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POLICY GAPS THAT DETER FOSTERING SUSTAINABLE CONSTRUCTION IN SRI LANKA

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ABSTRACT

One of the guiding principles used for structuring the policy of construction in Sri Lanka is to ensure achieving sustainable development. Though the construction practitioners in Sri Lanka are aware of sustainable construction practices, there is lack of verification as to enthusiasm of the state policy that has been extended to this noble cause. A desk review was carried out to demystify the existing policy directions. A comprehensive literature survey was carried out to identify the drivers and barriers of its implementation. A structured questionnaire survey was conducted among 100 individual practitioners to gauge their perception and experience. 80 responses were received, 62 were considered valid for analysis. Data collected were then analyzed using the relative importance index. It was revealed that the key driver is end user requirements and the crucial barrier is lack of policies. Only 3 out of 17 dimensions have been at least superficially earmarked within the policy framework. The study suggests that the uptake of enhanced policies would indeed help in fostering sustainability. The outcome will be valuable for the government officials to formulate a policy that truly promotes strategic direction. This is the first local research on identifying policy gaps related to the subject arena.

Keywords: *Barriers; Drivers; Policy Making; Sri Lanka; Sustainability.*

1. INTRODUCTION

In Sri Lanka, the guiding principles in structuring the policy of construction industry are to include combating environmental impacts and achieving sustainable development. The National Policy for Construction is formulated in terms of the provisions of Subsection 2 (1) of the Construction Industry Development Act No.33 of 2014. As stated, the aim of the construction policy is to create an efficient construction industry through regulation, standardization, capacity building and facilitation. A policy is deemed to be contextual and substantive. Context is all about barriers and drivers that affect the implementation of practices. Hence it is considered imperative to find out any policy dimensional gaps that eventually deter the sustainable practices and to highlight some promising ideas which could successfully fill those gaps. First, different definitions of sustainability are presented, and these aspirational standards are tested empirically as to their importance and compared with current policy goals. This is indeed a precursor to any policy revisit after 5 years of its introduction.

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The aim of this research is therefore to gauge the enthusiasm of the construction policy extended to the noble cause of sustainable construction. The objectives are to identify drivers, barriers, and policy gaps of sustainable construction.

2. DEMYSTIFYING SUSTAINABLE CONSTRUCTION

According to DuBose *et al*. (1997), "sustainability reconciles the pervasive human desire for a high quality of life with the realities of the global context. It calls for unique solutions for improving welfare that do not come at the cost of degrading the environment or impinging on the wellbeing of other people". Sustainable development was defined by the World Commission on Environment and Development (1987) as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Hill and Bowen (1987) identified four attributes of sustainability; social, economic, biophysical and technical. These are supplemented with a set of over-arching, process-oriented principles. Kibert (1994) finds sustainable construction as creating a healthy built environment using resource-efficient, ecologically based principles. According to Lawson (1992), sustainable construction includes 'cradle to grave' appraisal. Professional actors in the construction industry construct definitions of sustainable development to valorize their professional role (Abrahams, 2017). All stakeholders at all stages should commit to sustainability to enable change in perception to start with (Sfakianaki, 2015). The key factors that need to be considered include the release of conceptual guidelines and management regulations (Shi *et al*., 2012). This warrants a careful study on the drivers and barriers at the outset. Drivers are meant to be the various elements that trigger, sustain and expand the uptake of sustainable construction practices. On the other hand, "barriers" are the conditions that impede progress towards achieving a strategic business objective (Vandierendonck *et al*., 2010). However, there is ample requirement to apply these concepts in the local construction projects (Karunasena *et al*., 2016).

In a nutshell, sustainable development is a complex composite policy goal (Rydin *et al*., 2007). The way of positioning the construction sector into the global approach of sustainable development should be clarified and clearly claimed (Bourdeau, 1999). However, more holistic approaches are quite absent (Heijden and Bueren, 2013). A factor that may be hindering is the 'convoluted' nature of the policies (Warnock, 2007). Any national policy has to address this complex matrix. A policy offers a framework which is certainly useful for benchmarking. A policy provides a generic structure allowing flexibility (Presley and Meade, 2010). However, much of the research on technical and scientific knowledge has focused on the emergence of policy agendas (Rydin *et al*., 2007). The gap between policy intent and effective solutions remains difficult to close (Meacham, 2016). For effective policymaking, it is essential that these various paths (dimensions) be disentangled so that the policies may be targeted in a manner that induces a changed behaviour away from environmentally damaging inequitable growth (Robert and Herman, 1996).

3. DRIVERS AND BARRIERS

There are a number of challenges in introducing sustainable practices and certain enablers need adopting a more sustainable path (Plessis, 2007). Tables 1 and 2 depict the drivers and barriers of sustainable construction identified by past researchers, respectively.

Table 1: Drivers identified by past researchers

Drivers	Reference
Policy imposition Client requirements	Opoku and Ahmed (2014)
Green reputation Stakeholder influence Competitive advantage Legal requirement	Abrahams (2017)
Concession of tax Awareness on impacts	Roper and Beard (2006)
Monitoring system in place Certification program Accreditation scheme Regular audits	Bash and Haikines (2015)
Customer willingness to pay extra for green initiatives	Presley and Meade (2010)
Societal accountability Specific tender weightage on sustainable elements Technical knowhow	Majdalani *et al*. (2006)
Improved process flow and productivity	Rydin *et al*. (2007)
Improvement in environmental quality	Ogunbiyi *et al*. (2014)
Integration of principles of lean construction Energy conservation Improving indoor environmental quality Environmental/resource conservation Waste reduction	Mohamed *et al*. (2017) Meacham (2016) Ahn *et al*. (2013)

Table 2: Barriers identified by past researchers

Barriers	Reference
Lack of policy Lack of design itself Lack of codes	Opoku and Ahmed (2014)
Lack of public awareness Lack of demand Lack of strategic direction	Arif *et al*. (2013)
Low level of education and experience on sustainable construction Lack of demand for sustainable buildings Tendency to maintain current practices, and limited knowledge and skills of subcontractors	Ahn *et al*. (2013)
Wrong perceptions on capital costs	Susan and Eric (2014)
Lack of expertise Lack of database Resistance to change	Ahn *et al*. (2013)

Barriers	Reference
Lack of government support	
Lack of measurement tools	
Lack of incentives	
Lack of audits	
Higher investment costs	
Lack of cooperation	
Lack of technology	
Lack of training	
Increased capital costs	
Learning curve	Wyatt *et al*. (2000)
Attitudinal issues	Athapaththu and Karunasena (2018)
Lack of priority	
Lack of life cycle initiative	
More complex planning	
Building control systems	
Gaps in the legal framework	
Weak enforcement of prevailing rules	
Less institutional intervention	
Less commitment of key stakeholders	

4. RESEARCH METHODOLOGY

This study used a mixed approach where the validity and reliability of results are enhanced (Lund, 2012; Neuman, 2011). As the first step of the process, a desk review was carried out on the existing policy of construction in Sri Lanka to identify policy gaps if any. A literature survey was undertaken to identify drivers and barriers. An interview guideline was developed with the use of literature findings. A questionnaire was subsequently piloted on five (5) senior construction practitioners those who have more than 25 years working experience to establish the appropriateness of the questions and alleviate the inconsistencies if any. Some of the questions were amended to reflect the views of the pre-test respondents. A structured questionnaire involving closed-ended queries was subsequently disseminated among 100 construction practitioners in Sri Lanka using a stratified sampling method via online Google forms survey and 62 completed questionnaires were received with the rate of response of 62% (Table 3). The respondents were required to rank the extent to which each of the barriers and drivers do exist using a 5-point Likert scale. The degree of perception was taken on the Likert scale of 5 = strongly agree, 4 = agree, 3 = fairly agree (average), 2 = disagree, 1 = strongly disagree. RII (refer equation 01) was used for the analysis. RII aids in finding the contribution a particular variable makes to the prediction of a criterion variable both by itself and in combination with other predictor variables Johnson and LeBreton (2004). RII was calculated using equation (01).

$$RII = \frac{\Sigma W}{A \times N} \qquad (01)$$

Where: RII= Relative Importance Index; W= Weighting given to each factor by the respondents, A= Highest weight and N= Total number of respondents.

Table 3: Profile of the respondents

Designation of Respondents	Years of Experience							
	10 to 15		15 to 20		20 to 25		More than 25	
	Distributed	Received	Distributed	Received	Distributed	Received	Distributed	Received
Construction Manager	5	4	5	3	5	4	5	3
Site Manager	5	3	5	2	5	2	5	2
Project Manger	5	4	5	4	5	4	5	3
General Manager	5	2	5	2	5	3	5	3
Training experts in Construction Sector	5	3	5	4	5	4	5	3
Total Responses	*25*	*16*	*25*	*15*	*25*	*17*	*25*	*14*
Rate of Response	*62%*							

Findings of the empirical study were mapped with the literature findings and overlap factors were identified as 'crucial' in policy considerations.

5. FINDINGS AND DISCUSSION

5.1 POLICY REVIEW

A desk review was carried out to identify the policy actions and derivatives falling within the purview of sustainable construction. As such, the National Policy for Construction was formulated in terms of the provisions of Subsection 2 (1) of the Construction Industry Development Act No.33 of 2014. It was found that there are three key policy priorities namely, energy efficiency, disaster resilience and environment friendliness. Though the policy is silent on application on traditional knowledge, it must be noted that, the Construction Industry Development Act (CIDA), No. 33 of 2014 stipulates that in formulating the National Policy, emphasis shall be given to the involvement of professionals within the construction industry, including resource personnel in the field of traditional knowledge. The policy gaps are those silent in the various existing regulations (where the directives are not given as shown in Table 5). It does not broadly address any implementation mechanism either.

5.2 EMPIRICAL STUDY

A total of 80 responses were received and 62 were deemed to be valid for analysis after data screening, thus representing 62% response rate. 33% had never been engaged in sustainable construction projects. 45% reported that 1 out of 10 projects uses sustainable construction concepts whilst 22% reported that 1 out of 25 projects uses sustainable construction methods. Again, the majority had engaged in less than five such projects. It is observed that sustainable construction practices are not frequent. There are 10 key drivers and 14 barriers found in the empirical study. Tables 4 and 5 depict their overlap with the literature findings which indicates that these overlap factors are more imperative than non-overlap factors in drafting a policy.

Table 4: Empirical ranking of drivers and their overlap (O/L) with literature findings

Drivers	RII	O/L	Rank
Client requirements	0.79	X	1st
Stakeholders' influence	0.71	X	2nd
Cost efficiency	0.69		3rd
Competitive advantage	0.68	X	4th
Legislative provisions	0.67	X	5th
Awareness	0.67	X	5th
Clear and consistent guidelines	0.65	X	7th
Win more contracts to remain in business	0.64		8th
Financial incentives	0.60	X	9th
Company reputation and brand image	0.59		10th

Table 5: Empirical ranking of barriers and their overlap (O/L) with literature findings

Barriers	RII	O/L	Rank
Lack of polices	0.76	X	1st
Lack of codes	0.72	X	2nd
Lack of financial incentives	0.69	X	3rd
Lack of investment	0.68	X	4th
Initial cost	0.67	X	5th
Lack of client demand	0.66	X	6th
High cost of environmental service	0.66	X	6th
Insufficient research	0.64	X	8th
Lack of public awareness	0.64	X	8th
Competitive pressure	0.62	X	10th
Lack of database	0.62		10th
Lack of green products	0.60	X	12th
Lack of expertise	0.58		13th

With regard to barriers that inhibit the sustainable practices, respondents were asked to rank 14 items on a scale of 1 to 5 with one being the least significant factor and five being the most favoured factor. The analysis revealed that "lack of policies" was the first barrier. The lack of building codes was the next in line. It recorded a value of 0.72. This is followed by lack of investment with a value of 0.69. The least rank RII was the lack of lack of expertise. Further, the empirical ranking of drivers and barriers and their overlap with the literature findings highlight the priority of policy wise attention. Overlap is where the factors emphasized in both literature survey and empirical study.

Having identified that the lack of policies is the topmost barrier (Table 4), respondents were next asked to rank the various dimensions of sustainable construction drivers found in the empirical study. The most ranked dimension was "traditional knowledge". It recorded an RII value of 0.84. This was followed by "environmental friendliness" with an RII value of 0.81. Priority of projects was ranked again second with an RII value 0.81. The least ranked dimension was 'valuation of bonus' with an RII of 0.60. There are 17

dimensions ranked in the order of their relative importance so that the policy gaps with no directives become apparently plausible. The findings are illustrated in the Table 6.

Table 6: Ranking of policy dimensions

Dimension	Policy Profile	RII	Rank	Policy Directives
Traditional Knowledge	Foster culture in adapting TK	0.84	1st	CIDA Act, No. 33 of 2014, Article 2, Part 1
Environmental friendliness	Stimulate adoption of environmentally favourable construction practices	0.81	2nd	National Construction Policy, Sec 2.2, VI
Priority of projects	Take a scientific and apolitical approach	0.81	2nd	
Building adaptive reuse	Espouse means of BAR in respect of buildings nearing obsolesce	0.81	2nd	
Research	Establish centrally coordinated arm of research	0.76	5th	
Land use	Use non-arigable lands and harmonize land policy ensure complementarity	0.74	6th	
Low carbon initiatives	Encourage supply chain in carbon free materials and process selection	0.72	7th	
Deconstruction and recycling	Minimize the release of building debris to the environment	0.71	8th	
Solar energy	Explore market potentials	0.71	8th	
	Grant concessions	0.70	10th	
Green technology	Promote green in all design, construction and maintenance aspects	0.69	11th	
Procurement	Assign in tender evaluation equal weightage on the most environmentally favourable offer as same as the least cost and technically feasible offer	0.68	12th	
Green building indexing	Introduce green building index and indices along with the national green specification applicable for construction	0.68	12th	
Disaster resilience	Emphasize the use of building resilient concept and mainstream disaster risk reduction into construction practices and structures	0.68	12th	National Policy on Disaster Management, Sec 25.b/27.a
Sustainable Construction Index	Assess progress in sustainable construction. The result can help a nation to pinpoint areas needing improvement	0.67	15th	

Dimension	Policy Profile	RII	Rank	Policy Directives
Bid selection	Stipulate sustainable construction as a contractor selection criterion in bid documents	0.66	16th	
Mapping knowledge flows	Tacit knowledge can be transferred through strong ties in sparse networks	0.63	17th	
Valuation bonus/reduction	Assign a "valuation bonus" to a sustainable building or a "valuation	0.60	18th	

6. CONCLUSIONS

This study provided a number of dimensions that can guide policy formulation in Sri Lanka. Only 3 out of 17 dimensions have been superficially earmarked within the policy framework in Sri Lanka. They have been addressed in the legislation named CIDA Act, No. 33 of 2014. The National Construction Policy and the National Policy on Disaster Management refer to environmental friendliness and building resilience respectively. In a nutshell, the Government needs to focus on policy dimensions such as traditional knowledge to sustainable bid selection, deconstruction, adaptive reuse, reduction of taxes and levies, on sustainable products and low carbon initiatives. This being said, it is for certain that there is still no fully-fledged policies present. A policy gap analysis, like this, can be beneficial in long run as this research can help present the policies that may be necessary and efficient for the entire construction industry, that will otherwise deter the implementation of sustainable construction.

7. FURTHER RESEARCH

It is recommended that further studies be conducted using larger samples and also a probabilistic (random) sampling approach to validate the findings of this study so that the results can be generalized. It is also imperative to see how the various factors are related. Inferential statistical methods can be employed to determine whether there exists causal relationship between the various identified variables. For example, Analytic Hierarchy Process tools would help establish consistency of human perception and judgement. Such information will provide pertinent information on how to promote sustainable construction practices in Sri Lanka.

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