IMPLICATIONS IN OPERATION AND MAINTENANCE OF GREEN BUILDING IN SRI LANKA

Promodh Chandimal Senaratne

(179035 X**)**

Degree of Master of Science in Project Management

Department of Building Economics

University of Moratuwa

Sri Lanka

November 2022

IMPLICATIONS IN OPERATION AND MAINTENANCE OF GREEN BUILDING IN SRI LANKA

Promodh Chandimal Senaratne

(179035 X**)**

Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree Master of Science in Project Management

Department of Building Economics

University of Moratuwa

Sri Lanka

November 2022

DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Also, I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my dissertation, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature : Date:

The above candidate has carried out research for the Masters Dissertation under my supervision.

Signature of the supervisor : Date:

ACKNOWLEDGEMENT

I would like to express my immense gratitude to Dr. Anuradha Waidyasekara, my research supervisor for providing me an appreciated guidance throughout the research. Her invaluable, vision and motivation have inspired me deeply to create this as a good research. I have no words to praise her for what she has taught me. It was a great honour to me to work and study under her guidance. I take this chance to send my special thanks to all the lecturers of the MSc programme of University of Moratuwa who worked actively for giving their fullest support, wealth of knowledge and for sharing their experiences with me and for the safe literary time afforded to me to carry on my professional developments.

My heartfelt gratitude to my beloved family for their well understanding, excellent commitment and the great patience throughout the duration of my studies.

I am extending my thanks to all who are with me in my workplace and supported me to do this research study during this harsh time. They all have provided me extensive personal and friendly guidance to complete this research by providing encouragement and advice.

Lastly, I would like to precise my deep gratitude to all of my friends for their sincere assistances and the motivation given tome even by a word, to make this complete successfully.

ABSTRACT

The Green Building concept has turned out to be one of the appropriate principles for the sustainable development over the world. According to the interviewees' perspectives, there aren't any studies that methodically classify waste generated during building maintenance based on volume, structure, composition, and level of hazard. In this regard, it is possible to look into how this waste might be managed in accordance with the concept of sustainable waste management and contrast it with real-world scenarios in case studies. Green buildings are intended at accomplishing grading levels in green certifications but, most of the developers neglect to maintain the obtained certification category due to various reasons.

Therefore, this study attempts to look into the effects of running and maintaining green buildings. A preliminary analysis of the study's significant green aspects was included. Following that, six green-certified buildings were carefully chosen, and a thorough survey was carried out. A qualitative technique to research was adopted for this study. Manual content analysis and cross-case analysis were used to compile and analyze the data related to the operation and maintenance of green buildings. Through the case study analysis, the significant green features of the green buildings with relevant to operation and maintenance, current operation and maintenance practices, benefits of green building O & M, positive and negative implications of green building O & M, causes for the negative implications and the strategies for better O & M are discussed.

The current study recommends, green building developers to understand and be aware of the implications in operation and maintenance of green buildings. Further, this research attempts to increase the public awareness to influence the government and the private sector to practice O & M procedures and experience their positive implications and to know how to strategically eliminate the causes of negative implications as well.

Key words: *Green building, Green features, Green rating system, Operational and maintenance implications.*

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

O & M	- Operational & Maintenance
GB	- Green Building
GBCSL	- Green Building Council of Sri Lanka
BREEAM	- Building Research Establishment Environmental Assessment Method
LEED	- Leadership in Energy and Environmental Design
UNEP	- United Nations Environment Programme
GBCSL	- Green Building Council of Sri Lanka
LCD	- Life Cycle Design
HVAC	- Heating, Ventilating & Air Conditioning
CO_2	- Carbon Dioxide
ICP	- Integrated Construction Process
BMS	- Building Management System
USGBC	- United States Green Building Council
LED	- Light Emitting Diode
VFD	- Variable Frequency Drive
ISO	- International Organization for Standardization
AC	- Air Conditioner
IEQ	- Indoor Environmental Quality
CEB	- Ceylon Electricity Board
BOD	- Bio Oxygen Demand
IAQ	- Integrated Air Quality
VOC	- Volatile Organic Compound