UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF PERFORMANCE INDICATOR TOOL FOR BEST PRACTICES OF CONSTRUCTION WASTE MINIMISATION

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ABSTRACT

Construction waste management has evolved into an essential component of sustainability. The development of the Malaysian economy has led to a significant increase in construction activity. The increased construction activities have significantly accentuated the waste generation problem in construction projects. Thus, effective construction waste management should be implemented to prevent and divert construction waste from being dumped into landfills. Not only inefficient waste management but illegal dumping has also worsened the situation. Hence, this research aims to develop a performance indicator tool for best practices of construction waste minimisation. The research has three objectives: i) To identify the criteria and indicators for the best practices of construction waste minimisation in a construction project, ii) To determine the best practices indicators of construction waste minimisation in a construction project, iii) To develop the performance indicator tool for best practices of construction waste minimisation in a construction project. This study adopted a mixed-mode approach that involves both qualitative and quantitative methods. To achieve the first objective, semi-structured interviews with 11 construction practitioners and observation of four construction sites were conducted. The finding indicates 44 best practice indicators to be incorporated into the list of assessments. In the next phase, the questionnaire survey method was used to achieve the second objective. The questionnaire survey was distributed to 153 construction practitioners in the Klang Valley area to determine the importance level of best practices of construction waste minimisation. Klang Valley area was selected as the scope of study because the area contributed enormous value of work done in 2020. In addition, the study will only focus on residential projects since the residential project was listed as the most significant number of projects in 2020. The survey results were ranked with the Relative Importance Index (RII) analysis. The most important best practices indicator is OP4: Effective communication on-site, followed by KN1: Adequate knowledge of construction methods and sequence, and the least is HR2: Appointment of labour just for waste management. The third objective presents the Performance Indicator Tool for Best Practices of Construction Waste Minimisation (PITBCWM) development, using the weighted score obtained from the mean calculation of the questionnaire survey respondents. This tool assesses the performance of best practices by the level of implementation on-site. Next, the final process assessment of PITBCWM shall be summarised by signifying a rating classification, i.e., "Excellent", "Good", "Fair", and "Poor". This grading or rating will automatically generate once indicator scores are completed. In addition, a chart of each criterion's performance percentage will also be generated. The proposed PITBCWM has a significant contribution to make as an important improved measure for contractors in improving construction waste management strategies and setting the benchmark for waste management performance.

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CHAPTER ONE

INTRODUCTION

1.1   Research Background

The construction industry is considered one of the major industries that produce and improve all facilities in many ways, indirectly improving the overall living environment. Figure 1.1 shows Malaysia's construction sector growth and economic trend. Gross Domestic Product (GDP) from construction in Malaysia increased to RM 14 861 million in the third quarter of 2020 from RM 8,916 million in the second quarter of 2020. The statistic shows an increment of approximately 60%. This indicates that the construction industry is considered one of the economic forces in Malaysia. In addition, the increasing construction activities that produce waste have impacted construction waste management globally. Therefore, the construction industry is well-critiqued as the leading global factor affecting the environment (Marzouk & Azab, 2014; Nawi et al., 2018; Jain et al., 2020)
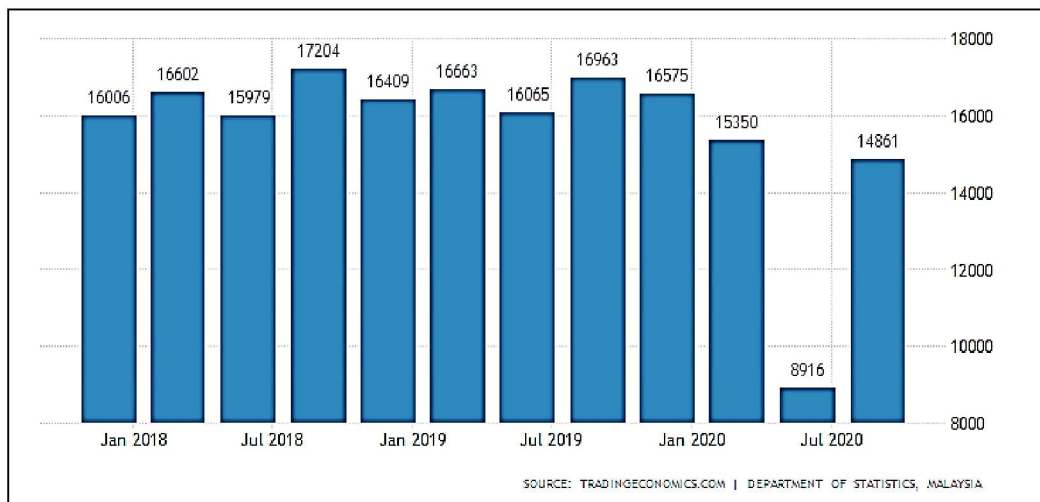

Figure 1.1 Malaysia GDP from the construction industry
Source: (DOSM, 2021)

Construction waste accounted for 35% of solid waste generated globally and is frequently disposed of in landfills or improper locations (Maués et al., 2020). The construction industry is responsible for causing the major volume of waste, which include a combination of inert waste and non-inert waste (Menegaki & Damigos, 2018).