



اَوْنِيُوْرَسِيْتِي تِي كُوْلُوْمِي مَارَا
UNIVERSITI
TEKNOLOGI
MARA

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF FRAMEWORK
FOR CONSTRUCTION WASTE
SECONDARY MARKET IN
MALAYSIA**

NUR AMIERAH BINTI HARUN

PhD

February 2022

ABSTRACT

The construction industry bears a proportionally significant weight of Malaysia's ever-increasing growth and development, resulting in ever more projects. While these initiatives boost the economy, they also generate more waste in proportion to their scale and influence. In Malaysia, construction operations generate a lot of waste, both in terms of natural materials and man-made construction materials. Furthermore, illegal dumping and inefficient waste management have exacerbated the situation. In contrast, higher efficiency methods that produce less waste and lead to better recycling allow projects to enhance revenues while decreasing expenditures. Hence, this research aims to develop a framework for construction waste secondary market in Malaysia. This is to be achieved by identifying the construction waste management profile; determining the barriers to construction waste secondary market implementation; investigating factors affecting the secondary market; and developing a framework for the construction waste secondary market in Malaysia. The method used for data collection was a questionnaire survey. The survey was conducted with 103 respondents, consisting of G1, G2, G3, G4, G5, G6, and G7 contractors in the Kuala Lumpur and Selangor area. Contractors are the only respondents because of the attention has been given on the adoption of recycling, reuse and recovery as ways to minimize construction waste dispose to landfills and their attitude has a direct impact upon decision making. This research presents a profile of construction waste management and sixteen significant barriers (inadequate site space; time consuming; contamination; level of knowledge; waste separation; waste management costs; lack of infrastructure; deconstruction; resale value; location; cost of recycling process; sustainable waste supply; guidelines; perception; constraints; and the sustainability of the secondary market) and six primary factors affecting the implementation of a construction waste secondary market in Malaysia. Reuse and recycling are the most promising practices for dealing with construction waste on-site. The significant factors affecting the implementation of a secondary market include policy (13 sub-factors); end markets (9 sub-factors); technical support and performance (4 sub-factors); infrastructure support (4 sub-factors); market supply (3 sub-factors); and secondary industry (2 sub-factors). This research has developed successful initiatives and strategies to transform the physical, economic, and social aspects of life through the secondary market.

ACKNOWLEDGEMENT

In the Name of Allah, The Most Beneficent, The Most Merciful, Prayers and peace be upon our Prophet Muhammad, His family and all His companions.

Firstly, I wish to thank Allah s.w.t for giving me the opportunity to embark on my PhD and for allowing me to complete this long and challenging journey successfully. My gratitude and thanks go to my supervisors Sr. Dr. Asmalia Che Ahmad, Assoc. Prof. Sr. Dr. Faridah Ismail and Assoc. Prof. Ts. Dr. Siti Akhtar Mahayuddin.

My appreciation goes to the respondents who participated and assisted me during data collection. Special thanks go to my colleagues (Petairian) and friends for helping me with this project.

Finally, this thesis is dedicated to my beloved husband
father and mother for their
vision and determination to educate me. This victory is dedicated to all of you.
Alhamdulillah.

TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	xi
LIST OF FIGURES	xiii
LIST OF SYMBOLS	xv
LIST OF ABBREVIATIONS	xvi
CHAPTER ONE INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	2
1.3 Research Gap	4
1.4 Aim	8
1.5 Research Questions	8
1.6 Research Objectives	8
1.7 Research Methodology	9
1.8 Scope of Research	11
1.9 Significance of The Research	11
1.10 Arrangement of The Chapters	12
1.11 Summary	13
CHAPTER TWO LITERATURE REVIEW	15
2.1 Introduction	15
2.2 Sustainability	15
2.2.1 Sustainability in Construction	15
2.2.2 Sustainable Development Goals	16
2.3 Construction Waste	18
2.3.1 Classification of Construction Waste	19
2.3.2 Construction Waste Generation	24

CHAPTER ONE

INTRODUCTION

1.1 Research Background

In 2014, Malaysia's construction industry grew tremendously at a rate of 11.6 %, while the Malaysian economy as a whole grew by only 6 % (Department of Statistics Malaysia, 2015). In the second quarter of 2016, the value of growth in construction work was 11.7 %, which equates to RM30.4 billion (Department of Statistics Malaysia, 2016). This growth is expected to continue in the future with an increase in construction activity and more construction waste generated.

Construction waste has placed a heavy burden on sustainable development in a lot of countries and regions. A study conducted by Ameh and Daniel (2013) found that an average of 21–30 % of cost overruns were incurred as a result of material wastage. All waste produced means that contractors have to bear a loss of profit due to the involvement of additional overhead costs and time extensions, as well as a decrease in productivity due to the additional time needed for cleaning up (Eusuf, Ibrahim & Islam 2012; Zou, Hardy & Yang, 2015) and considerable waste disposal costs (The Ingenieur, 2011; Nagapan, Abdul Rahman, Asmi, Memon & Latif, 2012; Eusuf et al., 2012, Rahim, Kasim & Mohamed, 2017). Similarly, a low priority is assigned to construction waste management and often few resources and incentives are made available to facilitate waste management (WM) processes (Sreenivasan, Marthandan & Malarzhi, 2012; Solid Waste and Public Cleansing Management Corporation (SWCorp), 2015; Rahim et al., 2017). The efficiency of construction industry practices and also the environment are negatively affected by the generation of construction waste (Rahim et al., 2017).

Several waste management policies have been issued to deal with increasing construction waste and improve the rate of recycling. As such, Malaysia is seeking to take construction waste management into consideration while developing a “circular cities” approach. Under growing political and financial pressure, contractors need to reconsider their traditional construction behaviours and develop a sound construction waste minimization strategy for their projects by taking the concepts of sustainable construction into account. Promoting reuse and recycling is not just a matter of