



Comprehensive Legislation Development and Policy Framework for Effective Food Waste Management in Malaysia

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ARTICLE INFO

ABSTRACT

Article history:

Received 29 March 2024

Received in revised form 9 May 2024

Accepted 20 May 2024

Available online 31 May 2024

Keywords:

Food waste management; excess food distribution; food wastage; Malaysia law

The problem of food wastage is a major international issue and in Malaysia itself, a total amount of 3,000 tonnes of edible food that is still good to be consumed is being dumped in landfills every day. The problem is that currently Malaysia has no laws to address food wastage. It has been over one year since the press statement and there is yet no law being formulated. The research objectives are to identify and resolve the factors leading to food wastage; and to formulate a legal framework by way of requirements and guidelines for a draft law to combat food wastage. The research adopted a qualitative methodology by studying and comparing similar laws and strategies adopted globally, measures adopted by businesses and social organizations that could be adopted successfully in Malaysia. This research has contributed towards changing lifestyle patterns in relation to food buying, consumption and wastage. Through publications from this research, knowledge were shared on efficient food management methods and social responsibilities. Towards this end, a model law has been proposed with guidelines to the public and businesses involved in the food industry to participate in a novel excess food distribution programme as part of their corporate social responsibility. This research is therefore timely and in line with the national strategy, impacting a critical social need.

1. Introduction

Food waste disposal falls under the category of solid waste disposal. As per the Malaysia Solid Waste and Public Cleansing Management Act 2007 (Act 672) ("the Act"), there are many techniques available for this type of disposal, including destruction, incineration, deposit and decomposition [1]. However, the problem of food wastage is a major international issue including Malaysia, and in Malaysia itself, 3,000 tonnes of edible food that is still good to consume has been dumped in landfills every day [2]. The average Malaysian family throws out a kilo of food daily, a serious waste of resources. This calls for an urgent Food Waste Management Development Plan for Malaysia. In December 2018, the then Deputy Prime Minister, Datuk Seri Dr Wan Azizah Wan Ismail said that

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<https://doi.org/10.37934/ard.117.1.110>

Malaysia was studying the issue of food wastage [3]. The research adopts a qualitative methodology by studying and comparing similar laws and strategies adopted globally and measures adopted by businesses and social organisations that could be adopted successfully in Malaysia.

The problem is that currently, Malaysia has no laws to address food wastage. It has been over a year since the press statement, and no law was being formulated. Although the Malaysia Solid Waste and Public Cleansing Management Act 2007 might be relevant in dealing with the issue of food waste management, the Act's functionality was restricted to situations involving inadequate solid waste management. At the moment, the Act only takes effect when a corporation violates the relevant laws. Not individual per se. In the case of *Pendakwa Raya v. L & K Bera Construction Sdn. Bhd.* [2017] MLJU 1851, the Sessions Court in Temerloh has dismissed a charge made under Section 2 of the Act. The court in fact has highlighted on the weaknesses of the Act namely the definition of solid waste is unclear under Section 2 of the Act. In view that the waste involved in this case is a solid waste construction, it was not properly defined under the Act.

Meanwhile, we may look into another Act in Malaysia which is Environmental Quality Act 1975 which could impose penalties and punishments for the offences against the disposal of solid waste. For example in the case of *Malaysian Vermicelli Manufacturers (Melaka) Sdn. Bhd. v Pendakwa Raya* [2001] MLJU 359, the Malacca Sessions Court convicted and sentenced the accused to a fine of RM75,000/- in default, a year imprisonment on a charge of discharging effluent into inland waters (Malacca river) contrary to Regulation 8(1)(b) of the Environmental Quality (Sewage and Industrial Effluents) Regulations (the Regulations) without a licence, which was an offence under section 25 (1) of the Environmental Quality Act 1975 (EQA) punishable under section 25 (3) of the same Act. In any event, this law is still not enough to resolve the whole situation of saving the food. Since the wastage of food is not an offence under any laws, the act of food waste is not wrong per se, it only becomes more to a moral obligation not to waste any food.

Thus, this research is in line with government national objectives, namely the Ministry of Domestic Trade and Cost of Living (KPDN) launched the Food Bank Malaysia (PFBM) programme as one of the "*Inisiatif Peduli Rakyat*" programmes to assist the less fortunate in obtaining food, which can subsequently lower living expenses [4]. The program also aligns with Sustainable Development Goal (SDG) 12.3 of the United Nation (UN), which aims to reduce the food waste generated by the retail and consumer sectors by half by 2030. Thus, the research objectives were to identify and resolve the factors leading to food wastage; and to formulate a legal framework by way of requirements and guidelines for a draft law to combat food wastage. This research has changed lifestyle patterns about food buying, consumption and wastage. Through publications from this research, knowledge of efficient food management methods and social responsibilities were shared. Towards this end, a legal and/or policy framework has been proposed with guidelines to the public and businesses involved in the food industry to participate in a novel excess food distribution program as part of their corporate social responsibility. This research is therefore timely and in line with the national strategy, impacting a critical social need.

1.1 Literature Review

Gustavsson *et al.*, [5] reported that nearly one-third of global food produced for human consumption is lost or wasted, amounting to 1.3 billion tonnes of food per year. This represents a lot of wasted resources which indirectly impact the environment in various ways such as soil erosion, deforestation, water and air pollution and greenhouse gas emissions from the storage, transportation and waste management [6]. According to Schanes *et al.*, [7], food wastage has been receiving international concern as it has a chain effect on food security and the environment, such as

resource depletion and greenhouse gas emissions. Although food wastage occurs throughout the supply chain, households are the main culprits. Lim *et al.*, [8] study on food waste reduction in Malaysia find that households contribute to approximately half the food wasted. Most of this is disposed in landfills, leading to further environmental problems of greenhouse gas in landfills that negatively impact climate change. They argue that a collective and distributive responsibility exists between the individual consumer, the supermarkets and food outlets. This collective responsibility involves educating both the consumers on individual responsibility and the business enterprises on collective measures that can be taken to reduce food wastage. The number of food waste recycling and reduction activities are low and lack of participation from the public [9]. Besides introducing the management method through social media, a stricter way by governing and imposing a stricter good food waste management policy, law and regulation will help educate the public and reduce food waste amount efficiently [10].

2. Methodology

This research adopts a qualitative research methodology through a systematic literature review of journals, reports, laws and regulations addressing food waste globally and a comparative study of how the selected countries have responded to the issue through laws, regulations and policies. The research comprises of library research based on keywords and relevant literature on food waste management that are collected from both digital and non-digital libraries. Being legal research, the information is obtained mostly from primary legal sources in the form of legislative texts comprising of statutes, regulations and guidelines.

Furthermore, the information gathered are primary legal sources in the form of non-legislative texts, which include procedures, guidelines, reported and unreported case law. Apart from that, secondary legal sources from law textbooks, law journals, seminar papers, legal documentation of law committee reports are also gathered. The information is also gathered from the literature in the field of social sciences, consisting of academic publications (textbooks, journals and reports) and non-academic publications such as newspaper reports and websites.

3. Results and Discussion

Food waste has become a global challenge with far-reaching economic, social and environmental implications. Like many other countries, Malaysia grapples with the substantial challenge of food waste. With a growing population and increasing urbanization, the demand for food has risen, contributing to higher levels of food waste generation. The problem is exacerbated by inefficient supply chains, inadequate storage facilities and cultural practices that may lead to over-purchasing and wasteful consumption. In addition, the consequences of food waste extend beyond the immediate loss of the commodity. Economically, it results in substantial financial losses throughout the food supply chain. Socially, it exacerbates issues of hunger and malnutrition, as perfectly edible food is discarded while others go without. Environmentally, decomposing food waste contributes to greenhouse gas emissions, soil degradation and the depletion of natural resources, leading to exacerbation of climate change [11].

According to SWCorp., although various awareness campaigns namely 'Value Food No Waste' has been held among the public and society to create awareness of food waste, however, the outcome is not so advancing and there is no significant reduction in food waste from 2019-2021 as per the Table 1 below despite in between these periods the movement control order was implemented in Malaysia [12].

Table 1

Solid waste (including food waste) in Malaysia by SW Corp.

Year	Solid waste (including Food waste) generated in Malaysia (tonnes per day)	Food waste (tonnes per day)	Types of food waste (tonnes per day)	
			Inedible (e.g. bones and fruit skin)	Edible (e.g. leftover meat and vegetables)
2019	38,120	16,964	12,893	4071
2020	38,294	17,041	12,952	4089
2021	38,219	17,007	12,926	4081

Source: Solid Waste Management and Public Cleansing Corporation (SWCorp)

3.1 Factors that Contribute to Food Waste and Solution to Mitigate

This research identified several factors leading to food wastage and proposes effective solutions to mitigate its impact.

3.1.1 Lack of awareness and education

One primary factor contributing to food wastage is a lack of awareness and education regarding the consequences of wasteful practices [13]. Without proper knowledge of waste management, individuals may discard food without fully understanding the environmental, social and economic implications. Therefore, comprehensive educational campaigns that highlight the impacts of food wastage and promote responsible consumption habits should be organized to avoid this. For example, Priefer *et al.*, [14] also suggested the most popular methods for preventing and reducing food waste are information campaigns. For example, in Europe, information and education initiatives, information platforms and in-person door-stepping programs have all been put into place to increase consumer knowledge and awareness of food waste prevention [15].

3.1.2 Inefficient supply chain management

Undeniably, inefficient supply chain management is a significant contributor to food wastage. Spoilage during transportation, improper storage facilities and delays in distribution all play a role in the degradation of food quality. For example, up to 50 % of the food produced is lost or wasted significantly in the food supply chain. But when overindulgence in calories is considered, as much as 65 percent of the world's food production is not distributed effectively [16]. This problem could be solved by adopting advanced technologies, such as real-time monitoring systems, which can enhance supply chain efficiency, reduce losses and ensure the timely delivery of food products [17].

3.1.3 Overly stringent quality standards

Further, it is to be noted that stringent quality standards imposed by retailers and consumers contribute to rejecting aesthetically imperfect or surplus produce. Relaxing these standards and promoting "imperfect" but perfectly edible food consumption can significantly reduce food wastage [18]. According to Pinto *et al.*, [19], awareness campaigns emphasizing such produce's taste and nutritional value can help change consumer perceptions. On the other hand, Capitão *et al.*, [20] is also of the view that the target audience for health promotion must actively participate for health programs to be developed and is effective. Health campaigns should use straightforward yet

engaging communication materials to reach the most susceptible populations, such as the underprivileged, uneducated, elderly and the younger generations.

3.1.4 Expiry date misconceptions

According to Neff *et al.*, [21], 84 % of consumers throw food away at least occasionally when it's close to the package date. Of all the evaluated date labels, the most interpreted as conveying quality was "best if used by". In contrast, "use by" and "expires on" conveyed safety. Over one-third of participants were unsure, and over one-third mistakenly believed that date labelling was subject to federal regulations. The previous study done by Melissa and Jennifer [22] showed that the respondents between 18 and 34 and those who misunderstood date labels were far more likely than other respondents to report throwing away food because of the date on the label. This is inconsistent with the data that indicated that while most respondents use food date labels, far fewer consumers understand their meaning. Only 37.2 % of respondents in their study knew the meaning of all three food date labels versus 81 % of respondents who reported either often or constantly looking at label dates. Thus, it can be concluded that consumer misunderstanding of expiration dates often leads to premature discarding of food items. Therefore, transparent and standardized date labelling, along with educational initiatives, can help consumers distinguish between "use by," "best by," and "sell by" dates, preventing unnecessary disposal of still-safe food [23].

3.1.5 Inadequate storage practices

Food wastage also caused by improper storage practices at both the household and retail levels contributes to food spoilage. According to Ananda [24] and Liu [25], the practices of storing food, preparing leftovers, eating out, grocery shopping frequency and expenditure are all significant contributors to household food waste. This is contributed by regular household food-related behaviours to reduce food waste effectively. Therefore, it is essential to encourage proper storage techniques, such as refrigeration and appropriate packaging, as this can extend the shelf life of perishable items. Public awareness campaigns can also educate consumers on optimal storage conditions for different types of food [26].

3.2 Legislation Relating to Food Waste Management in the Selected Jurisdiction

3.2.1 Singapore

Singapore shares the same jurisdiction with Malaysia in which both countries apply common law principles. Based on the Singapore National Environment Agency (NEA), to address food waste, Singapore has implemented several laws and programs. To encourage resource sustainability, particularly food waste handling, the Resource Sustainability Act (RSA) was gazetted in October 2019. The RSA places restrictions on handling and disposing of food waste in addition to reporting any packaging used or imported into Singapore. Under the RSA, owners and occupiers of commercial and industrial premises that generate large amounts of food waste must segregate their food waste for on-site or off-site treatment. This requirement was announced in 2020 and is expected to affect 360 shopping malls, hotels and other businesses.

The NEA plays a major part in Singapore's food waste management. To encourage decreasing food waste and recycling, they have put in place programmes and resources such as the 3R (Reduce, Reuse and Recycle) Programmes and to provide guidelines and resources for food waste segregation and treatment. With 813,000 tonnes of food waste produced in Singapore in 2022, food waste

comprised around 11 % of all garbage produced in the country, while food waste was recycled at 18 % [27].

3.2.2 Taiwan

Taiwan is an example of a nation that has successfully managed its food waste because it combines the government's initiative to implement strict laws on the same issue with the advancement of the usage of the current technologies. According to the Environment Protection Administration (EPA) [28], from 2003 to 2008, the government's "National Development Plan-Green Industry-Resource Recycling and Reuse Programme" promoted active industrial and private sector involvement in initiatives to reduce food waste. The most current revision to the Waste Management Act (also known as the Waste Disposal Act) was made on June 14, 2017. It was essentially developed for efficient garbage removal and disposal, better environmental sanitation and preservation of public health. Under the authority of this Act, the central governing body (i.e., the EPA) established some laws to encourage the use of food waste as available resources.

The Fertiliser Management Act, amended on June 19, 2002, was passed to preserve soil fertility, increase agricultural output and safeguard the environment. Its goals are to ensure fertilizers' healthy regulation and maintain their quality.

3.2.3 Japan

According to reports from the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of the Environment (MOE), Japan generated 5.7 million tonnes of "food loss and waste" during the 2019 fiscal year. It was produced annually by enterprises (2.6 million tonnes) and households (3.1 million tonnes), totalling 45 kilograms per person. The "Food Recycling Law," a relevant rule governing food waste management in Japan, aims to cut food waste by 1 – 2 % annually. This regulation mandates that Japan's food industry and other food waste producers recycle their waste into composts, animal feedstocks and biogas, among other beneficial goods [29]. The Food Recycling Law, which targeted company operators in 2000, and the Act on Promotion of Food Loss and Waste Reduction, enacted in 2019, are two laws the Japanese government established to address food loss and waste to reach the Sustainable Development Goals. Based on these legislative frameworks, the Japanese government began examining the nation's commercial practices to minimize food loss and waste. Extending the nation's infamously stringent best-before date was one initiative to enable businesses to sell food for a longer duration.

3.3 Formulating a Legal Framework/Policy to Combat Food Wastage

The issue of food waste is particularly significant, thus necessitating a comprehensive legislative and policy framework to address the various facets of the problem [30]. For example, to tackle the issue of food waste effectively, Malaysia must establish comprehensive legislation that addresses every stage of the food supply chain. This includes food labelling, storage, transportation and waste disposal regulations. Legislators should consider introducing incentives for businesses and individuals to reduce food waste and penalties for non-compliance.

It is also to be highlighted that addressing the multifaceted issue of food wastage requires a comprehensive approach that identifies and resolves underlying factors at various supply chain stages and consumer behaviour. Educational initiatives, policy changes, technological innovations and collaborative efforts between stakeholders are essential in building a sustainable food system

that minimizes waste. By addressing these factors head-on, we can foster a culture of responsible consumption, promote efficient resource utilization and contribute to a more sustainable and equitable future.

Therefore, in addition to identifying the factors contributing to the food wastage problem, this research also formulates several key requirements and guidelines for drafting a proposed legal framework on food wastage aimed at combating food wastage, emphasizing the need for a multifaceted approach involving various stakeholders across the food supply chain.

3.3.1 Defining scope and applicability

According to Hafner *et al.*, [31], the foundation of any effective legal framework lies in a clear and precise definition of the scope and applicability of the law. Therefore, the proposed legal framework on food wastage should encompass all stages of the food supply chain, from production and distribution to retail and consumption, ensuring a holistic approach to mitigating food wastage.

3.3.2 Establishing clear responsibilities

Furthermore, it is undeniable that assigning clear responsibilities to different stakeholders within the food supply chain is essential. For instance, producers, distributors, retailers and consumers should have distinct roles and obligations to minimize wastage. Therefore, the proposed framework should be able to provide clear guidelines for each stage to enhance accountability and facilitate effective implementation of the law [32].

3.3.3 Standardizing date labelling

According to Tiwari [33], one prominent contributor to food wastage is the confusion surrounding date labelling. The proposed legal framework should mandate standardized date labelling practices, distinguishing between "use by," "best by," and "sell by" dates. This clarity will prevent premature discarding of safe-to-consume food and reduce waste at the consumer level.

3.3.4 Implementing incentives and penalties

In addition, to encourage compliance with the law, a combination of incentives and penalties should be incorporated into the proposed legal framework [34]. Incentives, such as tax breaks or recognition for businesses adopting sustainable practices, can motivate stakeholders. Simultaneously, penalties for non-compliance, including fines or legal consequences, will deter wasteful behaviour and promote adherence to the law.

3.3.5 Encouraging donation programs

According to Aitken *et al.*, [35], a robust legal framework should incentivize the donation of surplus food to charitable organizations. This is because providing liability protection for donors and establishing guidelines for safely handling and distributing donated food seems to encourage businesses and individuals to contribute to food banks and reduce wastage.

3.3.6 Integrating technology

Leveraging technology is crucial in modernizing food waste management. According to Ding *et al.*, [36], the proposed legal framework on food wastage should encourage the adoption of technologies such as real-time monitoring systems, data analytics and digital platforms to enhance supply chain transparency, track food expiration and optimize inventory management.

3.3.7 Public awareness and education programs

In addition to that, the proposed legal framework should mandate and fund public awareness and education programs. These programs should focus on informing consumers, businesses and other stakeholders about the consequences of food wastage, best practices for reducing waste and the benefits of adopting sustainable approaches [37].

3.3.8 Regular review and adaptation

Lastly, the proposed legal framework on food wastage should include provisions for regular review and adaptation. Given the dynamic nature of the food industry and evolving technologies, periodic assessments and updates to the law will ensure its continued relevance and effectiveness [38].

4. Conclusions

In conclusion, a comprehensive legal framework is indispensable in the global fight against food wastage. A well-crafted law can create a conducive environment for sustainable practices, encourage responsible behaviour across the food supply chain and contribute to a more efficient and equitable food system by adhering to the outlined requirements and guidelines. The collaborative efforts of government, businesses and the public, guided by a robust legal framework, can pave the way for a future where food is valued, resources are conserved and waste is minimized. Food waste is a national priority. Formulating laws to encourage corporate social responsibility and devising effective ways to prevent food waste and distribute it to the needy sections of society will assist in poverty eradication, educate society against food wastage, create awareness in society to help in the distribution of excess food, cut wasteful spending and improve the economy and last but not least create wealth across society.

It is imperative that we all recognize and value the significance of properly handling our food. We as individuals need to take responsibility for our actions rather than depending just on the government or different Non-Government Organisations to take action. The concept of preserving food rather than throwing it away has to be embraced by society. Furthermore, it's critical that people understand how much bettering our environment may be achieved *via* effective food waste management.

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