

**TOWARDS CIRCULARITY IN TIMBER USE IN SRI
LANKAN CONSTRUCTION INDUSTRY: WAY
FORWARD FOR SUSTAINABLE TIMBER
GOVERNANCE**

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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. 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. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Prof. Y.G. Sandanayake

Signature of the Supervisor:

Date:

DEDICATION

*I dedicate this dissertation to
my beloved Wife, Daughter and Son,
my Friends,
& my Supervisor
for their endless support,
patience & encouragement. . .*

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ABSTRACT

Towards Circularity in Timber Use in Sri Lankan Construction Industry: Way Forward for Sustainable Timber Governance

Timber is widely recognised as a sustainable construction material due to its regenerative nature, low embodied energy and carbon, strong carbon sequestration capacity, and favourable strength-to-weight ratio. Despite these advantages, its use in the Sri Lankan construction industry remains limited. This underutilisation is driven by factors such as restrictive legislation introduced to curb forest degradation, durability concerns in tropical climates, inconsistent supply, and relatively high costs. Although Circular Economy (CE) strategies offer considerable potential to enhance sustainable timber use, their application in Sri Lanka is still largely unexplored. To address this gap, the study sought to develop a framework for CE implementation in sustainable timber governance within the Sri Lankan construction sector. A qualitative approach was adopted, combining a comprehensive literature review with semi-structured expert interviews.

The review examined timber use in construction, relevant CE strategies, implementation challenges, and associated governance instruments. Insights from both literature and interviews were analysed through content analysis to identify and validate key themes. In total, twelve CE strategies were identified to support the sustainable use of timber in the Sri Lankan construction industry. Of these, five strategies, such as “Design for disassembly” and “Industrial symbiosis” were directly adapted from existing literature. Four additional strategies, including the “Use of reclaimed timber,” were adopted with modifications to suit the local context. Furthermore, three entirely new strategies emerged from expert interviews: “Commercial plantation for regeneration,” “Preservation and treatment for prolonged use,” and “Encouragement of Engineered timber”. The study further revealed 22 challenges hindering the implementation of these strategies, including “Fragmented governance”, “Lack of CE-specific clauses”, “No legal recognition or standards for reclaimed timber”, “Negative attitudes toward reclaimed timber and aesthetic imperfections”, and “Public mistrust in commercial plantations”. Furthermore, 20 enablers, including “Traceability mechanism combined with material passport”, “Procurement guideline integrated with CE provisions”, “Regulatory mechanism for commercial timber plantation”, “Grading and classification of the reclaimed timber”, and “Product stewardship”, were proposed to support effective CE integration and address the challenges identified. These enablers are embedded with the proposed modifications or amendment of governance instruments clustered under three categories namely “Legislations”, “Regulation / Circular” and “Guideline”. These findings collectively informed the development of the proposed framework.

The study demonstrates how Circular Economy strategies can strengthen the sustainable utilisation of timber in the Sri Lankan construction industry, addressing a key research gap, offering a benchmark for future work, and supporting a broader shift toward increased local material sourcing and reduced dependence on imports.

Keywords: CE strategies, Timber, Construction Industry, Sustainability

TABLE OF CONTENTS

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS	v
LIST OF FIGURES	viii
LIST OF TABLES	ix
LIST OF ABBREVIATIONS	x
CHAPTER 1	1
INTRODUCTION TO RESEARCH	1
1.1. Research Background.....	1
1.2. Research Problem.....	3
1.3. Aim and Objectives	5
1.4. Research Methodology.....	5
1.5. Scope and Limitations.....	5
1.6. Chapter Overview	6
1.7. Chapter Summary.....	6
CHAPTER 2	7
LITERATURE REVIEW	7
2.1. Introduction	7
2.2. Timber as a Construction Material.....	7
2.2.1. Timber Usage in Construction - Global and Sri Lankan Context	7
2.2.2. Timber as a Renewable Material: Benefits and Limitations	9
2.2.3. Trends and Challenges in Timber Supply Chains	11
2.2.4. Demand Patterns in the Sri Lankan Construction Industry	13
2.2.5. Traditional vs. Engineered Timber Applications	14
2.3. Concept of Circular Economy (CE)	16

2.3.1.	Introduction to Circular Economy.....	16
2.3.2.	Significance of Circular Economy in the Built Environment	17
2.3.3.	Circular Economy Strategies.....	17
2.4.	Application of CE to Optimise Timber Usage	20
2.4.1.	Circular Economy Strategies Relevant to Timber.....	20
2.4.2.	Benefits of CE-Driven Timber Frameworks	22
2.4.3.	Challenges of Existing Governance that Hinders the Circularity in Timber Use.....	22
2.5.	Legislative Framework Governing Timber Usage in Sri Lanka	23
2.5.1.	Key National Legislation and Policy Instruments.....	23
2.5.2.	Strengths and Weaknesses of Current Legal Provisions	28
2.6.	Comparative Review of Global Best Practices of CE Integration in Timber Governance.....	29
2.7.	Integration Potential of CE with Timber-Related Governance Instruments ..	31
2.8.	Research Gap.....	33
2.9.	Summary of Literature Review	35
	CHAPTER 3	36
	RESEARCH METHODOLOGY	36
3.1.	Introduction to the Chapter.....	36
3.2.	Research design.....	36
3.3.	Research Approach	36
3.4.	Available Approaches	36
3.5.	Justification of Selected Approach.....	37
3.6.	Data Collection Technique – Semi-Structured Interviews.....	37
3.6.1.	Sample Selection	38
3.6.2	Expert selection criteria.....	39
3.6.3	Semi-structured expert interviews.....	41
3.7.	Data analysis	41
3.8.	Research Process	42
3.9.	Chapter summary	42

CHAPTER 4	43
RESEARCH FINDINGS AND DISCUSSION	43
4.1. Introduction to the Chapter	43
4.2. Overview of Data Collection.....	43
4.2.1. Objectives of expert interviews.....	43
4.3. Analysis of Expert Interview Findings.....	43
4.3.1. Integration of circular economy strategies for sustainable timber usage in the Sri Lankan construction industry	44
4.3.2. Challenges of existing governance that hinder the journey towards circularity in timber use in Sri Lankan construction industry	49
4.3.3. Influencing legislation, regulations and guidelines with regard to the timber use in construction industry in Sri Lanka	54
4.3.4. Enablers for CE strategies in sustainable timber governance in Sri Lankan construction	58
4.4. Framework for CE implementation in sustainable timber governance in Sri Lankan construction industry	63
4.5. Differences of findings compared to global context	66
4.6. Chapter Summary.....	66
CHAPTER 5	67
CONCLUSIONS AND RECOMMENDATIONS	67
5.1. Introduction	67
5.2. Conclusions	67
5.3. Recommendations	69
5.4. Contributions of this study	69
5.5. Further Studies	70
5.6. Concluding Remarks	70
References	71

LIST OF FIGURES

Figure	Description	Page
2.1	Global timber usage in construction (2015-2023)	8
2.2	Timber usage in construction in Sri Lanka	9
2.3	Environmental performance of timber compared to steel and concrete	10
2.4	Comparison of embodied CO ₂ and embodied energy of different building materials	10
2.5	Forest area in Sri Lanka (2015-2023)	12
3.1	Research process	42
4.1	The Framework for enhanced circularity in timber use	65

LIST OF TABLES

Table	Description	Page
2.1	The estimated share of log by supply source in 2010	12
2.2	Timber usage in construction	15
2.3	Key CE strategies	18
2.4	Summary of key CE strategies in timber specific applications	20
2.5	Summary of key national legislation and CE relevance in timber governance	26
2.6	Evaluation matrix CE integration	33
3.1	Available research approaches	37
3.2	Expert profile	39
3.3	Expert Selection Criteria and level of knowledge	40
4.1	Circular economy strategies for sustainable timber usage in the Sri Lankan construction industry	44
4.2	Challenges in implementing CE strategies in Sri Lankan construction industry	50
4.3	Influencing legislation, regulations and guidelines on timber use in construction industry in Sri Lanka	55
4.4	Enablers mapped for governance instruments	58

LIST OF ABBREVIATIONS

Abbreviation	Definition
BC	Before Christ
BIM	Building Information Modeling
BOQ	Bill of Quantities
BREEAM	Building Research Establishment Environmental Assessment Method
BS	British Standard
CB	Central Bank
CBE	Circular Built Environment
CBSL	Central Bank of Sri Lanka
CCA	Chromated Copper Arsenate
CDW	Construction and Demolition Waste
CE	Circular Economy
CEA	Central Environmental Authority
CIDA	Construction Industry Development Authority
CLT	Cross-Laminated Timber
CO ₂	Carbon Dioxide
DfD	Design for Disassemble
EIA	Environmental Impact Assessments
EN	European Norm
EPL	Environmental Protection Licenses
EU	European Union
EUTR	European Union Timber Regulation
FFPO	Fauna and Flora Protection Ordinance
FSC	Forest Stewardship Council
FSMP	Forest Sector Master Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas

GLULAM	Glue-Laminated Timber
GWP	Global Warming Potential
ICE	Inventory of Carbon & Energy
IEE	Initial Environmental Examinations
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
LCC	Life Cycle Costing
LEED	Leadership in Energy and Environmental Design
LVL	Laminated Veneer Lumber
MDF	Medium-Density Fiber
NDT	Non-Destructive Testing
NEA	National Environmental Act
NPC	National Procurement Commission
NTFP	Non-Timber Forest Products
PEFC	Programme for the Endorsement of Forest Certification
PVC	Polyvinyl chloride
QS	Quantity Surveyor
SCP	Sustainable Consumption & Production
SDG	Sustainable Development Goal
SFM	Sustainable Forest Management
SLS	Sri Lanka Standards
SLSI	Sri Lanka Standards Institution
STC	State Timber Corporation
UDA	Urban Development Authority