

Major Challenges in Implementing Green Construction

¹Afzan Ahmad Zaini and ²Intan Rohani Endut

¹Faculty of Architecture Planning and Surveying, University Teknologi MARA,
94300 Kota Samarahan, Sarawak, Malaysia

²Faculty of Civil Engineering, University Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia

Abstract: Green construction is associated with a plethora of challenges. On the account of these challenges, this research strived to explore the major challenges associated with the implementation of green construction. A total of 346 survey questionnaires were gathered from the top to middle managerial positions in Malaysia's construction industry. The theoretical framework was established and the data were analyzed using Exploratory Factor Analysis (EFA) and Structural Equation Modeling (SEM-AMOS). The rotated dimensions were renamed as "Operational Concerns," "Government support," "Economic and financial constraints," "Lack of education and regulatory compliance," "Industrial barriers" and "Organizational challenges" based on the theoretical framework. The results from the SEM-AMOS analysis denoted that all the major challenges were full moderation. Consequently, these results were complemented with 25 semi-structured interviews among construction stakeholders. The findings from the semi-structured interviews were analyzed using NVivo-9 Software. The insights revealed that the challenges were referenced 85 times. "High overall and up-front cost" was referenced 19 times as the highest reference, while "Difficulties in transportation and logistics" was referenced one time as the lowest reference. The original contributions in this study can be seen through the mixed method approach (i.e., qualitative and quantitative) in order to identify the most prominent challenges in the construction industry. The findings concluded that identifying the major challenges would help construction stakeholders minimize these challenges and encourage them to be more attentive and open towards the challenges in green construction.

Key words: Challenges, green construction, survey, semi-structured interview, SEM-AMOS

INTRODUCTION

Construction is one of the major contributors to the environmental problems (Qi *et al.*, 2010; Xian and Qiang, 2008; Tam *et al.*, 2004; Ball, 2002) and it consumes over 30% of the total energy resources (Zhou, 2010). Most of the resources consumed in construction are non-renewable, nevertheless, they are still being used excessively which may result in resource depletion and severe environmental pollution (Xian and Qiang, 2008; Tam *et al.*, 2004). Excessive environmental pollution also creates a significant negative impact on the environment and the health and safety of construction workers (Sousa *et al.*, 2015).

Problem statement: Construction activities include those related to noise, solid waste, water and air pollution (Tam *et al.*, 2006; Majdalani *et al.*, 2006). Other problems apart from environmental pollution are technical problems,

such as delays in construction projects, poor quality, workmanship and project failures (Gao and Low, 2014; Son and Kim, 2015).

Therefore, the transformational change from conventional construction to green construction is very crucial to minimize these negative impacts. However, the implementation of green construction is associated with a plethora of challenges such as higher initial investment (Hwang and Ng, 2013). The higher initial investment is correlated with obtaining resources used for the establishment of complex and challenging prerequisite systems such as the green rating tools prior to the construction practices of green construction (Pan, 2010).

Literature review: The theoretical framework for this research was developed and adapted from various theories of green and sustainability that include challenges as the moderating effect for green construction innovation which is the driving force of