

# Cost escalation and schedule delays in road construction projects in Zambia

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## Abstract

The wealth of any nation is gauged by its performance in infrastructure provision through its construction industry. The construction industry is large, volatile, and requires tremendous capital outlays. For developing economies, road construction constitutes a major component of the construction industry. This means that much of the national budget on infrastructure development is channelled to road construction projects. The aim of the study reported in this paper was to identify causes and effects of cost escalation and schedule delays in road construction projects. Using a detailed literature review, structured interviews and questionnaire surveys, the results of the study confirmed the prevalence of cost escalation and schedule delays in road construction projects in Zambia. The study established that bad or inclement weather due to heavy rains and floods, scope changes, environmental protection and mitigation costs, schedule delay, strikes, technical challenges, inflation and local government pressures were the major causes of cost escalation in Zambia's road construction projects. On the other hand, delayed payments, financial processes and difficulties on the part of contractors and clients, contract modification, economic problems, materials procurement, changes in drawings, staffing problems, equipment unavailability, poor supervision, construction mistakes, poor coordination on site, changes in specifications and labour disputes and strikes were found to be the major causes of schedule delays in road construction projects. Appropriate project management practices are thus required to curb the causes and effects of cost escalation and schedule delays in road construction projects.

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## 1. Introduction

Cost and schedule overruns can occur due to a wide range of causes on various types of projects. If project costs or schedules exceed their planned targets, client satisfaction would be compromised. The funding profile would no longer match the budget requirement and further slippage in schedule could result. The resulting effects would be detrimental especially in the case of developing countries whose wealth measure is greatly dependant on their performance in infrastructure provision through the construction industry, especially on road construction projects which constitute a major component of the industry.

According to Ahmed et al. [1], delays on construction projects are a universal phenomenon and road construction projects are no exception. They are usually accompanied by cost overruns. These have a debilitating effect on clients, contractors, and consultants in terms of growth in adversarial relationships, mistrust, litigation, arbitration, cash-flow problems, and a general feeling of trepidation towards each other [1]. This problem is not unique to developed countries but is also experienced in most of the developing economies too. The Hindu [26], an e-paper, carried an article that indicated that construction projects in India were prone to delays and cost escalation, causing contractors to back out of the some projects.

Major causes and effects of cost escalation and schedule delays on road construction projects in Zambia are outlined.

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In the bid to improve the economy, the Government of Zambia has over the past years spent a lot of resources on road construction projects. For example, US\$ 118.7 million was spent on road projects in 2005, US\$ 227 million in 2006 and US\$197 million in 2007 [9–11]. However, many road projects were rarely completed within the planned time and cost as can be seen in Table 1, leading to loss of revenue due to cost escalation and schedule delays. As a result of its overriding importance for both the client in terms of performance and the contractor in terms of money, time is the source of frequent disputes and claims leading to lawsuits [1], leading to more expenses and revenue losses by the parties involved.

## 2. Cost escalation

Cost escalation refers to the increase in the amount of money required to construct a road project over and above the original budgeted amount. In the India Infrastructure Report, Datta [5] described cost escalation as a ubiquitous problem in government projects. Cost escalation occurs when actual costs exceed previously estimated values [16].

Schexnayder et al. [25] and Merewitz [18] endeavoured to find some of the reasons that lead to cost escalation and categorized them into two broad groups: uncontrollable and controllable factors.

In a study to identify factors that cause inaccuracies in cost estimates of highway projects, the Government

Accountability Office [8], found that 77% of highway projects in the USA experienced cost escalation. Flyvbjerg et al. [7] also concluded that nine out of every ten construction projects experienced cost escalation. Most of the cost escalation is said to occur before construction begins. Among the many factors identified, GAO/RCED [8] specifically noted three:

- initial estimates were preliminary and not designed to be reliable predictors of project costs;
- initial estimates were modified to reflect more detailed plans and specifications as a project is designed; and
- a project's costs were affected by among other things, inflation and changes in scope to accommodate economic considerations that occurs over time as a project is designed and built.

Other studies [5,17–21,25] identified cost escalation to be a result of problems such as delay in land acquisition, unexpected problems in supply of raw materials, illegal encroachment on land even during project implementation, or due to internal problems in government organisations. It has further been noted that delays between the planning stage and actual implementation of especially large infrastructure projects is an ubiquitous problem resulting in cost escalation and failure to meet the demands as the construction completion horizon is reached even before the completion of the project [5].

Table 1  
Performance of selected projects in Zambia

	Name of project	Start date	Original finish date	Revised finish date	Original contract sum (US \$' million)	Final contract sum (US \$' million)	Remarks
1	Nyimba-Katete	October 2003	October 2004	July 2005	4.90	5.88	Beyond budget, beyond schedule
2	Lusaka-Mongu	January 2003	July 2005	On-going	24.25	25.33	Beyond budget, beyond schedule
3	Kasama-Luwingu	October 2001	November 2003	Nil	35.00		Beyond schedule
4	Mpika-Kasama	June 2001	December 2002	Nil	2.38		Beyond schedule
5	Mpika-Muwele	June 2001	December 2001	Nil	1.30		Failure to commence
6	Kashikishi-Lunchinda	June 2001	January 2003	Nil	37.50		Incomplete work
7	Chambeshi-Chinkobo	February 2001	August 2001	Nil	1.35		Failure to commence
8	Isoka-Muyombe	December 2000	March 2002	August 2002	4.00	5.50	Beyond budget, beyond schedule
9	Chinsali-Nakonde	April 1999	July 2000	November 2000	2.00	2.00	Beyond schedule
10	Mpika-Chinsali	March 1999	March 2000	November 2000	1.95	1.95	Beyond schedule
11	Mutanda-Kasempa	February 1997	February 1999	December 2000	3.84	6.45	Beyond budget, beyond schedule
12	Choma-Namwala	November 1994	February 1998	Nil	2.50	8.60	Beyond budget, incomplete work
13	Luanshya-Mpongwe	November 1994	January 1997	December 2001	2.53	3.63	Beyond budget, beyond schedule

Source: Projects progress report [23] and projects progress report [24].

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