

# A critical review of the causes of cost overrun in construction industries in developing countries

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**Abstract** - The success of any construction projects is related to its timely completion within the specified budget, with the right quality and environment. Cost overruns have been identified as major issue in many construction industries of the developing countries. It has been found that few projects got completed within the original estimated cost.

This work is an overview of the causes of the cost overrun in many developing countries as it has been found that all the factors are not similar to every project in developing countries though some of them are common such as poor management, fluctuation of material prices inaccurate material estimates and financial status of the contractor.

**Key Words:** cost overrun, causes, construction projects, developing countries.

## 1. INTRODUCTION

Construction industries have become an important player and are vital for the economic development of any country particularly the developing countries. This industry in developing countries suffers from a number of problems that affect the time, cost and the quality performances. Successful completion of construction projects within the specified budget has become a challenging task. It is uncommon that a project is completed well within the estimated time, budget and desired quality.

Good management of construction cost is an important task for the successful completion of a project. Most of the time, it is difficult to achieve good cost management and the project experience a huge amount of cost overruns. Effective cost planning relates the design of buildings to their cost so that while taking full consideration of quality, changes, risks, utility and appearance, the cost of a project is planned to be within the economic limits of the expenditure.

Cost overrun is described as the ratio of the change in the original contract amount to the original contract award amount. For the ease of comparison, the cost overrun can be

converted into a percentage value. Mathematically it can be expressed as (Endut et al., 2005):

$$\text{Cost overrun} = \frac{\text{Final Contract Amount} - \text{Original Contract Amount}}{\text{Original Contract Amount}}$$

Chitkara (2011) reported that the cost is the budgeted expenditure, which the client agrees to commit to creating or acquiring the desired construction facility. Cost overrun is the difference between the actual final cost of a construction project at completion and the contract amount, agreed by the contractor the owner during the signing of the contract. Cost overrun also called cost increase, cost escalation or budget overrun.

## 2. Effect of Cost overrun in construction projects

Cost overrun in construction industries is a global phenomenon, though the situation varies from nation to nation. The variation is affected by different factors based on the economy, geographical location and the construction environments of nations. Such factors are construction complexity, the presence of various interest groups such as consultants, contractors, the project owners, end users, financiers, project funding, materials, equipment, economic, climatic environment, political environment etc. As reported by (Flyvbjerg et al. 2007) Cost predictions are usually inaccurate but the large standard deviations indicate that the margin by which costs are "wrong" differs across projects. As an outcome, the ranking of the project is affected and decision makers are likely to implement inferior projects. Also, additional budget is required and the projects become more expensive than was initially estimated. They further reported that it is common to see construction projects failing to fulfill their goal within the estimated cost and time in such case a good cost performance project is required. Having good project cost management is one of the most important tasks for successful completion of a project. However, most of the times, it is laborious to achieve good cost management and the project would commonly have a noticeable amount of cost overrun.

The exact cost predictions are critical therefore High-quality cost management is a fundamental tool for managing cost escalation. This concern with the development of a realistic cost model with appropriate recognition of risk, commitment to addressing issues as they arise and regular cost monitoring throughout the project (Alias et al .2014) .

Cost overruns have obvious effects for the construction industry and key stakeholders. Cost overruns could bring about project abandonment and a drop in building activities to the industry. These can earn the bad reputation and inability to secure project finance or securing it at the higher cost due to added risks. As reported by Nega (2008) to the client, cost overruns imply more cost over and above the initially agreed upon at the onset, resulting in fewer returns on investment. To the contractor, due to non-completion and defamation, it implies the loss of profit that could jeopardize his or her chances of winning further jobs, if at fault. To the end user, the additional costs are passed on as higher rental or lease cost or prices. To the professionals, it implies the inability to deliver the value for the money and could well taint their reputation and results in the loss of the esteem reposed in them by the clients. Table 1 shows the effects of the cost overrun in the construction projects as reported by various investigators.

### 3. Cost overrun in construction industries in developing countries

The Construction industry is one of the major industries assisting impressively to the growth of the socio-economic development of a nation, especially in the developing countries. A construction project is a time-bound, high value and special construction mission of creating a construction service with the predetermined performance objectives defined in terms of quality specification, completion time, budgeted cost and other specified constraints (Chitkara, 2011). Poor cost performance in construction project was found to be a common problem around the world resulting in significant amount of cost overrun (Avotos, 1983).

The problem of cost overruns in the construction industry is all over the world though it is a serious issue in developing countries. Numbers of studies have also been conducted to investigate the construction cost escalation in many developing countries. It appears that the problems are sometimes attributed to the poor practice of project management, economic factors, and natural environmental conditions. Therefore, we might think that the construction cost overruns are amplified by the number of causes that provoke them.

### 4. Identification of the causes of cost overruns

Cost overruns in construction projects are results of many causes. Each cause has different rate of impact on the project cost at the project completion. This is a global problem as the construction industries worldwide often exceed the expected budget.

Numerous studies have outlined the issues of cost performance of the construction projects. There have been many researches in identifying the factors that affect the cost performance in the construction. Chan et al. (1997) reported that majority of the cost overruns mostly occurred during the construction phase in which many unforeseen factors are conceived over the conception design stages. A number of factors are responsible for the recent construction cost overrun. The most prevailing issues are increasing in material cost, major natural disasters, high volume of construction work, bid market disruptions and the regulatory climate. They further reported that upcoming issues which will increase cost are the shortage of labor as more and more skilled worker are retiring without new workers to replace them (Morris et al. 2006).

**Table -1:** Main effects of cost overrun in construction projects (Ibrahim, 2013)

Investigators	Year	Effect of cost overruns in construction projects				
		Less profit to client	Less profit to client	Less profit to client	Less profit to client	Less profit to client
Arditi et al.	1985			⊗		
Charoengam and Sriprasert	2001					⊗
Ahmed et al.	2003			⊗	⊗	
Mbahu et al.	2004	⊗	⊗	⊗	⊗	
Zainudeen et al.	2008		⊗	⊗		
Nega	2008	⊗	⊗	⊗	⊗	

The main factors causing cost overrun during construction stage of construction projects are poor planning, financial difficulties faced by the contractors, increasing of labor salaries, changes in client requirements, fluctuation of material prices, incomplete design drawings and specifications at the tendering stage, scheduling and monitoring, fluctuation of plant and machineries cost and lack of coordination among the management team (Jamaludin et al.2014).

In the past several decades, construction industries of many countries faced the issue of cost overrun though it is commonly acknowledged that the causes are subjected to more debate. There are various studies indicating the causes of cost overrun in many developing countries which have been discussed in the following subsections.

Frimpong et al. (2003) presented that the magnitude of the cost overruns vary depending on the size, location and the type of the project and the overruns were reported to be more frequent in large projects than small projects. Azhar (2008) mentioned that the medium sized firms are more prone to cost overruns in comparison to large and small firms as the main reason for this being that they are in the transitional phase and they need to take more risk to get more business and establish them. As reported by Eden et al. (2005) that there is more information that shows cost overrun mostly occurred in public projects but it does not mean that there are no cost overruns in the private sectors. In fact, many researchers found that projects of private sector tend to have larger cost overruns.

#### 4.1 Indian construction industry

The construction industry in India is one of the key economic industries and an important indicator of the development as it creates investment opportunities and is the main motivating force in Indian national economy. (Patil et al.2016). The industry is segmented with a fistful of major companies involved in the construction activities, mainly medium-sized companies specializing in activities and small and medium contractors who work as sub-contractor and carry out the work in the field.

In India, construction industry has suffered ever since last decade, recent events in the region coupled with the restructuring of economies, attracting foreign investment are expected to yield an unprecedented growth in the construction activities (Shanmugapriya et al. 2013) hence, improving construction efficiency by means of cost impressiveness and timeliness would definitely contribute to the cost savings for the country. They further reported that cost overruns on construction projects of India are considerable. Few projects get delivered on right cost but most of them lead to cost overruns. However, the major causes and magnitude behind these overruns remain understudied. Table 2 shows investigations that found out the causes and factors that lead to cost overrun in the construction industry of India.

**Table -2:** Causes of the cost overrun in Indian construction projects

Investigator	Year	Important causes of cost overrun
Iyer and Jha	2005	<ul style="list-style-type: none"> <li>▪ conflict among project participants</li> <li>▪ ignorance and lack of knowledge</li> <li>▪ presence of poor project specific attributes and non-existence of cooperation</li> <li>▪ hostile socioeconomic and climatic conditions</li> <li>▪ reluctance in timely decision</li> <li>▪ aggressive competition at tender stage and</li> </ul>

		short bid preparation time
Chitkara	2011	<ul style="list-style-type: none"> <li>▪ poor planning for implementation</li> <li>▪ Inadequate project formulation</li> <li>▪ Lack of proper contract planning and management</li> <li>▪ Lack of project management during execution</li> </ul>
Saraf	2013	<ul style="list-style-type: none"> <li>▪ improper planning</li> <li>▪ improper designing</li> <li>▪ site management decision making</li> <li>▪ construction methods</li> <li>▪ shortage of labour and technical personnel</li> <li>▪ construction mistakes and defective work</li> <li>▪ quality and shortage of materials and productivity</li> </ul>
Subramani et al.	2014	<ul style="list-style-type: none"> <li>▪ slow decision making</li> <li>▪ Poor design/delay in providing design</li> </ul>
Tejale et al.	2015	<ul style="list-style-type: none"> <li>▪ material shortage</li> <li>▪ shortage of labor</li> <li>▪ unavailability of competent staff</li> <li>▪ late delivery of materials and equipment</li> <li>▪ low productivity level of labour and Quality of equipment and raw material</li> </ul>
NaveenKumar	2016	<ul style="list-style-type: none"> <li>▪ delay in preliminary handing over of project</li> <li>▪ wrong/inappropriate choice of site</li> <li>▪ inadequate project preparation</li> <li>▪ increment of material prices</li> <li>▪ resources constraint</li> <li>▪ unpredictable weather conditions</li> <li>▪ fluctuations in the cost of materials</li> <li>▪ equipment allocation problems</li> <li>▪ lack of cost reports</li> <li>▪ design changes</li> </ul>
Patil and Pankaj	2016	<ul style="list-style-type: none"> <li>▪ high transportation cost</li> <li>▪ change in material specification</li> <li>▪ escalation of material price</li> <li>▪ frequent breakdown of construction plants and equipment's, and rework</li> </ul>

#### 4.2 Nigerian construction industry

Nigerian's construction industry is of paramount importance for economic growth and employment (Ogunsemi et al. 2006). The construction industry has outgrown all other sectors of the economy. Several opportunities exist including education, the ICT and subcontracting sectors. However, its contribution to the national GDP and employment of labor are quite low. Despite its considerable performance, the industry faces a significant number of challenges as almost all the projects are completed after duration much longer than initially planned and estimated cost (Mbachu et al. 1999). The common problems including the lack of locally available skilled labor, the unavailability of materials, power shortage, and the unethical practices are very common in the industry.

Several attempts by researchers to tackle the causes of cost overrun and remedy in construction projects Yielded sufficient positive results. Table 3 shows the various causes affecting the cost overruns in construction projects in Nigeria

**Table -3:** Main causes of the cost overrun in construction projects in Nigeria

Investigators	Year	Important causes of cost overrun
Okpala and Aniekwu	1988	<ul style="list-style-type: none"> <li>▪ price fluctuations in material</li> <li>▪ lapses in the management of human and material resources</li> <li>▪ shortage of materials</li> <li>▪ methods of financing</li> <li>▪ payments for completed works</li> <li>▪ poor contract management</li> </ul>
Elinwa and Buba	1993	<ul style="list-style-type: none"> <li>▪ cost of materials</li> <li>▪ fraudulent practices and kickbacks</li> <li>▪ fluctuation of prices of materials</li> </ul>
Sunday et al.	2012	<ul style="list-style-type: none"> <li>▪ inflationary increase in material cost,</li> <li>▪ inaccurate materials estimation</li> <li>▪ underestimating of project costs</li> <li>▪ increase in project scope among others</li> </ul>
Ameh et al.	2010	<ul style="list-style-type: none"> <li>▪ lack of experience of contractors</li> <li>▪ cost of material</li> <li>▪ fluctuation in the prices of materials</li> <li>▪ frequent design changes</li> <li>▪ economic stability</li> <li>▪ high interest rates charged by banks on loans</li> <li>▪ mode of financing, bonds and payments</li> <li>▪ fraudulent practices and kickbacks</li> </ul>
Kasimu	2012	<ul style="list-style-type: none"> <li>▪ materials price fluctuation &amp; insufficient time</li> <li>▪ lack works</li> </ul>

### 4.3 Indonesian construction industry

The construction industry in Indonesia plays an important role to its national economy and meeting the need of the nations. However, its competitiveness is considered low due to the lack of the success of its development strategies and policy. It is an essential contributor to the process of development efforts and improved living standards are established (World Bank, 1984).

The significance of the construction industry to the economy can be measured by its contribution to the investments, its gross domestic product GDP and an amount of manpower employed (Hillebrandt, 1988). The construction industry has not yet been capable of providing dependable support of the national economy. Many studies have been carried out and revealed the factors and the

causes of cost overrun in construction projects in Indonesia as shown in Table 4.

**Table -4:** Main causes of the cost overrun in construction projects in Indonesia

Investigator	Year	Important causes of cost overrun
Kaming et al.	1997	<ul style="list-style-type: none"> <li>▪ Material cost increase due to inflation</li> <li>▪ inaccurate material estimation</li> <li>▪ degree of complexity</li> </ul>
Kaming et al.	2006	<ul style="list-style-type: none"> <li>▪ Inflationary increases in materials cost</li> <li>▪ inaccurate material estimating</li> <li>▪ project complexity</li> </ul>
Rauzana	2016	<ul style="list-style-type: none"> <li>▪ estimated costs</li> <li>▪ Implementation and working relationships</li> <li>▪ project documents</li> </ul>

### 4.4 Construction industry in Saudi Arabia

Saudi Arabia is the largest exporter of oil in the world. Therefore the Saudi Arabia economy is constantly on the rise and the construction sector has experienced a construction growth during the past three decades as a result attracting construction professionals from all over the world. The construction industry value is estimated to be USD 84 billion in 2016 and is expected to grow at a compound annual growth rate of 7.8% to 2019. Due to the large pipeline of infrastructure projects, the construction sector is expected to contribute to 6.5% of the total gross domestic product (GDP) in 2016 and will account for 7.5% of GDP by 2020(Jeddah chamber, 2016). Despite wide facilities, the cost and time performance is considered to be one of the most serious and frequent problems in the Saudi Arabian construction industry (Faridi et al., 2006). Almost 30% of construction projects were completed within the specified schedule and estimated cost (Assaf et al., 2006). Many studies were conducted to examine the causes of cost overrun in the construction projects in this country since last decade. Table 5 presents the important causes leading to the cost overrun in the construction projects in Saudi Arabia.

**Table-5:** Main causes of the cost overrun in construction projects of Saudi Arabia

Investigator	Year	Important causes of cost overrun
Al-khalidi	1990	<ul style="list-style-type: none"> <li>▪ previous experience in contracts payments</li> <li>▪ availability of management finance and plans</li> <li>▪ type and size of contract and its content and project location</li> <li>▪ previous experience of contract type</li> </ul>

		<ul style="list-style-type: none"> <li>▪ size of contract</li> <li>▪ payments</li> <li>▪ project location</li> <li>▪ contract period</li> </ul>
Al-Juwairah	1997	<ul style="list-style-type: none"> <li>▪ cost materials</li> <li>▪ incorrect planning</li> <li>▪ contract management</li> <li>▪ wrong estimation method</li> <li>▪ previous experience in contract</li> </ul>
Al-Gwaiz et al.	2006	<ul style="list-style-type: none"> <li>▪ changes in design and duration</li> <li>▪ site disputes</li> <li>▪ work experience</li> </ul>
Alghonamy	2015	<ul style="list-style-type: none"> <li>▪ bid award for lowest price</li> <li>▪ frequent changes in design</li> <li>▪ improper planning</li> <li>▪ long period between design and time of implementation</li> <li>▪ payments delay</li> </ul>

		<ul style="list-style-type: none"> <li>▪ delay in decision by employer</li> <li>▪ design errors and changes</li> <li>▪ inaccurate estimation relocation of services and utilities.</li> </ul>
Azhar et al.	2008	<ul style="list-style-type: none"> <li>▪ fluctuation in prices of raw materials</li> <li>▪ unstable cost of manufactured materials</li> <li>▪ high cost of machineries</li> <li>▪ lowest bidding procurement method</li> <li>▪ poor project ( site ) management/poor cost control</li> <li>▪ long period between design and time of bedding/tendering, Wrong method of cost estimation</li> <li>▪ additional work</li> <li>▪ improper planning</li> <li>▪ inappropriate government policies</li> </ul>

#### 4.5 Construction industry in Pakistan

The construction industry is an important sectors in Pakistan and one of the largest sector that generate employment within the country as well as a key driver for the economic development of the country. However, the growth in this sector is critical for the growth in national income and is facing critical project management related issues of which cost overrun is quite noticeable (Azhar et al., 2008). Almost every project in the local industry is facing cost overruns when executed. The majority of the cost overrun factors 88% in construction industry lie in the medium severity impact range and the minimum range of cost overrun estimated in percentage is at least 10 % (Azhar et al., 2008).

There are several factors that are responsible for cost overruns in the construction industry. Attention should be paid to various factors as they cause additional cost in the project than initially estimated. Macroeconomic factors that affect the cost of the construction project are most severely. Table 6 shows the most important factors causing cost overrun in Pakistan’s construction industry.

**Table -6:** Important causes of the cost overrun in Pakistan’s construction industry

Investigator	Year	Important causes of cost overrun
Choudhry et al.	2012	<ul style="list-style-type: none"> <li>▪ inappropriate government policies and priorities</li> <li>▪ improper planning</li> <li>▪ price escalation on major construction materials and / or price adjustment</li> <li>▪ land acquisition and resettlement</li> <li>▪ inconsistent cash flows</li> </ul>

#### 4.6 Malaysian construction industry

The Malaysian construction sector directly contributed to €953 billion to Malaysia’s Gross Domestic Product as of 2013 (Yuling, 2014). Malaysia is actively working towards achieving a high-income status by 2020. Among the major economic sectors, the importance of the construction industry is unique. The Malaysian construction market is highly competitive. Most of the leading players are architects, contractors, and material suppliers. The industry is classified into four sectors namely, residential and nonresidential buildings, civil and special trade sectors. The spending on construction was €1294 billion as of 2012 and is expected to grow by 4,5% per annum. (Olanrewaju, 2015).

In a study conducted by ( Memon et al. ,2012) to the cost overrun is seen as a problem in construction projects in Southern and central Regions of the Peninsular Malaysia and reported the normal range of cost overrun as 5-10% followed by 10-15% of cost overrun as agreed by 38 (27%) respondents.

Cost overruns are distributed across seven class ranges, from 0% to more than 30.1% . There were several reasons for Projects which were completed below contract sum including design changes, reduction of work at client request, increased efficiency. The overall study showed a mean percentage overrun of 2% and it was observed to be 11.7% among positive overrun in the projects (Shehu et al., 2014). Many studies have highlighted the causes of cost overrun in the construction projects. Table 7 shows important causes of cost overrun in the construction industry in Malaysia.

**Table- 7:** Important causes of the cost overrun in construction projects of Malaysia

Investigator	Year	Important causes of cost overrun
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Investigators	Year	Important causes of cost overrun
Memon et al.	2010	<ul style="list-style-type: none"> <li>Cash flow and financial difficulties faced by contractors</li> <li>Contractor's poor site management and supervision</li> <li>Inadequate contractor experience</li> <li>Shortage of site workers</li> <li>Incorrect planning and scheduling by contractor</li> </ul>
Abdul-Azis et al.	2013	<ul style="list-style-type: none"> <li>contractor's site management</li> <li>information and communication</li> </ul>
Abdul Rahman et al.	2013	<ul style="list-style-type: none"> <li>fluctuation of prices of material</li> <li>cash flow and financial difficulties faced by contractors</li> <li>poor site management and supervision</li> </ul>

#### 4.7 Ethiopian construction industry

The construction sector is one of the most important contributors to the political, economic, social and technological development of Ethiopia (Turkey, 2011). About 50% of the federal capital budget is routed to the development of physical infrastructure (Jennifer, 2009). The Major activity is ongoing throughout the nation, in both infrastructure and residential sectors. It is not just the residential or infrastructure sectors that are powering construction boom, commercial construction activity is also playing important role in changing the face of the Ethiopian building industry. There is increased capital investment in the field, as well as, promote more advanced construction technologies and materials. An academic study on 24 projects Showed that 80% of the projects were experiencing the cost overrun in Ethiopia (Jennifer, 2009). More than 80% of the construction projects are run over budget and delayed (Thillai, 2013). Furthermore, the industry still largely relies upon labor intensive on-site activities. Table 8 shows the important factors leading to cost overrun in the construction industry in Ethiopia.

**Table-8:** Main causes of the cost overrun in construction projects in Ethiopia

Investigators	Year	Important causes of cost overrun
Nega	2008	<ul style="list-style-type: none"> <li>inflation or increase in the cost of construction material</li> <li>lack of planning and co-ordination</li> <li>fluctuations in the cost of labour</li> <li>insufficient geotechnical investigation</li> <li>additional costs due to variations work</li> <li>change in foreign exchange rate</li> <li>change orders</li> <li>costs due to special risks</li> <li>delay of drawings</li> <li>changes in plans and drawings</li> </ul>
Belachew et al.	2017	<ul style="list-style-type: none"> <li>material price fluctuation</li> <li>cost underestimation</li> <li>delay in supply of raw materials and</li> </ul>

Investigators	Year	Important causes of cost overrun
		<ul style="list-style-type: none"> <li>equipment</li> <li>inadequate review and contract documents</li> <li>lack of coordination at design phase</li> <li>lack of cost planning/monitoring during pre- and post-contract stages</li> <li>inaccurate evaluation of project time duration</li> <li>lack of experience of technical consultants</li> <li>Schedule delay and change</li> <li>inaccurate quantity take-off</li> </ul>

#### 4.8 Construction industry in Palestine

The construction industry is one of the largest and key economic sectors and the main force motivating the Palestinian national economy. It became one of the main mobilizers of the economy especially in terms of income and employment and, its contribution to the (GDP) gross domestic product.

The constructed facilities can be classified into four major categories: Commercial Building Construction, Residential Housing Construction, Institutional and Specialized Industrial Construction, and Infrastructure and Heavy Construction. The construction suffers from a number of factors that affect performances in the projects including time , cost and quality (Ibrahim et al., 2013) It is well known that most of the construction projects in Gaza Strip, palatine are exposed to cost and time overrun. The discrepancy between actual and estimated costs has average of 14.56%, ranging from 39.27% to 98.04 % which has affected the construction industry progress in Gaza Strip (Al-Najjar et al., 2008).Table 9 concludes important factors causing the cost overrun in the construction industry in Palestine.

**Table-9:** Main causes of the cost overrun in construction projects in Palestine

Investigators	Year	Important causes of cost overrun
Al-Najjar et al.	2008	<ul style="list-style-type: none"> <li>prices fluctuations of constructions</li> <li>contractor's delay of material delivery and equipment</li> <li>prices inflation.</li> </ul>
Enshassi et al.	2009	<ul style="list-style-type: none"> <li>increase in materials prices</li> <li>delay in construction</li> <li>supply of raw materials and equipment by contractors</li> <li>fluctuations in the cost of building materials.</li> <li>unsettlement of the local currency in relation to dollar value.</li> <li>project materials monopoly by some suppliers.</li> <li>resources constraint: funds and associated auxiliaries not ready</li> <li>lack of cost planning/monitoring during pre- and post-contract stages,</li> <li>improvements to standard drawings during construction stage</li> <li>design changes</li> </ul>

		<ul style="list-style-type: none"> <li>▪ inaccurate quantity take-off.</li> </ul>
Enshassi et al.	2010	<ul style="list-style-type: none"> <li>▪ increment of materials prices due to continuous border closures</li> <li>▪ delay in construction</li> <li>▪ supply of raw materials and equipment by contractors</li> <li>▪ fluctuations in the cost of building materials</li> <li>▪ unsettlement of the local currency in relation to dollar value</li> <li>▪ project materials monopoly by some suppliers</li> <li>▪ resources constraint</li> <li>▪ lack of cost planning/monitoring during pre-and post-contract stages,</li> <li>▪ improvements to standard drawings during construction stage and design changes, and inaccurate quantity take-off.</li> </ul>
Ibrahim et al.	2011	<ul style="list-style-type: none"> <li>▪ material price fluctuation</li> <li>▪ insufficient time for estimate</li> <li>▪ experience in contracts</li> <li>▪ size of contract</li> <li>▪ incomplete drawings</li> </ul>

		<ul style="list-style-type: none"> <li>▪ change orders by client during construction, and manpower shortage</li> </ul>
Ramabodu and Verster	2010	<ul style="list-style-type: none"> <li>▪ changes in scope of work on site</li> <li>▪ incomplete design at time of tender</li> <li>▪ contractual claims</li> <li>▪ lack of cost planning and monitoring of funds</li> <li>▪ delays in costing variations and additional works</li> </ul>

### 5. Conclusion

This study revealed that there are a number of factors that cause construction projects cost overruns. Fluctuations and increases in material price were found to be the most important problem which led to the construction cost overrun in the developing countries. It was also observed that all the factors are not similar to every project, although most of them are common to the projects in the developing countries such as poor management, inaccurate material estimates and financial status of the contractor. A considerable attention is required to build a policy so as to ensure the reduction in impacts of identified factors for infrastructure development in developing countries. The most important issue is the management of cost overrun and ignoring it will not decrease the purpose. The cost overrun was observed to be the major reason for the setback in the construction industry. In order to control and mitigate the cost overrun in building construction projects, Material prices and labor rates should be updated continuously. The quality of activities must be monitored ceaselessly by the consultant and quality professionals to set the required quality system in the different activities of the project so as to minimize and avoid any mistakes that may lead to rework of activities. The top management must react positively to the environmental and political changes by means of financial and managerial policies. The developing nations must come out with a few policies, rules and regulation to curb the cost overruns in construction projects in developing countries.

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### 4.9 South African construction industry

The construction industry plays a vital role in South Africa's national economy. It is a significant contributor to economic growth of the country (Windapo, 2013). Although the outlook for the South African construction industry is promising still there are many factors that may strongly affect the predicated growth. (Milford, 2010; Boshoff, 2010).

The common key risks identified in the industry are risks to expansion and growth of the industry, loss of key skills and expertise, health, safety and environmental sustainability; industrial unrest, project execution; transformation; tender risks and compliance with the laws and regulations. Also, Cost and time overruns are the most considerable problems faced by the industry and have negative effect on the construction industry. Many studies have been carried out and revealed the causes of these overrun. Table 10 shows the causes of cost overrun in different construction projects in South Africa.

**Table-10:** Main causes of the cost overrun in construction projects in South Africa

Investigator	Year	Overall Important causes of cost overrun
Baloyi, and Bekker	2011	<ul style="list-style-type: none"> <li>▪ increase in material cost</li> <li>▪ inaccurate material estimates</li> <li>▪ shortage of skilled labour</li> <li>▪ clients late contract award</li> <li>▪ project complexity</li> <li>▪ increase in labour cost</li> <li>▪ inaccurate quantity take-off</li> <li>▪ difference between selected bid and the consultant’s estimate</li> </ul>

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