

# IMPLEMENTATION OF MALAYSIAN GOVERNMENT INITIATIVES IN MANAGING CONSTRUCTION WASTE

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## Graphical abstract

Respondents Affiliation	Description	Number of respondents
Government agency	Manager/Assistant Manager	2
Federal Government	Chief Assistant Director/Engineer/Manager	5
Local Authorities within Selangor	Architect/Environmental Officer/Officer	8

## Abstract

Construction is one of the industries that able to generate wealth to the country and also contributes to the development of social and economic infrastructure. Lack of implementation of waste management practice in construction site is one of the problems to the construction industry in reducing environmental impacts and dumping areas. A higher demand for new developments causes the increase of construction activities which results in a significant impact on the environment. Hence, the aim of this paper is to highlight the Malaysian government strategies in the implementation of initiatives on construction waste management in Malaysia. In accordance with the stated aim, this paper intends to explore the initiatives implementation by the governing authorities to manage construction waste in Malaysia. This paper presents the implementation of Malaysian government initiatives in managing construction waste. The qualitative research method was applied to explore the existing implementation by the government in order to manage construction waste. Results indicates that the obligations of governing authorities in implementing the initiatives pertaining to construction waste management is inconsistent.

Keywords: Construction waste, waste management, implementation, initiative, policy, guideline, construction industry, Malaysia

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## 1.0 INTRODUCTION

Construction industry is important for economic growth because it increases the standard of living and allows opportunities in providing jobs. Unfortunately, the increase of developments in Malaysia have caused damage to the environment and affected the ecosystem. This damage has become a major problem in recent years [1]. In addition, Jain [2] reported that the construction industry produces a large amount of construction waste. On the other hand, the author has discussed that construction activities such as construction work, renovation or demolition generate inert and non-inert material. It is called as construction wastes [2]. Moreover, statistical data shows that ten percent (10%) to thirty percent (30%) of wastes were

generated from construction and demolition works [2].

Higher demands in infrastructure projects have led to an increase of negative impacts toward the environment [3]. Construction industry is a significant contributor to the waste stream and facing problems in managing waste in order to minimize the negative impacts towards the environment and dumping area. Multiple researches have been conducted on the topic of waste management in construction industry but there is lack of knowledge identified regarding the implementation of government initiatives on construction waste management. Thus, this research fills the gap of previous research by focusing on the implementation of government initiatives on construction waste management.

## 2.0 INSUFFICIENT IMPLEMENTATION OF MALAYSIAN GOVERNMENT INITIATIVES IN MANAGING CONSTRUCTION WASTE

Over the last two decades, environmental issues are becoming more serious and should be curbed in Malaysia. Rapid development such as buildings and infrastructure projects have led to a big waste generator and illegal disposal [3]. Mallak *et al.* [4] mentioned that the increasing problem that is occurring in Malaysia is illegal dumping area. This statement is supported by another author who states that illegal dumping site occurred from construction waste in Johor District resulted forty-two percent (42%) out of forty-six (46%) [5]. Mallak *et al.* [4] also added that there are 933 tons of wastes generated in Klang Valley and the illegal dumping sites have exceeded 52 numbers of sites. This is causing risks to the environment such as greenhouse emission and leachate. Furthermore, Nagapan *et al.* [5] have stated that more illegal dumping sites were found which results in risks to human health and environment along the road in Seberang Perai, Pulau Pinang. Additionally, Selayang Municipal Council has found two illegal dumping sites on an agricultural land in Sri Gombak and a private land in Bukit Jalil. Evidently, waste management practices adopted by contractors in Malaysia are indeed ineffective. Construction industry has not been regarded as an environmental friendly industry due to pollutions it creates and the various negative impacts it promotes towards the environment. Furthermore, the data showed that the rate of recycling in Malaysia is still low at five percent (5%) compared others developed countries such as Hong Kong and Japan [6].

Nizam & Yusoff [7] indicate that construction industry has the largest waste generators compared to other industries in Malaysia. However, construction wastes will not only produce negative impacts on the environment but it can also affect the contractor in managing waste disposal when the cost has increased. Development of building and infrastructure is growing rapidly. Consequently, the use of natural resources will also increase. Additionally, there are various types of materials used in a construction site that produced wastes. According to Nagapan *et al.* [5], there are six types of waste material has been found on 30 construction site which are concrete, metals, bricks, plastics, woods and others waste.

Small percentage of contractors are willing to consider the sustainable environment and recycling the construction material because of working pressure and limited time to complete the project ([8]; [9]). Moreover, construction industry always been linked to quality and quantity of waste [3]. Thus, in order to curb this problem, a strong enforcement in term of policy and legal instrument are needed; otherwise these problems will not be addressed effectively. Construction industry is responsible for developing a sustainable environment in term of infrastructure. Hence, to ensure sustainable

development is successful, the implementation of initiatives among the government and contractors are very important in order to managing construction waste.

## 3.0 RESEARCH AIM, OBJECTIVES AND RESEARCH QUESTIONS

This paper aim to highlight strategies in implementing government initiatives on construction waste management in Malaysia. The objective that underpins the research aim is to explore the initiatives implementation by the governing authorities to manage construction waste in Malaysia. The following research questions have been formulated as a result from the current scenario on construction waste management in order to gauge the research endeavor:

1. RQ 1.1: Who are responsible for implementing government initiative on construction waste management and monitor the current practices among the contractors in Malaysia?
2. RQ 1.2: What are the gaps in term of existing initiatives and current practices, why such gaps emerged and how to minimize these gaps?

## 4.0 THEORETICAL FRAMEWORK

### 4.1 Construction Waste

Construction industry is one of the industries benefiting the country in terms of economy and infrastructure. However, this thriving industry is responsible for one of the single largest waste streams in the country. Hence, the effectiveness of environmental management is very important [10]. Based on study carried out by Foo *et al.* [11] for three months in construction sites, the author has found five main types physical of wastes at the sites as follows:

1. Concrete waste caused by improper handling of concrete;
2. Timber waste when timber usually used as formwork. As we know timber formwork can be used at least three times before it is disposed.
3. Steel waste due to mistakes made while cutting off bars by the lack of experience workers;
4. Brick waste because of problems in handling of materials during the construction stage; and
5. Packaging waste generated at site during the delivery process. After the material used or delivered, packaging waste remain or leftover at site. The wastes are usually detected are wrapping plastic and paper.

A major stimulant to the Malaysian economy is construction industry. However, construction activities also generate waste that could threaten health and environment. Construction waste management is very important to avoid the negatives impacts to the environment, social and economy [5]. It will become an issue if handled poorly. According to Nor *et al.* [12] the impacts of construction waste on the environment are:

1. Unbalanced ecology;
2. Change of living environment;
3. Potential sewage;
4. Depletion of natural sources;
5. Energy consumption; and
6. Generation waste.

Hence, it will affect human health and the environment. Nagapan *et al.* [5] has regarded that the major factors that contribute to an increase of illegal dumping sites are financial issues and location of project. The distance between the location of project and the landfill site is too far has led contractors to not dispose waste to the gazette landfill. It is also intended to avoid payment for landfill charge and transportation cost to maximize the profit [5].

Activities carried out by the human will always generate waste. This was not a major issue, but it becomes a serious problem if waste management is not well managed. In the end, it will cause pollutions and give major impact to human health. Some of the direct health impacts have occurred due to poor waste management especially in developing countries [13].

#### 4.2 Waste Management

Waste and Resources Action Programme (WRAP) [14] has given their own definition for construction waste management as tools to identify suitable waste streams, target rates for waste generated and process to ensure a good practices achieved. The standard of living in Malaysia is increasing due to urbanization and population growth and unfortunately increases the production of wastes [15]. The awareness of environmental impacts caused by construction waste is very important. Several organizations in the construction industry have implemented waste management in order to reduce waste generated. As a result, some approaches and methods have been used to manage construction waste [16]. Implementation of good practices in management of construction waste contributes to sustainable development and helps to minimize waste in construction site otherwise it will be sent to landfill [14]. Additionally, the author also added a lot of benefits in implementing good practice on waste management in construction project such as:

- 1) Reduces financial cost for disposal through minimizing the use of material;
- 2) Reduces the environmental impacts; and
- 3) Maximizes sustainable design.

In reference to Abolore [17], disposal method usually used in Malaysia is landfilling process but it also depends on the availability of land to reduce pollution and environmental impacts. Due to the lack of emphasis on the aspects of landfill management, Malaysia is currently facing a big problem. The main problem faced by Malaysia is pollution [17].

Good practices in implementing construction waste minimization are following the waste hierarchy which is; reduce waste; reused material; and maximize recycled material [14]. In addition, the author also added that waste minimization is one of the methods in managing waste to “design-out” waste from construction projects and reducing it during construction level.

#### 4.3 Construction Waste Management Initiatives

The detailing of waste management and environmental protection initiatives are very much relevant to ensure the objectives are achieved. The formulation of appropriate legislation, bylaws, regulations, standards, and the integration of waste management into the legal framework as a policy is important in order to achieve environmental and sustainable development [18]. Controlling of industrial and hazardous wastes will be given special attention in laws and regulations [19].



**Figure 1** Timeline of solid waste management transition in Malaysia

The increase of wastes and problems during handling industrial solid wastes is an unpleasing fact. Therefore, the priority of operation the landfill will be given in accordance to the waste management hierarchy. Timeline of solid waste management transition in Malaysia is shown in Figure 1. In the 8th Malaysia Plan (2001-2005), “waste minimization,” “promotion of reuse,” “developing a recycling-oriented society” and “implementation of pilot projects for recycling” has been included as some of its main policy goals. Moreover, waste reduction, reuse, and recovery are required in solid waste management policy. In the 9th Malaysia Plan (2006 – 2010), reduce, reuse, recovery and recycling of

waste have been added for further emphasize of the existing policy. In order to achieve sustainable waste management, strategies need to be modified as follows:

1. Enhancement of awareness on waste minimization;
2. Strengthening of partnership for 3Rs Activity; and
3. Enhancement of institution to strengthen Government policies on WMP

The "National Strategic Plan for Solid Waste Management" was introduced in 2005 as solid waste management policy in peninsular Malaysia until 2020. The efforts of government to address this issue by introducing the Solid Waste and Public Cleansing Management Act 2007 and establishing two new federal institutions aiming to implement the country's solid waste management policy and to carry out their duties which are; National Solid Waste Management Department and Solid Waste Management and Public Cleansing Corporation [8]. Other than that, in 1976, Local Government Act was adopted to provide a better institutional and legal framework for local authorities to carry out their duties [18]. However, their scope of duties did not cover the construction waste management. Moreover, Construction Industry Master Plan (2006-2015) has been introduced to improve the performance of construction industry. Strategic Thrust No. 3 in Construction Industry Master Plan strives for the highest standard of quality, occupational safety and health, and environmental practices. One of the major concerns related to the environment is the production of construction and demolition wastes.

Solid Waste Management becomes more important in Malaysia due to the insufficient management of waste which caused negative impacts towards the environment. The failure of connection between policy and practice is caused by lack of implementation, weak enforcement, uncertainty over roles and responsibilities amongst governing authorities and limited stakeholder coordination. However, the Malaysian Government recognizes that appropriate waste management is essential in achieving sustainable development.

#### 4.0 RESEARCH METHODOLOGY

The first stage of data collection was started by reviewing a body of knowledge on the existing government initiatives pertaining to construction waste management. The purpose of that exercise was to address research questions 1.1 and 1.2. An interview protocol was prepared to ensure reliability and validity of qualitative data. The interview protocol has been prepared and piloted to the targeted group prior to actual data collection. The purpose of this exercise was to maintain internal validity of the data and reliability of the instrument. This qualitative research method has been designed by way of semi-structured interview. Samples of the

selected respondents were based on stakeholders and related agencies in construction waste management. Selected samples consist of related agencies from the Malaysian government which were seen as relevant to construction waste management. Among others, the samples were:

- i. Construction Industry Development Board (CIDB);
- ii. Solid Waste and Public Cleansing Management Corporation;
- iii. Local authority within Selangor (Petaling Jaya, Shah Alam, Ampang Jaya, Kajang, Klang, Selayang, Sepang and Subang Jaya); and
- iv. Standards and Industrial Research Institute of Malaysia (SIRIM)

The sampling frame of the above focus group has been identified prior to actual data collections take place. Due to the nature of qualitative research, the data has been collected until the saturation point is achieved; in this case the number of respondents was 15.

## 5.0 RESULTS AND DISCUSSION

### 5.1 Respondents

Table 1 indicates respondents affiliations, a total of 15 respondents has been interviewed in this research. Respondents with more than five years of working experience were selected. Two respondents were representing government agency, five of the respondents were attached to the federal government and the remaining from local authorities within the state of Selangor (Petaling Jaya, Shah Alam, Ampang Jaya, Kajang, Klang, Selayang, Sepang and Subang Jaya).

**Table 1** Respondents affiliations

Respondents Affiliation	Description	Number of respondents
Government agency	Manager/Assistant Manager	2
Federal Government	Chief Assistant	5
Local Authorities within Selangor	Director/Engineer/Manager Architect/Environmental Officer/Officer	8

## 5.2 Implementation of Government Initiatives

Table 2 showed respondents initiatives in government agency, federal Government, local authorities and federal government. Among all the agencies, the respondents confirmed that only government agency provided guidelines for construction waste management. According to Respondent 1, in order to improve the current practices in the construction industry, they have prepared the Guidelines on Construction Waste Management in 2008 to assist the stakeholders in construction industry in order to manage wastes on site;

*"...for the mean time, there is no initiative regarding to construction waste management except Guidelines on Construction Waste Management that have been introduced in 2008...but the guideline is not being implemented because there is a lack of enforcement...the implementation of guideline depends on contractor whether they want to follow or not...the guidelines have not been successfully implemented because this guideline existed due to public pressure for contractors" (Respondent 1).*

**Table 2** Respondents initiatives

No.	Respondents	Initiatives
1	Government agency	Guidelines on Construction Waste Management
2	Federal Government	Solid Waste and Public Cleansing Management Act 2007 (Act 672)
3	Local Authorities within Selangor	Local Government Act 1976 (Act 171)
4	Federal Government	Malaysian Standard MS 2547-2014

The guideline is not being enforced and translated in the form of strong legal instruments. Other than that, the implementation of the guideline in construction site has not been monitored by the government agency. Even though the government agency has recommended the stake holder to minimize construction wastes and moving towards sustainable construction practices through the guideline. However, it seems to be less efficient because there is a lack of enforcement and implementation.

On the other hand, in the 8<sup>th</sup> Malaysia Plan (2001-2005), the federal government of Malaysia has implemented the waste minimization, reuse and recycling as its main policy goals. Furthermore, in the 9<sup>th</sup> Malaysia Plan (2006-2010), the plan has been modified in order to achieve sustainable waste management to reduce, reuse, recovery and recycling of waste. In 2011, the federal government of Malaysia had introduced the Solid Waste and Public Cleansing Management Act 2007 (Act 672) to

address the waste issue. Two new federal institutions have been established which are National Solid Waste Management Department and Solid Waste Management and Public Cleansing Corporation to implement the solid waste management policies. However, Solid Waste and Public Cleansing Management Act 2007 (Act 672) were enacted only throughout peninsular Malaysia (except Perak, Selangor, Pulau Pinang, Kelantan and Terengganu) and the Federal Territories of Kuala Lumpur and Putrajaya because the state of government were given an option whether to comply or not the existing act. Three respondents have agreed that existing waste management policy in Malaysia only covers domestic and schedule wastes. In addition, it has not been used widely in our industry. According to Respondent 3, the existing policy has not been implemented directly in the Malaysian construction industry but it has been implemented in other industry.

*"...existing landfill sites in Malaysia are mainly for domestic and schedule wastes...at the present moment we don't have it for construction waste" (Respondent 3).*

Furthermore, Respondent 4 has added that;

*"...we have built facilities for recycling construction material in Sungai Kertas, Gombak on April 2014...but only used for Kuala Lumpur area... actually Sungai Kertas is only for construction waste disposal, our recycling machine park near there...but the problem now is delivery issue due to distance factor from construction site which involve high cost...so far, this method unsuccessful because of contractor don't want to follow..." (Respondent 4).*

In 1976, Local Government Act 2007 (Act A1311) was adopted to provide a better institutional and legal framework for local authorities to carry out their duties. Unfortunately, their scope of duties did not cover the construction waste management. Following that statement, according to Respondent 6, 7, 8, 9, 10 and 11, the local authority does not have responsibility for construction waste management.

Other than that, the Department of Standards Malaysia has appointed SIRIM Berhad to develop Malaysian Standards (MS 2547:2014) which specifies requirements for landfill safe closure. The Malaysian Standards provides guidance to protect public health and the environment by proper management of landfill safe closure and post closure land use; and to prevent environmental pollution and risks from the closed landfill sites and uncontrolled development of closed landfill sites such as leachate and gas emissions. Unfortunately, the guideline is still new and was not being enforced and translated in the form of strong legal instruments.

The data collected through semi-structured interview with government agency, federal government and local authority within Selangor indicated that the factors contribute to unsuccessful of existing initiatives are insufficient in term of implementation amongst the governing authorities, lack of enforcement and uncertainty of governing



authorities in performing their roles and responsibilities. As can be seen, this does not reflect to government aim in minimizing construction waste in Malaysia. In order to come up with solutions towards insufficient policy implementation among governing authorities, it is vital that these reasons are known.

## 6.0 CONCLUSION

From the analysis, it is indicated that the initiatives implementation among governing authorities is relatively ineffective as compared to other developed countries such as Japan, Hong Kong, Singapore and United Kingdom. This research is an attempt to propose a framework of implementation of the Malaysian government initiatives on construction waste management. Therefore, the proposed framework will be highlighting new strategies in implementing government initiatives that can be used as a basis of legal instruments and enforcement regime. The research output is expected to add into the existing body of knowledge on the theoretical mechanism to reduce adverse environmental impacts by way of effective government initiatives in management construction waste.

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