

ROLE OF REGULATIONS AND GOVERNANCE IN THE CIRCULAR ECONOMY FOR CONSTRUCTION: A COMPARATIVE ANALYSIS

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ABSTRACT

The construction sector is among the largest global consumers of raw materials and generators of waste, making regulatory governance a decisive factor in the circular economy (CE) transition. This paper presents findings of a comprehensive document analysis examining CE-relevant regulatory frameworks across six Asian jurisdictions, China, Japan, South Korea, Hong Kong, Singapore, India and Sri Lanka's (SL's) national regulatory landscape, comprising eleven instruments. Applying a structured analytical framework consistently across all documents, the study interrogates legislative intent, compliance mechanisms, enforcement architecture and identified limitations. The Asian analysis reveals stratification across three governance tiers, i) advanced statutory architectures with mandatory waste separation, ii) quantified recovery targets and multi-instrument enforcement, and iii) framework legislation with variable subnational implementation and early-stage disposal-oriented regulation. SL's framework is characterised by a pre-CE legislative inheritance, institutional fragmentation and a systematic implementation deficit. The Construction Industry Development Authority (CIDA) Regulations 2018 represent the only operative mandatory CE-adjacent obligation in the national framework, yet threshold, monitoring and penalty provisions limit their effectiveness. The paper concludes by identifying governance pathways informed by Asian regulatory experience and germane to SL's institutional context.

Keywords: Circular Economy; Governance; Policy Frameworks; Regulations; Sri Lanka.

1. INTRODUCTION

The construction industry (CI) has long been recognised as a dominant consumer of natural resources, accounting for over 40% of global resource usage (Weerakoon et al., 2023). Buildings account for nearly 40% of global energy consumption and solid waste generation, 30% of raw material use and nearly 33% of greenhouse gas emissions (Gowsiga et al., 2023). Construction and demolition waste (C&DW) is one of the most substantial waste streams worldwide representing 30 - 40% of total waste production and

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causing landfill congestion, soil contamination and greenhouse gas emissions (Gowsiga et al., 2023). Addressing these impacts requires a fundamental shift from the traditional linear take-make-dispose model towards a circular economy (CE) which is a viable pathway to sustainable development (Gowsiga et al., 2023; Kuzma et al., 2022).

Regulations define behavioural expectations, establish accountability and align collective action toward systemic transformation (Kyriakopoulos, 2021). Strong regulatory enforcement provides the essential top-down mechanism to accelerate CE adoption (Yu et al., 2022). Unlike standard sustainability or waste management instruments, which typically target end-of-pipe disposal or energy efficiency in isolation, CE-specific regulations mandate the systemic retention of material value across the full construction lifecycle, integrating design, procurement, use and end-of-life stages within a single governance logic (Kyriakopoulos, 2021; Calisto Friant et al., 2021). CE regulations are specifically designed to close material loops retaining resources at their highest value through reuse, remanufacturing and recycling across the construction value chain (Kyriakopoulos, 2021; Calisto Friant et al., 2021). Members of the European Union (EU) have been leading legislative efforts (Ballardini et al., 2020; Steenmans & Lesniewska, 2023). Asia presents a particularly instructive governance landscape for CE regulatory analysis. The region encompasses some of the world's most advanced CE statutory architectures alongside regulatory systems in early formative stages, operating within distinctive institutional cultures, economic contexts and governance capacities (Ghisellini & Ulgiati, 2020; Kyriakopoulos, 2021). Asian applications tend to prioritise material efficiency at the industrial level, reflecting manufacturing-based economies and centralised governance (Ghisellini & Ulgiati, 2020). Besides, developing nations face implementation challenges that go beyond resource constraints, with institutional fragmentation, limited enforcement capacity and competing development priorities constraining circular governance transitions (De Melo et al., 2022; Torgautov et al., 2021; Victar & Waidyasekara, 2024).

SL's CI demonstrated notable economic contribution, accounting for 1.20% of GDP growth in 2024 (Central Bank of Sri Lanka [CBSL], 2024) and 0.69% in the first quarter of 2025 (CBSL, 2025), reflecting its consistent role as a key driver of economic recovery. However, it lacks enforceable regulatory frameworks that facilitate CE transition (Bimsara et al., 2024; Weerakoon et al., 2023). Existing environmental and waste management regulations are outdated and poorly enforced, resulting in inadequate governance of C&DW and limited incentives for circular practices (Bimsara et al., 2024; Weerakoon et al., 2023). Understanding the range of regulatory approaches adopted across Asian jurisdictions provides a comparative basis for SL to assess how countries at differing stages of regulatory development might configure their own CE governance systems (Calisto Friant et al., 2021; Yu et al., 2022).

Therefore, this study addresses the research question, “how to bridge the regulatory deficiencies that constrain CE transition in SL's CI?”. The study aims to strengthen the SL's regulatory framework for CE in the CI through a comparative analysis of CE governance approaches across jurisdictions. Accordingly, the objectives of the study are (1) to examine CE-relevant regulatory landscapes across selected Asian jurisdictions in relation to the CI, and (2) to identify governance pathways for regulatory reforms in SL.

2. LITERATURE REVIEW

2.1 ROLE OF REGULATIONS IN CE TRANSITION

Reduced. Regulatory approaches to CE span a spectrum from prescriptive command-and-control measures to flexible performance-based regulations (Kyriakopoulos, 2021). Command-and-control instruments such as material recovery mandates provide clarity and ensure minimum compliance but may constrain innovation (Calisto Friant et al., 2021). Performance-based regulations, by contrast, set defined outcome targets without prescribing specific methods of compliance, allowing firms to meet the standards through the most cost-effective pathway (Kyriakopoulos, 2021). Market-based instruments, as a form of performance-based regulation, include Extended Producer Responsibility (EPR) schemes and material taxes that internalise environmental costs, using price signals to drive behavioural change without prescriptive control (Ballardini et al., 2020). Informational regulations and mandatory environmental disclosure enable market driven transformation without direct control over private decision making (Charef, 2024).

Regulatory instruments for CE implementation span several categories, each with different mechanisms and institutional requirements. Regulatory instruments establishing mandatory requirements, economic instruments internalising environmental externalities, informational tools addressing gaps and informational asymmetries and collaborative tools building consensus toward circular goals (De Melo et al., 2022; Kyriakopoulos, 2021). The effectiveness of any instrument is strongly conditioned by institutional capacity, market maturity, stakeholder characteristics and cultural norms (De Melo et al., 2022; Yu et al., 2022).

Effective regulatory regimes typically combine instrument types that address different dimensions. Overly prescriptive rules impose disproportionate compliance burdens on small firms and regulatory fragmentation hinder market development for recovered materials (Ahmed et al., 2024; Ballardini et al., 2020; Kyriakopoulos, 2021; Steenmans & Lesniewska, 2023). Effective regulatory strategies combine instrument types to reinforce one another. Regulations set minimum requirements, economic incentives make compliance financially beneficial, informational programmes build implementation capacity and collaborative mechanisms ensure buy-in (Ahmed et al., 2024; Yu et al., 2022). The appropriate combination, however, depends on local institutional capabilities, development priorities and available resources (De Melo et al., 2022).

2.2 INTERNATIONAL REGULATORY DIVERSITY

The EU's multi-level governance framework (Calisto Friant et al., 2021; Kyriakopoulos, 2021) and the United Kingdom's (UK's) performance-based strategy (Kyriakopoulos, 2021) demonstrate comprehensive legislative approaches, while Singapore's centralised enforcement model (Yu et al., 2022; Ghisellini & Ulgiati, 2020) and Japan's material-specific phasing (Ghisellini & Ulgiati, 2020; Yu et al., 2022) illustrate targeted sector-specific regulation. China's framework legislation with variable provincial implementation (Ghisellini & Ulgiati, 2020) and South Korea's economic instrument integration (Ghisellini & Ulgiati, 2020; Yu et al., 2022) reflect distinct institutional traditions. This diversity demonstrates that there is no single optimal regulatory path. The relative effectiveness of each model depends on its alignment with local governance capacity, institutional traditions and economic context rather than on the sophistication of the instruments themselves (Ballardini et al., 2020; Corvellec et al., 2022).

International evidence indicates that simple yet consistently enforced regulations achieve greater impact than comprehensive frameworks that outpace implementation capacity (Torgautov et al., 2021; Yu et al., 2022).

The regulations of developed economies cannot be directly transplanted to developing countries without substantial modifications (Abeynayake & Perera, 2025). Comprehensive regulatory systems assume monitoring infrastructure, multi-agency coordination and legal precedents are absent in developing economies (De Melo et al., 2022). For example, high recycling targets may be technically feasible but economically unviable without sufficient market demand and processing capacity (Victar & Waidyasekara, 2024). Enforcement credibility outweighs regulatory comprehensiveness in determining CE outcomes in developing countries (De Melo et al., 2022). Sequencing of interventions is equally critical, attempting wholesale regulatory transformation can overwhelm limited institutional capacity, necessitating phased approaches that lay foundational elements before advancing to more sophisticated requirements (Yu et al., 2022). Piloting on larger projects, where monitoring is manageable and demonstration effects are visible, provides evidence for subsequent expansions (Torgautov et al., 2021).

2.3 REGULATORY LANDSCAPE IN ASIA

Reduced. Infrastructure deficits, technical resource gaps, institutional fragmentation and financial constraints are recurrent barriers. Yet developing economies simultaneously lack the lock-in effects associated with entrenched linear infrastructure and deeply embedded supply chains prevalent in more advanced contexts (De Melo et al., 2022; Torgautov et al., 2021). Rapid urbanisation, while placing pressure on resources, creates windows to embed circular principles in new infrastructure rather than retrofitting existing systems (Torgautov et al., 2021; Victar & Waidyasekara, 2024).

China's CE Promotion Law illustrates the governance risks of national framework legislation with variable subnational implementation. India's governance trajectory further demonstrates how bilateral commitments and state-level fragmentation constrain the translation of national CE regulatory aspirations into consistent field-level compliance when regulatory authority is dispersed across jurisdictions of variable capacity (Corvellec et al., 2022; De Melo et al., 2022). Across Asian contexts, institutional fragmentation, limited enforcement capacity and competing development priorities collectively constrain circular governance transitions (De Melo et al., 2022; Torgautov et al., 2021).

2.4 REGULATORY CONTEXT IN SL

SL's regulatory framework for circular construction consists of a multi-layered system with varied legal force and enforcement capacity (Abeynayake & Perera, 2025). Authority is distributed among CIDA, the Central Environmental Authority (CEA), the Urban Development Authority (UDA), provincial councils and local government authorities, creating coordination challenges and potential regulatory gaps between institutional mandates (Victar & Waidyasekara, 2024; Weerakoon et al., 2023). Persistent disconnect characterises this landscape, progressive policy language articulates sustainability goals broadly consistent with global best practice (Ministry of Housing & Construction and CIDA, 2020), yet these remain untranslated into binding requirements, enforcement mechanisms and accountability systems (Abeynayake & Perera, 2025).

Guidelines are predominantly voluntary, carrying advisory rather than legal authority, which allows progressive regulatory intent to coexist with business-as-usual behaviour as there are no material consequences for disregarding sustainability provisions (Weerakoon et al., 2023; Wijesinghe et al., 2022). SL currently requires no design provisions for future disassembly, material recovery or building adaptability in either design requirements or permitting processes (Wijewansa et al., 2021). This creates path dependency in which early design decisions permanently foreclose circularity options over a building's entire lifecycle (Anastasiades et al., 2023). Further deficiencies include the absence of quantified material recovery targets, no legally binding waste hierarchy and a near complete absence of digital tracking infrastructure for material flows (Abeynayake & Perera, 2025; Victar & Waidyasekara, 2024).

3. RESEARCH METHODOLOGY

This study forms part of a broader study that followed a mixed-method approach. Accordingly, this paper adopted the qualitative approach and the document review technique for data collection and the content analysis technique for data analysis (Kagioglou et al., 1998).

Document analysis is particularly suited to regulatory research where the operative content of formal instruments must be assessed on its own terms rather than through practitioner interpretation (Bowen, 2009). Documents were selected based on four criteria applied consistently: (1) formal promulgation by a recognised governmental, intergovernmental or statutory authority, (2) current or recent operative status, (3) direct relevance to construction activities, waste management, material flows or the built environment and (4) accessibility through official legislative repositories or governmental publications. For the international component, jurisdictions were selected to represent Asia's principal governance typologies, across East Asia, Southeast Asia and South Asia.

Each instrument was evaluated against five analytical criteria: (1) legislative objectives and policy intent, (2) regulatory instruments and compliance mechanisms, (3) alignment with CE principles, (4) enforcement architecture and accountability provisions and (5) practical implications for construction actors. Identified limitations were documented to guard against attributing CE relevance based on superficial classification rather than substantive content review.

4. RESEARCH FINDINGS AND DISCUSSION

4.1 ASIAN CE REGULATORY FRAMEWORKS

The document analysis identified CE-relevant regulatory instruments across six Asian jurisdictions. Table 1 presents a comparative overview, structured by governance region.

4.1.1 East Asia

China's CE Promotion Law - 2008 establishes a national statutory basis for CE transition, mandating C&DW management plans, quantified resource utilisation targets and clean production audits for large enterprises. However, extreme geographic variation between coastal cities and interior areas produces a dual regulatory reality. Utilisation targets have been met primarily through aggregate crushing rather than high-value component recovery. Japan's Construction Material Recycling Law - 2000 mandates on-site separation, pre-demolition notification, material-specific recovery targets with named

professional liability and a manifest tracking system, though material quality enforcement at receiving facilities varies by prefecture. South Korea's Framework Act on Resources Circulation - 2016 combines mandatory reporting, resource circulation charges and mandatory recycled aggregate use in public construction, though downcycling to fill applications predominates over high-value structural use. Hong Kong's Construction Waste Disposal Charging Scheme - 2005 addresses disposal behaviour through fiscal disincentives but lacks a corresponding incentive for upstream material recovery.

4.1.2 Southeast Asia: Singapore

Singapore's CE governance architecture is the most comprehensively integrated system in the analysis. Green Mark Certification is mandatory for all new buildings and major renovations exceeding 5,000 m² gross floor area, with material efficiency and C&DW reduction as building permit conditions. The Carbon Pricing Act - 2019 creates a pricing signal favouring lower embodied carbon construction, the Resource Sustainability Act - 2019 underpins a national C&DW monitoring infrastructure and the Zero Waste Masterplan - 2019 commits to a 70% C&DW recycling rate by 2030. Limitations include recycling rate targets that aggregate volume recovery without distinguishing high-value reuse from low-grade crushing and coverage thresholds that exclude smaller projects.

4.1.3 South Asia: India

India's EU-India Joint Declaration on Resource Efficiency and Circular Economy - 2017 signals a bilateral CE governance reform commitment. However, governance aspirations diverge substantially from construction practice dominated by small contractors outside regulatory visibility, with no binding domestic CE legislation enacted for the CI at the time of analysis. C&DW governance remains fragmented across state-level instruments of variable coverage and enforcement.

4.1.4 Cross-Jurisdictional Analytical Observations

The international regulatory landscape reflects considerable diversity in legislative philosophy and implementation maturity (Calisto Friant et al., 2021; Kyriakopoulos, 2021). Jurisdictions differ according to whether their regulatory approach is anchored in product-level lifecycle obligations, waste management mandates or sector-specific construction requirements. The most sophisticated frameworks Japan, Singapore and South Korea exhibit multi-instrument architecture operating at complementary points along the construction value chain (Ghisellini & Ulgiati, 2020; Yu et al., 2022). Developing contexts reveal alternative models characterised by national framework legislation with variable subnational implementation (Corvellec et al., 2022).

Three cross-cutting observations emerge from the Asian analysis. First, regulatory effectiveness correlates not with the breadth of policy ambition but with the specificity and enforceability of individual instruments consistently enforced regulations achieve greater impact than comprehensive frameworks that outpace implementation capacity (Torgautov et al., 2021; Yu et al., 2022). Second, a persistent disjunction exists across all jurisdictions between recycling rate metrics and genuine material quality outcomes, volume-based statistics aggregate high-value component reuse and low-grade aggregate crushing into a single indicator, risking perverse optimisation. Third, the most successful governance models Japan, South Korea and Singapore address institutional coordination through systematic instrument stacking, with multiple regulatory mechanisms operating at complementary intervention points along the construction value chain.

Table 1: Comparative Overview of Asian CE Regulatory Frameworks for Construction

Jurisdiction	Instrument / Legislation	CE-Relevant Provisions	Identified Limitations	
East Asia	China	Circular Economy Promotion Law 2008 (amended 2013)	Mandatory C&DW management plans, quantified resource utilisation targets, clean production audit obligations, CE demonstration city/industrial park programmes	Extreme geographic variation between coastal and interior provinces, enforcement inconsistency across jurisdictions
		C&DW Management Regulations (provincial and municipal)	Source separation requirements, licensed processing facilities, demolition waste management plans, recycled aggregate use in public works	Regulatory variation across provinces creates market fragmentation, secondary material quality certification inconsistent
		Law on Promoting Clean Production 2003	Mandatory clean production audits for large enterprises, material efficiency requirements, hazardous substance reduction, lifecycle documentation	Less systematic application to construction than manufacturing, audit frequency and quality variable across provinces
		12th 5-Year Plan Guidance on Comprehensive Utilisation of Resources 2015	Quantified C&DW utilisation rate targets, central government demonstration programme for circular construction sites, processing infrastructure investment	Targets met primarily through aggregate crushing rather than high-value recovery, recovered material quality insufficiently verified
	Japan	Construction Material Recycling Law 2000 (Kensetsu Recycle Ho)	Mandatory on-site separation of concrete, asphalt, wood and metal, pre-demolition notification, material-specific recovery targets, manifest tracking system	Coverage limited to four designated streams, multi-decade implementation horizon required to achieve current compliance
		Building Standards Law (Kenchiku Kijunho)	Structural and material standards, building lifetime extension requirements, documentation for major structural elements, basis for recycled content requirements	Primary focus on structural safety, CE-specific provisions require supplementary secondary regulations to become operative
	South Korea	Waste Management and Public Cleansing Law (Haikibutsu Shoriho)	Duty of care obligations, industrial waste manifest system for C&DW, licensed carrier requirements, processing facility certification	Enforcement of material quality at receiving facilities varies, recycled material verification infrastructure differs by prefecture
		Framework Act on Resources Circulation 2016	Resource circulation performance assessment indicators, mandatory reporting for large producers, targets for reducing final disposal rates, resource circulation charges	Performance assessment applies principally to large enterprises, SMEs in construction largely outside systematic monitoring
	Construction Waste Recycling Promotion Act	Mandatory recycled aggregate use in public sector projects, source separation at demolition sites, licensed C&DW processor registration, permit-linked compliance	Mandatory recycled aggregate creates demand but does not address quality differentiation, downcycling to fill applications predominates	

Jurisdiction	Instrument / Legislation	CE-Relevant Provisions	Identified Limitations	
South-East Asia	Hong Kong	EPR Schemes and Deposit-Refund Mechanisms	EPR obligations for diverse product categories, deposit systems incentivising material return, construction material EPR under development, industrial symbiosis platforms	Construction material EPR presents design challenges distinct from packaging EPR, long service lives measured in decades not months
		Construction Waste Disposal Charging Scheme 2005	Levy on C&DW disposed at government facilities, fiscal disincentive for unnecessary waste generation, licensed disposal facility system, project-linked waste account	Addresses disposal behaviour only, no upstream material efficiency incentive, no corresponding support for material recovery investment
		Blueprint for Sustainable Use of Resources 2013	Strategic framework identifying C&DW as priority resource stream, landfill diversion targets, pilot recycled aggregate use in public works	Binding force limited to specific charging and licensing provisions, circular design and material reuse provisions remain aspirational
		Sustainable Construction Masterplan and Green Mark Certification	Mandatory Green Mark for new buildings and major renovations >5,000 m², material efficiency and C&DW reduction criteria, permit conditional on Green Mark compliance	Primarily addresses operational and energy performance, material circularity criteria not weighted equivalently to energy metrics
	Singapore	Resource Sustainability Act 2019	Mandatory waste reporting for large construction projects, national C&DW monitoring data foundation, authority for NEA to impose sector-wide waste reduction obligations	Reporting thresholds exclude smaller projects with cumulatively significant volumes, enforcement relies on self-reported data
		Carbon Pricing Act 2019	Economy-wide carbon price for large emitters, financial signal favouring lower-embodied-carbon materials, revenue supports CE transition initiatives	Applies at enterprise level, project-level carbon cost not systematically internalised in contract pricing without supplementary mechanisms
		Zero Waste Masterplan 2019	0% C&DW recycling target by 2030, prefabrication adoption targets, circular design guidelines, mandatory waste management plans for significant projects	Recycling rate target measures aggregate volume recovery, does not distinguish high-value component reuse from low-grade aggregate crushing
South Asia	India	EU-India Joint Declaration on Resource Efficiency and CE 2017	Bilateral CE governance reform commitment, policy orientation toward CE principles, technical cooperation for regulatory capacity building and knowledge transfer	CE aspirations substantially diverge from construction practice dominated by small contractors, no binding domestic CE legislation in CI enacted

4.2 CE REGULATORY FRAMEWORK IN SL

SL's regulatory landscape relevant to CE in the CI comprises a range of Acts and Laws promulgated across more than four decades. These instruments were designed to achieve specific sectoral or environmental objectives that, in most cases, predate the CE paradigm. Their relevance to circular construction governance, therefore, derives from incidental overlap with CE principles rather than deliberate circular design. Table 2 presents the analytical assessment of the seven primary legislative instruments examined.

4.2.1 Environmental and Planning Legislation

The National Environmental Act No. 47 of 1980 and its EIA Regulations (1993) provide the primary environmental governance gateway for major construction projects. However, CE dimensions including Design for Disassembly (DfD), material passports and secondary material specifications are absent in EIA assessment criteria and C&DW is not classified as scheduled waste. The UDA Law No. 41 of 1978 operates a development permit system, yet permit review contains no CE criteria. The Town and Country Planning Ordinance provides a statutory basis for area-wide material flow planning, yet CE provisions are not systematically applied and capacity differentials between urban and peri-urban authorities further constrain its operative effect.

4.2.2 Construction Related Legislation

The Construction Industry Development Act No. 33 of 2014 contains no CE content in its primary legislation. Its Section 41 secondary regulation-making powers, which could mandate CE practices, remain unexercised. The Coast Conservation Act No. 57 of 1981 governs coastal construction through a permit system addressing coastal ecology only, with C&DW management entirely absent from assessment criteria. The Municipal Councils, Urban Councils and Pradeshiya Sabhas Acts govern building approval across SL's 341 local authorities, with bylaws covering structural safety, fire and sanitation only. No CE content exists in any local authority framework, despite local approvals constituting the dominant category of construction by project number. The Chamber of Construction Industry Act No. 23 of 2019 establishes CCI as a self-regulation body with a CE knowledge dissemination role. However, its reach is limited to voluntary membership with no enforcement authority against non-members.

4.2.3 Governance Deficit and Reform Implications

A common pattern emerges in all legislative instruments. All three environmental and planning instruments hold significant untapped potential for CE integration through existing amendment and permit condition mechanisms that have not been activated to date. The governance deficit is therefore not the absence of suitable legislative architecture but the systematic failure to exercise existing powers: a governance implementation deficit (Abeynayake & Perera, 2025) paralleled across developing countries (De Melo et al., 2022; Yu et al., 2022). No agency exercises comprehensive oversight of C&DW flows, reflecting the institutional fragmentation as a critical barrier to CE transition (Charef, 2022; Weerakoon et al., 2023). The most productive near-term reform pathway lies within the existing legislative framework. CIDA's secondary regulation-making powers, EIA terms of reference and UDA permit conditions each represent actionable instruments for CE integration without requiring primary legislative change (Abeynayake & Perera, 2025; Hossain et al., 2020; Ahmed et al., 2024).

Table 2: Sri Lankan Legislative Instruments - CE Governance Assessment

Instrument	Responsible Authority	CE-Relevant Provisions		Identified Limitations
National Environmental Act No. 47 of 1980	CEA	Sec 23	✓ - Section 23Z is part of the Environmental Protection License (EPL) framework designed to regulate pollution. Mandatory EIA for all prescribed construction undertakings CE assessment gateway, currently addressed through project approval process.	Standard EIA terms of reference address construction-phase disturbance, CE dimensions (DfD, material passports, secondary material use) absent from prescribed assessment criteria CDW not classified as scheduled waste Enforcement resources stretched across all sectors
		Sec 24	✗ - Pollution discharge standards. Regulates environmental discharge from construction activities, relevant but C&DW and secondary material-use standards not incorporated.	
		First Schedule	✗ - Prescribed undertakings. Lists project categories triggering EIA, can be expanded to include CE-specific thresholds (DfD, material passports). Not yet done.	
Construction Industry Development Act No. 33 of 2014	CIDA	Sec 5 & 7	✗ - Contractor registration & grading. Registration system provides leverage for CE capability requirements potential exists but CE competencies not yet embedded in grading criteria.	Primary legislation contains no sustainability, environmental, or CE content No inter-agency coordination mandate CE-relevant use of secondary regulation powers not exercised to date
		Sec 41	✗ - Power to make secondary regulations. Authority to promulgate secondary regulations on technical standards, can be exercised to mandate CE practices. Not yet exercised for CE purposes.	
Urban Development Authority Law No. 41 of 1978	UDA	Sec 8	✗ - Development permit system. Covers highest intensity urban construction permit conditions mechanism is available for attaching CE requirements. CE criteria not yet included.	Current permit review contains no CE criteria Assessment confined to planning, land use, structural and safety compliance Amendment or implementing regulations required to incorporate CE conditions
		Sec 14	✗ - Implementing Regulations. Empowers UDA to issue implementing regulations, amendment or new regulation required to incorporate CE permit conditions.	
Coast Conservation Act No. 57 of 1981	Coast Conservation & Coastal Resource	Sec 14	✗ - Coastal zone permit system. Permit system covers all coastal construction including tourism, residential and port facilities. Coastal ecology addressed, &CDW and secondary material requirements absent.	Permit conditions address only coastal ecology, no C&DW management, secondary material, or DfD requirements imposed

Instrument	Responsible Authority	CE-Relevant Provisions		Identified Limitations
	Management Dept. (CCCRMD)	Sec 16	✗ - Permit conditions. Conditions may be imposed on coastal construction permits. Mechanism available to embed CE requirements but not yet utilised for this purpose.	CE dimensions entirely absent from prescribed permit assessment criteria
Town and Country Planning Ordinance & Amendment Act No. 49 of 2000	National Physical Planning Department, Provincial/Local authorities	Sec 3	✗ - Development scheme preparation. Planning framework determines where and what development may occur, potential instrument for area-wide material flow and CE infrastructure planning. CE provisions not applied.	CE-relevant planning provisions (material flow assessments, processing facility zones, waste infrastructure requirements) not systematically applied
		Sec 10	✗ - Development control. Development approvals under the planning framework can be conditioned to require CE assessments. No such conditions issued to date.	Capacity differential between urban and peri-urban authorities limits consistent application
Municipal Councils Act, Urban Councils Act & Pradeshiya Sabhas Act	Local Authorities (341 bodies)	Building Plan Approval Provisions	✗ - Local approval authority covering all residential and smaller commercial projects, numerically the largest approval class. CE content absent from all local building bylaws.	Building bylaws exclusively address structural safety, fire, sanitation and dimensional compliance
		Waste Management Service Provisions	✗ - Mandate for local solid waste management services, C&DW could be incorporated into local waste management frameworks. National standards for local CDW management absent.	No CE content in any local authority building bylaw framework No national standards for local CDW management Extreme variation in capacity across 341 local authorities
Chamber of Construction Industry Act No. 23 of 2019	CCI Sri Lanka	Statutory Incorporation Provisions	✓ - Establishes CCI as formalised self-regulation body, CE knowledge dissemination and standard development role recognised. Currently facilitative and normative only.	Limited regulatory authority, voluntary membership
		Standard Development Powers	✗ - Authority to develop professional standards and best practice guidance, can be directed toward CE standards development. Effectiveness dependent on voluntary engagement.	No enforcement against non-members Effectiveness dependent on voluntary engagement Formalised coordination with CIDA is still developing

4.3 GOVERNANCE PATHWAYS: LESSONS FROM ASIA FOR SL

Regulatory progression in CE construction governance follows a discernible path from disposal management through material recovery optimisation to upstream circular design integration (Calisto Friant et al., 2021; Kyriakopoulos, 2021). SL's current condition aligns with the first stage, addressing C&DW through waste classification and licensed disposal requirements without interrogating the material efficiency or design decisions that determine C&DW generation rates. The qualitative leap to upstream integration, exemplified by Japan's pre-demolition notification systems and Singapore's Green Mark material efficiency criteria, requires a reorientation of regulatory philosophy from end-of-pipe waste management toward circular material governance (Yu et al., 2022).

In the medium term, CIDA's secondary regulation-making powers should be exercised to incorporate CE competence requirements into contractor registration, reaching across the project scale spectrum that the LKR 500 million threshold excludes. In the long term, dedicated CE framework legislation would provide the statutory basis for mandatory C&DW recovery targets, EPR for construction materials and a national material information infrastructure for which no current SL instrument provides adequate legal authority (Abeynayake & Perera, 2025).

5. CONCLUSIONS AND RECOMMENDATIONS

This paper presents findings of a comprehensive document review of CE-relevant regulatory frameworks across six Asian jurisdictions and SL's national regulatory landscape. Asian jurisdictions exhibit a pronounced stratification across three governance tiers: (i) advanced statutory architectures with mandatory waste separation, quantified recovery targets and multi-instrument enforcement, (ii) framework legislation with variable subnational implementation and (iii) early-stage disposal-oriented regulations. Japan, Singapore and South Korea demonstrate that mandatory obligations, quantified recovery targets, multi-instrument enforcement and design-stage integration are achievable outcomes of sustained regulatory development. China's framework legislation illustrates the governance risks of delegation to lower-capacity jurisdictions without accompanying institutional capacity building. India's early-stage CE governance demonstrates how bilateral policy commitments and state-level fragmentation can constrain the translation of CE aspirations into operative regulatory provisions.

SL's regulatory framework is characterised by a pre-CE legislative inheritance, institutional fragmentation and a systematic implementation deficit. The CIDA Regulations 2018 represent the only operative mandatory CE-adjacent obligation, but threshold, content orientation and monitoring provisions collectively limit governance effectiveness. The most technically sophisticated instrument the Guidelines for Green Rating of Construction Materials has negligible regulatory impact due to its voluntary character and isolation from procurement and permitting systems.

Regulatory effectiveness in CE construction governance depends not on the breadth of policy articulation but on the specificity, enforceability and institutional coherence of individual instruments. SL's existing framework contains architectural elements that could be progressively activated through regulatory amendment to close identified governance gaps, drawing on the graduated implementation models the Asian evidence base validates. As a priority, the CIDA Regulations 2018 should be reformed to lower the SWMP threshold, mandate circular material hierarchy compliance within SWMP content,

establish a national C&DW data registry and introduce meaningful penalties. CIDA's secondary regulation-making powers should be exercised to incorporate CE capability requirements into contractor registration. Finally, SL requires dedicated CE framework legislation to establish the statutory basis for mandatory C&DW recovery targets and EPR for construction materials. In establishing targets, SL should avoid pitfalls evident in China and Singapore, where volumetric recycling rates conflate high-value component reuse with aggregate crushing; recovery targets should therefore be quality-differentiated to ensure rates reflect genuine material circularity rather than perverse optimisation towards volume alone. Collectively, these governance reforms carry implications beyond SL, offering transferable lessons for developing economies where the gap between CE policy ambition and operative regulatory implementation remains a pervasive challenge.

The international comparative analysis is limited to six Asian jurisdictions, limiting the generalisability of findings beyond Asia. Within the SL analysis, the scope is restricted to Acts and Laws, excluding regulations, policies, codes and guidelines, which may contain additional CE relevant provisions. As this paper forms a part of a broader study the identified limitations directly inform the relevant phases of that research. It will extend the analytical scope to encompass the full spectrum of SL regulatory instruments and will develop a structured implementation framework for the identified governance pathways. It will also identify specific regulations, policies, codes and guidelines for enactment or amendment in SL, derived from the international instruments examined.

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