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CIRCULAR ECONOMY POLICY FRAMEWORK FOR PROMOTING SUSTAINABLE CONSTRUCTION PRACTICES IN SRI LANKAN CONSTRUCTION INDUSTRY: STAKEHOLDER PERCEPTION

E.H.K.K. Karunarathna[1], B.L.S.H. Perera[2] and C.S. Kalugala[3]

ABSTRACT

Circular economy has emerged as a promising strategy to mitigate environmental impacts and foster sustainable development. Although Sri Lanka has implemented several regulations and policies aimed at promoting sustainability in construction, actual progress remains limited. This research mainly investigates stakeholder perceptions regarding developing a circular economy policy framework tailored specifically for the Sri Lankan construction industry. Furthermore, the study reviews global CE policy frameworks, assessing both top-down and bottom-up approaches, and evaluates the current state of CE practices in Sri Lanka. Moreover, it identifies key barriers influencing the adoption of CE policies within the sector. Adopting a mixed-method approach, the research gathers qualitative data through a comprehensive literature review and semi-structured interviews, while quantitative data is collected from Likert-scale questionnaires distributed to industry stakeholders. Analytical techniques include the Relative Importance Index (RII), thematic analysis, and content analysis. Findings indicate that CE adoption in Sri Lanka is currently minimal, primarily due to the absence of effective regulations and policy enforcement. However, stakeholder responses suggest a moderately positive perception towards the development of a CE policy framework. The study highlights the necessity of introducing mandatory regulations and tailored policies to enable effective CE implementation. Key recommendations include establishing design guidelines for dismantlable and reusable buildings, developing a CE certification system similar to the Green Rating System, promoting multi-use building designs, implementing green financing options, restricting landfill disposal of reusable materials, and offering tax incentives to companies that comply with CE requirements. These context-specific strategies aim to advance sustainable construction practices in Sri Lanka.

Keywords: *Circular Economy; Construction Industry; Policy Framework; Stakeholder Perception; Sustainable Construction.*

[1] Lecturer, Civil & Construction Department, SCOT campus, SCOT campus, kasunyakarunarathna@gmail.com
[2] PhD Scholar, College of Science, Massey University, New Zealand, samindi3d@gmail.com
[3] Lecturer, Civil & Construction Department, SCOT campus, Sri Lanka, cskalugala@gmail.com

1. INTRODUCTION

As the human population expands and income increases, the consumption of material resources is intensified, which leads to more scarcity, elevated costs, and significant potential loss of these resources to future generations' use (Adams et al., 2017). To address the optimization of resource consumption, energy use minimization, and reduction of greenhouse gas emissions caused by construction practices, both government and construction organizations need to seek sustainable solutions as the building stock grows (Illankoon & Vithanage, 2023).

In the current era, the circular economy appears as a promising solution to establish environmental sustainability to create economic and industrial structures that are less resource-consuming and with better waste management (Teerikangas et al., 2021). The CE concept is gaining recognition in the construction industry as an alternative strategy to move away from the basic linear module, which consists of extracting, landfilling & reusing, and developing sustainability in a systematic manner (Rahla et al., 2021). Slowing, narrowing, and closing material loops using circular strategies (like reuse, repair, refurbish, recycle, and recover) has raised interest in the circular economy concept to accommodate minimizing problematic challenges emerging from the construction context (Eberhardt et al., 2020). Transitioning towards circularity will provide the ability to resolve emerging issues in the industry by reducing the use of primary materials, protecting material resources, and reducing the carbon footprint (Adams et al., 2017).

Since built structures vary from other short life-cycle goods produced in a more controlled environment, it is a challenge to transit towards circularity via regular policies due to the shortage of clear regulations to adopt CE goals and corruptions among official policies, regulatory frameworks, and traditional industrial practices on the way towards a circular economy related built environment (Yu et al., 2022). According to Ghufran et al. (2022), developing countries need to initiate further research on the implementation of CE for the construction industry.

According to Fernando et al. (2022), to ensure resource efficiency and enhance sustainability in the Sri Lankan construction industry, both the government and the industry stakeholders need to take the necessary actions in promoting and implementing the 6R concept consist of reduce, reuse, recycle, rethink, refuse, and repair, alongside other circular strategies. Therefore, there appears to be a significant need to understand stakeholder perceptions when developing a practical policy framework that transitions the Sri Lankan construction industry from linear to circular practices to achieve sustainability.

This study is required to bridge the existing gap in identifying the stakeholder perception of an effective policy framework to promote the circular economy in the Sri Lankan construction industry by reviewing the circular economic principles and policy frameworks found globally in the domain of sustainable construction, examining the circular economy practices adopted in the Sri Lankan construction industry to promote a circular economy, determining the key drivers and barriers in adopting the circular economy-related frameworks and investigating the Stakeholder perception of having a CE framework within the Sri Lankan construction industry.

2. LITERATURE SURVEY

The circular economy in the construction sector can be identified as a promising concept that will provide long-lasting structures while ensuring the proper value of construction materials (Torgautov et al., 2021). Implementing CE principles to drive toward sustainable development by connecting stakeholders has become a priority in construction projects (Senaratne et al., 2023).

2.1 CIRCULAR ECONOMY POLICY FRAMEWORKS PRACTICED IN GLOBAL CONTEXT

The circular economy in the construction sector in the current era can be identified as a promising concept that will provide long-lasting structures while ensuring the proper value of construction materials (Torgautov et al., 2021). According to van Buren et al. (2016) developing a circular related economy will require effective changes in consumer behavior, government policies, and industrial practices as well as the simultaneous renewal of sectors such as energy, logistics, and finance. In 2015, CE was adopted as a guiding principle in the policies of many countries, and they implemented it mainly in two ways. While China is adopting top top-down national policy approach, other countries are implementing a bottom-up policy approach for implementation.

According to (Fitch-Roy et al., 2021) explained that circular economy regulatory policy packages are more recent adaptation form in CE policies, while in earlier CE policy-making contexts China has developed CE policies under the Circular Economy Promotion Law 2008 and since then many national governments have implemented strategic policy measures based upon circular economy principles including South Korea's Framework Act on Resource Circulation 2016. China, as a country, considers the future sustainability of the economy and social welfare, attracted by CE and has made various attempts to implement the CE concept considering micro, meso, and macro levels one at a time (Mohajan, 2021). Furthermore, Mohajan (2021) states that in 2008, the CE policy of China was established through the "Circular Economy Promotion Law", that was to guide China's economic development in ways that save energy, water, and materials and defend the environment, creating a closed loop of all materials in every stage of production, distribution, and consumption process.

Although it originated in Europe, the circular economy (CE) levels of European policymaking, with the European Commission (EC) addressing concerns about high commodity prices through its leading initiative on resource optimization, first implemented through the Roadmap to a Resource Efficient Europe and then developed into the Circular Economy Package of policy measures (De Melo et al., 2022). Furthermore, for the construction phase of the work, the Ellen MacArthur Foundation (EMF) indicates adaptation of technology as an important aspect in the implementation of CE principles (Hentges et al., 2022). While the EU follows bottom-up policies, the government of China (GoC) has provided a clear view of top-down national policies to transition towards CE for a sustainable economic structure, and they have accepted the economic structure since 2002 (Mohajan, 2021).

The circular concept is also implemented in countries such as Denmark, Netherlands, Scotland, Sweden, Japan, and Germany, while in some countries, it has been planning to

be implemented including England, Austria, and Finland (Ogunmakinde, 2019). The comparison of the national CE policy frameworks presented in Denmark, Finland, Norway, and Sweden showed that the policy landscapes of countries are quite similar with unified goals and objectives, and it is prominently featured in their CE policy documents (Zu Castell-Rüdenhausen et al., 2021).

2.2 CURRENT ADOPTION STATES OF CIRCULAR ECONOMY PRACTICES IN SRI LANKAN CONSTRUCTION INDUSTRY

Standard CE practices in the construction industry can be listed as carbon embodied materials reduction, lighter materials used in construction, use of cement alternatives like pulverized fuel ash and ground granulated blast furnace slag, re-utilization of mixed used buildings, reuse of wooden materials and façade from demolition waste, adopting modular construction principles by reusing steel from old buildings, and use of solar panels, use of local resourced biomaterials and use of recycled materials such as 100% recycled PVC from perused electric cable covers, pipes, and hoses. Additionally, CE practices extend to building on contaminated land, using greywater systems to recycle water from baths and showers, and constructing new buildings with blocks that can be easily disassembled and reused once the building reaches the end of its life (Torgautov et al., 2021).

Despite the long-term benefits and high environmental degradation of the circular method, most industries in Sri Lanka still accommodate linear or take-make-and-dispose economic models (Aluthge & Mendis, 2023). Furthermore, Fernando et al. (2022) highlighted that due to the newness and unpopularity of the circular economy concept in the Sri Lankan context, the applicability of the principles of circular economy is still in the initial stage. Even though the circular economy model presents a sustainable alternative to the traditional linear economic model, it also consists of barriers, and one of them is the high initial investment required to change towards the circular model from a linear model (Aluthge & Mendis, 2023).

But CE adoption in the Sri Lankan construction context is still in its infant stages, and the 3R principles of reduction, reuse, and recycling act as 3 major processes in successfully contributing to the reduction of global resource supply demand, supporting sustainability in construction projects (Fernando et al., 2022). As the growing trend of obtaining the GREEN SL rating system in Sri Lanka is expected to provide different marketing perspectives, Weerakoon and Thayaparan (2023) suggested introducing mandatory checkpoints within the GREEN SL system as it can enhance the value of rating system as well, and it will also help with the CE implementation.

According to (Wanaguru et al., 2022) material wastage generated in construction is around 25% sand, 20%of lime, 14% cement, 14% bricks, 10% ceramic tiles, 10% timber (formwork), 7% rubble, 7% reinforcement (steel), 6% cement block, 5% of paint, and 3% of asbestos sheets due to in approximately 38% of Sri Lankan construction firms are lack of clear policies on waste management alongside with the lack of recycling contractors in Sri Lanka. According to Fernando et al. (2022), current conditions and practices in the construction sector prove that CE can be used to achieve the industry's sustainability. Current trends along with practices in the construction industry explain that implementing Circular Economy (CE) concepts can help the sector become more sustainable, as CE provides ways to minimize the environmental degradation from construction activities.

2.3 BARRIERS TO ADOPTING CIRCULAR ECONOMY RELATED POLICY FRAMEWORKS

Circular Economy as an emerging concept for construction, there are concerns that conceptual confusion might be a barrier to its widespread adoption (O'Leary et al., 2024). Furthermore, the Sri Lankan construction industry faces a key barrier in the lack of awareness about potential CE practices, which are implemented in each stage of a construction project while implementing CE in construction (Ishan et al., 2023). Meanwhile, the lack of supportive regulatory frameworks to encourage CE transition is defined as a critical challenge that accompanies CE policymaking. (Yu et al., 2022) identified that a lack of relevant environmental regulations and laws was driving the rest of the barriers to a CE in this industry.

Lack of interest and knowledge, companies' reluctance due to limited technical and financial resources, incompatible corporate strategies, and a regulatory framework that restricts the development of circular models are the main barriers to the adoption of a circular economy in Sri Lankan industries (Aluthge & Mendis, 2023). Moreover, (Weerakoon & Thayaparan, 2023) state that due to corruption taking place at various levels by the officers, Sri Lanka does not have a proper system to implement the circular policies.

Furthermore, lack of awareness of sustainable concepts like circular economy and willingness to follow the traditional project management practices by construction professionals, regarding only the initial cost of a project despite the life cycle cost of a project, are the barriers in the Sri Lankan context that were highlighted at the (Fernando et al., 2022).

Existing literature consistently emphasizes that overcoming these barriers requires a collaborative and integrated framework involving policymakers, regulatory authorities, professional institutions, and industry stakeholders. Suggested strategies include increasing stakeholder awareness, promoting education and training programs, strengthening technical innovation, developing clear regulatory standards, encouraging partnerships, and introducing effective policy mechanisms to support CE implementation (Ishan et al., 2023; Munaro & Tavares, 2023). Furthermore, Weerakoon and Thayaparan (2023) highlighted the importance of introducing unified guidelines and policy frameworks for CE implementation in Sri Lanka through the collective involvement of academic and industry experts.

3. METHODOLOGY

This study accommodates both qualitative and quantitative data through data collection using a questionnaire and semi-structured interviews with practical aspects from industry stakeholders. Using a mixed approach is a thoughtful strategy for exploring complex topics like the circular economy's role in achieving sustainable goals in the construction sector, particularly in Sri Lanka.

3.1 QUESTIONNAIRE SURVEY

The questionnaire survey was conducted to examine the level of awareness of the circular economy (CE), relevant sustainability policies, and the key drivers, barriers, and gaps affecting CE adoption in the Sri Lankan construction industry. A simple random sampling

approach was employed to provide each member of the target population, comprising project managers, engineers, architects, quantity surveyors, designers, and other construction professionals with sustainability-related experience, an equal chance of selection. A total of 50 respondents participated in the survey. The sample size was considered adequate based on methodological recommendations for similar construction and CE studies that have successfully utilized sample sizes ranging from 40–60 respondents to obtain reliable findings (Golzar & Noor, 2022; O'Leary et al, 2024; Wanaguru et al, 2022). The questionnaire consisted of three sections covering respondent demographics, awareness and perceptions of CE policies and practices, and views on the drivers, barriers, and gaps related to CE adoption. Data were collected through Google Forms, email, and hard-copy questionnaires and analysed using the Relative Importance Index (RII) analysis. Analysis.

Table 1: Respondent profile of questionnaire survey

Designation	Number of Respondents	%
Quantity Surveyor	20	40%
Engineer	17	34%
Architect	7	14%
Project Manager	2	4%
Sustainability consultant	2	4%
Environmental process Operative	1	2%
Surveyor	1	2%

3.2 SEMI -STRUCTURED INTERVIEWS

Semi-structured interviews were selected to obtain expert insights on the circular economy. Purposive sampling was used to select participants with specialized knowledge and experience in sustainable construction and construction policy-making. Accordingly, six industry professionals were interviewed using semi-structured questions with predefined inquiries and opportunities for open-ended discussions. The interview sample was justified through data saturation, as no new themes or insights emerged beyond the sixth interview. The interviews were audio-recorded, transcribed, and analysed using thematic analysis to identify recurring themes and perspectives. This process aimed to explore current practices, drivers, barriers, and gaps in the transition towards circularity, as well as perceptions on developing a policy framework for the Sri Lankan construction sector.

Table 2: Respondent's profile of interviews

Code	Profession	Experience
RE	CIDA Representative (Engineer)	30 years
CS	CIDA Representative (Surveyor)	20 years
SE	Senior Engineer	18 years
SQ	Sustainability consultant (Quantity surveyor)	8 years
EP	Environmental process operative (Green Building Council of Sri Lanka)	6 years

Code	Profession	Experience
SC	Sustainability consultant (Engineer)	6 years

4. ANALYSIS AND DISCUSSION

4.1 THE FAMILIARITY OF THE CIRCULAR ECONOMY CONCEPT IN THE SRI LANKAN CONSTRUCTION INDUSTRY

The findings indicate that most respondents possess a moderate level of familiarity with the circular economy (CE) concept, suggesting that stakeholders have a basic understanding of its principles and applications. Only a small number of respondents reported being unfamiliar or very unfamiliar with the concept, indicating that awareness of CE exists within the Sri Lankan construction industry to some extent. However, the interview findings provide a deeper perspective, as all interviewees emphasized that stakeholder awareness remains insufficient for the effective implementation of CE practices. As highlighted by RE, "all of the stakeholders should have a clear idea about the circular economy before creating sustainability via circular economy practices in any kind of construction project." This finding suggests that basic awareness alone is inadequate for successful CE adoption. Since the implementation of circular practices requires the active involvement and coordination of key project stakeholders, including clients, consultants, and contractors, a comprehensive understanding of CE principles is essential to ensure informed decision-making and effective collaboration. Therefore, enhancing stakeholder knowledge through awareness programmes, training initiatives, and industry guidance is a critical prerequisite for advancing sustainability through circular economy practices in the Sri Lankan construction sector.

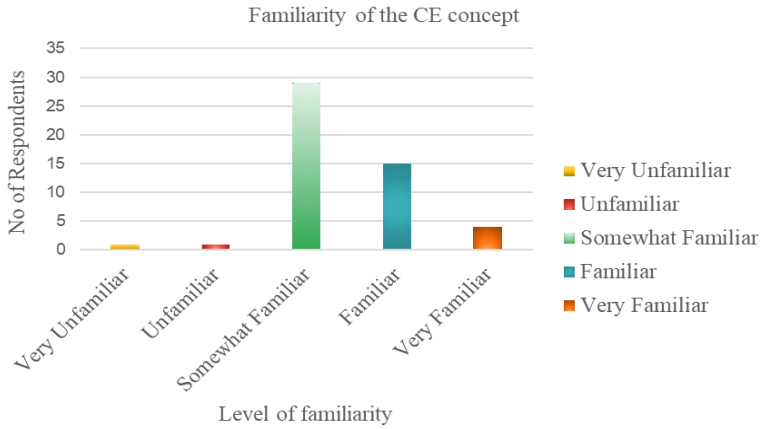

Figure 1: Familiarity of circular economy concept among Sri Lankan construction stakeholders

4.2 FAMILIARITY OF THE CIRCULAR ECONOMY PRACTICES IN SRI LANKAN CONSTRUCTION CONTEXT

According to Table 3, the CE practices identified by Torgautov et al. (2021) were ranked based on stakeholders' agreement regarding their influence on CE adoption in the Sri Lankan construction sector. Reuse of building materials (PR01) emerged as the most influential practice with the highest RII value of 0.756, reflecting its direct cost-saving benefits. This was followed by the use of eco-friendly concrete alternatives, such as hempcrete, fly ash, and slag-based cement (PR06), with an RII value of 0.696,

highlighting stakeholder recognition of sustainable material solutions. Adoption of modular and prefabricated construction methods (PR13), limiting landfill disposal of construction and demolition waste (PR07), construction on containment land (PR14), and demolition waste harvesting (PR08) jointly ranked third with an RII value of 0.684, although their implementation is constrained by higher investment and technical requirements.

In contrast, the least influential practices were the reduction of carbon-embedded materials, cradle-to-cradle design, and 3D printing with recycled materials. Among these, 3D printing with recycled materials received the lowest RII value (0.480), mainly due to its high technical complexity, substantial initial investment, and limited stakeholder awareness. Similarly, cradle-to-cradle design recorded a relatively low RII value of 0.564, reflecting challenges associated with recycling infrastructure and waste management capabilities within the Sri Lankan construction industry.

Table 3: RII ranking table for familiarity of circular economy practices in Sri Lankan construction context.

Code	Circular practice	RII Value	Rank	Importance level
PR01	Reuse of Building Materials	0.756	1	High -Medium
PR02	Recycling construction waste	0.640	11	High - Medium
PR03	Use of eco-friendly materials	0.680	7	High - Medium
PR04	Optimizing the supply chain focusing on the just-in-time (JIT) delivery and minimizing surplus materials.	0.672	10	High-Medium
PR05	Reduction of the use of carbon-embedded materials.	0.588	16	Medium(M)
PR06	Using eco-friendly concrete alternatives such as Hempcrete and low-carbon cement alternatives like fly ash or slag	0.696	2	High - Medium
PR07	Limiting the landfill from the disposal of construction and demolition waste.	0.684	3	High -Medium
PR 08	Demolition waste harvesting	0.684	3	High - Medium
PR 09	Employment of gray water recovered from bath and shower systems.	0.608	12	High - Medium
PR10	Cradle-to-Cradle Design (fully recyclable or compostable material usage)	0.564	17	Medium(M)
PR 11	3D printing with recycled materials	0.480	18	Medium(M)
PR12	Design structures that can be easily disassembled with materials that can be reused, repaired, or repurposed.	0.569	13	Medium(M)
PR13	Adopt modular and pre-fabrication construction methods.	0.684	3	High-Medium

Code	Circular practice	RII Value	Rank	Importance level
PR14	Construction on containment land.	0.684	3	High-Medium
PR15	Reutilizing several small buildings into one large building	0.676	9	High- Medium
PR16	Applying new eco-friendly renewable technologies.	0.680	7	High - Medium
PR17	Consider up to 6R or 10R strategies in construction instead of the commonly used 3R strategies.	0.592	15	Medium
PR18	Integration of green financing options for sustainable projects.	0.596	13	Medium

4.3 KEY BARRIERS IN ADOPTING THE CIRCULAR ECONOMY-RELATED FRAMEWORKS

Literature review has identified 09 main barriers from the literature from the similar studies done in global context, which can be evaluated considering their identification as a barrier among stakeholders to emphasize their appearance rate in the Sri Lankan construction industry. The RII calculation will provide the ranking in order of agreeability with the key barriers identified by the stakeholders in the Sri Lankan construction industry, highlighting which has the most impact on the current Sri Lankan industry.

Table 4: RII ranking table for barriers in adopting CE related policy framework in Sri Lanka.

Code	Key Barrier	RII value	Rate	Importance level
BR01	Lack of knowledge and awareness (Ishan et al., 2023).	0.7875	6	High-Medium
BR02	High initial cost of implementation (Fernando et al., 2022).	0.820	4	High
BR03	Lack of government support (Yu et al., 2022)	0.804	5	High
BR04	Absence of clear regulations and policies (Yu et al., 2022)	0.824	3	High
BR05	Resistance to change to new technologies (Fernando et al., 2022).	0.836	1	High
BR06	Lack of expertise (Aluthge & Mendis, 2023).	0.832	2	High
BR07	No guarantee of economic benefits (Fernando et al., 2022).	0.748	8	High-Medium
BR08	Limited stakeholder collaboration (Fernando et al., 2022).	0.728	9	High-Medium
BR09	Lack of a supportive market to facilitate reuse or recycling (Aluthge & Mendis, 2023).	0.756	7	High-Medium

The findings indicate that the barriers to circular economy (CE) adoption in the Sri Lankan construction industry largely align with those identified in both local and international literature, although their relative importance varies within the local context. Previous studies have highlighted inadequate awareness, lack of expertise, weak regulatory support, financial constraints, and resistance to change as key challenges to CE implementation (Fernando et al., 2022; Ishan et al., 2023; Aluthge & Mendis, 2023; O'Leary et al., 2024). The RII analysis revealed that resistance to change towards new technologies is the most significant barrier (RII = 0.836), followed closely by lack of expertise (RII = 0.832), suggesting that behavioural and capacity-related factors have a greater influence on CE adoption than policy-related issues. These findings are consistent with studies from other developing countries, where limited technical knowledge and reluctance to adopt innovative practices hinder the transition to circular construction (Yu et al., 2022; Munaro & Tavares, 2023). In contrast, limited stakeholder collaboration recorded the lowest RII value (0.728), indicating that stakeholders perceive knowledge and skill gaps as more critical barriers. Therefore, alongside developing supportive CE policies and regulatory frameworks, policymakers and industry stakeholders should prioritize awareness programs, professional training, and knowledge-sharing initiatives to enhance industry readiness and facilitate the effective implementation of CE practices in Sri Lanka.

4.4 Stakeholder Perception of Having a CE Framework Within the Sri Lankan Construction Industry.

So, according to the questionnaire survey, the importance of adopting circular economy policies to enhance sustainability in the Sri Lankan construction industry is emphasized in the chart below. The majority of the respondents have chosen that it is very important to adopt circular economic principles to enhance sustainability. While 30 respondents chose the very important level, 15 respondents chose that it is important to adopt CE-related policies to enhance sustainability. The least number of respondents have chosen a neutral level of importance towards adopting CE-related policies, while none of them chose an unimportant or very unimportant level.

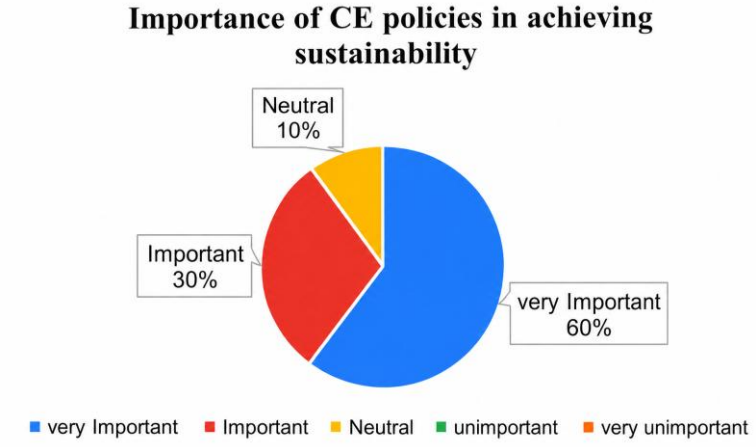

Figure 2: Importance level in adopting CE-related policies to enhance sustainability

Then, RII analysis was carried out to prioritize the recommendations found through literature for developing a circular economy policy framework that enhances

sustainability in the construction industry based on their perceived importance according to the respondent's ratings.

Table 5: RII ranking table for practical recommendations in adopting CE related policy framework in Sri Lanka.

Code	Recommendations	RII value	Rate	Importance level
R01	Provide tax breaks and subsidies for companies that meet CE requirements.	0.64	7	High-Medium
R02	Develop green financing schemes specifically for sustainable construction projects.	0.713	4	High-Medium
R03	Create guidelines for designing buildings that can be easily dismantled and reused.	0.76	1	High-Medium
R04	Fund the development of localized recycling facilities in each district to process construction waste and reduce transport emissions.	0.7	6	High-Medium
R05	Promote multi-use building designs (storefront buildings with apartments on the upper floors)	0.72	3	High-Medium
R06	Develop a certification system for the circular economy, such as the green rating system in Sri Lanka.	0.7278	2	High-Medium
R07	Restrict landfill disposal of recyclable or reusable construction and demolition materials.	0.713	4	High-Medium

The findings support existing literature, which emphasizes that overcoming CE implementation barriers requires collaborative efforts among policymakers, regulatory authorities, professional institutions, and industry stakeholders (Ishan et al., 2023; Munaro & Tavares, 2023). Consistent with these recommendations, the most highly rated policy measure by stakeholders was the development of guidelines for designing buildings that can be easily dismantled and reused (RII = 0.760), reflecting the industry's need to reduce demolition and material recovery costs. The second-ranked recommendation was the introduction of a CE-focused certification system similar to the existing Green Building Council Sri Lanka (GBCSL) rating system (RII = 0.728), indicating stakeholder confidence in certification-based approaches to encourage sustainable practices. Promoting multi-use and adaptable building designs was ranked third (RII = 0.720), highlighting the importance of maximizing resource efficiency throughout a building's lifecycle. These findings reinforce the argument of Weerakoon and Thayaparan (2023) that Sri Lanka requires clear CE guidelines and policy frameworks developed through collaboration between industry and academic experts. Therefore, policymakers should prioritize practical design standards, certification mechanisms, and adaptable building approaches to accelerate the transition towards a circular construction industry.

4.5 DISCUSSION ON INTERVIEW FINDINGS

Interviews with key stakeholders indicate that while awareness of circular economy concepts in Sri Lanka's construction industry is at a moderate level, their actual implementation remains minimal. RE and CS consistently highlighted that the industry is still in an early transition phase, largely due to the absence of mandatory regulations,

limited stakeholder support, high initial costs, and insufficient awareness. Circular practices are mainly confined to basic activities such as recycling and the use of locally sourced materials, with only a few large or foreign-funded projects adopting more advanced approaches due to external requirements. Additionally, SQ stated resistance to change from traditional construction methods and reliance on unsustainable waste disposal practices further hinder progress. Overall, majority of respondents stated that, the lack of a strong regulatory framework and enforcement mechanisms has resulted in low adoption of circular practices across the industry.

Despite these challenges, several key drivers for advancing circular economic practices were identified by SE, EP and CS, including regulatory enforcement, resource scarcity, increasing public awareness, and the need for improved sustainability. Stakeholders emphasized that government commitment and policy support are essential to drive widespread adoption, with regulatory bodies expected to lead through clear policies, compliance requirements, and monitoring systems. Additionally, RE and EP mentioned that organizations such as CIDA and GBCSL were recognized for their complementary roles in enforcing regulations and promoting awareness, certifications, and training programs.

Additionally, thematic analysis of the open-ended questions from questionnaire supported by interview responses from RE, CS and EP identified the responsibilities of regulatory bodies such as CIDA and GBCSL. Respondents highlighted that CIDA should focus on policies, regulations, and compliance related to circular economy principles, while GBCSL can promote certification systems, awareness programs, and training initiatives to encourage circular practices. Together, these organizations can also provide financial incentives, technical support, and guidance for the industry's transition towards circularity.

Furthermore, responses emphasized the role of professional bodies such as SLIA, IESL, and IQSSL in developing a suitable policy framework for sustainable construction in Sri Lanka. Respondents noted that these bodies can collaborate with regulatory authorities and industry stakeholders to create awareness through training programs, educational initiatives, industry standards, localized recycling support, and certification systems. They can also contribute significantly to changing stakeholder mindsets towards adopting circular economy practices.

5. CONCLUSIONS

This study addresses a key research gap by identifying stakeholder perceptions on developing a circular economy (CE) based policy framework to enhance sustainability in the Sri Lankan construction industry, revealing generally moderately positive attitudes toward such policies. Based on the findings, the study recommends several context-specific measures, including developing design guidelines for buildings that can be easily dismantled and reused to reduce demolition waste, introducing a CE-focused certification system similar to the existing GBCSL green rating scheme, promoting multi-use and adaptable building designs to optimize resource use and extend building life cycles, and establishing green financing mechanisms such as low-interest loans to improve the economic feasibility of circular practices. Additional recommendations through the survey and interview findings include restricting landfill disposal of recyclable construction and demolition waste, funding localized district-level recycling facilities to

reduce transport emissions and strengthen closed-loop systems and providing tax incentives and subsidies for companies complying with CE requirements. Furthermore, future research could be done through detailed case studies in Sri Lanka, comparative analyses with other developing Asian countries, and long-term post-implementation and life cycle assessments, while acknowledging limitations related to sample size and varying levels of stakeholder expertise, which may affect the generalizability of the findings.

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