



EFFECT OF EXTERNAL FACTORS ON COMPLETION OF CONSTRUCTION PROJECTS IN KENYA: A CASE STUDY OF THE DEPARTMENT OF HEALTH, MAKUENI COUNTY, KENYA

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ABSTRACT

The completion of construction projects is dependent on a project cycle that is seamless to ensure reliability. External factors in the study included political factors, socio-economic factors and technological factors. The objectives were the effect of political, socio-economic and technological factors on the completion of construction projects in the department of health, Makueni County, Kenya. The theoretical framework included the theory of constraints and the resource dependency theory. The target population was the 238 projects in health facilities in Makueni county initiated between financial year 2021/2022 and 2022/2023. The respondents were the facility managers who are also the Health Facility Project Management Committee secretaries. Cross sectional Descriptive study approach was utilized in this study. A stratified sampling approach was used. The sample size was 150 projects. Primary data was gathered using a structured questionnaire. Chi-square test was used to determine association between variables. Multivariate logistic regression analysis was used to determine the effect of significant external factors on completion of construction projects. Statistical significance was assumed at $P < 0.05$. Majority of the study participants were aged between 31.0 and 40.0 years old (56.0%), were nurses (77.3%), had managed their facility for over 5 years (74.7%) and were working in a Dispensary (77.3%). The male and female participant ratio was 1:1. There was less likelihood of the projects being completed in the presence of political involvement, transition in leadership, and contract payment (OR 0.1, 0.7 and 0.3 respectively). Political involvement and contract payment were found to be statistically significant when it came to project not being completed ($p < 0.001$ and $p < 0.004$ respectively). Raw material availability was significantly associated with completion of projects ($p < 0.03$). Multivariate analysis showed increased odds of completing construction projects from 2.7 to 5.3 times when raw materials were available. The study concluded that political factors and socio-economic factors significantly affect completion of construction projects. The study recommends that key stakeholders involved in the construction management process such as politicians be taken through monitoring and evaluation training to ensure that projects are well management and all risks averted. The researcher recommends a comparative study on the effect of technological factors on completion of construction projects.

Keywords: Health Facility, Project, External, Political, Socio-economic, Technological

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INTRODUCTION

Globally, the history of construction is difficult to back date since construction has evolved over time. Construction may have involved pit houses or even shelters at the onset. Humans manipulated environments to attain sanctuary from the elements. Temporary domiciles were mainly man made tents and windbreaks(Alameri et al., 2021). Globally, political factors have been shown to be key influencers of project completion. Political interference, leadership transitions and delays in contract payments can have negative depending on the political interest at any given time. Chang (2018). Transitions in leadership and timeliness of payments of contracts were identified as significant challenges to project completion in several construction projects in Sub Saharan Africa (Beyene, 2023). Studies have been done in Kenya on the influence of politics on construction. Moses et al. (2019) stated that lack of political goodwill will have a proportionate impact on the completion of construction projects. The Kenyan elections are infamous for stalling of projects. A case in mind is the road construction projects that remain unfinished any time the elections happen (Moses et al., 2021).

Globally, socio economic factors describe the aspects of livelihood within a given population. Socio economic factors need to be optimum for a construction project to be completed as per the project plan. Community participation is essential to the success of construction projects. The building of hospitals and schools is essentially a community led need(Bucăța & Rizescu, 2019). Khahro et al. (2023) illustrated that lack of skilled labor and resources were key social factors having an impact on construction completion in Pakistan. Moreover, poverty was a contributing factor to stalling of projects. The study identified key challenges facing construction in the developing world (Khahro et al., 2023). Erick et al. (2019) through a study done at the Kenya National Highways authority (KNHA) revealed that projects that had adequate resources

and skilled manpower were more likely to be completed (Erick et al.,2019).

Globally, technology and automation are emerging necessities of the modern construction industry. Studies done in America and Japan demonstrated that the use for technology in the project design is essential. Internet connectivity is essential for any modern project (Chen et., 2020). Mavetera et al. (2019) illustrated that the use of digital technology is taking root in the South African economy particularly in government projects in the construction sector. The South African context demonstrates the key influence that technology can have in the developing world particularly where the government provides a reliable environment for projects (Mavetera et al.,2019). Olembo et al. (2019) demonstrated that projects without IT investments do not have adequate risk protection. It is essential for construction projects, particularly those that serve the public, have internet connectivity and support(Olembo, 2019).

Statement of the problem

Globally, Project delays and lack of completion have had a negative impact on the delivery of health care services (Vasugi et al., 2018). Sub Saharan Africa has been severely affected by service delays particularly in essential services whenever projects stall or fail to take off (Gashaahun, 2020). Many studies have been done on organizational factors hindering completion of construction projects while the role of external factors remains largely unverified (Moses et al., 2021). Makueni County has faced challenges in completion of projects in the health department. The department has streamlined the organizational factors including having a project management committee and ensuring the committee follows up the project from inception to completion. Unfortunately, many projects remain uncompleted long after the projected deadlines. It is against this background that this study sought to establish the effect of external factors on completion of construction projects in the department of Health, Makueni County.

Study Objectives

The objectives of this study were as follows:

- To assess the effect of political factors on completion of construction projects at the department of health, Makueni County, Kenya.
- To determine the effect of socio-economic factors on completion of construction projects at the department of health, Makueni County, Kenya.
- To establish the effect of technology on construction projects at the department of health, Makueni County, Kenya.

This study tested the following hypothesis:

- **H₀₁**. There is no significant relationship between political factors and completion of construction projects at the department of health, Makueni County, Kenya.
- **H₀₂**. There is no significant relationship between socio-economic factors and completion of construction projects at the department of health, Makueni County, Kenya.
- **H₀₃**. There is no significant relationship between technology and completion of construction projects at the department of health, Makueni County, Kenya.

LITERATURE REVIEW

Theoretical Literature

Theory of constraints

Eliyahu Goldratt was the originator of the Theory of Constraints (TOC) through the 1984 novel, "The Goal". It is now widely referenced in project management. It identifies the limiting factor also called the constraint that impedes achieving a goal. Thereafter, it implies that overcoming the constraint means that it is no longer the limiting factor. The constraint can also be referred to as bottlenecks. The Theory hypothesizes that every system in complexity, including the construction process has multiple linked activities some acting as constraints upon the entire system. The relevance to this study is that the external project factors,

namely political, socio economic and technological can act as bottlenecks to the entire construction process. The Theory of Constraints in this regard means that overcoming these powerful forces as barriers will inevitably improve the entire construction process and assist the project manager achieve the overall goal(Rota et al., 2021).

This theory was expected to demonstrate to what extent political factors including political involvement, contract payments and transitions in power affect completion of construction projects. This theory also assessed the extent to which socio-economic factors like availability of skilled labor and raw materials affect completion of construction projects.

Resource Dependence Theory

According to Pfeffer and Salancik (1978), the resource dependence theory explains how the behavior of organizations is affected by the external resources in possession. These organizations transform and negotiate with the external environment so as to acquire sufficient resources to exist and flourish. The theory heavily depends on transactions with other players and establishments within the external environment so as to acquire resources. The only catch in this relationship is overreliance on the external environment. This theory rightfully fit in this study since the construction projects rely on a reliable external environment for completion. The presence of political goodwill means a project will progress unhinged. The availability of technological support means a project will meet quality and time requirements. The resources availed by a conducive external environment promote the success and efficiency of the project overall, Resources that are scarce delay the completion of construction projects. Strategies including political lobbying by the community increase the organization's portfolio and support, strengthening and developing links to other partners(Akram & Abrar Ul Haq, 2022).

This theory assessed the extent to which socio-economic factors including raw material availability

and skilled labor availability influence completion of construction projects. The theory was also rightfully assessed by the link between technological factors including internet connectivity and completion of construction projects.

Empirical Literature

Effect of political factors on completion of construction projects

Beyene (2023) conducted a study analyzing the impact of political factors on completion of construction project in Addis Ababa, Ethiopia. The study entailed a survey of 11 respondents who practiced actively in the construction industry. Changes in leadership during elections were a significant factor. Lack of continuity after elections meant that white elephant projects remained unfinished. Delay in payment of contracts to stalling of major construction projects including hospitals and schools. Transitions in leadership and timeliness of payments of contracts were identified as significant challenges to project completion in several construction projects (Beyene, 2023).

Moses et al (2019) conducted a study to analyze the effect of micro and macro environment on implementation of relevant partnerships in the construction industry in Kenya. The study evaluated the political surroundings and the skill level within the public sector. The study was a descriptive cross-sectional survey. The population entailed three public private partnerships in the country. A sample size of 31 projects was derived by use of a sample frame. Studies have been done in Kenya on the influence of politics on construction. The study determined that lack of political goodwill will have a proportionate impact on the completion of construction projects. The Kenyan elections are infamous for stalling of projects. County governments have been blamed for poor planning and eventual stalling of construction projects countrywide. Allocation of tenders to cronies by politicians has been a thorn in the flesh of many. Delay in payment of contracts is a common challenge in the Counties with many projects

including those in Health being affected (Moses et al., 2021).

Khahro (2023) conducted a study assessing the extent to which socio-economic factors affect the completion of construction projects in Pakistan. A sample of 29 expert respondents was obtained. Project managers and consultants involved in major projects were interviewed. Khahro et al. (2023) illustrated that lack of skilled labor and resources were key social factors having an impact on construction completion in Pakistan. Moreover, poverty was a contributing factor to stalling of projects. The study identified key challenges facing construction in the developing world (Khahro et al., 2023).

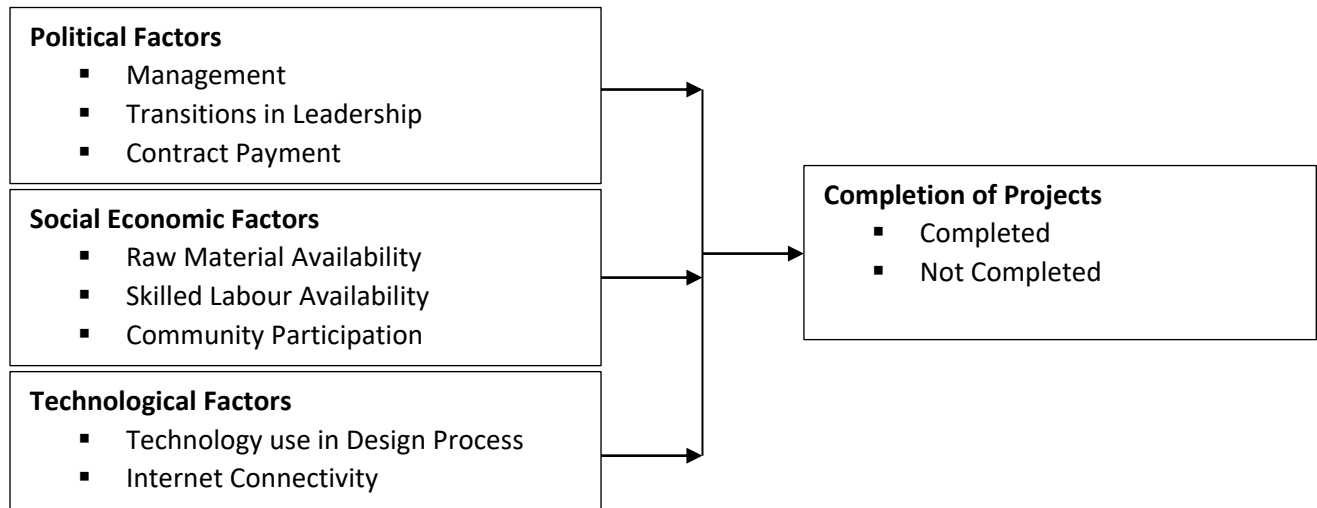
Mavetera (2019) conducted a study to assess the impact of socio-economic factors on the construction sector in South Africa. The study used both qualitative and quantitative approach. The role of skilled labor was found to have a positive impact on the completion of projects. The study recommended the need of adequate supervision by all relevant departments including public works (Mavetera et al., 2019).

Chen (2020) analyzed the impact of modern algorithms in construction projects in China. The study targeted large construction firms in the capital. Technology and automation are emerging necessities of the modern construction industry. The study demonstrated that the use for technology in the project design is essential. Internet connectivity is essential for any modern project. Social media is essential for construction companies as an advertisement and connecting tool (Chen et al., 2020).

Abeyasinghe (2022) analyzed the impact of technological factors on completion of construction projects in Sri Lanka. 39 factors were identified after interviewing 163 Civil Engineers. The engineers were identified after random sampling method. Skilled worker shortage was the main hindrance. Poor internet connectivity was also highlighted. Lack of use of technology in the design process was

a significant challenge. The need for capacity building and oversight, particularly on technology use in construction was highlighted (Abeysingye, 2022).

Conceptual framework



The independent variables in this study were political factors, socio economic factors, technological factors and environmental factors while the dependent variable was completion of project. The figure below shows the relationship between the four independent variables and the dependent variable.

Independent Variables

Dependent Variable

Figure 1: Conceptual Framework (Source: Journal of Construction and Project Management 2021)

METHODOLOGY

Cross sectional descriptive study approach was utilized in this study. This research was carried out at Makueni County, Kenya. Makueni County is located in the Eastern Part of Kenya. It borders several counties comprising of Machakos to the North, Kitui to the East, Taita Taveta to the South and Kajiado to the West. The study dwelt on construction projects at the health facilities including hospitals, health centres and dispensaries managed by a doctor, clinical officer or nurse respectively. The target population was all 238 projects conducted in the health facilities in Makueni county during financial years 2021/2022 and 2022/2023. This study used a stratified sampling method which divides a population into strata or subsets. It was appropriate for this study due to the geographical heterogeneity of the construction projects in Makueni.

$$n = \frac{N}{1 + Ne^2}$$

Where:

n is the desired size

N is the total population

e is the degree of accuracy given at 0.05 testing at 5% confidence level

$$n = \frac{238}{1 + 238 * 0.05 * 0.05} = 150 \text{ respondents}$$

FINDINGS AND DISCUSSION

Completion of construction projects

There were 150 projects that were assessed for their completion status, of which only 58 (38.7%) were completed, while 92 (61.3%) were incomplete. The results are as shown on Table 1.

Table 1: Completion of construction projects

Projects complete	Frequency, (n=150)	Percent
Yes	58	38.7
No	92	61.3

Political factors on completion of construction projects

Table 2 present the results of the assessment of these political factors.

The results indicate that there is less likelihood of the projects being completed if there is political

involvement, transition in leadership, and delay in contract payment (OR 0.1, 0.7 and 0.3 respectively). Political involvement and contract payment were found to be statistically significant when it came to projects not being completed (p 0.001 and p 0.004 respectively).

Table 2: Political factors on completion of construction projects

	Projects complete		OR (95% CI)	p-value
	Yes (n=58)	No (n=92)		
Political involvement, n (%)				
Yes	47 (81.0)	89 (96.7)	0.1 (0.04 – 0.5)	0.001
No	11 (19.0)	3 (3.3)	Reference	
Transition in Leadership, n (%)				
Yes	47 (81.0)	79 (85.9)	0.7 (0.3 – 1.7)	0.432
No	11 (19.0)	13 (14.1)	Reference	
Contract payment, n (%)				
Yes	40 (69.0)	81 (88.0)	0.3 (0.1 – 0.7)	0.004
No	18 (31.0)	11 (12.0)	Reference	

Socio-economic factors on completion of construction projects

This section assesses the effect of socio-economic factors on completion of construction projects at the department of health, Makueni County, Kenya. Table 3 presents the results of the assessment of these socio-economic factors.

The results indicate that the likelihood of projects being completed is 2.7 times more likely with the availability of raw materials. The other factors assessed were presence of skilled labor and community participation. Raw material availability was significantly associated with completion of projects p 0.03.

Table 3: Socio-economic factors on completion of construction projects

	Projects complete		OR (95% CI)	p-value
	Yes (n=58)	No (n=92)		
Raw materials availability, n (%)				
Yes	33 (56.9)	30 (32.6)	2.7 (1.4 – 5.4)	0.003
No	25 (43.1)	62 (67.4)	Reference	
Skilled labor availability, n (%)				
Yes	21 (36.2)	47 (51.1)	0.5 (0.3 – 1.1)	0.075
No	37 (63.8)	45 (48.9)	Reference	
Community participation, n (%)				
Yes	36 (62.1)	66 (71.1)	0.6 (0.3 – 1.3)	0.216
No	22 (37.9)	26 (28.3)	Reference	

Technological factors on completion of construction projects

Table 4 present the results of the assessment of these technological factors.

The results indicate that the likelihood of projects to be completed is 1.1 times more wherever there is internet connectivity. None of the

technological factors were statistically significant when it came to completion of projects. The results indicate that the likelihood of projects to be completed is 1.1 times more wherever there is internet connectivity. None of the technological factors were statistically significant when it came to completion of projects

Table 4: Technological factors on completion of construction projects

	Projects complete		OR (95% CI)	p-value
	Yes (n=58)	No (n=92)		
Adequate technology use, n (%)				
Yes	26 (48.1)	46 (50.0)	0.9 (0.5 – 1.8)	0.829
No	28 (51.9)	46 (50.0)	Reference	
Internet connectivity, n (%)				
Yes	31 (53.4)	46 (50.0)	1.1 (0.6 – 2.2)	0.681
No	27 (46.6)	46 (50.0)	Reference	

Multivariate analysis

Three factors were analyzed at the multivariate level. The two political factors included political involvement and contract payment. One socio-economic factor, that is raw material availability was statistically significant and was also analyzed. Technological factors were not statistically significant and they were not analyzed at this level. The three variables were subject to multivariate analysis with the use of Binary Logistic Regression.

The results indicated increased odds of completing construction projects from 2.7 to 5.3 times when raw materials were available. Analysis of political involvement demonstrated that the odds were more or comparatively similar (0.2). Analysis of contract payment the odds were less or comparatively still the same (0.2). Raw material availability and contract payments still remained statistically significant when it came to association with the completion of projects $p < 0.05$ as shown in table 5 below.

Table 5: Multivariate analysis of factors on completion of construction projects

	cOR (95% CI)	p-value	aOR (95% CI)	p-value
Raw materials availability, n (%)				
Yes	2.7 (1.4 – 5.4)	0.003	5.3 (2.3 – 12.2)	<0.001
No	Reference		Reference	
Political involvement, n (%)				
Yes	0.1 (0.04 – 0.5)	0.001	0.2 (0.1 – 1.1)	0.059
No	Reference		Reference	
Contract payment, n (%)				
Yes	0.3 (0.1 – 0.7)	0.004	0.2 (0.1 – 0.6)	0.006
No	Reference			

CONCLUSION AND RECOMMENDATIONS

The study concluded that external factors significantly affect completion of construction projects. This was key in the case of the department

of health, Makueni county. The study also concluded that political factors affect the completion of construction projects. The most significant political factors include delay in contract

payments and political involvement. The study concluded that socio-economic factors affect the completion of construction projects. The availability of raw materials is a significant factor when it comes to the completion of construction projects. The study concluded that technological factors do not significantly affect the completion of construction projects. However, this may be a contextual challenge with most facilities in the African context lacking technological access.

The study recommends that key stakeholders involved in the construction management process such as politicians be taken through monitoring and evaluation training to ensure that projects are well management and all risks averted. The study recommends that contractor are paid on time to ensure that projects do not stall or fail to complete. The study recommends that proper planning is done by the health facility project management

committees to ensure that raw materials are available on time. Proper planning should consider scope and cost of the project.

The study recommends that counties performance contracts should be achievable to ensure that all initiated projects are completed on time. The study recommends that the health facility project management committee should not be changed until the assigned project is completed.

Suggestion for further research

The researcher recommends further research on the effect of technological factors on completion of construction projects. The researcher recommends a comparative study between projects with access to technology and those without. This study will offer insight on this gap since it was not fully captured in this study.

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