

# IMPACT OF ECONOMIC DECISIONS ON BUILDING CONSTRUCTION MATERIAL PRICES IN SRI LANKA

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## ABSTRACT

*The economic crisis had a substantial impact on the Sri Lankan construction sector. The economic crisis was characterised by several economic problems, including currency devaluation, high inflation, and rising debt levels. Building construction materials prices have also increased drastically during the economic downturn period. These increases in the price of building materials were attributed to several economic factors including inflation rate increases, local currency devaluation and changes in government decisions and regulations, to name a few. Hence, the main aim of this research is to assess the impact of economic decisions on building construction material prices in Sri Lanka during the last 10 years. The mixed research approach was followed to achieve the aim of the study. A comprehensive literature review followed by a market survey to find building materials price data and fifteen semi-structured interviews were carried out with construction industry professionals during the empirical investigation. The collected data was analysed through materials price data analysis and code-based content analysis using NVivo. The findings revealed inflation rate, interest rate, and foreign exchange rate as the key macroeconomic factors that influence the price determination of building materials, while other economic factors and decisions also affect the building material prices in Sri Lanka. Further, this study proposed possible strategies and mitigation measures to minimise the impacts. Construction industry stakeholders can use the research findings to implement the appropriate strategies to minimise the building material price escalation impacts.*

**Keywords:** Building Construction Materials; Construction Industry; Economic Crisis; Price Fluctuations.

## 1. INTRODUCTION

The construction sector is one of the most responsible sectors for the environmental transformation and physical development of a country (Elkhider & Salma, 2020). The built environment includes infrastructure works, building works, and other heavy engineering projects (Huang et al., 2018). Construction is one of the fastest developing sectors, which creates significant impacts on economic growth at the global level, influences on construction materials exchange, creates job markets, and also builds

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necessary infrastructure facilities for social and economic development (Sarmiento-Rojas et al., 2020). Normally, the construction sector runs together with a significant quantity of construction materials and energy utilisation (Huang et al., 2018). Materials are used extensively in building constructions (Oghenekevwe et al., 2014). Hence, building construction materials are identified as a key component of construction works, since they comprise a large portion of construction project costs and significantly impact the construction industry's growth and quality of output (Babalola et al., 2021).

Construction projects are impacted by the price fluctuation of the construction materials (Oghenekevwe et al., 2014). Increasing the price of building construction materials is a common issue at the global level and developed nations are also affected in recent years, where several developed nations have been highly confronted with the issue of rising building construction material prices (Danso & Obeng-Ahenkora, 2018). Similar to other countries globally, in Sri Lanka, the construction sector is one of the main contributors to the Gross Domestic Product (GDP) of the national economy (Central Bank of Sri Lanka [CBSL], 2021). However, the construction sector is in danger of collapsing under the ongoing economic crisis (Lanka News Wed [LNW], 2022). There are several research conducted on the construction materials price fluctuations at the global level. However, there is a lack of study on building materials price fluctuations due to economic factors specifically for the Sri Lankan construction industry during the current economic crisis. Therefore, there is a need to assess the impact of economic decisions and factors on building construction materials price fluctuations and propose strategies to minimise the impacts of building materials price fluctuations to stabilise the Sri Lankan construction industry. Hence, this paper presents the research findings on the impact of economic decisions on building construction material prices in Sri Lanka during the last 10 years and strategies to minimise those impacts. This paper starts with an introduction followed by a literature review and Section 3 presents the research methodology. The research findings and discussion are presented in Section 4 followed by conclusions and recommendations.

## **2. LITERATURE REVIEW**

This section reviews the literature review on the building materials prices fluctuations, and relationship between economic decisions and factors and building materials prices.

### **2.1 IMPORTANCE OF BUILDING MATERIALS TO THE CONSTRUCTION INDUSTRY**

Building materials simply defined as any materials utilised in building construction projects (Babalola et al., 2021). In the past times, most building construction materials were obtained naturally such as clay, brick, lime, wood, stone, and straws ( Taylor, 2013). In the twentieth century, awareness, innovative and advanced technologies introduced better performance, more effective, and durable building materials to the construction industry around the world such as steel, reinforced concrete, metal, and plastic products, to name a few (Taylor, 2013).

Building construction materials are considered crucial inputs in the construction process and these building material costs symbolise the largest portion of the whole building cost (Oginni et al., 2014). Building construction materials have a significant part in today's technologically advanced and innovative construction environment and no engineering areas cannot have the potential to manage activities without their utilisation (Duggal,

2017). The building materials industry is a significant contributor to a country's national economy because its outputs decide both construction work's quality and quantity (Babalola et al., 2021). It is impossible to overemphasise the significance of building materials, when building materials are assembled together, they create various purpose of building structures (Babalola et al., 2021).

## **2.2 BUILDING CONSTRUCTION MATERIALS PRICE FLUCTUATIONS**

The construction project cost depends on various factors, direct costs like cost of materials, labour costs, machinery and equipment cost, and indirect costs like construction site mobilisation costs (Isikdag et al., 2022). Furthermore, authors stated that the construction material cost is the major direct cost, and it is influenced by other various cost elements such as the cost of raw materials, cost of production, transportation, and logistical expenses. Building materials price fluctuation is a common issue in both developing and developed countries and this building material price increases lead to high construction costs (Danso & Obeng-Ahenkora, 2018).

Stakeholders involved in the construction sector, particularly, contractors face lots of challenges when the building materials price fluctuation time (Isikdag et al., 2022). It is hard to predict the construction materials prices, these cause uncertainties when making decisions during the procurement procedures because of these price fluctuations (Isikdag et al., 2022). Building materials price fluctuations make significant negative impacts on construction projects' success and these unpredicted price fluctuations affect construction project completion costs and also impact the potential for project completion (Marzouk & Amin, 2013).

## **2.3 ECONOMIC FACTORS INFLUENCE THE PRICE FLUCTUATIONS OF BUILDING MATERIALS**

According to the several literature findings, inflation rate, interest rate, foreign exchange rate, demand and supply of materials, importation, import duties, government economic policies, energy cost, crude oil prices and transportation cost are the economic related factors that influence the price of building construction materials (Babalola et al., 2021; Kamaruddeen et al., 2020; Oladipo & Oni, 2012; Omede & Saidu, 2020). Oladipo and Oni (2012) revealed in their study that there is a strong correlation between macroeconomic variables such as inflation rate, interest rate, and foreign exchange rate, and building construction materials prices.

The changes in government economic decisions, local taxes, and charges greatly influence in an unforeseen way in building materials production and price determination (Danso & Obeng-Ahenkora, 2018). Further to the authors, building materials buyers may incur an additional cost because of the taxes and charges imposed by the government on building materials suppliers. According to Obeng-Ahenkora and Danso (2018), the prices of building construction materials are directly influenced by the government's economic decisions and fiscal policies. Further, especially in developing nations, the government's poor economic conditions also impact the construction sector due to building materials price fluctuations (Sweis et al., 2008). According to Fernando et al. (2017), construction materials price fluctuations were identified as the significant financial risk factor impacting the construction projects in Sri Lanka. The construction industry has collapsed due to skyrocketing of building materials prices, especially steel, cement, and other raw materials in Sri Lanka. Even though Gunathilake (2022) identified main causes behind

these recent materials price increases in Sri Lanka, thorough investigation needed to identify the Economic factors influence the price fluctuations of building materials.

### 3. RESEARCH METHODOLOGY

A comprehensive literature survey was carried out to understand the theory-based information from the research area. The relationship between the economic factors and decision and the building materials prices in the global context are discussed from a wider perspective to elaborate the research problem and hence the main aim of this research is established to assess the impact of economic decisions on building construction material prices in Sri Lanka during the last 10 years. Therefore, in order to achieve the aim, and the objectives building materials price data analysis and in-depth expert opinions to identify and understand the impact in a descriptive manner are required. Thus, this research was employed through the mixed research approach. A market survey with suppliers, manufacturers and contractors was conducted to find the building materials prices and materials price data was analysed to understand the price trends during last 10 years. Subsequently, semi-structured interviews were conducted with 15 experts who are practising in the Sri Lankan construction sector. The experts were selected through purposive sampling. NVivo software was used for qualitative data analysis using code-based content analysis.

### 4. RESEARCH FINDINGS

The semi-structured interviews were conducted with 15 industry professionals who are well qualified and currently practising in the Sri Lankan construction sector, engaging in project management, procurement management, quantity surveying, and civil engineering in Sri Lanka. The profile of each respondent is summarised in Table 1.

Table 1: Details of interviewees of expert interview

Code	Designation	Experience
R1	Director/Chartered Quantity Surveyor/Cost and Claims Specialist	40 Years
R2	Freelancer/Manager- Contracts	35 Years
R3	Director/Chartered Quantity Surveyor	20 Years
R4	Executive Director- Contracts	18 Years
R5	Contract Administrator	25 Years
R6	Commercial Manager/Contract Administrator	15 Years
R7	General manager- Estimates and Contracts	17 Years
R8	Manager- Project Monitoring and Controlling	15 Years
R9	Manager- Contracts and Procurement	14 Years
R10	Section Head- Central Tendering Unit	17 Years
R11	Construction Project Manager/Senior Operation Engineer	14 Years
R12	Construction Project Manager/Chartered Engineer	15 Years
R13	Senior Quantity Surveyor	15 Years
R14	Senior Quantity Surveyor	14 Years
R15	Chartered Civil Engineer	12 Years

Interviewees were selected to address various aspects of their expertise relating to the research area. The respondents' experience ranges from 12 to 40 years. All the

respondents stated that their organisation and their current building construction projects were severely affected by the economic downfall. Respondents further discussed that, especially drastic building materials price escalations has significantly impacted the operations and performance of the construction projects. The key research findings are discussed below.

#### 4.1 BUILDING CONSTRUCTION MATERIALS PRICE TRENDS DURING THE LAST 10 YEARS IN SRI LANKA

A comprehensive market survey was carried out to collect data on building construction materials prices during last 10 years. Number of materials were limited to 15 materials based on the opinions of the suppliers, manufacturers, and contractors. Figure 1 shows the major building construction materials' price fluctuations during the last 10 years in Sri Lanka.

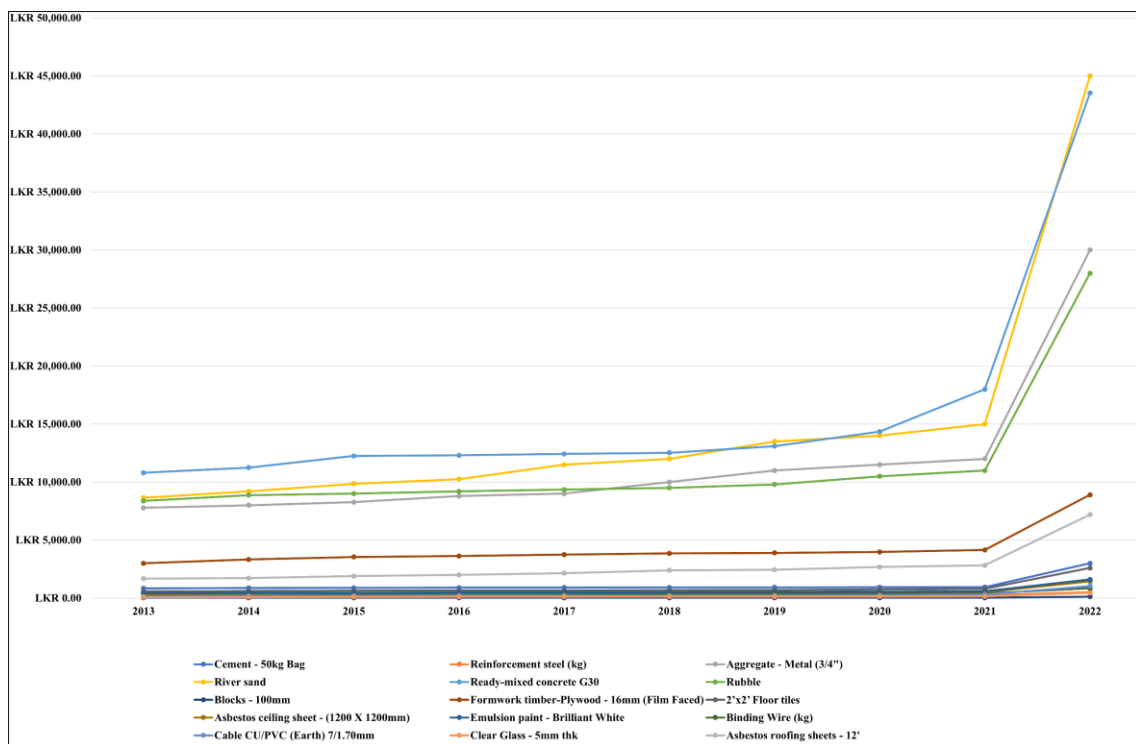


Figure 1: Building construction materials price trends during the last 10 years in Sri Lanka

The graph emphasises the upward trend of building construction materials prices in Sri Lanka over the past decade. According to the graph, building materials prices increased from 2013 to 2021, which was moderate increment, and it was reasonable and acceptable, which was in line with the annual inflation rate. However, there was a drastic increment in the price of building materials in 2022 due to the consequences of the economic crisis and post-COVID-19 pandemic impacts.

Overall, the graph clearly depicts a sharp rise in building construction materials prices in Sri Lanka in 2022, where the prices increased two to three times. For instance, the graph reveals that the reinforcement steel and aggregate average prices increased by 104% and 150%, respectively in 2022 compared to the price of the same building materials in 2021, which was double time increased, while the cement prices increased by 215.8%, which was triple time increased. The escalated percentages of individual building materials

apparently indicated that the price of building materials drastically increased in 2022. Sri Lankan construction industry experienced substantial negative effects because of these extreme price rises for building construction materials.

#### 4.2 ECONOMIC DECISIONS AND FACTORS THAT DETERMINE THE BUILDING CONSTRUCTION MATERIALS PRICES

During the semi-structured interviews, the experts were requested to identify the key economic factors that determine the building construction material prices in Sri Lanka. Figure 2 summarises the research findings.

Name	Sources	References
Economic factors determine the price of building construction materials prices	15	144
Inflation rate	15	24
Interest rate	15	27
Foreign exchange rate	15	20
Demand for materials	15	16
Supply of materials	15	21
Importation policies and controls	15	18
Import duties	15	16
Government price controls	15	17
Energy cost	15	21
Crude oil prices	15	17
Transportation cost	15	17
BOI concessions	12	17

Figure 2: Economic factors determine the building construction materials prices

All the respondents stated that the inflation rate increase have a significant impact on the prices of building materials in Sri Lanka, as it can affect the cost of raw materials, production costs, transportation, and taxes. R4 and R14 highlighted that inflation has a direct impact and it increases the building materials prices. In Sri Lanka, inflation rate during the last 10 years tends to increase. *“Building materials prices increased slowly every year. After 2022, there was a drastic increase in the inflation rate, that mention as a hyperinflationary situation. Building materials prices suddenly increased double and triple times in Sri Lanka”*, according to R14.

Highlighting the impact of interest rate - R4 mentioned that *“if the interest rate increases, cost of production also increased because borrowing cost is higher when the interest rates are higher, so the suppliers, subcontractors, manufacturers have to revise their pricing to accommodate the higher interest charges. so that the building material price will automatically go up”*. R2 and R6 stated that interest rates can affect the cost of borrowing money for construction projects. When interest rates are high, it can make it more expensive for builders to purchase building materials, as they will have to pay more in interest on their loans.

Most of the raw materials and the building materials are imported from foreign countries. R5 emphasised that when the exchange rate is favourable, it can make imported materials cheaper for domestic buyers, while a weaker exchange rate can make imported materials more expensive while a weaker exchange rate can make local production cheaper, as the cost of production inputs is in the local currency, leading to a decrease in the prices of locally manufactured materials. R6 stated there was a moderated increment in the USD

exchange rate in past years but in 2022, the foreign exchange rate drastically increased and led to significant increases in building materials prices.

R11 argued import policies and controls can also affect the price and the availability of materials. R4 highlighted that *“recently the government has restricted the importation of some building materials, which created a materials scarcity in the market, so to cater to the demand suppliers increased the prices. The opportunity for the suppliers because of this material scarcity. Hence again the building materials prices went up”*.

Moreover, R1 emphasised that *“import duties are taxes imposed by the government on imported building materials, and they can make imported materials more expensive if the Sri Lankan government imposes high import duties on building construction materials. After adding the high taxes, the prices of the materials will automatically go up”*. R1, R6, and R14 highlighted that the Export Development Board (EDB) levy, also referred to as a “CESS” range from 10% to 35% adwert valorem on a range of imports identified as “necessary” or as competing with local industries. Further, most of the imported building materials are also subjected to the Ports and Airports Development Levy (PAL). PAL was revised by the government in December 2019, imposing tariffs ranging from 5% to 10% on various product categories and the PAL was removed for some materials by the 2018 government. Furthermore, the Sri Lankan government levies a value-added tax (VAT) on most imports ranging from 8% to 15%. Moreover, R1 and R14 mentioned that the government has imposed another Social Security Contribution Levy (SSCL) at the rate of 2.5% from 2022 October. Hence, all above economic factors have imposed a significant impact on the building construction material prices in Sri Lanka.

### 4.3 IMPACTS AND CHALLENGES FACED BY THE BUILDING MATERIAL INDUSTRY DUE TO THE ECONOMIC DOWNTURN

According to the respondece, the building material industry like other industries has been impacted and faced various challenges by the economic crisis in Sri Lanka. Figure 3 illustrates the impacts and challenges faced by the building materials industry due to the current economic crisis.

Nodes			
Name	Sources	References	
Impact of the economic crisis on the building construction materials industry	15	104	
Drastic increases in building materials prices	15	15	
Building materials scacity	15	15	
Difficulty in obtaining credit - Issues in opening Letter of credit (LC)	15	15	
Import restrictions	13	13	
Difficulty in obtaining foreign exchange	12	12	
Supply chain disruptions	11	11	
Building materials production has been affected	10	10	
Demand for building materials has reduced drastically	8	8	
Tax hikes and the introduction of new taxes	8	8	

Figure 3: Impacts and challenges faced by the building materials industry

The economic downturn had a substantial impact on the building material industry, resulting in several challenges. One of the significant challenges was the increase in the price of building materials. The increase in prices was due to a combination of factors, such as inflation rate increases, local currency devaluation, and changes in government



decisions and regulations. Further, the downturn period led to a reduction in demand for building materials due to a decline in construction activities, which adversely affected the industry.

#### 4.4 IMPACTS OF BUILDING CONSTRUCTION MATERIALS PRICE FLUCTUATIONS ON THE SRI LANKAN CONSTRUCTION SECTOR

All respondents stated that the economic crisis, specially, the drastic building materials price escalation heavily impacted all construction organisations and the projects. Figure 4 presents the impacts of building construction materials price escalations.

Nodes		
Name	Sources	References
Impacts of building construction materials price escalations	15	138
Construction cost increases	15	20
Building product's final cost increases	15	15
The volume of construction products reduces	15	16
Client expectations for quality project delivery reduce	15	18
Increases in building construction project suspensions, terminations, and abandonment	15	19
Unemployment of construction workers and staff	15	20
Disputes between parties involved in the construction	15	16
Contractors face financial and cash flow difficulties	15	18
Causing budgeting and forecasting problems for builders	13	15
Causes delays in project completion	13	18
Affect the contractor's project planning and the master programme schedules	12	14
Affect the contractors' profit margins	10	11
Poor quality of the construction works	7	13
Failures in building construction due to less-quality materials	7	7
Contractors' fraudulent practices increase	6	9
Increased cost Claims due to building materials Price fluctuation and exchange rate fluctuation	5	5
Reduction in construction demand and amount of work	5	6
Time pressures for contractors in material procurement	4	4
Slow progress and concurrent delays	4	4
The client may reduce the scope of the works - omissions	3	3
Increase in contractors-to-project ratio	3	3
Increase in the bidding competition	3	4
Affect the growth and investments in the construction sector	3	3
Make difficult to offer affordable housing options	2	2
Impact on future construction projects	2	3
Contract frustrations for contractors	2	3
Construction firms feel stressed to obtain projects	2	2
Aggressive assumptions made for bidding	2	2
Construction firms become insolvent	2	2
Poorly motivated employees and reduction in overall performance	1	1

Figure 4: Impacts of building construction materials price escalations

Time and cost were obviously impacted, and additional costs and time were incurred due to the delay and other consequences in the construction projects. Most of the respondents stated that they have experienced the different types of impacts and consequences while



drastic building materials price escalation in Sri Lanka. R1 highlighted that these impacts due to the building materials price escalation have serial impacts and R5 highlighted “*the impacts of increasing building construction materials prices have multiple chain effects, which means that the effects are interrelated and can have a ripple effect throughout the construction sector and the economy of the country*”.

Most of the respondents stated that it is obvious when the building materials price escalates, the overall construction cost will go up and if it decreases naturally construction cost will be less. Price escalations in building construction materials may have a direct impact on the construction project costs, as builders have to pay more for materials purchases if the price rises, which can lead to cost overruns in construction projects. R2, R4, R5, and R7 highlighted that building contractors are experiencing lots of consequences and they struggle to manage their ongoing projects due to the drastic construction cost increases in projects after 2022.

R6 explained, when the cost of building materials increases, there is a risk of degradation in client expectations for quality project delivery. The clients may expect a specific level of performance and quality from a construction project, but if the price of building materials rises, it may be necessary to use less expensive or second standard materials to stay within the available budget. This may result in performance and quality compromises, as well as decreased client satisfaction.

Most of the respondents stated that impacts of poor quality of the construction works, failures in building construction due to less-quality materials, and contractors’ fraudulent practices are joined with the quality of building materials and products. Respondents, who are representing large scale contracting organisation did not agree with these quality-related impacts due to the building materials price escalations. They highlighted that while the building construction materials prices are high, low, or not affordable, they cannot compromise the quality of the construction works. Contractually construction works need to be done in accordance with the drawings, specifications, and other standards. The Engineer and the Client will not approve the usage of inferior or low-quality building materials. R7 highlighted “*when we consider our project’s quality of the works, we are at a manageable level. we don’t have such kind of building failure issues due to less quality of materials during the last 10 years*”.

R1 and R2 further argued that the poor quality of the construction works, building construction failures due to less quality materials and contractors’ fraudulent practices affect the building construction projects in non-contractual constructions and small-scale constructions such as residential buildings. Contractors may use inferior quality materials or low-quality materials when the building materials prices increase to maintain their profit margins. However contractually, it may not be possible to reduce or compromise the quality of the construction works in any circumstances.

The overall construction project cost may significantly increase because of rising building materials prices, which may cause projects to be delayed, suspended, terminated, and abandoned completely. Therefore, there can be a decrease in demand for construction workers, which might lead to layoffs and unemployment. R4 and R7 argued that construction workers may face unemployment when cost of materials rise and decline in the number of construction projects.

Contractor representatives stated that most of the contractors faced severe cash flow and financial difficulties due to the high inflation period in Sri Lanka. Building materials

prices increased drastically, and contractors had to procure materials at higher costs than budgeted. Contractors had to pay for materials upfront while waiting for payment from clients, leading to payment delays and impacting their project's cash flow.

#### 4.5 STRATEGIES TO MINIMISE THE IMPACTS OF BUILDING MATERIALS PRICE ESCALATIONS

Respondents highlighted that there are no effective strategies to minimise the impacts of these challenges because the hyperinflationary building materials price escalation is new to the Sri Lankan construction industry. Figure 5 suggests possible strategies that could be used to minimise the impacts of price escalations on building construction materials.

Nodes		
Name	Sources	References
Strategies to minimize the impacts of building materials price escalations	15	112
Applications of value engineering principles	15	23
Implementing efficient material management practices	15	17
Providing detailed error-free designs and comprehensive specifications	13	14
Proper planning of contractor's financial resources	13	15
Increasing the usage of local building materials	13	15
Implementing integrated project delivery methods	13	14
Encourage local production	12	14
Effective human resource management at the site	11	12
Develop an information management system for building materials	11	13
Implementation of lean construction principles to reduce building materials wastage	11	11
Bulk purchasing	10	10
On-time payments of funds	9	12
Early procurement practices	9	13
Understanding project requirements and needs	8	10
Government need to take action	8	8
Reducing site wastes	7	7
Stockpile building materials when prices are low	7	7
Accelerate design time and timely documentation	6	11
Estimate the new projects accordingly to the trends of inflation and other factors	6	6
Maintenance of control and effective administrative system	5	5
Minimising variation	5	5
Change the procurement mechanism	5	11
Applying early corrective action	4	5
Maintain good relationships with stakeholders	4	6
Having appropriate planning and management	4	5
Effective contractor and workers relationship	4	4
Effective communication with workers and stakeholders	4	4
Establish long-term agreements with manufacturers and suppliers	4	5
Maintain a central procurement system or central store system	4	4
Diversifying suppliers and materials	3	3
Go with the flexible specifications	2	2
Maintain Building materials standards	1	1

Figure 5: Strategies to minimise the impacts of building materials price escalations

According to R6, suitable strategies and mitigation measures for building material price fluctuations will depend on the availability and accessibility of resources, the impact of

the price increases, and the needs of the organisation. A combination of strategies may be necessary to minimise the effects of building materials price escalations and stabilise the Sri Lankan construction sector.

This drastic building material price increment is a huge risk to construction projects. Hence, risk sharing, and risk transfer are also suitable mitigation measures for the current situation. The alternative method to handle this sort of unforeseen price escalation risk is to change the procurement mechanism. According to the respondent's statements, some suggestions for modifying the procurement mechanism in the construction contracts are given below:

- Adopt the correct alternative procurement method according to the project requirements and needs,
- Discuss between the parties and arrange different agreements that might be suitable for the current circumstances,
- Agree on USD rate for supplier's and subcontractor's works,
- Revise the BOQ to share the risk of the price fluctuations between parties in post contract stage /Re-tendering,
- Use partnering methods such as joint venture collaborations and public-private partnerships, and
- Use integrated project delivery methods.

## **5. CONCLUSIONS AND RECOMMENDATIONS**

The research emphasises the significant role that economic decisions and factors play in the price of building construction materials in Sri Lanka, the impacts of building materials price fluctuations on the performance of the construction projects and firms and possible strategies to minimise the price escalation impacts. The comprehensive literature review, market survey and semi-structured interviews with experts in the construction sector were assisted to achieve the aim of the research. The research findings indicate that building construction materials prices have significantly impacted the Sri Lankan construction industry due to the current economic crisis. The drastic increase in building materials prices has resulted in cost overruns, delayed project delivery, quality related issues, cash flow issues for contractors to name a few. In addition, the quality of construction works can be compromised in non-contractual contracts due to the use of inferior materials to maintain profit margins during price fluctuations. Based on the research findings, it is recommended that stakeholders in the construction industry should take necessary measures to mitigate the impact of building materials price fluctuations. These measures may include risk sharing and risk transfer mechanisms in contracts, changing the procurement mechanism, and implementing suitable strategies to stabilise the construction sector. Further, encouraging the use of local building materials to reduce the impact of foreign exchange rate fluctuations and reducing the import taxes and other duties on construction materials to make them more affordable. It is also recommended to revise and update the CIDA price fluctuation formula to cover all building materials and incorporate provisions to address high inflationary situations. The Sri Lankan construction industry can be stabilised, and sustainable growth can be achieved by taking these measures.

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