UNIVERSITI TEKNOLOGI MARA

ENVIRONMENTAL RISK ASSESSMENT FRAMEWORK FOR INDUSTRIAL PROJECTS IN THE MALAYSIAN CONSTRUCTION INDUSTRY

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ABSTRACT

In the past decade, mankind has been manipulating the natural environment to better suit its needs of providing buildings and infrastructure for residential, commercial, business and industrial purposes. The rapid industrialisation that has taken place has generated several issues with regard to the environment. The impact to the environment can be categorised into several aspects such as ecosystem impact, natural resources impact, and public impact. Plus, the rapidly growing construction industry has contributed significantly to environmental pollution. However many construction projects suffer from mismanagement due to lack of formalized risk management procedures. The aim of this research is to develop an environmental risk assessment framework for industrial projects in Malaysia and the objectives for this study are, first to study risk assessment tool and risk management models, second to determine the risk assessment construct within environmental elements and lastly to validate the framework on environmental risk assessment focusing on industrial projects in Malaysia. This research employs the mixed method approach using cases studies and a questionnaire survey targeted at the occupants living in the surrounding areas of the case study locations and the scope of the research is to assess the environmental risk assessment for two construction projects in Malaysia by investigating Sabah Ammonia Urea (SAMUR) and Lynas Advanced Materials Plant (LAMP) projects. This research focuses on the phases during and after the construction process. The findings of the research show that the two projects are perceived to have negative environmental impacts such the highest pollution for SAMUR is land pollution and for LAMPS project is greenhouse emissions. Based on the data gathered, a risk assessment framework was developed, applicable to industrial projects in Malaysia. The construction industry can utilise the framework as a guideline for environmental issues caused by industrial construction or projects. Therefore, managing environmental risks in construction projects has been recognised as a very important process in order to achieve the project objectives in terms of time, cost, quality, safety and environmental sustainability. To ensure high performance of projects, risk factors and their impact towards the environment need to be addressed during the construction phase or after project completion.

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CHAPTER ONE
INTRODUCTION

1.1 Research Background

The construction industry is one of the most significant businesses contributing to socio-economic development, especially in developing countries (Hussin, Abdul Rahman, & Memon, 2013). However, industrial activities have contributed to environmental degradation and social impacts. The uncontrolled exploitation of resources has driven the weakening of the environment (Department of Environment Malaysia, 1997) ; (Shari & Soebarto, 2012). Faced with this increase in demand, it is fundamental to include risk management in the planning and management of projects to identify, assess, manage and control the risks that would be against the objectives of the project (Kerzner 2001; Kansal & Sharma, 2012). Based on the study by Zolfagharian et. al. (2012), 'Ecosystem impacts' is the highest impact on the environment caused by construction activity at 67.5%.

According to Altoryman (2014) the lack of the usage of standard methods of risk management in development has caused construction projects to suffer from low performance and contributes to negative impacts on the environment. In order to avoid the problems that may occur, a standard risk management model is needed based on an in-depth study of the development environment to lay down the foundation for planning a Standard Construction Risk Management Model for the future. This shows that employers must have vast knowledge and awareness of the effects of their activities towards the environment. Furthermore, they must ensure that pollution is kept within acceptable parameters in order to prevent further disruptions towards the surrounding community.

The purpose of this study is to review issues of construction and industrial activities and their impacts to the environment focusing on the industrial projects in Malaysia. This research begins with a review of the categories of environmental impact, followed by a review of risk assessment tools, risk management model and relationship of risk assessment constructs. Finally, the research findings will form a basis in producing a framework, namely the environmental risk assessment framework for industrial projects in Malaysia.