this case study research, firstly, we review the literature on solid waste management, from different countries in order to grasp the issues and challenges, as well as the recommendations in managing the issues. While most of the studies used survey methods, we carry out an in-depth study in order to have a holistic understanding of the business management practices of FreshAir. As suggested by Scapens (1990), understanding how business management information is used in day-to-day organisational activities can enrich the detailed study of its practice.

The study seeks information from the management staff of FreshAir on their management practices, using in-depth, semi-structured interviews. For this study, three interviews were successfully conducted with the key staff of the company. They are: (i) Ms Qistina, Head, Business Development, Strategic Planning and Risk Management, (ii) Mr Azman, Manager, Operations and Planning Department, and (iii) Mr. Cheong, Manager, Quality Department. The interview time ranges from 1-3 hours with each of the key participants narrating their roles at FreshAir, as well as the issues and challenges they face in carrying out their tasks.

In addition to the interview transcripts, in order to gain background information of FreshAir, the researchers reviewed the following internal documents: the group's annual reports, the organizational structure, the group's webpage and its news bulletins.

4.0 FreshAir Company Background

FreshAir was appointed by the State Government to manage solid waste and public cleansing in December 2009. Later, on 19th September 2011, the Federal Government

signed the privatization agreement with all concessionaire companies including FreshAir, to manage waste collection and public cleansing. The concession is governed by Act 672 Solid Waste Management and Public Cleanliness Act 2007 and this has been in force since 1st September 2011. Following this, two institutions were established, namely the Department of National Solid Waste Management and the Solid Waste and Public Cleansing Management Corporation.

Owned by two parent companies, FreshAir operates with nine (9) departments and headed by the Chief Executive Officer. The various departments include Operation & Planning, Fleet Engineering Management and Safety, Health & Environment, Corporate Communication, Quality Improvement & Technical Audit, Finance & Account, Human Resource & Administration, Management Information Systems, Strategic Planning, Business Development and Risk Management. Each department is headed by their respective Heads of Department (HODs) except for Operation & Planning, Fleet Engineering Management and Safety, Health & Environment departments, which are headed by a Senior Manager. The Operation & Planning Department is further divided into 12 Operation Service Units headed by 12 Service Area Managers. These twelve areas were clustered into two categories: the large and small areas. For the large areas, the locations are FSA1A, FSA2E, FSA3J, FSA3M, FSA3L and FSAIB whereas for small areas, the locations are FSA1C, FSA1D, FSA2F, FSA3H and FSA3G.

Generally, FreshAir's services cover three categories or schemes. In terms of waste collection, the schemes are further categorized into premises (housing or residential areas), commercial buildings, institutions, industrial areas, governmental and places of worship. Each area or scheme is defined based on the number of premises (ranging from 20,000 to 25,000 premises) or the density of population. In terms of public cleansing, the scheme is further categorized into types of drains (based on size and rates) and public washrooms. In addition, FreshAir also offers special services to cater for waste collection and cleansing after special events such as carnivals, feasts, night or Ramadhan markets. FreshAir also has six (6) sub-contractors serving them, which translate to about 10% of their activities. The concession agreement allows concessionaires to sub-contract their work not exceeding 30% to other parties.

FreshAir is also involved with other concession teams throughout Malaysia to promote public awareness on their existence, together with the Solid Waste and Public Cleansing Corporation or Perbadanan Pengurusan Sisa Pepejal dan Pembersihan Awam (PPSPPA). They have conducted roadshows and programs to promote public awareness especially on the 3R program (recycle, reuse and reduce). Under the Act 672, FreshAir is expected to help preserve Malaysia's environment by having a proper and uniform waste management system that will eventually bring benefits to all. For example, a new ruling starting September 2015 on solid waste separation is seen as positive step in creating a more efficient and effective waste management system in Malaysia. This new rule is a way of educating and creating awareness among Malaysians to protect the environment.

5.0 Business Management Techniques Used in FreshAir

Given the limited accessibility of data, the study could only rely on the data from the interviews with three key personnel and the initial meeting with the Chief Executive Officer (CEO) and the Heads of Departments (HODs). The aim is to understand the use of business management techniques within the few areas selected for discussion in this paper, i.e. strategic management, general and operational management, as well as quality management. With the understanding of the business management practices and its challenges, the study would be a very good resource for the writings of teaching cases and could also lead to better understanding of effective ways to adapt and improve the implementation of business management theories, particularly on cost management (cost savings) which was raised by the management team of FreshAir during the initial meeting.

5.1 Strategic Management

In any organization, strategic and good management practice is important to survive in a competitive environment. The strategic management process means defining the organization's strategy. It is also defined as the process by which managers make a choice of strategies for the organization that will enable it achieve better performance. Strategic management is a continuous process that appraises the business and industry in which the organization is involved; appraises its competitors; and fixes goals to match all the present and future competitors and then reassesses each strategy. Therefore, it is realized that each component interacts with the other components and that these interactions often occur in chorus.

According to Mrs Qistina, the head of Strategic Management and Business Development Department, they are responsible for the strategic planning of FreshAir, which focuses more on reporting the operations to update the board of directors, as well as providing recommendations on challenges faced during operations. The department would need to present the strategic plan to the board for approval on how much they would be investing and the targeted projects. The strategic planning and business development includes finding ways to reduce operational costs. The waste collection service covers residential areas, industrial areas, commercial (supermarket) and institutional areas, including collection for areas that have carnivals. Details are gathered from other departments and coordinated by Mrs Qistina. Hence, Mrs Qistina would need to plan and manage costs effectively in accordance with the type of areas covered in the contract between FreshAir and the Federal Government.

As FreshAir would need to come up with good and relevant recommendations to the HQ, Mrs Qistina is not only responsible for expanding their business to include industrial or commercial area, but also for findings ways on cost savings. Few efforts were made by FreshAir to improve the efficiency and effectiveness of their operations,

which include designing and constructing mini transmitting stations. The mini stations are used as temporary sites for collecting waste before sending the waste to landfills to shorten the journey – small trucks will be delivering the waste to mini stations and then a large truck (with the capacity of 5 small trucks) will pick up the waste and deliver to the landfill. The business development team of FreshAir also has been able to design an underground bin system, whereby 2/3 of the container is build underground, which is 9 times bigger than normal container. This project could save the cost of buying the normal bin and could afford to hold big capacity of waste. These actions were taken in order to reduce the operational costs.

In line with the government's aspiration towards 3Rs (Reduce, Recycle, Reuse), FreshAir plays a vital role as an appointed concessionaire by the government to increase the recycling rate from 4% in 2007 to 22% by year 2020. This program would be able to reduce the amount of waste and hence could lead to cost reduction in waste collection. Mrs Qistina also mentioned that their team is also responsible for planning of activities that could gain some revenue for FreshAir, for example selling compost. Composting is converting waste into something that could be used, such as compost, and it will be sold by the marketing and sales staff.

5.2 General and Operations Management

The management functions of planning, organizing, directing and controlling need to be in place to ensure that an organization is capable of attaining its vision, mission and objectives. The basic function is planning, which is to determine the course of actions for a desired outcome. This function is necessary to ensure proper utilization of the resources in the organization. Organising is a process of bringing the resources to develop productive relationship among them with the aim of attaining organizational goals. It involves activities such as identification of activities, classification or grouping of activities, assignment of duties, delegation of authority, creation of responsibilities and coordinating authority and responsibility relationships. Directing is influencing, guiding, supervising, motivating sub-ordinates to work towards the organizational goals and finally, controlling and monitoring is about measuring the actual performance in relation to the expected performance and correction of deviations, if any, to ensure achievement of organizational goals.

In terms of management theory, the head of department, Haji Azman has implemented the theory in the workplace. The four main functions were applied in the organization to ensure effectiveness and efficiency of the management of the company's operation. The resources were planned through schedules and feedback through meetings and data gathering assisted the department to manage the resources especially limited resource such as the fleet of lorries, trucks etc. In terms of organizing Mr Azman made sure the tasks were completed although the company sometimes faced resource constraint. He also knows his personnel very well and is capable of selecting the right individual to

do the job. In terms of directing, he is capable of leading and directing the workers on the targeted performance by explaining to them what they are required to do. Not only could he plan, manage and direct the department, but he is also capable of controlling and monitoring the performance of his department. He performs the controlling function through assigning each service unit with its own KPIs. The performance measurement used by the department is key performance indicators (KPIs) which mainly emphasized the financial and operational aspects. This would be reported on the scorecard and the action taken would be based on the scores that indicated poor performance. The KPIs is one way to measure performance and to differentiate the performing and non-performing service unit. However, the indicators used were mainly financial factors and this is something that the department has to improve on as there are also other non-financial indicators that they can consider such as learning and innovation, which is also the focus of the Balanced Scorecard.

Operations management is managing the inputs that are required to create products and services and transforming them by adding value to them and delivering successfully to the customer. The operations of FreshAir are based on the system theory approach. System theory approach emphasize the delivery of value added services to customer (end user) through inputs such as workforce, trucks, and other related cleaning equipment, that are transformed through certain processes. The input, transformation, process and output need to be effectively and efficiently managed by the company in order to operate successfully.

5.3 Quality Management

Having working experiences over 25 years in various local and international companies, Mr Cheong, the head of the Quality Assurance Unit, Quality Management and Monitoring (QMM), Internal Audit Unit and Safety Unit is very capable in handling problems related to monitoring and implementing the Standard Operating Procedures (SOP) as well as other managerial issues such as quality control and assurance, audit and safety.

Meeting or better still exceeding customers' expectation is an essential task for businesses. Quality management became popular in the 70s and 80s after Japanese businesses improved and sustained their businesses through quality improvement, which resulted in increased sales and market share. Based on this case study, it can be highlighted that the company has focused on these dimensions to increase its effectiveness and efficiency by applying SOPs and quality management concepts.

The management of the workflow in the department was bound to the SOPs, written instructions intended to document the daily task undertaken. Having SOPs would ensure companies to be consistent in dealing with any transactions and also to ascertain that certain quality level of its services would be attained. SOP is a significant tool

to communicate important corporate policies, regulations and best practices. It was important for employees to adhere to the written instructions to ensure that intended goals are attained. These SOPs could be an integral part of quality assurance systems. In the context of FreshAir, Mr Cheong instructed waste operators or collectors to fill in a form if they could not collect garbage according to the given schedule. For instance, garbage might not be collected due to road blockage by residents who are celebrating a wedding ceremony at the time of the collection. According to its SOPs, they were required to fill in a form known as work obstruction form. However, sometimes they do not fill in the form thus causing difficulties for the department in cross checking with the residents when complaints arise. Based on Mr Cheong's explanation, the FreshAir garbage collection operations were based on the Collection Schedule and Cleaning Operations Schedule. If the garbage collection operators could not access the residential areas due to work obstruction caused by the residents, the operators had to fill in the work obstruction form. This form served as an evidence to indicate that the work obstruction was due to the failure of the residents to inform the company that the garbage collection route that was normally used by the garbage operators was blocked due to wedding event and others. Residents who are affected due to uncollectable garbage could inform the Residential Community Committee in advance so that the committee could inform FreshAir ahead of time. FreshAir, in turn, would provide bigger garbage bin for resident's usage subsequently.

Quality assurance also comprises of administrative and procedural activities implemented in a quality management system so that requirements for a product or service would be fulfilled. This concept was one approach to provide guarantee that the tasks were done correctly; hence, these would increase customers' confidence and satisfaction from the services. Moreover, there were two principles included in the quality assurance management. These are: fit for purpose (services should be suitable for the intended purpose) and right the first time (mistakes should be eliminated). In the context of FreshAir, Mr Cheong indicated that inspections on the 13 areas under the supervision of the company were done at random to check whether work had been done according to specifications. For instance, the specification for cutting grass at junction of traffic light was 100 meters from the left and 100 meters from the right. In addition, the adoption of Geographical Indicator System (GIS) enabled the inspectors or Mr Cheong to identify incomplete work done by the workers and identify corrective actions or penalties immediately. These efforts by FreshAir are intended to increase its service quality, customer confidence and level of satisfaction on its services.

6.0 Discussion and Conclusion

The aim of privatization of solid waste management in Malaysia is to resolve the issues of solid waste management faced by local authorities such as finance and cost management, lack of expertise in integrated, effective, efficient and technologically

advanced system, illegal dumping and lack of management skills on disposal and landfill system. The Solid Waste and Public Cleansing Management Act 2007 (Act 672) adapted from best management practices in solid waste management from Japan, Denmark, Switzerland, Germany and the United States is expected to improve and ensure high-quality services in solid waste management in Malaysia. The Act 672 also authorized the appointed concessionaires to take over the solid waste management from state government and local authorities to provide recommendation and implementation of policies and strategies pertaining to solid waste management services, as well as promoting participation and awareness among the public. Inadequate budget, low economic status of households and low attitude to solid waste workers and to their jobs are identified as hindering factors of appropriate SWM service.

One of the biggest challenges raised by the FreshAir's CEO in the first meet-up with the management team is the increasing costs of operations in public cleansing and waste collection. Disposal of waste through landfilling is becoming the biggest issue in waste management as most of the municipal landfills have been filled up at a very fast rate. To add a new landfill will be difficult as the capital expenditure for a new landfill might reach up to millions of ringgit in average whereas the operating expenditure of landfills could be high due to the increase in population. Zainu, Wan Mohamad Ali and Songip (2015) reported that most solid waste companies or local authorities could not cope with the capital expenditure which could reach RM30 million for a new landfill to be set up or even the operating expenditure of a landfill is around RM30-40 per tonne on average. Hence, FreshAir would need to work out ways of managing the operations of waste collection and disposal in a most efficient and cost effective manner. As described in the previous section, the business development unit of FreshAir has been cost effective by designing the transmittal station, or intermediate treatment facilities and underground bin system, which lead to a reduction in the collection and disposal costs. The recommendation of Agamuthu et al. (2011) indeed make sense in practice as FreshAir has designed adapted or localized facilities, vehicles and systems that could cope with high-density wastes.

FreshAir would also need to work together with other appointed concessionaires around Malaysia to improve the design of landfills to include the latest technology in waste treatment, such as leachate treatment system, gas ventilation system and waste reduction facilities or treatment prior to disposal (Manaf, Samah and Zukki, 2009). This is consistent with finding alternatives to landfills for waste treatment as recommended by Sharifah et al, (2008).

Delays in collection due to improper ways of dumping waste by the households add further complications to the waste collection task. Many households in Malaysia have insufficient knowledge about waste separation practices making the collection task quite problematic. A study carried out by the Solid Waste And Public Cleansing

Management Corporation in 2006 (MHLG, 2006) found that public awareness on recycling was relatively high. This is consistent with our findings on public awareness. Unfortunately, we believed that though the public are aware about the 3R practices, they are not practising it.

It is recommended that all parties should work together in providing in-depth knowledge on waste minimization. Although households are aware of the environmental issues and recycling campaigns, they do not perceive the current situation in Malaysia as very serious. It would be more cost effective if the Federal Government together with the three appointed concessionaires could work on campaigns and enforcement. Beginning September 2015, some states under the three concessionaires are forced to separate their waste. This implementation is pursuant to regulations under Solid Waste and Public Cleansing Management Act 2007 (Act 672) enforced in Federal Territories: Kuala Lumpur, Putrajaya, Johor, Melaka, Negeri Sembilan, Pahang, Kedah and Perlis. The process of separating solid waste at source involves separating solid waste according to waste composition such as recyclable waste, residual waste and bulky/garden waste. The separated wastes will be collected every week according to fixed schedules. The action is enforced in stages, hence, would be able to meet the issue of waste minimization (by reducing the amount of waste sent to landfill) as well as reducing the costs of waste collection and disposal. Malaysia would benefit most if all parties would be able to work together both on the technical and behavioural elements. Continuous campaigns, more in-depth knowledge, motivation and training would be among the immediate efforts required by the concessionaires, the local, the state, and the federal government for a cleaner, greener and environmentally safer Malaysia in the future.

Implementation of recycling campaign is a way to reduce waste disposal problem. Recycling is cheaper and a more environmentally friendly alternative than seeking new landfill site, and capable of extending the lifespan of existing landfills. Besides, the program is more economical by substituting raw materials with used materials, conserves energy, and creates jobs. To ensure successful recycling, people must know how to recycle and be motivated to recycle. For FreshAir to sustain their campaign, they would need to balance three elements suggested by the three-legged stool of sustainability, economic, social and environment. It would need to support and strengthen the coordination between FreshAir and household/public, their employees as well as the concessionaires, local authorities and federal government. The use of balanced scorecard is recommended to equip FreshAir with appropriate techniques in managing performance, particularly in cost management. The focus of balanced scorecard on four perspectives, namely financial, customer, internal business processes and learning and growth would provide better measurement on how FreshAir manages its activities. The concept of strategy map in relating the measures for each perspective would trigger immediate action to manage any issues pertaining to its sustainability.

The use of survey to measure customers' perceptions from time to time can be further improved by conducting online surveys, which would provide a very effective indicator on their performance on waste collection. A fundamental requirement to educate public or household especially in handling waste would promote social, economic and environmental sustainability (Agamuthu et al., 2011; Mohd Dinie & Mashitoh Mat Don, 2013; Kassie, 2016).

The strategies formulated and immediate action by FreshAir are concluded to be cost-effective, through enhanced service quality from the use of key performance indicators, monitoring and quality control and through courses and trainings conducted to improve their delivery system. FreshAir would need to work especially on the inventories and database, with clear guidelines and regulations as sustainability would need elements standing-in as three-legged stool which are the economic, social and environment.

Effective management of solid waste requires cooperation from the public. FreshAir would also need to give more emphasis to public awareness and information dissemination through dialogues, seminars and mass media. Allocating more resources to the solid waste management sector needs support from the local authorities and the federal government. Support from local authorities and federal government to improve solid waste management systems such as more financial aid and tax incentives may be introduced to encourage the development of recycling industry and business, or labourer protection programmes may be provided to improve wages and working conditions of labourers, including solid waste management workers. It is, therefore, important to ensure that public and other stakeholders' awareness activities are incorporated hoping that in due time, the sustainability of solid waste management projects will be significantly improved.

To conclude, the findings suggest that the primary purpose of having business management and accounting information is to help organizations make appropriate decisions, which serves as an integral part of strategic and operation management, as well as quality management. The management functions of planning, organizing, directing and controlling are in place to ensure that FreshAir attains its vision, mission and objectives and hence to survive in a competitive environment. Hence, this study serves the purpose of in-depth analysis for better understanding of the business management practices of freshAir.

The study, however is limited to the findings from the interviews with only three key participants. We faced some difficulties in getting appointments with the respective Heads of Departments. At times when the appointment date has been fixed earlier, there were last minute postponements or cancellations and finally our request for appointments were turned down. Nonetheless with such limitations are common in case study research. It is hoped that the findings provide some insights into the business management practices within a solid waste organization in Malaysia.

"The authors like to express our utmost gratitude and thanks to the Ministry of Education, Malaysia for providing the funding for this research project via the Fundamental Research Grants Scheme (FRGS)."

References

Agamuthu, P., Chenayah, S., Fauziah, S. H., & Dennis Victor. (2011). *3R related policies for sustainable waste management in Malaysia*. Conference Proceedings of Innovation and Sustainability Transitions in Asia', Kuala Lumpur, Malaysia, Paper 135 (*Non-ISI/Non-SCOPUS Cited Publication*).

Akta 672 Akta Pengurusan Sisa Pepejal dan Pembersihan Awam. (2007). *Undang-undang Malaysia*. Percetakan Nasional Sdn Bhd.

Badgie, D., Mohd Armi, A. S., Latifah, A. M., & Azizi, M. (2012). Assessment of municipal solid waste composition in Malaysia: Management, practice, and challenges. *Polish Journal of Environmental Studies*. *21*(3), 539-547.

Horngren, C. T., Datar, S., Foster, G., & Rajan, M. (2012). *Cost accounting: a managerial emphasis*. 14*th* edition, England: Pearson.

Kassie, K. E., (2016). The problem of solid waste management and people awareness on appropriate solid waste disposal in Bahir Dar city: Amhara region, Ethiopia. *ISABB Journal of Health and Environmental Sciences*, *3*(1), 1-8.

Manaf, L. A., Samah M. A. A., & Zukki, N. I. M. (2009). Municipal solid waste management in Malaysia: Practices and challenges. *Waste Management, 29*, 2902–2906.

Memon, M. A. (2010). Integrated solid waste management based on the 3R approach. *Journal of Material Cycles and Waste Management, 12*, 30-40.

Ministry of Housing and Local Government Malaysia Report. (2006). *The study on national waste minimisation in Malaysia* – Final Report.

Mohd Dinie, M. S., & Mashitah, M. D. (2013). Municipal solid waste management in Malaysia: current practices, challenges and prospects. *Jurnal Teknologi (Sciences & Engineering)*, *62*(1), 95–101.

Scapens, R. W. (1990). Researching management accounting practice: The role of case study methods. *British Accounting Review*, *22*, 259-281.

Sharifah, A. S. A. K., Zainal Abidin, H., Sulaiman, M. R., Khoo, K. H., & Ali, H. (2008). Combustion characteristics of Malaysian municipal solid waste and predictions of air flow in a rotary kiln incinerator. *Journal of Material Cycles and Waste Management, 10,* 116-123.

Tchobanoglous, G., & Kreith, F. (2002). *Handbook of solid waste management* (2nd ed., p. 950). McGraw-Hill.

Zaini S. (2011). Municipal solid waste management in Malaysia: Solution for sustainable waste management. *Journal of Applied Sciences in Environmental Sanitation, 6*(1), 29-38.

Zainu, Z. A., Wan Mohamad Ali, W. M. S., & Songip, A. R. (2015). *Present and future innovations in solid waste management in Malaysia*. Conference Proceedings of International Conference on Waste Management, Ecology and Biological Sciences, Kuala Lumpur, Malaysia, 21-27.