

Managing Waste Sustainably: The Case of Freshair

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Abstract

Issues related to waste management, primarily due to the lack of dumping sites, inefficient collection and waste disposal are affecting many developing countries, including Malaysia. The increasing population aggravates the need for proper waste management concerning the collection and disposal of waste which, if not properly managed, would result in grave environmental and health issues. This study seeks to understand the practice of the waste management system of FreshAir, one of the concessionaires appointed by the Federal Government of Malaysia to manage solid waste. This study provides insight into the operations and strategic initiatives of FreshAir in managing solid waste using a case study research design. Among the strategies adopted by FreshAir include being more cost efficient with the use of a temporary hub to reduce transportation costs in transporting waste to the landfill. Using a public survey, the challenges in efficiently managing solid waste mainly stem from increased operating costs and the lack of household awareness and cooperation, especially regarding waste minimisation and separation. This study would create awareness and provide empirical evidence for policymakers to work together and set out strategies to achieve sustainable development goals, especially on waste minimisation and separation.

Keywords: Sustainability, solid waste management, strategy, case study.

Introduction

Waste implies unwanted resources, which evidently will create additional costs and environmental issues if they are not well managed. Open dumping, open burning and leachate issues are among the palpable negative effects of inefficient waste management. Malaysia, as with other developing countries, relies heavily on landfilling as the primary method of solid waste disposal. Moh and Manaf (2014) reported that the rapid increase in population has resulted in the volume explosion of waste, which calls for more landfilling areas, leading to land scarcity and an increase in land prices. In Malaysia, many landfills have reached their capacity (Moh & Manaf, 2014). In addition, landfilling and incineration are not sustainable and can adversely impact the environment (Beleya et al., 2019). Hence there is a compelling need for a more cost-effective and environmentally friendly solid waste handling and management system.

An alternative to minimise solid waste can be found in food waste composting.

However, it is a process that is less effective in developing countries like Malaysia due to improper segregation (Thi et al., 2015), inefficient waste separation strategy and improper waste separation facilities (Yukalang et al., 2017). Lim et al. (2016) supported that if a country wants to reduce or minimise the solid waste amount effectively and efficiently, the country needs to have a decent municipal solid waste management system to help deal with sustainability issues.

The management of waste in Malaysia is under the responsibility of the Ministry of Housing and Local Government (MHLG). Management of solid waste is done through an integrated management system, in which Malaysia initiated the privatisation of the sector in 1993 and granted concessions to four concessionaires throughout the country. These concessionaires collect and transport waste from residential and commercial sites to the final disposal centres. The privatisation of solid waste management in Malaysia is aimed to solve the challenges faced by local authorities in managing solid waste, namely in finance and cost management, due to lack of expertise and advanced technology, illegal dumping and lack of management skills on disposal and landfill systems (Rosliza et al., 2016). In addition, the concessionaires are expected to improve and ensure high-quality services in solid waste management, provide recommendations and implement policies and strategies on solid waste management services and promote participation and awareness among the public (Zarifah et al., 2017).

A sound waste management system with timely waste collection, temporary transfer of waste, efficient public cleansing and landfill management are needed to ensure that both cost-efficient and effective systems are in place. The system would help create sustainable and environmentally friendly operations by the operators of solid waste management organisations. In developing countries such as Malaysia, the rapid growth of solid waste generation is due to the high growth of the population. Coupled with poor solid waste management systems, these have created serious environmental and sustainability issues. The practical solution to these issues lies in establishing effective and efficient strategies for managing solid waste.

The issue of business sustainability has pushed many organisations worldwide to implement appropriate strategies as it is crucial for organisations to adapt and remain viable in the changing business environment. Hence, this study aims to understand how FreshAir, one of the four concessionaires appointed by the State Government in December 2009, sustainably manages solid waste and public cleansing.

This paper focuses on the operation and management practices of FreshAir with the hope of gaining more insight, knowledge and understanding of the issues and challenges faced by the company. The empirics discovered might serve as a reference for those dealing with solid waste management to help plan and organise efforts for more effective and sustainable solid waste management strategies. These findings could also be used to form the basis for recommendations that will help to improve the existing waste management system and reduce the number of threats and fatalities caused by inefficient waste management strategies.

Waste Management Challenges and Strategies

Technically, "solid waste" means garbage, refuse, sludge, and other discarded solid materials, including solid waste materials resulting from industrial, commercial, and agricultural operations and community activities (EPA, 2020). Malaysia's total solid waste generation was 38,563 tonnes per day in 2015 and has increased by 5.19% to 49,670 tonnes per day in 2020 (Rangga et al., 2022). Thus, solid waste should be managed properly; otherwise, it could threaten the environment and public health. Examples of environmental risks are flash floods, blocked drainage, polluted water from waste dumps and disposal sites, as well as polluted water due to leachate flowing from waste dumps and disposal sites. The public health risks associated with improper household waste management include physical, biological, non-communicable diseases and psychosocial and ergonomic issues (Fadhullah et al., 2022). Badgie et al. (2012) reported that the management of solid waste had become a crucial issue, particularly in the urban settings of Malaysia.

With the increasing population in Malaysia, solid waste companies face the risk of rising costs (Greco *et al.*, 2015) related to waste collection, transfer and disposal. Upon assessing their waste management strategies, many municipalities were found to have problems with their waste management costs (Cialani & Mortazavi, 2020; Passarini *et al.*, 2011; Jacobsen *et al.*, 2013; Victor & Agamuthu, 2013). In addition, the nature and composition of solid waste vary between areas, which has implications for its handling and disposal. Given the rising amount of solid waste in Malaysia and its rising costs, local authorities and appointed concessionaires continually seek to improve their strategies in dealing with waste.

The main mode of municipal waste disposal and treatment in Malaysia is landfilling. Open dumping is the lowest cost option for lower-income countries, but it is an uncontrolled and inadequate form of waste disposal (Ferronato & Torretta, 2019). Nevertheless, landfills are quickly filled, and rapid urbanisation inhibits land acquisition for new landfill sites (Sharifah *et al.*, 2008). Generally, local authorities worldwide face challenges in seeking long-term alternatives for landfilling (Beleya et al., 2019).

Moh and Manaf (2014) mentioned that the rapid increase in population has resulted in the volume explosion of waste, which calls for more landfilling areas. As a remedy to the landfill issue, a suggested method as an alternative to using landfills for municipal solid waste (MSW) treatment (Sharifah *et al.*, 2008) is the use of incinerators. However, incineration in Malaysia is relatively new due to its high initial costs.

Waste separation is a vital strategy to reduce the amount of solid waste going into landfills. However, the public's lack of awareness and commitment to practising waste segregation and recycling brings considerable challenges to the country in managing solid waste. Due to low public participation, food waste recycling and reduction activities also lack numbers (Moh & Manaf, 2014). Moh and Manaf (2014) reported that food waste's reuse and recycling rate is relatively low compared to paper and plastic. Although food waste is biodegradable and could be converted into compost, public awareness of composting is still low due to a lack of practice in waste separation. Hence, there is a strong need for a good waste separation strategy, and Malaysians should be educated on its practice, especially to help minimise food waste efficiently.

In addition, Beleya *et al.* (2019) concluded that enhanced MSW management is crucial for a sustainable environment and should be both a government-centric and citizen-centric process. There is an urgent need for adequate waste-related data, improved standard operating procedures, and better technology in dealing with issues related to environmental sustainability. Hence, this study will provide empirical evidence on the current practice of solid waste management strategies and policies that lead to environmental sustainability.

Research Methods

A case study research design was adopted to provide an in-depth investigation of the strategic initiatives performed by FreshAir, one of the four concessionaires appointed by the Federal Government of Malaysia to improve and ensure quality service and a sustainable environment concerning the management of solid waste. Scapens (1990) recommended using a case study approach because understanding the day-to-day organisational activities will help enrich the detailed study of its practice.

This study involved two phases of data gathering. The first phase involved gathering information from key personnel of FreshAir concerning their operation and management practices using in-depth, semi-structured interviews to capture a greater depth and breadth of data. Semi-structured interviews were the primary method of data collection as interviews are the most frequently used method in qualitative research (Mason, 1996). As a result, four informative interviews were successfully carried out at the head office and one of the main outlets of FreshAir, involving the following individuals¹:

- (i) Mr Cheong, Manager, Quality Department,
- (ii) Mr Azman, Manager, Operations and Planning Department,
- (iii) Ms Qistina, Head, Business Development, Strategic Planning and Risk Management, and
- (iv) Mrs Mashyitah, Head, Finance and Accounts Department.

The interviews were audiotaped with the permission of the interviewees and later transcribed. The semi-structured questions addressed to each head of the department were to fulfil the main objective of this study which is to understand the daily operations and strategic initiatives adopted by FreshAir in managing solid waste. Participants were to describe and comment on their roles, responsibilities, and challenges while performing their tasks. In addition, they were asked to describe the contribution of other units of FreshAir and how they would solve issues or challenges as a team. The interview transcriptions were later analysed by reading and rereading the data and noting the initial ideas. The results were subsequently analysed by extracting examples or strategic initiatives conducted by FreshAir concerning the research questions and literature. The report consisting of an interpretative stance serves as empirical evidence for the case study analysis.

In addition to the interview transcripts and to validate information obtained from FreshAir, additional documents were reviewed in this study. The documents include the group's annual reports, organisational structures, webpage, and news bulletins. The related documents serve as data triangulation for the narratives (interviews). It is imperative in a case study design for data to be collected through multiple sources of information to ensure data triangulation (Miles & Huberman, 1994).

¹ The names of the company and interviewees are disguised to respect their privacy.

The second phase of data gathering involved a questionnaire survey, which was undertaken to seek households' awareness and opinions on their level of satisfaction concerning the services provided by FreshAir. A total of 400 households served by FreshAir were identified based on convenience sampling, and questionnaires were distributed face-to-face accordingly to the population density for the area covered. Out of the number, 398 questionnaires were returned, yielding a response rate of 99.5%. The distribution of the respondents' profiles is shown in Table 1. Generally, the respondents are representative of the Malaysian population in terms of gender, race and educational background.

Table 1 Survey respondents' profile (n=398)

	Frequency	Percent
Gender		
Male	214	53.8%
Female	184	46.2%
Race		
Malay	210	52.8%
Chinese	140	35.2%
Indian	43	10.8%
Others	5	1.2%
Education		
Secondary, certificate, diploma, degree	318	79.9%
Primary level or no formal education	80	20.1%

Background of FreshAir

FreshAir was initially appointed by the State Government to manage solid waste and public cleansing in December 2009. Later on 19 September 2011, the Federal Government signed a privatisation agreement with all concession companies, including FreshAir, to manage waste collection and public cleansing in Malaysia. The concession is governed by Act 672, Solid Waste Management and Public Cleanliness Act 2007 and has been in force since 1 September 2011. Owned by two parent companies, FreshAir operates nine (9) departments and is headed by the Chief Executive Officer. The 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. Broadly, FreshAir is responsible for:

- 1) Waste collection: categorised into premises (residential houses), commercial, institutions and government buildings, and places of worship. Each area or scheme is defined based on the number of premises (ranging between 20,000 to 25,000) or residents' density.
 - 2) public cleansing: categorised into types of drains (based on sizes and flow rates) and public washrooms.
 - 3) waste collection and cleansing after special events such as carnivals, feasts or Ramadhan bazaars.
- Solid waste collection, for example, in one of the districts can reach from 1000 to 1300 tonnes per day. This situation will worsen, especially after a natural disaster such as a flood.

Findings and Discussion

The first phase of data gathering comprises collecting information from interviews with key personnel from FreshAir. Only four relevant departments were selected for the interviews (represented by the Head of Department), which was structured to gain insight into the daily operations of FreshAir, namely in the area of 1) strategic management, 2) financial/cost management, 3) operational management, and 4) quality management. The interviews, which lasted for one to three hours, helped provide an in-depth understanding of the employees' roles and contributions to the daily operations and strategic initiatives of FreshAir. In addition, the implementation of solid waste management collection and disposal services, as well as key strategic initiatives, were identified from the interviews. These were validated by the documentation analysis and further analysed in the next section. The strategies include:

1. Cost Reduction
2. Waste Minimisation and Waste Separation
3. Recycling Campaign
4. Public Awareness
5. Managing Waste Sustainably

Cost Reduction Strategies

As FreshAir continually generates updated and relevant reports to its headquarters, Qistina informed that the company is responsible for expanding its business to serve industrial or commercial clients and discovering strategies to improve cost savings. Our interview discovers at least three cost-saving strategies, shown in Table 2.

Table 2 Cost-saving strategies

1. Mini transfer stations
2. Underground bin system
3. Sikar cement
4. Leachate pipes

One of the strategies initiated by FreshAir to reduce operational costs includes designing and constructing mini transfer stations. As Qistina mentioned:

"So other than that, for my department as well, the focus is not only to increase income but also to initiate cost savings for current expenditure. For example, now we have started utilising transfer stations (mini transfer stations), where first we take the waste to the transfer station. Then a big truck will take the waste from the station to the landfill. This has solved the trucks' problem of travelling a long distance. The distance from collection points to the landfill is far. Previously, all the trucks we have had to collect the waste, take them to the landfill, and come back; so the petrol costs are high. So, when we open the current transfer station, all trucks do not have to go far. Then there is only a large truck that can load waste five times the normal truck to be taken to the landfill".

The mini transfer stations are used as temporary sites for collecting waste before sending the waste to a landfill to shorten the journey – smaller-sized trucks will deliver waste to these mini transfer stations. Then a large truck (with the same capacity as five smaller trucks) will pick up the waste from here and deliver them to the landfill.

The business development team of FreshAir has also designed an underground bin system, whereby two-thirds of the container is built underground and is nine times bigger than the size of their normal container. This project could help Fresh Air saves from buying the normal bins while, at the same time, the underground bin can afford to hold a larger waste capacity. These actions are taken to reduce the company's operational costs. Ms Qistina added:

"Apart from that, under our department, there is research and development (R&D) as well. The R&D has started. We make an underground bin system. This underground bin system also has a more cost-saving purpose because the underground bin we make has a small exterior that looks small, where 2/3 of the barrel is near the basement. So the capacity of the barrel is nine times the ordinary barrel. So, this saves our trucks from collecting a lot at once, right? With that, we can make savings from purchases. So, we do not have to buy up to 9 regular barrels. We just planted a bin that can accommodate the waste capacity."

The findings show that the major costs involved during waste collection come from solid waste collection and its disposal, the collection of recyclable materials for recycling, waste separation and processing, and transferring of solid waste. Therefore, the best way to minimise the cost is by focusing on improving transport efficiency and establishing a new waste transfer station near the waste generation. This strategy would minimise the cost of waste transportation to the landfill, leading to a competitive advantage in terms of cost savings. Transfer and transportation of waste are very important and involve two steps:

- i. Transfer of waste from the smaller collection vehicle to a larger vehicle.
- ii. The distance travelled is reduced by transferring waste to transfer stations instead of transporting it from all waste generation points to the final disposal site.

Another unique problem concerning solid waste in Malaysia is leachate. FreshAir needs to resolve issues concerning leachate to reduce the number of complaints they receive and reduce costs associated with clean-up. As Qistina shared:

"We also have other issues under study. For example, leachate (water from the waste) will not flow out because we apply *sikar* (*sikar* cement that is water-proof) near the truck internal. So water will not come out. We also have a leachate pipe that will suck leachate from the truck. We installed the leachate pipe there. This is the first in Southeast Asia. No one else has introduced it. But in Finland, there are, but using different concepts. This is because the solid waste in the country has little water. So, no leachate pipe connects to the trucks".

Waste Minimisation and Waste Separation

The process of separating solid waste at the source involves separating solid waste according to waste composition, such as recyclable waste, residual waste and bulky/garden waste, as described by Azman (Head of Operations). The separated waste will be collected every week according to fixed schedules. This action is enforced in stages, helping in waste minimisation (by reducing waste being sent to landfills) and reducing the costs of waste collection and disposal. FreshAir believes Malaysia would benefit most if all parties could work together on the technical and behavioural aspects. As a proactive measure, FreshAir engages in ongoing campaigns and provides more in-depth knowledge, motivation and training to the public and its employees. This strategic initiative is among the immediate efforts done by the concessionaires, the local government, the state, and the federal government for a future clean, green and environmentally safe Malaysia.

Azman and the operations team at FreshAir agree that it would be cost-effective if the Federal Government, with the three appointed concessionaires, could work together on a campaign and enforce it. Since September 2015, several states under the three concessionaires have implemented compulsory waste separation. This implementation is pursuant to regulations under the Solid Waste and Public Cleansing Management Act 2007 (Act 672). It is enforced in the Federal Territories of Kuala Lumpur and Putrajaya, as well as in the states of Johor, Melaka, Negeri Sembilan, Pahang, Kedah and Perlis. In sum, the initiatives to minimise and separate waste are summarised in Table 3.

Table 3 Minimising and separating waste initiatives

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1. Weekly collection of separated waste
 2. Continuous campaigns
 3. Provision of knowledge, motivation and training to the public

Recycling Campaign

Recycling is one of several methods being commonly used to help reduce problems associated with waste disposal. Recycling is cheaper and more environmentally friendly than acquiring a new landfill site. It is also able to help extend the lifespan of an existing landfill. In addition, recycling helps conserve energy and create jobs and is a more economically feasible option by substituting raw materials with used materials. However, people must know how to and be motivated to recycle to ensure a successful recycling programme. In order to sustain itself, FreshAir needs to strike a good balance in terms of the economics, social and environmental elements as suggested by the 3-legged stool of sustainability. The elements would help support and strengthen the coordination between FreshAir and households/public, their employees, other concessionaires, local authority and the federal government.

Kaplan and Norton (1992; 1996) introduced the use of a contemporary performance measurement system via what they called the Balanced Scorecard. It is considered a balanced scorecard because it considers not only the financial measures but also the non-financial measures and perspectives in measuring performance. A balanced scorecard is recommended to equip FreshAir with appropriate techniques in managing performance, particularly in cost management, as costs are associated with activities. It focuses on four perspectives: financial, customer, internal business processes, and learning and growth. As a result, the balanced scorecard provides a better gauge of how FreshAir manages its activities.

The concept of a strategy map relating to the measures for each perspective would trigger immediate actions in managing sustainability issues.

The use of surveys by FreshAir to periodically measure customer perception can be further improved by conducting online surveys, which would be a highly effective indicator of their performance on waste collection. A fundamental requirement to educate the public or households, especially in handling waste, is essential and would help pave the way towards achieving social, economic and environmental sustainability.

Public Awareness

In the second phase of data gathering, findings from the survey showed that households being served by FreshAir were not aware of the job scope of FreshAir. For instance, residents or clients were unaware of the daily garbage collection schedule, which caused them to file complaints. Residents or clients were also unaware that they must inform FreshAir, through their neighbourhood association representative, should they wish to hold celebrations, such as wedding feasts in front of their houses. If this is practised, FreshAir garbage operators would not be liable to fill in additional forms, such as the Work Obstruction Form, to perform their tasks satisfactorily. Instead, they could have provided larger garbage bins for the convenience of the residents involved in occasions such as these. FreshAir has set its standard operating procedures (SOP) in place. However, the success of implementing these SOPs is entirely dependent upon the participation of the community or residents being served by FreshAir. Furthermore, delays in garbage collection due to improper waste dumping by the households add further complications to the waste collection task. Many households in Malaysia lack sufficient knowledge about waste separation, making the collection task quite problematic.

In line with the government's aspiration toward the 3Rs (Reduce, Recycle, Reuse) initiative, FreshAir plays a vital role as an appointed concessionaire by the government to increase the recycling rate from 4% in 2007 to 22% by the year 2020. Reuse and recycling of solid waste are among the strategic actions taken to help reduce the amount of waste generated and hence, could lead to cost reduction in waste collection. A critical factor in minimising solid waste is related to public awareness (Zainu & Songip, 2017), as people's activities are the main contributor to solid waste generation. However, although the Malaysian government has launched recycling campaigns to encourage the participation of different community groups and non-governmental organisations, these campaigns did not receive a favourable response from the public (Zainu & Songip, 2017). In addition, the findings showed that to minimise waste disposal in landfills, only 34% of the respondents (customers of FreshAir) have reused or recycled solid waste (Zarifah et al., 2017). This percentage is considered low given the various campaigns organised to create public awareness of the benefits of waste minimisation, such as the 3Rs (reduce, recycle, reuse) implemented by FreshAir and other non-profit organisations.

Food waste makes up the highest composition of waste collected from residential areas, thus Azman recommended that residents should be made aware of food waste composting and be shown the ways to do so by the FreshAir team or other non-profit organisations, especially those who work closely with environmental issues. Rodzidah (2019) recommended that recycling bins should be provided adequately and placed at appropriate locations to promote recycling and improving solid waste management at higher education institutions throughout Malaysia.

Composting is another method for minimising waste (Lawson, 2020). Although Zarifah et al. (2017) found that not many respondents compost their household waste, a majority of the respondents are interested in doing so if proper demonstrations were shown and are very supportive of the idea of centralised composting. Therefore, we believe that educating the public on composting know-how is essential for waste minimisation.

Managing Waste Sustainably

Among the recommendations outlined in a report by PEMANDU include sustained implementation with continuous improvement in minimising solid waste being sent to landfills for solid waste management in Malaysia (MHLG, 2015). PEMANDU is the Prime Minister's Department's performance management and delivery unit. It was set up in 2009 to lead change in the country and to ensure that its national transformation programmes were successfully delivered (Centre for Public Impact, A BCG Foundation, 2016). However, it was dissolved in 2018, when the new government was formed in Malaysia after the 2018 election.

The report also advocates for the optimisation of waste through recovery and treatment. The target set by 2020 is that there will be 100% implementation of mandatory separation at source in states that adopt Act 672, with a 22% recycling rate.

FreshAir, other concessionaires, and the Solid Waste and Public Cleansing Corporation (or Perbadanan Pengurusan Sisa Pepejal dan Pembersihan Awam, PPSPPA) are working together to promote public awareness of the concessionaires' existence. They have conducted roadshows and programmes to promote public awareness, especially on the 3R (recycle, reuse and reduce) initiative. Under Act 672, FreshAir is expected to help preserve Malaysia's environment by establishing an appropriate and uniform waste management system that will eventually benefit all. For example, a new ruling in September 2015 for solid waste separation is seen as a positive step in creating a more efficient and effective waste management system in Malaysia. This recent ruling is one of the ways that can be used to educate and create awareness for Malaysians in helping to preserve the environment.

One of the biggest challenges pointed out by the CEO of FreshAir in the first meet-up with the management team is the increase in costs due to operational issues in public cleansing and waste collection. Disposal of waste through landfilling is fast becoming the biggest issue in waste management because, for most municipalities in Malaysia, landfills are being filled up very quickly. Creating a new landfill would be difficult as the capital expenditure for a new landfill is enormous, reaching up to several million Malaysian Ringgit on average. In contrast, the operating expenditure of a landfill would continuously increase due to the increase in population. Hence, FreshAir must explore all avenues to manage waste collection and disposal operations efficiently and cost-effectively. As described in the previous section, the business development unit of FreshAir has implemented cost-effective measures by designing the transfer stations, intermediate treatment facilities and underground bin system, which leads to reduced waste collection and disposal costs. FreshAir would also need to work with other concessionaires in Malaysia to improve the design of landfills to incorporate the latest technology in waste treatment, such as using leachate treatment systems, gas ventilation systems and waste reduction facilities for treatment before disposal (Latifah et al., 2009).

Delays in collection due to improper waste dumping by the households add further complications to the waste collection task. Many households in Malaysia lack sufficient knowledge about waste separation, which exacerbates problems related to waste collection. A study carried out by the Solid Waste and Public Cleansing Management Corporation (SWCorp) in 2009 found that public awareness of recycling was relatively high. The finding is consistent with our findings on public awareness, but unfortunately, although the public is aware of the 3Rs, it is not being put into practice. Our survey findings also indicated that the public perceived waste issues and concerns as not that serious and 57% of the respondents believed that the cause behind these issues is due to lack of enforcement. Although 80% were satisfied with the collection service, 90% of respondents agreed that the federal or local government should enforce strict laws on waste management. In addition, 83% of respondents agreed that there is a need for involvement of the private sector and non-governmental organisations (NGOs) in waste management. Hence, it is recommended that all parties should work together and contribute to providing in-depth knowledge on waste minimisation. Although most households are aware of environmental issues and recycling campaigns, they do not perceive the current situation in Malaysia as very serious.

Reports on operational activities are made daily at FreshAir to ensure all relevant issues concerning waste collection and public cleansing are addressed accordingly. This is important as oversights could incur additional operational costs; for example, there are penalties due to mistakes or for not meeting the company's key performance indicators (KPIs). According to Azman, the service (operational) unit is accountable for any errors or mistakes with proper documentation. It has to show relevant proof in the form of photos or videos.

Records show that a majority of workers in FreshAir are former city council employees; most have lower-level education, some of whom are elderly. These workers carry with them their past work culture, habits and mindset into the new business structure at FreshAir. This does not bode well for FreshAir as it requires the company to engage in training programmes for its employees, which must be done continuously for the workers to gain the expected competencies. The past work culture and mindset of these former public servants, specifically the operators, would not work best in a private business setting where income is the main indicator of a company's performance. Accordingly, this became a challenge to FreshAir as it had to absorb the workers into the company. At the same time, management had high expectations that the workers could be on par and perform at their jobs similar to their counterparts in the private sector. The employees were not used to the new business environment and work culture, largely due to problems related to their attitude. Thus, an adjustment period was needed to help the employees adapt to perform well in the new business environment at FreshAir.

The work culture and mindsets of the workers previously employed by the local council were initially difficult to change. Their outlook and attitude are reflected in their perceptions and practices toward performing their tasks at work. Responding to this challenge, Mr Cheong, one of the managers at FreshAir, went for the practical approach. He and his team took the initiative and went on-site to train and illustrate the correct way to perform the tasks at hand to the employees. They also inspected whether the employees carried out their jobs as specified and explored to determine the cause of problems if workers were unable to perform any particular tasks. In effect, continuous training was one of the solutions used to help create and promote positive work culture for the employees at FreshAir.

Conclusion

This study aims to provide empirical evidence on challenges or potential barriers affecting waste management systems, as well as to provide some recommendations or strategies in managing waste, such as in Malaysia, and hence help improve environmental sustainability at the national level. It is intended that this study will help create public awareness of environmental issues caused by poor solid waste management, which will lead to health and safety risks. In an effort to continuously encourage Malaysians to embark on the 3R initiatives, FreshAir recently introduced a reward-based recycling programme known as Recycle for Life (RFL), which aims to inspire the public to recycle and recover their waste to help in the sustainability of the environment. Issues related to waste disposal should be a shared responsibility not only for the local authorities but also for those who care about the environment, including individuals, organisations and states. For example, in Malaysia, a non-profit organisation called Zero Waste Malaysia (ZWM) was established in 2016 mainly to advocate for sustainable development and aims to increase the local community's awareness of sustainable living by encouraging a zero-waste lifestyle. Encouraging Malaysian citizens to make small gradual changes, ZWM helps create awareness, delivers talks and takes part in information-sharing sessions to aid in reducing environmental threats due to poor solid waste management.

Environmental and health threats can be mitigated by establishing a comprehensive waste management system for efficient waste collection, transportation, and systematic waste disposal. In addition, increasing public awareness and conducting programmes or activities to reduce waste generation and boost waste recycling would help achieve the same goals.

This study may act as a basis for the concessionaires, non-profit organisations and authorities to plan future residential waste segregation initiatives. This study also recommends emphasising community involvement in waste reduction, recycling, and garbage separation at the source as a way of life. Thus, the good attitude toward trash separation at the source and the unfavourable effects of waste should be emphasised in the campaigns and training. To achieve successful sustainable solid waste management, top-down and bottom-up strategies should be combined.

Cooperation from various stakeholders, namely households, various industries, schools or higher education institutions, local councils and non-profit organisations, is vital for waste segregation programmes to be successful. Just as Rome was not built in one day, FreshAir embarks on an ongoing mission to improve its strategies to manage current issues related to waste management and find ways to help the nation achieve a sustainable environment in the future.

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