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## Acts 672 and 171: Inconsistencies and effective retail food waste management.

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### Abstract

In 2021, Malaysia produced 17,007 tonnes of food waste daily, according to SWCorp. Retail food waste management is crucial because retailers are one of the main causes of food waste in Malaysia. Act 672 and Act 171, the two categories into which the current regulatory framework governing retail food waste is divided, have different implementations in peninsular Malaysia. These discrepancies have resulted in a number of issues, including conflicting authority, a lack of awareness, lax enforcement of laws and bylaws, and inconsistent provisions regarding food waste segregation at the source. Adopting uniform legislation that can accommodate both laws, imposing strict penalties on both, increasing awareness of waste segregation, personnel, and facilities, and putting mechanisms in place for collaboration are the most effective ways to address the problems. By increasing sustainability, these tactics may improve the effectiveness of managing food waste in retail settings.

**Keyword:** Sustainability, Food Waste, Retailers, Policy Changes, Separate at Source

## 1.0 Introduction

Food waste is generated as a result of human activities, including commercial, agricultural, and domestic practices. One of the types of businesses that produce waste under the commercial practice is the retail industry (S. Syed, 2006). The retail industry is one of the main service sectors in Malaysia that contributes to ecological pollution through high production of solid waste (Gawri Vijayan, 2015). According to the SWCorp Health Environmental Officer, the amount of solid waste generated in Malaysia in 2020 is 38,294 tonnes/day in which 44.5% of the waste produced is food waste. The estimated percentage of food waste that is contributed by the retailers is 25.8%.

In Malaysia, solid waste management regulatory frameworks control the handling of food waste. At the moment, recycling, composting, incineration, and landfilling are the food waste management techniques that can be used in conjunction with solid waste disposal and treatment. Nonetheless, the majority of the food waste produced by the retailers is dumped in landfills (Siti Wahidah Abd. Ghafar, 2017). Economic and technological factors play a part in this as landfills don't require expensive or sophisticated equipment (Imran Ahmad et al.,2019). Food waste disposed of in landfills presents a significant challenge for the government to manage due to its unsustainable effects. The disposal of food waste to the landfill and the failure to conduct food waste segregation at source also contributes to the degradation of environment as it contributes to the emission of greenhouse gases in the landfills (W. J. Lim et al.,2019). Consequently, it is essential that Malaysia implement sustainability principles while implementing and carrying out the crucial responsibilities related to managing food waste, such as preventing them and recycling.

Reuse and recycling rates for food waste are currently reported to be relatively low (5%) when compared to plastic (80%) and paper (60%) ((W. J. Lim et al.,2019). Unlike paper and plastic waste, food waste does not have a nationalized disposal system. Consequently, there is minimal source separation of food waste and limited composting of food waste. This is due to the fact that, despite the fact that over 90% of food waste is biodegradable and simple to recycle, Malaysians still lack awareness about recycling and minimizing food waste. An essential first step in waste management, especially for reuse and recycling, is the separation of wastes at the source. Among the producers of solid waste who are required to separate waste at the source are retailers. Solid waste generators, including retailers, are mandated by several laws pertaining to food waste to segregate waste at the source.



Figure 1: Food waste in the landfill

Under the Solid Waste and Public Cleansing Management Act of 2007 (Act 672) and the Local Government Act of 1976 (Act 171), food waste management is handled under the solid waste management category. There are some similarities and differences between the two distinct laws that govern retail food waste management in Malaysia in terms of waste segregation at the source provisions, enforcement agencies, legislation implementation, and subsidiary legislations. To increase the

effectiveness of managing retail food waste management in Malaysia, it is important to pinpoint the disparities that lead to different issues with the regulations controlling solid waste management. (Fig 1)

## **2.0 The Discrepancies between Act 672 and Act 171**

The pertinent laws, Acts 672 and 171, deal with solid waste and, implicitly, food waste. The incompatibility of the two laws is what prevents food waste from being handled effectively. Act 672 offers a crucial legal foundation for the country's regulations, public sanitation, and solid waste management. It describes the legislative framework and procedures that must be followed in Malaysia for the appropriate handling, gathering, moving, treating, and disposing of solid waste, including food waste. Act 672 defines solid waste as (a) any scrap material, unwanted surplus material, or rejected products resulting from the application of any process; (b) any material that must be disposed of because it is broken, worn out, contaminated, or otherwise spoiled; or (c) any other material that is required to be disposed of by the authority in accordance with this Act or any other written law, except scheduled wastes as specified under the Environmental Quality Act of 1974.

Apart from that, in accordance with the Solid Waste and Public Cleansing Management Corporation Act of 2007 (Act 673), the Act grants the Solid Waste and Public Cleansing Management Corporation (SWCorp) the power to establish policies and procedures relating to public cleaning and solid waste management. Act 672 has been implemented in six states: Kedah, Perlis, Pahang, Johor, Negeri Sembilan, Melaka, and two federal territories: Kuala Lumpur and Putrajaya.

On the other hand, Act 171 is exclusive to Peninsular Malaysia and does not apply in West Malaysia, which encompasses Sabah and Sarawak. This Act aims to regulate local authorities' creation, structure, roles, and authority at the city, municipal, and district levels. These acts typically outline the duties of local government, including financial management, town planning and development, waste management, public amenities, public health and sanitation, and other issues pertaining to local governance. Act 672, on the other hand, specifically deals with waste management and is intended to help local authorities fulfil their duties, which include managing solid waste and maintaining public sanitation. This demonstrates that specific laws dealing with issues like waste reduction, recycling, and recovery related to solid waste management are lacking. Nevertheless, states that decide not to put Act 672 into effect rely on Act 171 and its related legislation to control solid waste management, which includes handling food waste from retail stores.

The primary distinction between the two laws is the enforcement body responsible for managing food waste from retail establishments. Under Act 672, the SWCorp is the enforcement agency that oversees solid waste management; however, under Act 171, local authorities are the relevant enforcement agency. According to the laws that outline the duties, each enforcement agency is responsible for distinct tasks. While Local Authorities must adhere to the responsibilities outlined in Act 171, SWCorp under Act 672 is required to act in compliance with Act 673. Act 171 imposes on local authorities to regulate the states, but Act 672, which is also implemented by the states, gives SWCorp the authority to oversee solid waste management.

Acts 672 and 171 are similar in that they both have provisions that forbid the unlawful disposal of waste generated by retailers. For example, under section 72 of Act 171, Local Authorities in Peninsular Malaysia are authorized to establish, maintain, and perform sanitary services, including the destruction or disposal of trash, litter, dead animals, and all types of refuse and effluent. Section 71 of Act 672, which prohibits anyone from performing any unauthorized depositing, separating, storing,

collecting, transporting, or disposing of solid waste in a manner inconsistent with this Act, also mentions the illegal disposal of waste.

Act 672 cases, as stated in this section, typically involve the unlawful disposal of waste. The implementation of food waste management among retailers is demonstrated by the recent case of a vegetable trader who violated section 71(1) by illegally disposing of commercial food waste. The trader was fined RM30,000 under section 71(8), with the potential of a six-month jail sentence for nonpayment. Both laws are still in effect even though they do not specifically address retail food waste because it is governed by solid waste management (Nur Fazini Asro & Ramzi Sulaiman & Asmida Ahmad (2018).

Acts 672 and 171, which grant the relevant authority the authority to enact subsidiary legislation, also permit the passing of bylaws. Solid waste generators, including retailers, are subject to various duties and obligations. Two examples of these are the Solid Waste and Public Cleansing Management (Scheme for Commercial, Industrial, and Institutional Solid Waste) Regulation of 2018 and the Source Separation Initiative of 2015. The Minister may make regulations under section 108 of Act 672 in order to provide solid waste management services. Yet at the same time, Section 73 gives Act 171 the authority to draft bylaws that govern solid waste management-related activities. The local and state governments have different bylaws. For example, bylaws that have been implemented are the Collection, Elimination and Disposal of Waste By-Laws of 2007 in Selangor and the Separation of Waste and Licensing of Recyclable Waste Collection Services By-Laws of 2016 in Penang Island. It is necessary to address the various ways that the states are implementing the By-Laws differently from one another.

## **2.1 By-Laws under Act 672 a) Source Separation Initiative (SSI) 2015**

The purpose of the SSI is to encourage retailers and residents to segregate solid waste within their homes. While segregating waste among retailers is one of the goals of the SSI's introduction in Malaysia, the provisions in question are solely focused on helping the household sector separate its solid waste. Residents must, for example, separate their waste into categories such as paper, plastic, aluminium, and non-recyclable waste, which includes residual waste (wet waste, such as diapers and food waste). Landed home owners who neglect to segregate their waste will be fined for each infraction. Penalties for the first offence are RM50, the second is RM100, and the third is RM 500. The fines for non-landed residences, like apartments and condominiums, are RM 500 for the third violation, RM 200 for the second, and RM 100 for the first. For every fourth offence, a substantial fine of RM1,000 will be applied, irrespective of the type of residence.

Malaysia still has difficulties getting the public to commit to practicing the SSI and to a large extent. The absence of participation can be ascribed to a lack of civic duty on the part of individuals to handle solid waste independently, as they frequently believe that the local government bears exclusive responsibility for this task (Hafierul Hafiz Md Razi et al , 2022). Just 10% of households in high-rise buildings separate their waste at the source, according to data from SWCorp from 2019, which suggests that the SSI is not strictly enforced. Based on data gathered by SWCorp and feedback from households, a number of issues are responsible for the SSI program's lagging progress (Hafierul Hafiz Md Razi et al, 2022). Among these are the mindset of Malaysian households, ignorance, and insufficient recycling infrastructure. The problem persists despite government initiatives to raise awareness through recycling campaigns. Even with government initiatives to increase awareness through recycling campaigns, there

is still uncertainty and no definitive solution to the issue. Many households opt not to separate their waste, believing that it is more convenient to put all waste—including recyclables—into a single plastic bag.

#### **b) Solid Waste and Public Cleansing Management (Scheme for Commercial, Industrial and Institutional Solid Waste) Regulation 2018 (ICI Regulations 2018)**

The ICI Regulations 2018, a subsidiary law under Act 672, impose duties on retailers under Rule 7 to segregate their solid waste into the four categories (recyclable, residual, bulky, and garden solid waste) specified in Rule 4. Commercial solid waste that is non-recyclable, cannot be reused, or cannot be composed is classified as residual waste. In contrast, recyclable wastes include waste made of paper, plastics, glass, metal, and food waste. If solid waste generators are found guilty of violating Rule 7's requirements for waste separation at the source, they could face a fine of up to RM10,000. Note that the ICI Regulations 2018 only specify categories of recyclable and non-recyclable solid waste, and they do not require waste separation at source, especially for food waste. For this reason, it is still common in the retail industry for food waste to be mixed with other waste types.

According to SWCorp Kedah, it is easier to enforce the waste separation at source requirements of the ICI Regulation 2018 on retailers than it is on the residential sector. This is because the retailers fall under the purview of the SWCorp's Industrial, Commercial, and Institutional Waste division, which is in charge of managing solid waste generators that are putting waste segregation into practice at the source in accordance with the ICI Regulations of 2018. Rather than employing a concession company chosen by the government to collect their waste, retail companies are required by Rule 6 to designate a licensee for collection services. In any case, the chosen business needs to hold a license and follow the 2018 ICI Regulations. For instance, the waste that the Kedah retailer collects needs to be collected and separated before it is sent to the landfill in Jabi, Kedah. Interestingly enough retailers and other producers of commercial waste would rather dispose of their waste in landfills. The retailer bears the responsibility of ensuring that their waste is managed in accordance with commercial waste regulations, as opposed to being mixed with household or domestic waste and the lorry transporting the waste must be licensed. The retailer will be fined for failing to comply. In the household sector, waste separation at source is enforced differently and since failure to separate waste at source does not result in fines, changes in household habits are difficult to achieve.

One of the states implementing Act 672 is Cameron Highland, Pahang, where various waste disposal and treatment methods, including composting, incinerators, and landfills, are centralized. Composting is a technology that can be used by certain retailers to treat food waste, specifically vegetable waste. The waste collected for composting technology will be collected by the waste management concession company (Alam Flora Sdn. Bhd.) using special bins, at an expense of RM80 per bin. Among the waste that is collected is food waste, which includes various types of vegetables. Vegetables make up the majority of the waste, not other food waste. The bins are stored in the shops, hotels, and farms. Before the waste could be made into fertilizer, it needed a week to start composting. The Malaysian Ministry of Housing and Local Government (MHLG), in collaboration with Malaysian Agricultural Research and Development Institute (MARDI), has worked on this project most recently.

However, waste separation at source will not be enforced in the retail sector even after the ICI Regulations 2018 come into effect. Cameron Highland's excessive solid waste overflow within the incinerator plant compound is a serious issue that the Pahang State government has been made aware of. This results from the volume of solid waste being more than the incinerator can handle. With only

40 tonnes per day in its design capacity, the incinerator is small. The amount of garbage that was sent to the incinerator plant each day during the school break reached 62 tonnes. The incinerator's operator claims that excessive solid waste has resulted in serious leachate pollution. Despite the fact that the operator is not at fault for the actions of the commercial, industrial, institutional and household sectors that generate solid waste, the Department of Environment has since fined them for the leachate that was produced. Sadly, there is no way to penalize solid waste generators because there are no legal restrictions preventing them from producing excessive amounts of waste.

ICI Regulations 2018 in Cameron Highland require retailers to dispose of their solid waste in an incinerator since the landfill can only handle bulky waste as per the terms of the contract. However, the majority of retailers decline to employ this technique because it is more expensive than disposing of the solid waste in a landfill. While using a landfill only costs RM80 per ton, using an incinerator costs RM200 per ton. The high cost of using an incinerator is a subject of many complaints, but it is unavoidable given the high cost of maintenance and technology. Since there are no laws that forbid retailers from disposing of their waste in landfills, SWCorp had no choice but to disregard it.

Waste that is intended only for burning needs to be separated at the point of collection in order to comply with the rules for operating an incinerator. The only area where waste is separated for the incinerator is the apron chain of the pre-treatment room; any metal waste is separated using a magnetic separator. Metals are not used in incinerators because of their higher melting point than other materials. Food waste and other types of waste are not separated from one another. Consequently, tons of other non-burnable waste are being sent to the Cameron Highland incinerator plant, including wood, couches, and refrigerators. They don't separate waste at the source other than what goes into the composting bins because they don't have enough facilities for recycling.

SWCorp is not currently addressing the issue of solid waste overflowing on the grounds of the incinerator plant. This is a result of the operator and the SWCorp and MHLG supervisors' inability to reach an agreement on the matter of waste overflowing. Each party is unable to act immediately due to their own limitations, even in the most dire circumstances. This makes it more difficult to find a quick fix for the solid waste overflow problem. There should be no delays because every day more solid waste builds up. Authority conflicts are common when dealing with a large issue such as solid waste overflowing in a disposal facility. Because of this, the agencies involved usually exercise caution so as not to unintentionally cross their jurisdictional boundaries. Another problem is that the public bins that retailers provide are not designed to separate waste at the source. These are limited to solid waste disposal only. Because of this, the excessive production of solid waste is exacerbated by the mixing of solid waste from homes and businesses.



Figure 2 and 3  
**show the situation of overflowing of waste in an incinerator compound in Cameron Highland**

Still, if the requirement for waste separation at the source outlined in the ICI Regulations 2018 is followed, it encourages recycling and could help reduce the quantity of food waste dumped in landfills. However, the requirement for retailers to segregate their waste is only applicable in the states that adopted Act 672; it is not applicable across the entirety of Malaysia. (Fig 2 and 3)

## **2.2 By-Laws under Act 171 a) Collection, Elimination and Disposal of Waste By-Laws 2007**

As one of the states that uses Act 171 to regulate solid waste management operations, Majlis Bandaraya Shah Alam (MBSA) in Selangor claims that they also rely on bylaws passed under section 73 of the Act. The solid waste management activities in Selangor are governed by the subsidiary legislation under Act 171, which is implemented by the MBSA and other local authorities. Selangor's waste is all handled by Worldwide Holding Sdn. Bhd., which provides waste management services in collaboration with its subsidiary businesses.

The Selangor By-Laws forbid the unlawful disposal of waste in public areas. Moreover, it mandates that commercial waste, including food waste from retail establishments, be disposed of at any facility selected by the Council and specifically forbids the unlawful disposal of waste from the commercial sector, including food waste from retail establishments—be disposed of at any facility chosen by the Council. Those who commit any of the offences will be subject to compounds totaling RM 1000. The Collection, Elimination and Disposal of Waste By-Laws of 2007 and Section 73 of Act 171 require all Selangor local authorities to implement this compound. However, these bylaws still lack any explicit language regarding waste separation at the source. The state's waste separation policy is now centred on raising public awareness of the act.

For example, face-to-face programs were used to launch the waste separation program in 2015. In 2018, Shah Alam's landed houses had to start sorting their waste at the source, separating it into recyclables (plastic, cans, paper, e-waste, etc.) and non-recyclables (food waste, etc.). Separate days are designated for the collection of recyclable and non-recyclable waste. The program will continue in 2023 and be able to increase the frequency of solid waste collection by collaborating with other businesses. Roadshows and campaigns are being used to inform the people in the household sector about this program. Cooperation with the 24-member Residents Representative Council of Shah Alam is imperative to enhance the process.

The programs won't work without a face-to-face advocacy program with the residents. The population is made up of many different groups, such as high school graduates, medium- and high-educated locals, students, and villagers. The challenge facing the Local Authority is to encourage citizens in all categories to become advocates of change. Act 171 does not contain any explicit provisions or clauses requiring waste separation, which makes it very difficult to reduce food waste, especially in the home sector. As a result, teaching the community about the advantages of waste segregation becomes increasingly challenging.

A few steps have been taken to address the issue of food waste. The MBSA was the first Local Authority in Malaysia to launch the food waste separation at source program in restaurants. Primarily because food waste accounts for the bulk of solid waste and therefore reduction measures should be

implemented. Therefore, cutting the food waste percentage by 50% will significantly aid in solving the issue. In the states where Act 672 is applicable though, food waste separation at the source has not yet been implemented. Apart from waste separation, restaurants must comply with the MBSA's requirement to segregate not only waste but also used cooking oil and recyclable materials. For the time being, they mainly function as rules and guidelines for the restaurants. However, the restaurant's owners won't be held responsible for any violations. The initiative hasn't been closely followed since it was started in 2020.

The MBSA made an effort to solve the food waste issue. Although food waste is currently separated at the source by the MBSA, retailers are not currently a part of the local authority project. The inadequate legal framework and personnel are the cause. As a result, retailers like AEON, Setia City Mall, and ICity Mall typically launch their own solid waste management programs. Together with the separation of food waste, the initiatives also include recyclable materials and raising public awareness. Setia City Mall even invested in a composting machine. Since the local government has no control over retail waste, the company is taking this initiative to reduce the amount of waste it produces. The costs of the waste collection services are entirely the retailers' responsibility. The high cost of reducing their own retail solid waste was probably the driving force behind their decision. Even though some retailers have their own methods for handling and getting rid of food waste, sanitary landfills remain the most widely used disposal option in Selangor. (Fig 4)



**Figure 4: Sanitary landfill in Jeram, Selangor**

There is currently no restriction on the amount of waste that solid waste generators can provide, and the execution is narrow. Furthermore, there are no regulatory frameworks that deal with the issue. The state's implementation of Act 171, the 2007 Waste Collection, Elimination, and Disposal By-Laws, is to blame for this, as it is excessively broad and insufficient to address the problem of excess waste. There is no explicit provision to enforce the act.

**b) Separation of Waste and Licensing of Recyclable Waste Collection Services By-Laws 2016**

Next, we have the 2016 Separation of Waste and Licensing of Recyclable Waste Collection Services By-Laws from Penang. Penang began implementing the waste segregation at source policy on June 1, 2017, in compliance with the 1976 Local Government Act. The policy mandates that occupants of landed properties place recyclables—such as paper, plastic, aluminium cans, and used glass containers—next to their trash can for pickup. Since then, every Saturday in their respective regions, Majlis Bandaraya Pulau Pinang (MBPP) and Majlis Bandraya Seberang Perai (MBSP) collect waste for landed properties. On the other hand, waste separation in high-rise buildings is the responsibility of the residents, and the procedure is managed by Joint Management Bodies (JMB) or Management Corporations (MC). The recyclables they have collected can also be sold.

Penalties for violating the waste separation provision include a maximum fine of RM2,000, a maximum jail sentence of one year, or both, if found guilty. Repeat offenders are equally liable. If residents of landed housing areas, the JMB, MC, and high-rise buildings fail to perform their waste separation responsibilities, they could face a compound fine of RM250. The Seberang Prai City Council (MBSP) achieved the highest recycling rate in Malaysia in 2020, at 55%. A great deal of cooperation has been exhibited by the various stakeholders, which include municipalities, state agencies, businesses, non-governmental organizations, and local councils. Together, these programs have somewhat improved recycling and waste management.

In an endeavour to combat food waste, MBSP has also implemented food waste segregation at source on the mainland, with the aim of separating organic waste from the general waste stream. On Penang Island, though, the MBPP does not have an organic waste management program. To address this issue, the Consumers' Association of Penang (CAP) has taken the lead in implementing different composting techniques at the household level and has made use of the By-Laws to separate organic waste from general waste. One approach CAP has pursued in collaboration with Penang's residents and schools is to introduce different composting techniques suitable for different settings. One particular issue, though, is meeting the demands of apartment residents for a composting method that is simple to use, odourless, and quick. In light of this challenge, CAP is working hard to promote and assist Penang's citizens in composting. However, a significant obstacle to encouraging broad composting activity is the lack of a legally binding statute. Many people find it more convenient to dispose of their food waste with other general waste rather than composting it.

Moreover, there are no provisions in the bylaws that address the food waste of the retailers. The president of CAP asserts that the government needs to come up with solutions to address Penang's food waste issue. In addition, he advocated for the creation of rules and regulations to control food waste in supermarkets and hotels. In order to inform consumers and food retailers about food waste and its effects, he recommended that the government launch a continuous, national education campaign called "zero food waste." At the same time, the Penang State government initiated the Penang State Challenge Incentive, targeted at community-based initiatives, hotels, factories, institutions, and hypermarkets (Penang Green Council, 2023). This incentive's principal goal is to address the problem of food waste and prevent it from ending up in the Pulau Burung landfill. The interested parties or applicant must create a suitable food waste management model that includes processing, efficiently managing and disposing of food waste, and separating it from other waste and recyclables. Before providing the incentive, each applicant will be evaluated by The Penang Green Council (PGC). A single selected candidate will receive a reward of RM2,000. This reward emphasizes abilities and innovative solutions that demonstrate appropriate food waste management practices.

### **3.0 Reconciling the Discrepancies Between Act 672 And Act 171**

There are various lessons to be learned from the experience impacting the food waste issue. It is clear that Acts 672 and 171 differ significantly, which has resulted in a variety of environmental problems. The first is that waste must be separated at the source according to both laws. Act 171 only addresses waste segregation requirements in its bylaws implemented in Penang, not in Selangor, whereas Act 672 requires retailers to perform waste segregation at the source in both of its bylaws. This demonstrates the inconsistent way that waste segregation at source is being implemented in Malaysia. The inconsistent implementation of

Act 672 has been further compounded by the various municipalities enforcing it. Apart from that, the commercial, industrial, and institutional sectors were not covered by Act 171's requirement to segregate waste; it only applied to the residential sector. Furthermore, "waste" or "solid waste" are mentioned in general in all of the bylaws, with no special emphasis on food waste. Food waste is included in the definition of solid waste. Although the mixing of food waste with other wastes contributes to greenhouse gas emissions, the likelihood that it needs to be separated is circumvented.

A potential solution to the uneven implementation of waste segregation at the source could involve harmonizing Acts 672 and 171, which mandate food waste separation at the source for solid waste producers, such as retailers and other providers. Enforcing food waste segregation through bylaws in both laws could address a number of environmental problems, including lowering greenhouse gas emissions and improving the effectiveness of food waste recycling and treatment. Uniform legislation capable of addressing the provisions of Acts 672 and 171 is the answer. To ascertain the optimal approach for implementing food waste segregation at the source, it is essential to actively collaborate with relevant enforcement agencies, stakeholders, and conduct additional research on public awareness and retailer surveys. It is undeniable that harmonizing the two laws could increase the effectiveness of food waste management while also considerably reducing the amount of solid waste disposed of in landfills. The key to making this uniform law effective will be to apply it widely and consistently.

Acts 672 and 171 represent yet another divide. Act 171, for example, contains no regulations about the handling of food waste by retailers. Provisions for the governance of retail food waste management under commercial solid waste regulations are found in the ICI Regulations 2018 under Act 672. It's not necessary for local governments to implement it. Although there are no legal obligations for the public or private sectors to adhere to, it is nonetheless the local government's responsibility to spearhead the promotion of food waste segregation in these industries. Currently, there are no laws governing the disposal or treatment options for solid waste on Penang Island, which makes it difficult to encourage solid waste generators to use composting as a method of treating food waste on the island.

Taking into account everything that has been said thus far, the answer resides in the implementation of thorough laws that regulate how retailers handle, separate, and dispose of food waste. If retailers adhere to the law, the extensive legislation may help address the issue of noncompliance in the industry. This ought to be carried out, particularly within the retailers themselves, given the various constraints the government is placing on them—such as licensing requirements. Act 672 and the related subsidiary laws are also not as strictly enforced as Act 171, in comparison. It has been noted that local governments, who do not depend on SWCorp, manage food waste more effectively.

A plausible rationale for the drawbacks could be the state and local governments' emphasis on reducing garbage disposal costs. Further, Act 672 is still not being implemented, despite enforcement agencies' efforts to manage solid waste. Another indication of this is the household participants' unwillingness to adhere to the SSI bylaw. This is due to a number of factors, including insufficient

recycling facilities, poor household habits in Malaysia that prevent waste from being separated, and a lack of awareness regarding the importance of waste segregation from the source.

As a service provider for waste management, SWCorp could make a contribution by encouraging public awareness-raising. The younger generation can be taught to segregate waste by implementing targeted educational programs in schools and other educational institutions. They should also use digital platforms and social media to disseminate information and recommendations on food waste segregation and recycling. If the platforms are filled with remarkable and creative content that can capture people's attention, they might contribute to raising public awareness. The enforcement of both laws should include the imposition of severe penalties, such as fines, on individuals or businesses that violate food waste segregation regulations.

Intense penalties, such as steep fines, license suspensions for retailers, or other legal repercussions depending on the severity of the offence, should be highlighted more to raise awareness of the significance of separating waste. This is due to the fact that Act 672's bylaws, which set fines for noncompliance, did not include harsh penalties, rendering the regulation insufficient on its own. The severe penalty could increase public awareness because it sends a clear message about how important waste segregation is to solid waste management. For the purpose of segregating food waste, the government must also expand its facilities and workforce. Employing more people to manage retail food waste management and expanding the facilities available to retailers for the treatment of their food waste are both necessary if they want the solid waste generators, to produce less food waste.

The final point of contention, Acts 672 and 171 enforcement agencies are at odds with one another over authority. SWCorp claims, authority conflicts are inevitable since the management of solid waste, in particular, may directly involve other enforcement agencies such as the Department of Environment and the Department of Irrigation and Drainage. The conflict could be resolved by creating mechanisms for collaboration that would allow for regular meetings and channels of communication between local authorities, SWCorp, and other relevant agencies. This would promote cooperation, information sharing, and coordination in waste management initiatives. In addition, the mechanism could address pressing issues that call for immediate attention, like solid waste overflow. With appropriate governance of the solid waste management system, this could improve the efficacy of managing food waste.

#### **4.0 Conclusion**

This paper summarizes the differences between Acts 672 and 171, focusing on a number of key areas including waste segregation at the source, enforcement bodies, and retail bylaw implementation. Numerous inconsistencies have been noted, including the lack of consistency among the Acts, which makes implementation challenging and weakens enforcement of the current laws. In order to achieve the 12th Sustainable Development Goal, which calls for halving global food waste by 2030, Malaysia should take into account the suggested strategies for boosting retail food waste management effectiveness.

By avoiding the landfill, the SWCorp and the Local Authorities can manage solid waste in a more sustainable way. In the future, the primary method of disposing of retail solid waste will no longer be landfills; instead, a system of anaerobic digester machines and composting should be widely used as alternatives to landfills for the treatment and disposal of food waste. Waste segregation is critical to the efficient management of food waste because it is a prerequisite for processing and energy production.

Since the retail industry's legal framework for managing food waste is still in its infancy, pursuing sustainability in this field may provide challenges. As of now, there isn't any legislation created especially to deal with food waste. Acts 672 and 171, two regulatory frameworks governing food waste in retail establishments, include provisions that are generally made with little consideration for the retail sector. Some retailers do make an effort to manage their waste by putting independent initiatives into place, as opposed to relying solely on the solid waste management legislative systems. This suggests that even in the absence of legal frameworks, all parties engaged in retail food waste management, such as SWCorp, local government, stakeholders, and the general public, can actively contribute to enhancing the sustainability of food waste management practices. Only through concerted effort and collaboration of all involved can the environment be made sustainable. We won't be able to go from waste to wealth or from zero to hero before then. (Figure 5,6,7,8,9 & 10)

**Figure 5,6,7,8,9 & 10:** Below is a list of the effects of improper solid waste disposal.







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