

ENVIRONMENTAL POLLUTION AND EXISTING REGULATIONS: A REVIEW ANALYSIS

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ABSTRACT

Construction industry despite being the important industry in generating economy, the increased number of pollution cases from construction projects in Malaysia is alarming and becoming one of the environmental issues. Although actions have been taken, there is no indication of a reduction of cases. Moreover, there is a need to revisit the existing laws pertaining to pollution. This paper presents a review on the environmental pollution and existing regulations in Malaysia. Furthermore, analysis of court cases on pollution is presented. The paper further identifies the issues on construction pollution and the gap in the existing legislations. The findings may be used as a platform for more extensive scholarly research in the stated area.

Keywords: *environmental pollution; Environmental Quality Act 1994; construction pollution; existing legislations in Malaysia*

INTRODUCTION

Construction is an industry that is divided into three categories which are industrial, building and infrastructure. From the year 1990 to 2016, pollution in the construction activities has increased rapidly. Malaysia's poor performance in global EPI has raised attention and concerns from the government and authorities (Ahmad, 2013). At the present moment, construction activities are among the contributors for air, water, and noise pollution. The increased number of pollution cases from construction projects in Malaysia is alarming and becoming one of the environmental issues. In addition, environmental management is an idea in political ecology and environmental policy that aims for supporter's maintainability as the incomparable thought for dealing with all human activities such as political, social, and financial (Munda, 2012). The administration of environment in Malaysia commenced with the coming into force of the Environmental Quality Act 1974. Governance incorporates government, business, and normal society and highlights entire framework state. Issues of pollution in the construction industry are very much about classification, causes, and impacts of construction pollution; cases; elaborate about the existing regulations on Environmental Quality Act 1974 and previous research on pollution in the construction industry. The purpose of this paper is to review based on the literature available online of the environmental pollution and the existing governance implemented in Malaysia.

ENVIRONMENT POLLUTION

Kozlovska and Strukova (2013), define environmental pollution as "the development procedure in building site introduces nearly at the point some adverse effect on the various component of the environment". In the 21st century, there has been an increment in the measure of both national and worldwide environmental pollution problems. Water pollution has been of real significance in Malaysia as it influences the nature of stream water (Ibrahim, H., & Kutty, 2013). Among the most concerning issues in Malaysia is the environmental pollution (Poon et al., 2016). For instance, these impacts can undermine the biological system estimations of rivers. Due to this reason, there is a need to consider the reasons for ecological debasement for the most part because of anthropogenic activities. Anthropogeny is an

activity that is identified because of the impact of individuals on nature (Tejerina-garro, Maldonano, Ibanez, Pont, & Roset, 2005). Given these points, pollution in Malaysia occurs in various conditions, not limited to agriculture, industrial, and as well as construction. Having said that, construction is the primary focus of this paper since the industry is very much important in the sense of providing multiplier effects to other industries and crucial for the economy (Mitchell, 2005). Furthermore, construction projects and pollution seem very much interrelated.

Agricultural

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Industrial

Between years 1990 to 2015, urban development has been one of the important motivating factors of countries' economic improvement. Since the 1990s, Malaysia filed a standard of 4.5% commercial development; in the meantime, urbanisation (Shahbaz et al., 2016). This rustic urban driven relocation additionally changed the economy base of the country from

horticulture to modern. Urbanisation is identified with industrialisation, mechanical association, globalisation, and movement (Shahbaz et al., 2016). On the other hand, industrial will give effect on the earth, human wellbeing, and prosperity (Lee, Mokhtar, Goh, Singh, & Chan, 2015). Along these lines, worries reporting on the air pollution issues have been brought up in various industrial sectors (Zhang et al., 2016). Therefore, Malaysia's Department of Environment has to find other ways such as initiatives programme, enforcement, and coordination to tackle the environmental pollution problem.

Construction

In Malaysia, issues on population and rapid urbanisation are very common. Thus, the increasing population causes high demand in construction activities, in which such activities can be divided into three categories which are industrial, building and infrastructure (Abdullahi, 2015). From the years of 1990 to 2015 pollution in the construction industry has increased rapidly. Pollution in construction that dominantly happens a mid development may helpfully put the building association as the capable party (Torp et al., 2016). In addition, the danger of contamination during construction activities, particularly when earth clearing activities and earthworks are included. Thus, the construction industry has to look for an alternative to minimise pollution cases about the construction pollution.

POLLUTION IN CONSTRUCTION INDUSTRY

Classification of Construction Pollution

Most of the pollution in construction industry involves three types of pollution namely water, air; and noise (Shen et al., 2010). The industry can be defined as the broad conglomeration of industry and sector, which adds value to the creation, and maintenance of fixed assets within the built environment¹. Whereas, the construction works can be defined as the provision of a combination of goods and services arranged for the development, extension, installation, repair, maintenance, renewal, removal,

¹ (Section 1(h) Construction Industry Development Board Act, No 38 of 2000).

renovation, alteration, dismantling, or demolition of a fixed asset including building and engineering infrastructures². Water pollution is caused by sources of building sites which are paint, solvents, construction debris and dirt, and harmful chemical and diesel or oil. Secondly, air pollution can take place due to the construction activities which are from demolition, toxic materials, burning, an operation of diesel engines, and land clearing. Thirdly, noise pollution is caused mainly by heavy equipment, machinery, and vehicles at the construction sites (Gray, 2016). The problem of these three types of pollution in construction is further discussed:

Water pollution

According to Prasanna et al.(2012), water pollution is a major issue in Malaysia and affects contrarily on the supportability of water resources. It diminishes clean water accessibility impressively as the expense of treating polluted water is too high where in a few examples contaminated waters are not treatable for utilisation. For example in several states in Malaysia, some population experience the floodplain, which provides highly fertile land for agriculture and land of housing, industrial developments and recreation. This situation has brought people into conflict between human development and stream environment. Such situation would expand the level of pollution into stream channels (Juahir et al., 2010). Therefore, numerous existing laws are additionally not far reaching enough and do not bargain straightforwardly with water issues. Furthermore, the reduction of water pollution in construction sites has turned to be more severe in Malaysia.

Air pollution

Development activity that adds to air pollution includes land clearing, operation of diesel motors, devastation, blazing, and working with harmful materials. All development locales create abnormal amounts of dust and this can convey for extensive separations over a drawn out stretch of time. It has been explored that the biggest source of particulate contamination incorporates coal ignition, engine vehicle outflow, and industrial dust (Zhang et al., 2016). As there is an expanding pattern of the quantity of development and construction activities, it is anticipated that construction dust contamination will turn out to be more genuine later on. In this way, it is of need and noteworthiness to research the measures that can make development dust pollution moderate (Zhang et al., 2016).

² (Section 1(j) Construction Industry Development Board Act, No 38 of 2000).

Noise pollution

Noise is the most persistent physical contaminant in human environments. Noise is very much related to construction projects and may give rise to legal action on nuisance. Noise can cause a series of detrimental health effects on human beings, among which the best-studied effect produced by the overexposure to noise is the loss of hearing. For instance, occupational noise-induced hearing loss has been concerned in many industries, e.g. utility industry, manufacturing industry and mining industry (Li, Song, Wang, Zheng, & Ning, 2016). As mentioned in Table 1.3, there are 4287 cases of Occupational Noise-Induced Hearing Loss (NIHL) obtained from Factory and Machinery Department Occupational noise, from Department of Occupational Safety and Health, Ministry of Human Resources Malaysia. Besides that, a major controlling factor of noise pollution in construction site, when it comes to layout planning, in regulating sound levels reaching a particular receiver point in the vicinity of the construction site, is the distance separating the noise emitting source and the receiver, together with any barriers that may disrupt the sound propagation path (Hammad, Akbarnezhad, & Rey, 2016).

Previous Research on Causes of Construction Pollution

The construction industry, despite being one of the most important industries in generating economy, construction projects are among the contributors to air, water and dust pollution. The increased demand for the construction project will lead to the pollution in construction. Table 1.1 presents a list of causes of construction pollution which is obtained from the literature review.

Table 1.1: List of Causes Construction Pollution

NO	AUTHORS	STATEMENT	CAUSES
1.	Yusof, Zainul, Zailani, Govindan, & Iran manesh (2016)	"Construction projects consume amount of resource, waste, and energy that gives to the sector's largest share of the total adverse control to the environment"	Consuming amount of resource, waste and energy

2.	Sharifinia, Mahmoudifard, Imanpour, Ramezanpour, & Yap (2016)	"Contamination from heavy metals in surface water is one of the main quality problems"	Heavy metals contamination
3.	El-Sawalhi, & N. (2015)	"The environment is undermined by extremely a variety of issues, some of which brought about by the activities of development project"	Variety of issues due to development activities
4.	Poon et al. (2016)	"The effectiveness of Department of Environment (DOE) of Malaysia in enforcing policy remains low because of limited operational budget, limited human and technical resources, and poor support from outside bureaucracy"	Poor enforcement
5.	Manan, Z., Alwi, & S. (2015)	"Malaysians have indifferent attitude of the approaching system towards a long-term development in inclination to short-term fast economic gains which has contributed hugely to the environmental hardships of the country"	Behaviour and attitude
6.	Maidin & Ainul (2005)	"The challenges faced by the Malaysian government in overcoming environmental problems arising from poorly planned development activities"	Poorly planned development activities
7.	Shahbaz, Loganathan, Muzaffar, Ahmed, & Ali Jabran (2016)	"In the urban city, the increasing numbers of richer citizens pushes demand for the intensive product which also leads to higher level of air pollution"	Demand for the intensive product of construction

From the literature presented in Table 1.1, it can be concluded that the causes of construction pollution are from the construction activities which are consuming amount of resource, waste and energy, heavy metals contamination,

variety issues due to development activities, poor enforcement, behaviour and attitude, poorly planned development activities, and demand for the intensive product of construction. Therefore, construction participants ought to have an overall view of the construction process from the beginning until the end.

Impacts of Construction Pollution

Construction pollution will provide negative impacts to the environment and well-being of human. For example, natural disaster, health disorders, disturbance to surrounded area, severe haze to the environment, exposure to noise, diseases to the human, and being the pollutant to the water and air quality. Table 1.2 shows a list of impacts of construction pollution:

Table 1.2 Lists of Construction Pollution Impacts

NO	IMPACTS OF CONSTRUCTION POLLUTION	CATEGORIES	AUTHOR
1.	The construction industry in Malaysia can be seen as a major cause of pollution. It contributes negative impacts to the environment such as the use of building materials harmful to human health, flash floods and soil erosion.	Natural disaster	Abidin & N. (2010)
2.	Many studies have covered various aspects of health disorders that are considered a direct result of exposure to noise pollution in construction.	Health disorders	Hammad et al. (2016)
3.	Construction activities pose a risk of introducing pollutants into the environment which can affect the workers on site, the neighbourhood, or the local ground, water and air quality.	Disturbance to surrounded area	Bello & Oyedemi (2009)
4.	Critical haze in Malaysia occurs because of boundary atmospheric pollution of construction and gives effect such as diseases to human being.	Severe haze to the environment	Murgan & Hamid (2016)

5.	Noise pollution from the construction activities can cause a series of detrimental health effects on people, of which the best-studied effect produced by the overexposure to noise is the loss of hearing.	Exposure of noise	Li, Song, Wang, Zheng, & Ning (2016).
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Recorded Cases of Pollution

List of diseases cases in year 2015 (January-August) was obtained from Department of Occupational Safety and Health, Ministry of Human Resources Malaysia (Yusoff, 2015). Table 1.2 shows the disease, pollution categories, and a number of cases.

Table 1.3: List of Diseases and Cases of Occupational Diseases and Poisoning

POLLUTION CATEGORIES	DISEASES	CASES
Air Pollution	Occupational Lung Diseases (OLD)	86
	Occupational Skin Diseases (OSD)	36
	Occupational Cancer	2
Noise Pollution	Occupational Noise Induced Hearing Loss (NIHL)	4287
	Disease cause by Physical Agent	5
Water Pollution	Occupational Poisoning	27
	Disease cause by Biological Agent	67
Others	Occupational Muscular – Skeletal Disorders (OMD)	208
	Psychosocial Problem	2
	Other Types of Occupational Diseases	16
	Non-Occupational Diseases	9
	Total	4745

As a conclusion, the noise disturbance has become a common problem as a result of the industrialisation whereas, from the Table 1.3, majority cases 4287 of disease Occupational Noise-Induced Hearing Loss. Having said that there are no reliable data specifically on construction projects. Even so, the data can be used as an indication that the issue of pollution is alarming, in which the construction industry is one of the contributors. On that note, greater awareness in planning and improved standards of construction can help mitigate potential issues on pollution. Other than that, scholarly research needs to be conducted to minimise the gap on the stated issues.

EXISTING REGULATIONS PERTAINING TO CONSTRUCTION POLLUTION

The government of Malaysia established a department of environment to oversee issues and cases on construction pollution. Besides, the organisation of environment in the nation began from the coming into power of the Environmental Quality Act 1974 under the Division of Environment under the Ministry of Housing and Local Government. From that point forward, environmental enactments identifying with particular issues of environmental concerns have been gazetted. The organisations can be seen as a backup to the improvement condition of the nation and an impression of its advancement state (Mustafa & Mohamed, 2015).

Background Environmental Quality Act 1994

Environmental Quality Act 1994 is legislation very much related to the prevention, abatement, control of pollution and enhancement of the environment, and for purpose connected therewith. The environment is defined as the physical factors of the surroundings of human beings including land, water, atmosphere, climate, sound, odour, taste, the biological factors of animals and plants, and the social factor of aesthetics³. In addition, pollutants means any natural or artificial substances, whether in a solid, semi-solid or liquid form, or in the form of gas or vapour, or in a mixture of at least two of these substances, or any objectionable odour or noise or heat emitted, discharged or deposited from any sources which can directly or indirectly cause pollution and includes any environmentally hazardous substances⁴.

³(Section 2 (Act 127) Environmental Quality Acts 1974.

⁴ (Section 2(Act 127) Environmental Quality Act 1974).

As per the Summary of the Environmental Act 1994, Malaysia has had naturally related enactment since the mid-1920s (Mohammad & D., 2011). Be that as it may, the law is restricted in degree and lacking for taking care of complex rising fundamental issues. So through EQA, 1974, a complete type of statute and an office to control contamination was set up. EQA is an empowering bit of law for anticipating, decreasing and controlling pollution, and improving the earth, or for other related purposes. On the other hand, contamination is “controlled” through the system of licenses issued by the Department of Environment.

In addition, there are regulations under Environmental Quality Act 1974; regulations can be defined as a rule of order having the force of law, prescribed by a superior or competent authority, relating to the actions of those under the authority’s control⁵. Table 1.4 outlines the relevant regulations addressing the specific construction pollutions as published by the Construction Industry Development of Malaysia⁶, in complimentary of the Environmental Quality Act 1974. These regulations together with the Act serve as the guidelines for the construction participants to preserve the environmental quality from construction pollutions.

Table 1.4 Existing Regulations in Malaysia

NO.	REGULATIONS
1.	Environment Environmental Quality (Clean Air) Regulation 1978
2.	Environmental Quality (Motor Vehicle Noise) Regulations 1987
3.	Environmental Quality (Control Of Emission From Diesel Engines) Regulations 1996
4.	Environmental Quality (Refrigerant Management) Regulations 1999
5.	Environmental Quality (Halon Management) Regulations 2000
6.	Environmental Quality (Control Of Emission From Petrol Engines) Regulations 1996
7.	Environmental Quality (Dioxin And Furan) Regulations 2004
8.	Environmental Quality (Control Of Lead Concentration In Motor Gasoline) Regulations 1985
9.	Environmental Quality (Sewage And Industrial Effluents) Regulations 1979

⁵ (“regulation”, 2016)

⁶ (“Act 1407”, 2016)

10.	Environmental Quality (Control Of Emission From Motorcycles) Regulations 2003
11.	Environmental Quality (Control Of Petrol And Diesel Properties) Regulations 2007
12.	Environmental Quality (Control Of Pollution From Solid Waste Transfer Station And Landfill) Regulations 2009
13.	Environmental Quality (Industrial Effluent) Regulations 2009
14.	Environmental Quality (Sewage) Regulations 2009
15.	Environmental Quality (Scheduled Wastes) Regulations 2005

The increased number of pollution cases from construction projects in Malaysia is alarming and becoming one of the environmental issues. Although actions have been taken to curb these issues, there is no indication of a reduction cases. Given this point, the effectiveness of the Environmental Quality Act 1974 together with its subsidiary regulations is hindered by the absence of a specific legislation for construction pollutions. In fact, Federal Government of Malaysia has difficulties in coordinating relevant policies because states had been arranging a degree of independence to identify their environmental policy from the Federal Government. In the other hand, environmental pollution in Malaysia is still occurring due to the overlapping between existing governmental organisations to monitor climate issues. There are also laws that have been implemented to attain sustainable environment and development in the country. This situation has led to ambiguity and uncertainty among construction participants to address any adverse event, to clearly spell out the jurisdiction of the federal government, and to state legislature pertaining to the issue of construction pollutions, which subsequently obstructs the imposition of liability.

It is well discussed that, a proper implementation of the legislation and the regulations concerning construction pollution should be in place. The Department of Environment (DOE) of Malaysia should develop a consistent pollution control for example better enforcement of compliance with existing pollution control regulations and to get support from other agencies. Also, co-operation between local authorities would be able to reduce the cost of such monitoring environmental control. On that note, there is a need to revisit the existing laws about construction pollution from construction projects. In which a further research is expected on this. Further, the state of today's environmental quality calls for alternative means to provide immediate

solutions on the environment pollution. Construction participants also need to establish planning objectives as indicators to minimise construction pollution in site. Lastly, to live in a healthy environment, it is a necessity to explore ways of minimising adverse impacts of construction activities to the environment. More importantly, by educating people for good awareness about pollution control, it is hoped to reduce the pollutant and experiences of a comfortable natural environment for the sake of our future generations.

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