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### The Implementation of Environmental Management in Malaysian Construction Project

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#### ABSTRACT

Environmental management relates to the control of human activity which could impact on the environment. This research aims to investigate relationship between the factors and the implementation of the environmental management in construction project. Based on the literature review, the theoretical framework was formulated to provide the hypothesis. Correlation analysis was then conducted to test the relationship between the factors and the implementation of environmental management in construction project. A total of 136 respondents were selected from registered contractor company grade G7 to obtain a more thorough overview of the implementation of environmental management in construction project. The result from correlation analysis revealed that the relationship is significant, where the proposed relationship is accepted. In conclusion, the implementation of environmental management in construction project is depending on several factors such as barrier factor, supporting factor and team management support.

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#### INTRODUCTION

The government has provided environmental guideline that has to be fulfilling during the construction phase. These laws and acts includes Environmental Quality (Sewage Effluent) Regulations, 2009, Interim National Water Quality Standards (INWQS), Environmental Quality (Motor Vehicles Noise) Regulations 1987, Guidelines for Prevention and Control of Erosion and Siltation by DOE 1978, Planning Guidelines for Environmental Noise Limits and Control by DOE, Factories and Machineries (Noise Exposure) Regulations 1989 and Environmental Quality (Clean Air) Regulations 1978.

In Malaysia, the required system regarding EIA ended up being presented throughout the Environmental Quality (Prescribed Activities) (EIA) Order, 1987, within forces conferred by means of section 34 A of the Environmental Quality (Amendment) Act, 1985 of which specifies which in turn pursuits are usually at the mercy of EIA. Nineteen types of task are usually prescribed: industry, airports, housing, infrastructure, agriculture, drainage and irrigation, fisheries, forestry, mining, power generation, petroleum, ports, quarries, resort, railways, and transportation, recreational development, water supply, waste treatment and disposal, and land reclamation. This Environmental

Impact Assessment is provided to assist the contractor/developer to recognize, foresee and evaluate information about impacts of a proposed project on the environment and to find out the method on mitigation prior to project approval along with implementation.

Few measures to make building work more environmental friendly have been adopted relatively by the construction sector compared to other business sectors. However, when it comes to actively responding to and dealing with environmental problems the construction sector has lagged far behind others (Griffith, A., 1996). At the origin of all the environmental issues and problems will be the necessity to improve consciousness in addition to determination of most parties involves in construction sector such as contractors, developers, authorities and client (Ithnin, I., 2006).

Furthermore, many factors contribute to the minority implementation of Environmental Management in construction project. These challenges and barriers that may affect the successful management of environmental cause the need for a more coherent and structured approach in construction organizations. As construction activity has a significant impact on the environment, there is a vital need for the construction industry to add one more dimension "the environment" to its success paradigm. Construction industries need to

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harmoniously make use of resources and limit undesirable environmental impact by way of organizational improvements and targeted investment (Ofori, G., *et al.*, 2006). Therefore, it is essential to find and focus what are the implementation factors which can be used to satisfy the needs of the industry to successfully manage the environmental issue.

#### ***Malaysian Construction Industry:***

Generally, Malaysian construction industry covers two areas, general construction and special trade works. General construction consists of civil engineering construction, residential construction and non-residential construction. While the second area comprises activities of electrical works, metal works, sewerage, sanitary and plumbing works, refrigeration and air-conditioning works, carpentry, tiling and flooring works, painting works and glass works (CIDB, 2006). Hence, the construction industry could be described as a significance economic driver and a major productive sector in Malaysia due to the amount of industry linked to it.

#### ***Environmental Management in Construction Industry:***

Several studies have been done to review the implementation of environmental management in construction project in various countries. In China, according to (Tam, V.W.Y., *et al.*, 2005), the environmental awareness of enterprise is essential in environment protection due to the construction industry have been considerably lagging behind. The situation has been reflected by the characteristics of construction form which is (i) deficient of systematic rules, (ii) lack of training/programs and (iii) hesitant to boost resurge input.

While in Hong Kong, despite much recent argument and focus to green issues, sustainability and environmental protection, very few organizations, particularly within the construction industry, have implement the environmental management. It seems that the working practice developed by contractors places much value on short term benefits with less counting on the long-term benefits that could be gained from investments such as in environmental management (Tam, V.W.Y., *et al.*, 2005).

It is crucial to have an environmental management plan to demonstrate how key factors will be managed during the construction and operation period of the project. Depending on the topic of each plan, the content will vary. The environmental management plan typically outline the following item, (i) the objectives, existing environment condition, relevant guidance and legislation, (ii) development potential risk or impact, (iii) management strategies, (iv) measures and mitigation, (v) report on monitoring (iv) contingency measures [2].

Environmental management relates to the control of human activity which could impact on the environment. Construction of transport infrastructure can have significant environmental impacts if not undertaken with care. Environmental awareness for civil construction projects .Seven aspects of operation where departments are required to concentrate their environmental activities has been discovered by The Directions on Greening Government Operations released by Environment Canada in 1995. Those seven area comprise human resource management, procurement, energy use, motor vehicle fleets, waste management, water usage and land use management (Ormazabal, M. and J.M. Sarriegi, 2013). Also not to forget about some of the non-technical procedural matters engaged in the field of environmental compliance which include tracking environmental commitments, internal communications, communications with contractor, prevention, documentation and reporting and monitoring (WSDOT, 2012).

#### ***Environmental Management in Malaysian Construction Industry:***

Since the Third Malaysian Plan has been established, the environmental consciousness and awareness in public against environmental protection has been growing in Malaysia. Thus, those parties involved in the development of many new projects such as designers, proponents, contractors and operators have to accountable and comply appropriate responsibility pertaining to the environmental management and activities (Zakaria, S.F., 2005). However, Survey on the construction projects in the Department of Irrigation and Drainage (DID) Malaysia within year 1999 to 2003 reveals that the environmental management in the site was poorly managed.

In Malaysia, established corporation, CIDB which is covers on the development, improvement and expedition of construction industry has clarified environment and other issues related to sustainability as part of major concerns in the construction industry (CIDB, 2006). CIDB also has organized several workshops, discussions and dialogues to systematically tackle and focus on environmental needs in the construction sector.

Besides, certification guidance scheme for ISO 14001 Environmental Management System (EMS) and CIDB EMS Certification Programme to contractors have been introduced. By obtaining the certification, local contractors can now compete and stand on par with other contractors at international level. This scheme is developed with the purpose to better aid contractors in undertaking a more organized and effective environmental management practice as a sign of support to preserve and conserve our environment. It also helps to provide information on other contractors whom has given strong and good commitment regarding environmental

management to related bodies like Jabatan Kerja Raya (JKR), housing developers and local authorities. Furthermore, it is an effective means for CIDB to monitor and report on practices and awareness levels amongst Malaysian contractors concerning environmental management as a whole.

As our nation progress, instead of relying solely on country development projects, construction companies in Malaysia have been urged to explore their businesses overseas. As the demand for sustainable developed is in growth, Malaysian company will gain advantage if they possess the ISO 14000 standards. However, there is only a few companies obtain ISO 14000 certification.

### ***The Implementation of Environmental Management in Construction Project:***

In consideration to examine the possibility of implementing the environmental management in construction project, many different aspects have to be considered. Therefore, the following section is a literature review of the different factors, which are related to initiatives for environmental management that would stimulate the adoption.

#### ***Barrier Factors:***

(Post, J.E. and B.W. Altman, 1994) discovered numerous barriers to environmental change and categorized them as “industry barriers” and “organizational barriers”. Industrial barriers can be classified such as; capital costs, configuration of current operations, technical information, industry regulation and competitive pressures while organizational barriers described as ; poor communication ,employee attitude, inadequate top management leadership and past practice (Zutshi & Sohal,2004)

[16] has identified the following aspects as obstacles in implementing the environmental management;

- i. Lack of support and resources available
- ii. Lack of set guidelines for setting of objectives and targets and extent of involvement of employees, suppliers and other stakeholders;
- iii. Lack of guidelines on how to accomplish ‘continuous improvement element of the standard;
- iv. Costs

In organization, the ability to influence their organizations on depends on two factors which is client sensitivity to the environmental issue and the awareness and the awareness and commitment from the top management in the company even though almost half of the companies in the research are aware of the design criteria in producing environmentally sustainable building and construction projects and importance of Environmental Management System (Abdullah, A.M., 2006).

#### ***Supporting Factors:***

An important input for the social exchange process among entities involved in a given relationship is from the social support. To build social support and network, communication is the developing key. Communication, on the other hand, deals with producing, issuing and transmitting reports documents and withholding occasional meetings among the project participants so that the proposed timing, method and strategy are made available and understood. In essence, the collaboration of the various participants in a project is measured by how effectively the communications channels were managed (Mathieu, D., 2005).

#### ***Team Management Support:***

According to (Sulaiman, N., 2011), to create environmental awareness among Malaysian, the roles of construction authorities are essential. Since the government is an authorized body, policy maker and enforcer in developing and issuing new regulations or incentives , enforcement is vital to assure that the standards and requirements are complied. An effective legal framework for promoting environmental management is highly demanded due to the need of legal support (Tam, V.W.Y., *et al.*, 2005).

Governmental departments should organize training courses workshops and seminars on the subject of environmental management for the management of all construction firms as the environmental awareness of top leader and middle management were ranked first and second respectively. In practice, based on previous research strong EM is positively correlated to the financial performance of the firm (Klaussen, R. and C. Mclaughlin, 1996). It is suggested that experience sharing from those ISO-14000 certified firms to be included in training module. From their experience, the participants could learn and gain more about the implementation process and benefits.

Trans disciplinary research has the potential for the integration of stakeholder and disciplinary knowledge. This approach is crucial to the success of management strategies as stakeholders are directly involved in the participatory research process (Duspohl, M., *et al.*, 2012).

#### ***Methodology:***

A quantitative research method has been adopted in this research to identify the factors and its relationship between the implementation of the Environmental Management in Construction Project. This study conducted in Kedah state. The population involves all employees from registered contractor company grade G7.It is about 210 contractors grade G7 was registered in Kedah according to Construction Industry Development Boards (CIDB) as March 2014. The self-administered questionnaire was distributed to the registered G7 contractor in Kedah. A total of 136 respondents were selected to

obtain a more thorough overview of the implementation of environmental management in construction project.

## RESULTS AND DISCUSSION

There are several findings that have been found in this study. From the correlation analysis, it can be

summarized that the entire hypothesis gives a positive relationship to the implementation of environmental management in construction project. In this analysis supporting factors seemed to have the strongest association with r-value 0.768, followed by team management support and barrier factors. Table 1 shows the list of hypothesis with r-value and p-value.

**Table 1:** List of hypothesis with r-value and p-value

	Alternative hypothesis	r	p	Results
H <sub>A</sub> (1)	There is a positive relationship between the barrier factor and the implementation of environmental management in construction project.	0.533	0.002	Significant
H <sub>A</sub> (2)	There is a positive relationship between the supporting factor and the implementation of environmental management in construction project.	0.768	0.000	Significant
H <sub>A</sub> (3)	There is a positive relationship between the team management support and the implementation of environmental management in construction project.	0.734	0.000	Significant

This study provides evidence that the implementation factors affected the implementation of environmental management in construction project. Knowing the three important variables will help better implementation on environmental management in construction project. There might be some companies out there that have been wondering why they have difficulties in implement the environmental management in construction project. The answer might be there, right on their doorsteps, but they might have overlooked or underestimated the importance of some issues in their operation. They might want to review the operation of their system against the three variables revealed in this study. And to those companies who have not yet implemented the environmental management system in construction project, it is advisable for them to study these three variables before embarking on a full implementation of environmental management.

### Conclusion:

Knowing the three important factors will result better implementation on environmental management in construction project. There might be some companies out there that have difficulties in implement the environmental management in construction project. And to those companies who have not yet implemented the environmental management system in construction project, it is advisable for them to study these three factors before embarking on a full implementation of environmental management.

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