

How Construction Sector responds to the Economic Recession: Identification of Adverse Effects and Sustainable Responsiveness

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Abstract

The construction industry is a significant source of income generation to the economy contributing more than 9% of the GDP in Sri Lanka. Thus, the construction industry is concurred a direct positive correlation with the cyclical nature of the economy resulted in a stagnation during the economic recession. In general, practitioners adopt various strategies in response to a recession to realize firms' continued existence and development. However, the current responsiveness to mitigate adverse effects identified became reactive which only considers the short-termism. Hence, the recession responsiveness must be aligned with the sustainability for a long term proactive implication. Therefore, this research study aims to assess the adverse effects and the sustainable responsiveness during the recession. The research gap was then approached through a questionnaire survey among construction practitioners to gather ordinal data on criticalness of adverse effects and appropriateness of recession responsiveness. Then, the research was concluded by extracting appropriateness of adopting sustainable responsiveness to mitigate adverse effects. The analysis derived cost control strategies have given more sustainable responsiveness supersedes the other strategies. Thus, it is recommended to be aware of the recession rather beware.

Keywords: *Adverse effects, Construction Industry, Economic Recession, Responsiveness, Sustainability*

1.0 Introduction

The financial crisis which has shaken the global economy during 2008 - 2009 was considered as the most devastating economic downturn since the great depression of 1930s. The highlights of recent economic developments published by the Central Bank of Sri Lanka (CBSL, 2012) explained that the market confidence in international financial markets is deteriorated by the European sovereign debt crisis led to heightened volatility in capital flows of Asian economies. Thus, it flagged in descending of Key Economic Indicators (KEI) of Sri Lanka (CBSL, 2012). The global recession caused by the financial crisis having an impact on the real economy and signs are visible in the construction sector, mainly in the form of postponing investment or abandoning of proposed contracts. Further, construction companies face financing difficulties and in some extreme cases, even bankruptcy (Nistorescu&Ploscaru, 2010). Additionally, unemployment rates of construction professionals have increased as a result of the crisis. Thus, contractors adopt various strategies in response to the recession to realize firms' objectives of continued existence and development. However, many survival strategies innovated are reactive and short-termism focuses on economic perspective.

Though, sustainability as a term in isolation has gained merits, sustainable construction has not yet identified as a recession responsive strategy in the prolonged recession. Thus, innovative survival strategies are needed to be found out immediately in order to cure its appalling effects on

the construction under the prominence on sustainable development in the long run. Thus, this paper aims to:

- To identify the adverse effects in the construction industry during the recession.
- To identify the current responsiveness to mitigate the adverse effects recognised in the construction industry.
- To recognise the concept sustainability and sustainable responsiveness in the construction sector.
- To assess the adverse effects' existence, current responsiveness and sustainable responsiveness in case of Sri Lankan construction industry.

The paper structure begins in the following sections with a review of literature on economic recession hit building construction, adverse effects and current responsiveness for a recession and then ascertain the sustainable responsiveness. The next section presents the research methodology followed by data analysis. The paper finally presents discussions and conclusions of the research study.

2.0 Literature review

2.1 *Economic recession and its impact to construction industry*

2.1.1 Overview of economic recession

There is a clear demarcation of two terminologies Recession and Depression. The depression is the most severe version of a recession. Thus, trough dates marked at the depression while the recession is the negative inclination in the business cycle (NBER, 2012). The contraction is therefore commonly identified as the recession which brings about a significant decline in KEI (Moore, 2012). Moreover, illiquidity, credit crunch, currency devaluation, and bankruptcies are the further effects posed troublesome in weakening the financial system of interdependent economies

2.1.2 The impact of economic recession on KEI of Sri Lankan economy

The challenges faced in achieving the growth in 2009 included the synchronized downturn in major economies and the heightened security concerns with the escalation of the conflict in the North of Sri Lanka (CBSL, 2009). Moreover, KEI in the macroeconomic environment marked significant movement during 2009 as illustrated in Figure 1. The high openness evident from the external adverse effects during the recession was reasoning to a gradual decline in demand in developed countries for imports thus led to lowering net exports. Further, rising international commodity prices put significant strain on the balance of payments, with the current account deficit reaching the highest. Furthermore, the rupee depreciation resulted due to high foreign debt repayment which can reduce meeting other expenditure. Also, average inflation dropped to lowest level and monetary policy was amended to result in a falling treasury bill rate to a level below the inter-bank money rate, provided a gradual upturn in money supply. However, despite of gloomy prospects for employment in the world, unemployment and labour migration in SL remained at an exceptionally low level.

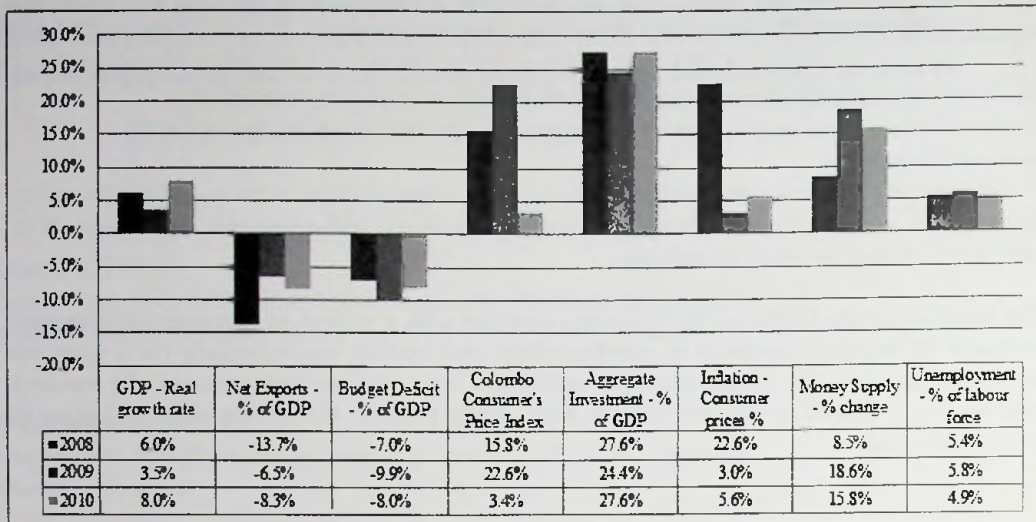


Figure 1: Fluctuation in Key Economic Indicators of Sri Lanka
Source: (CBSL, 2012)

2.1.3 Construction sector's influence to the recent economic recession

The year 2009 appeared as a significant deterioration. According to Verick and Islam (2010), the global crisis was emerging as isolated turbulence in the subprime segment of the US housing market mutated into a full blown recession by the end of 2007, which was known as the housing bubble burst. As a result of the overhang in the supply of housing opened up for financial institutions to extend vast numbers of mortgages at attractive rates. Consequently, the fundamental cause of the crisis was the combination of a credit boom and a housing bubble (Acharya & Richardson, 2009). Moreover, the capital regulations on banks reduce the amount of capital to hold against assets which was then resulted in the risk of mortgage defaults in the banking sector and rendered them insolvent when the housing bubble popped.

2.2 Adverse signs in construction sector during the recession

The construction industry plays a vital role in the national economy and gets affected by macroeconomic fluctuations. In Sri Lanka, construction industry contributes 9.39% of GDP in the year 2012 (CBSL., 2012). Iteratively, result in adverse inferences to the national economy. Thus, the impact to the construction sector is explained as follows:

Adverse effects	Description
Financing	Construction companies face financial difficulties due to tight credit conditions and result in bankruptcy in the worst case (Nistorescu & Ploscaru, 2010). The reason was higher reliant on bank lending while being more exposed to late payment by clients. Subsequently, banks withdraw lending for construction projects. For instance, bank credit granted for housing purposes registered a decrease by 1.5% in Sri Lanka during the year 2009 (CBSL, 2009).
Demand and Supply	Economic fluctuations influence both demand and supply in the construction industry. The fall in overall demand for construction was mainly due to the sharp decline in the value of public sector contracts (Goh, 2004). Thus, competitiveness has been increased and tender bids were underestimated (Gunaratne, 1993). In the supply perspective, the profitability of construction firms worsened by a sudden increase of lending rates due conservative risk management during the crisis. Further, sectorial interlink with the construction

Adverse effects	Description
	sector propagates the effect on market amplifying the overall economy. Thus, overall equilibrium moved downward even though mega construction road network development, flyover construction existed during 2009.
Unemployment	The high unemployment is a response to the shortfalls in aggregate demand, signaling the unstable economy. Thus, during the recession high labour costs mean the sacrifice of many labourers' jobs and contractors' profits. Similarly, drop in contribution of employment in Sri Lanka during the crisis was mainly due to the construction sector (CBSL, 2009).
Constraints on material and plant	The economic crisis is followed by the knock on effects of reduced demand for building materials and capital investment in machinery and equipment (CBSL, 2009). Therefore, building material manufacturing currently operate at close to half their capacity. CBSL (2009) stated that there was a drop of building material imports by 24.1%.
Procurement and supply chain	The procurement function is faced with a dilemma: it needs to reduce spending without increasing the pressure on suppliers who are on the edge of bankruptcy in a recession (Cherif&Maira, 2011). For instance, the drop in supply chain can be proven by the slowdown in construction resulted in decelerating of the construction sub-sector (CBSL, 2009).
Future prospects led by customer confidence	The consumer confidence gets terrified during the recession. In the worst case, the recession ends up into a liquidity trap in which people hoard money and refuse to spend no matter how much the government tries to expand the money supply which leads to reduce construction spending (Goh, 2004). Thus, many clients tend to adopt "wait and see" approach due to the uncertainty.

2.3 Current responsiveness to mitigate adverse signs in recession

Current responsiveness in the construction sector are the strategies to realize firms' objectives of continued existence and development in response to the recession. Thus, crisis responses have identified under three categories as Contracting-related actions, Cost-control related actions and Financial-related actions (Lim et al, 2010).

2.3.1 Contracting-related actions

Contracting-related actions are adopted by contractors in finding every possible way of procuring work to maintain their turnover (Hillebrandt, Cannon & Lansley, 1995). The companies were reluctant to undertake projects that are too large or beyond their experience which stretch their available resources and capabilities (Lim et al, 2010). Subsequently, contractors accept less work to maintain market share. Further, it was suggested that contractors would need to be "disciplined aggressive" in their business venture and place greater emphasis on cost, risk and resource management. At the same time reputation with clients plays important roles in dictating their ability to obtain sufficient jobs to tide over the recession (Green, Larsen & Kao, 2008). Lim et al (2010) listed contracting-related actions according to the frequency of adaptation by the Singaporean contractors in the recession. Thus, "Bidding for more projects within the firm's

competency' and 'Setting limits on the project size which offset the failure of one project to the firm's operation' have ranked at the topmost.

Further, Hillebrandt et al. (1995) stated that the lower bid pricing strategy with a tiny or zero profit margins during recession periods can be attained by minimizing the cost of rework, negotiating lower prices for supplies and direct sourcing of input material. Drucker (1980) stated contractors should return to their fundamentals and core competence in line with the business environment for opportunities in potential markets instead of diversifying. Consistently, defensive strategies such as aggressive pricing, diversification and forming joint ventures are short-termism. In a longer slow-down these strategies are not sustainable. Furthermore, the effective corporate governance may be considered as a quick remedial action to overcome from the recession (Jayaramana, Ibrahim and Guatc, 2011). Moreover, according to the Michael Potter's generic strategy 'Diversification' and 'Differentiation' strategies are aligned with the contracting related responsiveness (Kaplan Financial Limited [KFL], 2010).

2.3.2 Cost control-related actions

The need of a more active role in managing projects and the company's cash flow and procurement procedures during the prolonged recession is highlighted under the cost control related actions (Lim et al, 2010). Thus, Lim et al (2010) listed cost control-related actions which are more toward site management, financial management and human resources management. Similarly, Gunaratne (1993) stated that the cost saving measure is especially important in a recession where the client looks at value for money. Further, restructuring of the workforce into teams enabling share skills and maintaining a lean group of core staff becomes a cost saving in crisis (Choppin, 1991). Similarly, Michael Potter's cost leadership strategy is aligned with the cost control actions to improve the firm's performance by cost cutting (KFL, 2010).

Moreover, imposing wastage rates for construction materials on site, material recycling, inventory management and Just in time (JIT) delivery concept, strengthening the procurement function by internal and external collaborations and partnering with key suppliers also highlighted (Tam & Tam, 2006).

2.3.3 Financial-related actions

'Creating uncommitted financial resources', 'Negotiating for alternative loan services' marked the frequently practicing financial-related actions in the Singapore contractors during the recession (Lim et al, 2010). Furthermore, contingency fund allocation mitigates the lagged impact of the recession on the business operation (Lim et al, 2010). Besides, borrowing money from banks to finance debts and increase working capital is common during a recession. The remaining companies, on the other hand, claimed to operate within the working capital and adopted the "wait-and-see" mode because of the unwillingness to overstrain the debt obligation. Apart from "cash rich" companies others have to negotiate for alternative loan services in response to economic disturbance (Hillebrandt et al, 1995). In response to invest in highly liquid assets, Dulaimi and Hong (2002) found that 50-70% of construction equipment have been leased financed which is a cost effective strategy.

2.3.4 Government policy-related actions

The way to reestablish the customer confidence in a recession is to pump government spending to expand the money supply as per 'Keynesianism', nevertheless Friedman and Swartz introduced 'Monetarism' which recommends keeping the money supply steady to allow for the growth of the economy and adjusting inflation, unemployment and output level according to market demands (Friedman and Swartz, 1963).

An even bigger outbreak on Keynesianism came from Robert Lucas stated that the recession is self-correcting once it is realized. Thus, government should do nothing but await the correction out. Simply, people in the economy make choices based on their rational outlook, available information and past experiences (Derakhshan, 2011).

2.4 Sustainability and sustainable responsiveness in the construction sector

The sustainability meets the needs of the present without compromising the ability of future generations to meet their needs (Brundtland Commission, 1987). According to Kibert (2008), sustainability addresses three mutually reinforcing pillars as the ecological, social and economic issues which aligns with the triple bottom line concept. Thus, it is a single indicator prescribing sets of multi-disciplinary indicators. Policies and practice that support sustainable development have become more widespread following concerns over the extent of man's activities on the natural environment. Deforestation, decimation of water catchments, destruction of endangered fauna and flora, soil erosion, landslides, waste creation, pollution, desertification and the like have become a critical problem (Kibert, 2008). Hence, sustainable initiatives emerged as a solution to cure the adverse impact.

Sustainable construction can be defined as a construction process which is carried out by incorporating the basic objectives of sustainable development, bringing environmental responsibility, social awareness, and economic profitability to the built environment and facilities for the wider community (Asad and Khalfan, 2006). Further, sustainability can be incorporated within the whole construction process which resulted in the incorporation within the Process Protocol as a Sustainability Management Activity Zone (Asad and Khalfan, 2006).

Hence, the sustainable responsiveness have explained according to the authors' interpretation as the long term strategic solution to mitigate adverse effects in the construction industry in the prolonged recession. The responsiveness supports with the sustainable benefits to survive in the long term beyond the consideration of economic perspective about the short term profit maximization. Thus, sustainable responsiveness extend to the environmental responsibility and social responsibility when selecting the survival strategies for the long term existence.

2.5 Exploration of the research gap

Aforementioned literature findings conveyed that the construction industry generally faces a critical adverse conditions which stagnating the forward movement of the industry during the recession. Although, there are many responsive strategies existed and innovated through previous studies are post-mortem applications which use as a reactive approach once adverse conditions are identified. Though, sustainability as a term in isolation has gained merits, however sustainable innovation has not yet identified as a survival strategy in the prolonged recession. Therefore, as to mitigate the threat existence and enhancing the opportunity, it needs to investigate how and in what angle the benefits of sustainable responsiveness attain to survive in the recession focusing on the Sri Lankan context as explored the research gap in Figure 2 below.

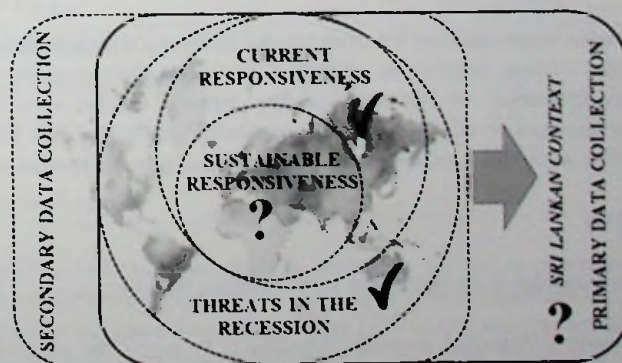


Figure 2: Research gap

3.0 Methodology

An extensive literature review was carried out to investigate adverse signs in recession, current responsiveness and the sustainable construction in isolation. Then the research gap was further elaborated to guide the approach. The study then carried out on a survey approach to investigate the adverse signs recognized under the Sri Lankan context and the current responsiveness adopted by the Sri Lankan construction practitioners under the worst economic conditions.

A questionnaire survey was carried out among a sample (35) of construction consultants, contractors and financial officers in the construction industry. The approach was more towards collecting qualitative ordinal data. Respondent's self-assessment of criticalness and appropriateness respectively of adverse effects and responsive strategies were according to the Likert scales given below.

Likert Scale 1: Adverse effects in the construction industry during the recession

1	2	3	4	5
No influence	Somewhat influential	Influential	Very Influential	Critical

Likert Scale 2: Recession responsive strategies

1	2	3	4	5
Poor	Fair	Good	Very Good	Excellent

Thus, Likert-type data analysis was based on the significant measurement by using the Relative Importance Index (RII) to rank the criticalness of adverse effects and the appropriateness of responsiveness. The following formula was used to compute RII from the data where the RII shall change from 0% to 100%. Weightage was as per the Likert scale weighting 0 being the least and 5 being the highest. Where; W = Constant expressing the weighting given to each response, A = The highest weighting, n = The frequency of responses, N = Total Number of the Responses.

<p>Relative importance/difficulty index =</p> $\frac{\sum w}{AN}$
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Source: Gunawardena et al. (2004, p.6)

Subsequently, the results were validated by using central tendency which is the median of the data set. Subsequently, the current responsive strategies were categorized under sustainability and non-sustainability interpretation by the sustainability experts. Finally, concluded the research finding determining the extent of practicing sustainability measures and the appropriateness practicing sustainability in the Sri Lankan context as recession responsiveness.

3.0 Data analysis

3.1 Adverse Signs recognized in the construction sector during the recession

One aspect of the above mentioned research objective is to assess the adverse effects existence during the recession. The list of 21 adverse effects was extracted from the literature review and a survey was carried out to assess whether the respondents have recognised the particular adverse effect during the recession and the level of criticalness on the construction industry according to the Likert Scale 1. The term "Recognition" is the percentage frequency of adverse effects recognition.

Table 1: Critical adverse effects recognised by Sri Lankan practitioners

Adverse Effects / Threats	Recognition	RII	Rank
Late payment by clients	100%	0.89	1
Financial difficulties due to tight credit conditions	100%	0.87	2
Demand on competitiveness has increased	100%	0.85	3
Leaving the liquidity of firms in hazard	100%	0.80	4
Clients tend to adopt "wait and see" approach	91%	0.78	5
Postponing investment in property	100%	0.78	5
Experiencing low investment levels	100%	0.77	7
Growing the number of unsold built construction facilities	86%	0.73	8
Decline in the value of public sector contracts	77%	0.72	9
Profitability of construction firms was worsened	100%	0.71	10
Withdrawal of lending by banks	94%	0.71	10

Top 10 critical adverse effects were ranked according to RII is illustrated in Table 1. Over 80% respondents have experienced in all the adverse effects. 'Late Payment by clients' was marked as the most critical issue gaining the relative importance of 89%. Considering the critical influence of the top 10 effects in segregation, it has dispersed between 18% range, which is from 89% to 71% of RII emphasising all effects have recognised as critical. Further, the top 10 critical effects can be categorised under 3 headings; 'Financing', 'Demand and Supply' and 'Future prospects led by customer confidence' as described in the literature review. Most importantly, adverse effects related to financial matters have ranked in the 1st and 2nd positions.

Moreover, the central tendency of the top 10 set is 4 ('Very Influential') for all the effects except for the effect ranked 10th 'Decline in the value of public sector contracts' is 5 ('Critical'). It is expressing the validity and the consistency of the results generated from the ranking according to RII. Though, the central tendency and the RII rank are contradictory in the 10th ranked effect which is due to the least recognition of the effect compared to all factors in Table 1. In other words, the above top 10 data set generated a moderate positive linear correlation coefficient (r) of + 0.70 between Recognition and RII. Consequently, lesser recognition of the 10th ranked adverse effects was resulted in lower RII in contrast with the highest median obtained. Therefore, the contradiction between RII and median can be solved.

Table 2: Non critical adverse effects recognised by Sri Lankan practitioners

Adverse Effects / Threats	Recognition	RII	Rank
Drop in the volume of building material imports	100%	0.62	17
Reduced demand for building materials	89%	0.56	18
High unemployment of non-professionals	71%	0.45	19
Drop in capital expenditure on machinery	94%	0.38	20
Increasing labour redundancy cost	23%	0.11	21

The bottom 5 adverse effects were ranked according to RII is illustrated in the Table 2. Eventhough the 4 effects have recognised by over 70% of the respondents, however, 'Increasing the labour redundancy cost' has recognised only by 17% of the sample. Similarly, it has ranked at the bottom earning the lowest relative importance of 10%. Alike, the central tendency of the data set is ranged between 3 ('Influential') and 2 ('Somewhat Influential'), expressing the lesser criticalness of the adverse effects except, the 10th ranked effect which denotes non-criticalness.

Moreover, reviewing the literature findings, the unemployment rate in Sri Lanka remained at an exceptionally low level, despite of gloomy prospects for employment in the world (CBSL, 2009).

Accepting the literature statement, the survey results proven that the adverse effects 'High unemployment of professionals and non-professionals' have not recognised as a critical issue in Sri Lankan industry.

3.2 Recession responsive strategies

Another aspect of the research objective is to assess the Sri Lankan practice of recessional responsiveness in the construction industry. The list of responsive strategies is extracted from the literature synthesis under the headings of contracting related actions, cost control related actions and financing related actions. However, government policy control action had not been taken into the consideration due to its uncontrollability. Further, the data collection was supplementary carried out to assess the possibility to convert the recessional adverse effects into the opportunity.

Then the survey was carried out to assess whether the respondents have practiced the particular strategy during the economic recession and the level of appropriateness of the strategies according to the Likert Scale 2. "Level of practicing" is the percentage frequency of strategy practiced by respondents. The survey respondents were asked to rank the appropriateness, even if not practiced due to constraints imposed on the real construction practice. However, if a respondent unmarked any row it is deemed to be assumed that the strategy is "Inappropriate". Accordingly, RII ranking was established for higher and lesser appropriateness of the responsive strategies.

3.2.1 Contracting related actions

The list of 25 contracting related recession responsive strategies were extracted from the literature synthesis. Appropriate contracting related actions are tabulated in Table 3 and bottom 5 lesser appropriate strategies are tabulated in Table 4.

Table 3: Higher appropriate contracting related actions during the recession

Contracting - related actions	Level of practicing	RII	Rank
Minimising the cost of rework by quality output	83%	0.86	1
Forming partnership and reputation with clients	86%	0.78	2
Forward contracts with suppliers and subcontractors	89%	0.75	3
Bidding for more projects within the firm's competencies	71%	0.75	4
Negotiating the lowest prices for supplies	83%	0.72	5
Emphasising on cost, risk and resource management	83%	0.71	6
Specialising in a core expertise	74%	0.71	6
Venturing into overseas markets	74%	0.70	8
Undertaking short-term and fast track projects	80%	0.68	9
Subcontracting work from other contractors	69%	0.64	10

According to Table 3, over 69% of the respondents have practiced all the top 10 responsiveness. 'Minimising the cost of rework by quality output' ranked at the top gaining the RII of 86%. 'Forming partnership and reputation with clients' ranked 2nd and following 'Forward contracts with suppliers and subcontractors' which has the highest level of practicing of 89%. Similarly, the central tendency of the data set is 4 ('Very good') for all top 10 contracting related strategies. It is expressing the validity and the consistency of the results generated from the ranking according to RII.

In contrast to the findings of Lim et al (2010), strategies such as 'Minimising the cost of rework by quality output', 'Negotiating the lowest prices for supplies' and 'Emphasising on cost, risk and resource management when bidding' have to be 'considered as appropriate strategies under the Sri Lankan context.

Table 4: Lesser appropriate contracting related actions during the recession

Contracting - related actions	Level of practicing	RII	Rank
Acquiring projects from defunct companies	54%	0.44	21
Putting equity into projects	43%	0.35	22
Forming joint venture with other contractors	29%	0.34	23
Adopting merger and acquisition	34%	0.26	24
Bidding for projects below the cost	37%	0.18	25

Level of practicing of strategies in Table 4 has marked below 54% of the respondents and the RII has also minimal below 44%. According to the findings of Lim et al (2010), the above listed lesser appropriate contracting related actions marked a lower frequency of practice in the Singapore construction industry too as illustrated in Table 1 in the literature review section. Moreover, 'Acquiring projects from defunct companies' has the central tendency of 3 ('Good') and 1 ('Poor') for the strategy 'Putting equity into projects' and the remainder is 'Inappropriate' according to the central tendency. Therefore, the central tendency is aligned with the RII ranking. Thus, validate the result obtained by both measures.

Apart from the contracting related strategies identified through the literature reviews, respondents have suggested the following: 'Develop systems for checks and balances', 'Education and training', 'Plant hire', 'Renegotiate the terms of the contract (reduce the contract scope where appropriate)', 'Rescheduling of projects' and 'Public private partnership' as further appropriate strategies.

3.2.2 Cost control related actions

The list of 23 cost control related recession responsive strategies were extracted from the literature synthesis. Top 10 appropriate cost control related actions are tabulated in Table 5 and bottom 5 lesser appropriate strategies are tabulated in Table 6.

Table 5: Higher appropriate cost control related actions during the recession

Cost control - related actions	Level of practicing	RII	Rank
Implementing stricter site management to reduce wastage	100%	0.87	1
Effective human resource management (HRM)	100%	0.81	2
Inventory management	100%	0.79	3
Freezing staff recruitment	100%	0.74	4
Exploring the use of alternative construction materials	91%	0.74	4
Implementing stricter procurement procedures	100%	0.69	6
Implementing stricter financial management on cash flow	80%	0.65	7
Adopting energy efficient practices	91%	0.62	8
Maintaining a group of core staff	77%	0.57	9
Restructuring of the workforce into teams	86%	0.53	10

According to Table 5, over 77% respondents have practiced all the top 10 responsiveness. 'Implementing stricter site management to reduce wastage' ranked at the top gaining the RII of 87% and the maximum central tendency of 5 ('Excellent'). The central tendency of the other strategies above the cut-off line ranged from 3 ('Good') to 4 ('Very Good') expressing a positive acceptance to the recession responsive strategies. In contrast between top 10 contracting related actions and top 10 cost control related actions, it denotes a higher concentration to cost controlling in the current construction practice, compared between frequencies of practicing.

Table 61: Lesser appropriate cost control related actions during the recession

Cost control - related actions	Level of practicing	RII	Rank
Laying off employees	80%	0.33	19
Freezing salaries of employees	77%	0.31	20
Converting permanent employees into temporary placements	54%	0.30	21
Cutting employees' salaries	34%	0.18	22
Employing foreign professionals on a contract basis	23%	0.13	23

Levels of practicing of recession responsive strategies in Table 6 have marked below 54% of the respondents, except the strategies 'Laying off employees' and 'Freezing salaries of employees'. Though 80% and 77% of the sample laying off employees and freezing salaries of employees, they are not appropriate in terms of ethical perspective. However, RII of below 30% demonstrated the inappropriateness of all the above strategies to cure recession adverse effects. Moreover, the central tendency of the data set is ranged in the Likert rating from 0 ('Inappropriate') to 2 ('Fair') validating the results generated from RII.

In contrast to the findings of Lim et al (2010), the results of the survey have given a greater emphasis to HRM for utilising the available local staff effectively by maintaining a core staff and restructuring workforce. Instead of being unfavourable to employees like, 'Laying off employees' which is simply hiring and firing them according to the economic dynamicity, 'Freezing salaries and bonuses', and 'Employing foreign professionals' as described in the literature section.

Apart from the strategies identified through the literature reviews, the respondents have suggested '*Variation management*' as a further cost control related strategy.

3.1.3 Financing related actions

The list of 8 financing related recession responsive strategies was extracted from the literature synthesis. The appropriateness of each strategy is tabulated in Table 7.

'Negotiating for alternative loan services' is the strategy marked at the top of the list gaining the RII of 74% and practiced by all respondents. The central tendency of top 4 strategies has been marked the Likert rating of 4 ('Very good'). However, 'Adopting the "wait-and-see" mode' is a strategy which has the second highest level of current practicing, nevertheless by simply accepting the risk cannot be traced as an appropriate strategy. Meanwhile, lowest prioritised two strategies according to RII 'Investing in machinery that has a high liquidity value' and 'Creating uncommitted financial resources' have marked inappropriate according to the central tendency.



Table 7: Appropriateness of financing related actions during the recession

Financing - related actions	Level of practicing	RII	Rank
Negotiating for alternative loan services	100%	0.74	1
Security agreements with project owners & financial institutes	80%	0.73	2
Investing into R&D to further explore business opportunities	69%	0.55	4
Lease financing construction equipment	31%	0.56	3
Investing surplus funds in financial investment	31%	0.49	5
Adopting the "wait-and-see" mode	91%	0.44	6
Investing in machinery that has a high liquidity value	31%	0.30	7
Creating uncommitted financial resources	29%	0.20	8

In contrast to the findings of Lim et al (2010), the strategy 'Creating uncommitted financial resources' has not widely practiced by Sri Lankan construction practitioners and level of appropriateness was marked 20%. However, it marked at the top most financial related strategy of the Singapore contractors in the prolonged recession.

Apart from the strategies identified through the literature reviews, the respondents have suggested *Innovative financial arrangements with contractors (contractor funding with rearranged payment options)* and *Exploring project finance ventures* as appropriate financing related recession responsive strategies.

3.2.3 Viewing recession as an opportunity

Based on the survey findings, appropriateness of converting adverse effects (adverse effects) of recession to opportunities can be attained by the strategy 'Reformatting the firm's strategic objectives'. Currently, all the respondents are up to some extent reformatting their strategic objectives during the recession and gained the RII of 71% with a central tendency of 3 ('Good'). 'Developing aggressive marketing response' is another strategy during the recession ranked 2nd gaining 55% RII and a central tendency of 3 ('Good'). However, invest aggressively to overtake competitors was only practiced by 33% of the sample and appropriateness of that is 34% RII. Additionally, it is suggested 'Review the current practices and make amendments' and 'Practicing innovative procurement methods, like Built Own Operate (BOT) model' to get the maximum out of the recession viewing in a different angle.

3.3 Sustainable responsiveness: Sustainability focussed strategies in the recession

The aforementioned literature reveals that one of the key reasons for the current economic downturn is due to unsustainable business practices and being very much concerned about profits and not adequately focusing on making a balance between monetary gains with social and environmental aspects. Thus, sustainability focussed responsive strategies have been extracted from the strategies addressed above by the experts in the field of sustainability. The expert opinion was obtained and Mode was used to determine the central tendency of direct answers (YES/NO). Thus, the analysis results are tabulated in Table 8 and Table 9 along with the explanation. Concurrent questionnaire was used to collect data in the opinion survey.

3.3.1 Sustainable contracting related actions

Table 8: Sustainable contracting related responsiveness during the recession

Type of responsiveness	Level of practicing	RII	Rank
Minimising the cost of rework by quality output	83%	0.86	1
Forming partnership and reputation with clients	86%	0.78	2
Forward contracts with suppliers and subcontractors	89%	0.75	3
Bidding for more projects within the firm's competencies	71%	0.75	4
Emphasising on cost, risk and resource management	83%	0.71	6
Specialising in a core expertise	74%	0.71	6
Venturing into overseas markets	74%	0.70	8
Practicing Corporate Governance principles	83%	0.61	11
Diversifying into other construction-related business	60%	0.54	12
Sustainable Construction	69%	0.49	14
Limiting project size (Complexity)	77%	0.49	16
Approach towards Socially Responsible Investment	77%	0.49	16
Diversifying into different non-construction business	46%	0.47	20
Education and training (suggested)			
Develop systems for checks and balance (suggested)			
Public private partnership (suggested)			

Out of 30 contracting related strategies 14 were categorised under the sustainable interpretation. In more emphasis 7 strategies were marked as sustainable out of top 10 contracting related strategies tabulated in Table 3.

3.3.2 Sustainable cost control related actions

Table 9: Sustainable cost control related responsiveness during the recession

Type of responsiveness	Level of practicing	RII	Rank
Implementing stricter site management to reduce wastage	100%	0.87	1
Effective human resource management (HRM)	100%	0.81	2
Inventory management	100%	0.79	3
Exploring the use of alternative construction materials	91%	0.74	4
Implementing stricter procurement procedures	100%	0.69	6
Implementing stricter financial management on cash flow	80%	0.65	7
Adopting energy efficient practices	91%	0.62	8
Maintaining a group of core staff	77%	0.57	9
Restructuring of the workforce into teams	86%	0.53	10
Partnering with suppliers	80%	0.53	11
Lowering the illiquid stock holdings	74%	0.50	12
Material recycling	66%	0.47	14
Water filtration and reuse	69%	0.47	14
Adopting Just in time (JIT) delivery concept	57%	0.41	16
Creating green jobs	60%	0.39	17
Use of bio-fuel for various construction machineries	54%	0.35	18
Variation Management (suggested)			

Out of 23 cost control related strategies 17 were categorised under the sustainable interpretation. In more emphasis to top 10 cost control related strategies tabulated in Table 5, nine strategies are marked as sustainable responsiveness in the recession.

3.3.2 Other sustainable related actions

Out of 9 financing related strategies tabulated in Table 7, only 3 were aligned with the sustainable interpretation. They are 'Security agreements with project owners and financial institutes', 'Investing into R&D to further explore business opportunities' and 'Investing surplus funds in financial investment'. Furthermore, 'Reformulating firm's strategic objectives' and 'Practicing innovative procurement methods, like BOT model' are long term strategies to the recession. This change management is an opportunity during the recession.

However, the opinion of the construction expert is that the sustainability is a long term benefit arrival mechanism. Thus, cherry picking of strategies may not be beneficial during the worst time. It must be incorporated in the current system. Therefore, increasing the current level of practicing will result in gaining the experience of real benefits during the recession. However, the right strategy must be integrated at the right time.

4.0 Conclusions and recommendations

The construction industry is a significant source of income generation to the country's GDP which leads to a direct consequence in stagnation of the industrial position during the economic recession in a dynamic moving environment. The deterioration in financial conditions due to 'Late payment by clients' and 'Financial difficulties due to tight credit conditions' have marked critical adverse effects facing by a developing country like Sri Lanka acts as a barrier in moving forward.

Current strategies to overcome difficulties in the economic recession have been considered inefficient and appeared the need of an optimal extraordinary solution to mitigate the adverse effects in the construction sector. As far as survival strategies have been developed mainly on economical perspective that leads to short term wealth maximization which is not a strategy to sustain in the long run. Sustainable construction is a long term value creation which companies are currently pursuing behind. Achieving the right balance between the three pillars of triple bottom line supports true sustainability. Current responsive strategies in the construction sector can be grouped under, contracting related actions, cost control related actions and financing related actions. 'Minimizing the cost of rework by quality output', 'Implementing stricter site management to reduce wastage' and 'Negotiating for alternative loan services' were marked at the most appropriate strategies under each respective heading. However, some of them demonstrated proactive measures align to the sustainable interpretation without referring to the term sustainability as an adjective directly. Thus, it has been extracted under a clear heading "sustainable responsiveness" to cure threat existence in the recession as research findings.

Therefore, it can be concluded that sustainability favourably responses the recession to mitigate adverse effects in a greater extent in the construction industry. Thus, sustainable responsiveness enable the construction industry's forward movement even at an economy's stagnation by directing the long term strategic establishment within the construction practice. However, the public awareness must make for the real benefit out of this research finding.

However, the scope of this paper is limited to identify adverse effects and ranking the most appropriate sustainability focussed strategies for long term existence. Hence, this paper gives the preliminary findings of an ongoing research process which is then intended to categorize recession responsiveness by different construction stakeholders through an expert interview survey. Further, a framework will be developed to illustrate specific adverse effects focused sustainable responsiveness to mitigate appalling effects in the recession. Furthermore, the real sustainability advantage to avoid threats in the recession is intended to assess based on the ST(Strength-Threats) quadrant of SWOT analysis to derive at the conclusion of the research process.

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