

# Integrating environmental management into food safety and food packaging in Malaysia: review of the food regulation 1985

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**Abstract.** Food safety is an important issue that is related to public safety to prevent the toxicity threats of the food. Management through legal approach has been used in Malaysia as one of the predominant approaches to manage the environment. In this regard, the Food Regulation 1985 has been one of the mechanisms of environmental management through legal approach in controlling the safety of packaged food in food packaging industry in Malaysia. The present study aims to analyse and to explain the implementation of the Food Regulation 1985 in controlling the safety of packaged food in Malaysia and to integrate the concept of environmental management into the food safety issue. Qualitative analysis on the regulation document revealed that there are two main themes, general and specific, while their seven sub themes are included harmful packages, safety packages, reuse packages, polyvinyl chloride (PVC), alcoholic bottle, toys, money and others and iron powder. The implementation of the Food Regulation 1985 in controlling the safety of packaged food should not be regarded solely for regulation purposes but should be further developed for a broader sense of food safety from overcoming the food poisoning.

## 1. Introduction

### *1.1. Food packaging matters for food safety and environmental management.*

Food safety is an important public safety issue to prevent the toxic threats of the food. According to the World Health Organization [1], safe food is defined as a food confidence degree where it does not cause disease or harm to the consumer when it is prepared, served or eaten according to their usefulness. Safe food means food prepared on clean and sanitized surfaces with utensils and dishes that also are cleaned and sanitized. Moreover, from consumer's perception, safe food are more practical like food that does not make a person ill, purchasing fresh chicken and not having the package leak or drip juice, making them wonder about the integrity of the initial seal [2]. Food safety problems can be caused by chemical, microbiological and physical food contaminants. According to Wilcock [3] and Kher et al. [4], microbial contamination of food is also an important issue for public health. Potentially harmful microorganisms proliferate rapidly in the human body once ingested. Changes in eating habits and increasing in the distribution of pre-prepared meals have also augmented the threat of microbial hazards. Moreover, chemicals such as heavy metals, agrochemical residues, food additives used during food processing, traces of antibiotics in animal products and veterinary chemicals all represent potential risks to public health [4].



Eating food that has been contaminated with dirt and germs will involve Food Water Borne Diseases (FWBD) in human bodies. Among various types of the diseases including food poisoning, cholera, typhoid, dysentery and viral hepatitis A, food poisoning is the most popular in FWBD in Malaysia in terms of a number of cases (Table 1). Food poisoning, which can be defined as a situation where taking a contaminated food or ingestion of contaminated food affected by bacteria or toxin bacteria [5] affect human bodies, can cause various symptoms such as diarrhea, vomiting, nausea, discomfort, headache, dizziness and abdominal pain [6]; [7]. These facts indicate that food poisoning is one of the important challenges to be tackled for food safety and particularly against FWBD in the country. In this regard, food packaging is considered as one of the effective approaches to overcome and reduce the toxicity of food that lead to food poisoning.

Environmental management was a stand points to the issue of controlling the safety of packaged food in food packaging. Food packaging helps consumers to take foods hygienically and safely. According to Hawkins [8], materials that are used for packaging food are sometimes considered as a source of risk to the food, can be eventually wastes after use if not reused or recycled, and they can be a source of water and air pollution if packages as wastes are not properly treated. These general concerns also explain the situations of Malaysia. The issue of food packaging therefore needs to be considered from multiple perspectives: food safety and environmental management.

### 1.2. Aims

This article aims to analyze and explain the legal developments of food safety in Malaysia with a focus on food packaging, taking a particular case of the Food Regulation 1985 as a key development in the country, and to integrate environmental management standpoints to the issue of controlling the safety of packaged food in food packaging industry in Malaysia.

**Table 1.** Number of cases and incident rates every 100,000 population (KI) for FWBD from 2002 to 2010

Year	Food poisoning		Typhoid		Cholera		Dysentery		Viral hepatitis A	
	Case	(KI)	Case	(KI)	Case	(KI)	Case	(KI)	Case	(KI)
2002	7,023	28.6	853	3.5	365	1.5	292	1.2	295	11.0
2003	6,624	25.4	785	3.0	135	0.5	310	1.2	-	-
2004	5,957	23.3	484	1.9	89	0.4	356	1.4	107	0.4
2005	4,641	17.8	1,072	4.1	386	1.5	141	0.5	44	0.2
2006	6,938	26.0	204	0.8	237	0.9	105	0.4	64	0.2
2007	14,455	53.2	325	1.2	133	0.5	146	0.5	94	0.4
2008	17,322	62.5	201	0.7	93	0.3	92	0.3	36	0.1
2009	10,238	36.2	303	1.1	276	1.0	154	0.5	40	0.1
2010	12,519	44.2	210	0.7	443	1.6	104	0.4	39	0.1

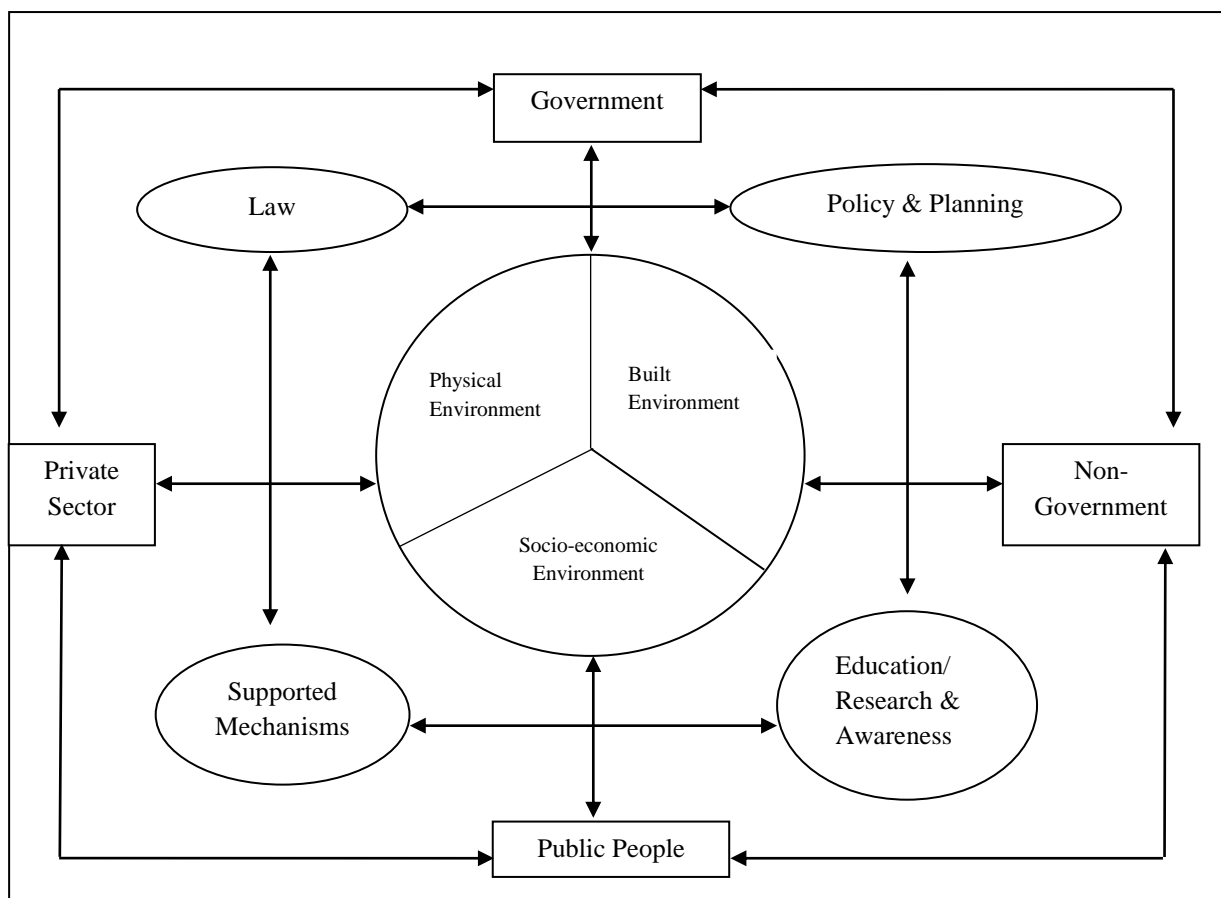
## 2. Food packaging: developments as technology and legal definition in Malaysia

Food packaging is defined as wrappers or containers used to protect food or other products from dirt, germs and damaged. The use of various plastics has developed as new materials for packaging in 1950, when there was a rapid rise in the number of food poisoning cases that reported to the authorities in the United Kingdom [7]. Nowadays, packaging manufacturing uses a variety of materials and labeling methods to protect and promote a product but some of the product may have chemicals material that may affect the health. Therefore, it is important to identify environmental management approaches in dealing with the safety control of food packaging to overcome food poisoning and other diseases that related with FWBD.

Packaging in Malaysia is under certification schemes related to food safety assurance under the Ministry of Health Malaysia, namely Good Manufacturing Practice (GMP) Certification Scheme. Section 2 in the Malaysia Food Act 1983 indicates that packages can include anything in which or any means by which food is wholly or partly cased, covered, enclosed, contained, placed or otherwise packed in any way whatsoever and include any basket, pail, tray or receptacle of any kind whether opened or closed.

### 3. Environmental management as concept

There can be many strategies under environmental management that are useful for ensuring a food safety such as review and update the legislation, strengthening the infrastructure, enhancing collaboration between the government, corporate bodies, non-governmental and international organizations. Environmental management in food safety also covers to develop and train human resources and deal a strategic plan on educating consumers to raise their awareness about the issues.



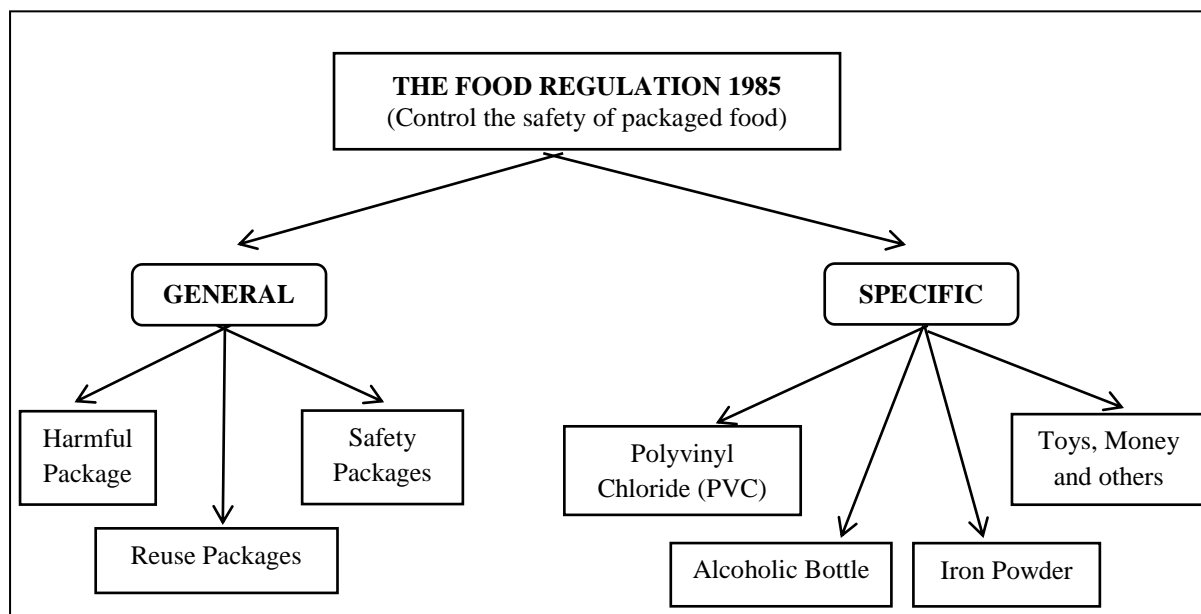
**Figure 1.** Environmental management process

Each individual in this world active to some extent environmental management, but the refer scope here is through a conscious and systematic measure by individual or groups of people acting together to produce a useful physical environment in terms of the economy, which has aesthetic values, ensures the health, comfort and safety [11]. The environment can be divided into two, namely the physical environment and human environment. The physical environment is the “site” to all forms of human activity that also known as a natural process of large systems. The environment is not merely made up from physical components, but also the social, economic and culture that shaped and carved by humans [11]. Environmental management as concept is to optimize the balance among different components of the environment through controlling their dynamic interactions.

For effective management, an understanding of the components and the relationship between them is very important and cooperation also required for all fields, science, engineering and social sciences. A combination of environment information systems acts as a focal point of cooperation between stakeholders and mechanisms of environmental management [10] (Figure 1). Government, non-government, private sector and public involve in cooperation between stakeholders together with law, policy and planning, supported mechanisms, and also education, research and awareness. Malaysia's international involvements have influenced the environmental management in the country. Malaysia has responded and taken in from its experience at the international level to accept the knowledge into the strategy and policy on the environment in the country [11].

According to Muhammad Rizal & Jamaluddin [12], environmental management can be divided into two approaches namely environmental management through legal approach and environmental management through non-legal approach. Management through legal approach has been used in Malaysia as one of the mechanism to manage the environment. According to this understanding, the Food Regulation 1985 is one of mechanism of environmental management through legal approach in controlling the safety of packaged food in food packaging industry in Malaysia.

#### 4. The Food Regulation 1985



**Figure 2.** Themes and sub themes of the Food Regulation 1985 related to the safety of packaged food.

The Food Regulation 1985 was developed under the Malaysia Ministry of Health and enacted in 1985. The Food Regulations 1985 has created and aims to protect consumer from harmful food poisoning beside to ensure the safety of food sold in Malaysia. This Regulation consists of 10 Sections. The Food Regulation 1985 includes two main themes and seven sub themes that are focused on controlling the safety of packaged food as shown in Figure 2. The themes are divided into *general* and *specific*, while their sub themes are divided into harmful packages, safety packages, reuse packages, polyvinyl chloride (PVC), alcoholic bottle, toys, money and others and iron powder.

##### 4.1. General theme

Food packaging with unsaid name, type and detail on package is categorised as *general*. This includes harmful packages, package security and usage packages again. Regulation 27 is about dangerous usage prohibition. Individuals are not allowed to import, manufacture, or advertise.

“Except as to how stated others in this Regulation, no one else could import, manufacture, advertise for sales or sell, or use or causes or allow use in

preparation, packaging, storage, past dispatcher or food exposure for sales, any package, tool, former or vessel which produces or can put out in the content any material that is poisonous, damage or deform, or which helps in the food attenuation"[Regulation 27]

While packaging purpose is to protect food products from source of pollution which caused the food product's perishable, it is also to facilitate operation and manufacturer, distributor, seller and consumer [13]. These can cause loss, damages and could threaten the safety and altogether can cause diseases whether in man or environment because it has poison content or toxic poison content or toxic. Harmful incidents sometimes occur due to chemical substances which include in packer when it recycled or utilized for different uses.

Safety of food packaging is a way to avoid the package to be dangerous and hazardous materials, which mostly cause unsafe package.

"No person shall import, manufacture, advertise for sale or sell any package, appliance, container or vessel made of enamel or glis porcelain intended to be used in the preparation, packaging, storage, submit and post or exposure of food for sale whether it can transfer lead, antimony, arsenic, cadmium, or any other poisonous substances to the food prepared, packed, stored, delivered or exposed in it, or do not have resistance to acid unless the package, appliance, container or vessel satisfies test described in the Thirteenth Schedule " [Regulation 28]

There are many categories of distribution and reuse package related to food safety. It is stated in Regulation 32(1).

"Subject to subregulation (2), no person shall use, or cause or permit to be used, in the preparation, packaging, storage, or exposure for sale, submit and post" [Regulation 32(1)]

#### 4.2. Specific theme

Packages stated a name or information that is related to the specific packaged food are included within a *specific* theme. There are packages made from from polyvinyl chloride (PVC), alcoholic bottle, toys, money and others and iron powder. PVC which contains excess vinyl chloride monomer (VCM) is prohibited from using, importing, manufacturing food packages.

"There is no even one could import, manufacture or advertise for sales or sell or are using in provision, packaging, storage, or past dispatcher to food exposure for sales, any package, tool, former or rigid vessel or not solid made from polyvinyl chloride which contains more than 1 mg / kg vinyl chloride monomer" [Regulation 29]

PVC is one of major thermoplastic substance because it is a polymer that is relatively cheap and versatile. In 1976 more eight million tons of PVC was invoked throughout the world [14].

"No person shall import, manufacture or advertise for sale or use in the preparation, packaging, storage, submit and post or exposure of food for sale, any package, appliance, container or receptacle rigid or se,i-rigid made of polyvinyl chloride containing more than 1mg/kg of vinyl chloride monomer"[Regulation 29]

Toys, money and others are strictly prohibited from placing in food packaging mainly for sale. It may risk and attracted a child. Maybe they will eat together with the food.

"Nothing toys, money or other things can be put in food for sale, or in the food packaging"[Regulation 36(1)]

They however may be put into the food packaging if stated in accordance with the following conditions.

"Nothing in sub regulation (1) may prohibit placed in food or in food packaging,"

a) A body to measure the quantity of food that is recommended for consumption, provided that the thing was sterile;

- b) The label referred in sub regulation (6) of Regulation 12, or
  - c) Any reduced iron powder packets for the purpose of absorbing oxygen”
- [Regulation 36 (2a), (2b), (2c)]

Iron powder can be put into food packaging, only if it is packed in oxygen-absorbing packets that are not contaminated, damage or to enter the food. Labels on iron powder itself must not be contaminated.

"The reduced iron powder specified in paragraph (c) of sub regulation (2) Regulation 36 must be packed in packets in a manner that does not contaminate the oxygen absorber, spoil or get into the food"

[Regulation 36A (1)]

## 5. Conclusion

Management through legal approach has been used in Malaysia as one of the predominant approaches to manage the environment. In this regard, the Food Regulation 1985 has been one of the mechanisms of environmental management through legal approach in controlling the safety of packaged food in food packaging industry in Malaysia. The qualitative analysis of the present study revealed the Food Regulation 1985 provides two main themes related to the safety of packaged food, namely general and specific. It also identified that their sub themes consists of harmful packages, package security, used packaged, PVC, alcoholic bottle, toys, money and others and iron powder.

The implementation of the Food Regulation 1985 in controlling the safety of packaged food should not be regarded solely for regulation purposes but should be further developed for a broader sense of food safety from overcoming the food poisoning, FWBD and other health-related issues to sound environmental management. The present study suggests that the concept of environmental management may facilitate the integration of the food safety regulations and policies and human and environmental health through interactions between various stakeholders and components.

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